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Contextual Votes:
The Behavioral Consequences of Voting by Mail

DISSERTATION

submitted in partial satisfaction of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

in Political Science

by

Steven James Linder

Dissertation Committee:
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Associate Professor Kamal Sadiq
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2023

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ABSTRACT OF THE DISSERTATION

Contextual Votes:
The Behavioral Consequences of Voting by Mail

By

Steven James Linder

Doctor of Philosophy in Political Science

University of California, Irvine, 2023

Professor Marek Kaminski, Chair

Existing research into the electoral consequences of mail ballots have almost entirely concentrated on their ability to improve voter turnout and attract a distinct user-base. However, the same features that are commonly identified as enabling mail ballots to manipulate voter participation, such as letting voters choose where and when they participate, should allow them to influence how voters directly perceive and evaluate alternatives as well. To fill this gap in the literature, I examine 109 California elections covering a 44-year period to determine if the increasing use of mail ballots over time had appreciably impacted two common electoral phenomena, incumbency advantages and primacy effects, known to be particularly sensitive to a voter's state of mind at the crucial moment when they make a decision. The results show that while voting by-mail has had zero impact on primacy effects, its rising use has progressively reduced the vote shares of incumbent candidates to where it almost entirely negates their arbitrary advantage over non-incumbents. This ultimately signifies that mail ballots are indeed changing voter behaviors in hereto unexpected ways, and does so enough to meaningfully impact the overall outcomes of elections.

CHAPTER 1

Uncertain Choices

Changing Behaviors through Service Implementation

Elections are a means to an end. They are a mechanism for allowing groups to reach

consensus when selecting a preferred candidate to fulfill a particular task or representative role.

Yet elections are also unique in that they act as a vital deliberative institution found throughout

all levels of societies across the world. As with any institution, the design of an election's

individual components determines both how it operates and the range of results it can produce. In

the case of elections, these constitute the numerous mutually supporting rules, materials, and

services that together enable them to act as a deliberative institution. These various features are

typically collectively referred to as electoral systems, and their essential foundational role in

enabling elections ensures that they are always a major influence on how these institutions

operate as a whole.

Despite their significance and ubiquity to public life, electoral systems are surprisingly

delicate and highly sensitive to change. Altering seemingly minor details such as the specific

formula used to count votes, or the number of contests included on a single ballot, can actually

have repercussions throughout the entire system and dramatically change the outcomes of

elections (Kaminski, 1999, Augenblick & Nicholson, 2016). This has made understanding how

the internal components of electoral systems operate and interact with each other a high priority

for both academics and political actors seeking to preserve, or improve, the integrity of these

systems. The results of these efforts over the last seventy years have been the development of an

imposing literary corpus dissecting nearly every conceivable aspect of electoral systems design.

Historically, the bulk of this expansive literature has focused on the overarching rules governing these systems due to their readily observable relationship to the conduct of elections and participating actors. However, advancements in data collection have since drawn increasing interest towards how the numerous components that actually enable elections to occur can also influence their overall conduct. While not often categorically distinguished as such within the literature, studies of these elements collectively show them to have consequential transformative effects on a system comparable to those of the rules governing them.

The interactive components of an electoral systems hold particular significance due to their uniquely intimate relationship with the voters participating in them. In order to participate in elections, voters must engage with the assorted materials and facilities that enable them to express their preferences and have them recorded within an electoral system. Research into these features has increasingly found that their design and the quality of their implementation has substantial influence over voters' access to information, perception of alternatives, and overall ability to participate (Bundy, 2003, Riley & Richey, 2011, Alvarez et al., 2013). In shaping the voter user-experience, these features are subsequently then capable of influencing the course of elections by subtly encouraging voters towards choosing some alternatives over others, or altering their desire to participate at all (Lau & Redlawsk, 2001). Among the numerous elements identified by researchers to have such an impact, one of the most influential has been found to be the ballot itself, which has led to it becoming a powerful tool for shaping voter behavior while participating.

Studies of ballot design have shown that many of the basic aesthetic and organizational decisions that go into the creation of a ballot have a disproportionate impact on how voters subsequently participate and evaluate alternatives (Wand et. al. 2001, Kimball & Kropf, 2005).

Some decisions, such as how alternatives are organized on the ballot and the order in which they are listed, can bias voters towards or against certain alternatives depending on their strategic placement relative to other choices (Shue & Luttmer, 2009). Others, like what descriptive information is given about candidates, or how exactly that information is presented, can be persuasive for uncertain voters or even provide the only substantive information a voter has about a contest (Matson & Fine, 2006, Bonneau & Cann, 2015). Even the instructions and procedures for marking a ballot can influence voter perceptions by making it more or less difficult for voters to make their intended choice in the first place (Wand et. al. 2001, Herrnson et al., 2012). By introducing or manipulating small systematic biases, the design of the ballot has been repeatedly demonstrated to fundamentally alter the progress of elections to a degree that makes it a particular concern for scholars and electoral engineers alike.

Alongside the immediate consequences from the design of the ballot itself, the methods used to then deliver ballots to voters has also received attention from scholars interested in learning how they may similarly affect voter behaviors. All elections must inherently offer some means for voters to acquire a ballot so that their preferences can be recorded and returned for tabulation. The organization of these processes, commonly identified as the voting methods of an electoral system, consequently have tremendous influence over the distribution of ballots, their accessibility to voters, and the amount of effort needed to participate. Unsurprisingly, research into the effects of voting methods has then shown them to be particularly influential over voter turnout, since by dictating how rigorous the process is to acquire a ballot, they subsequently alter the incentives for voters to participate and how often they do (Karp & Banducci 2000, Southwell & Burchett, 2000, Alvarez et al., 2013). Yet while the literature has repeatedly demonstrated voting methods to be highly impactful in facilitating voter participation, little work has been

done to explore their behavioral effects on voters in other areas despite their strong theoretical potential to modify the effects that the design of a ballot has on voters' evaluation and selection of alternatives.

Voters often enter into elections under a variety of external pressures and without a fully formed opinion for all of the contests they may encounter on their ballot (Bowler et al. 1992). Typically, voters resolve their information and dispositional problems by relying on heuristic cues that help contextualize alternatives and enable them to make decisions without having to meaningfully increase their time and effort spent on participating (Lau & Redlawsk, 2001, Shugart et al. 2005). These cues act as indicators that allow voters to infer the potential consequences of their choices through the implied associations a given cue embodies, which the voter formulates through their experiences, observations, and interactions with others. A common example are political party affiliations, which subtly inform voters about the general platform, policies, and actions that an associated candidate may then advocate for or implement if ultimately victorious. Quite often a large number of these cues can be found directly on a voter's ballot, where the presence or absence of different elements can determine their effectiveness or which alternatives benefit most from them. As voting methods then shape how and where participation occurs, they also inadvertently alter how voters respond to the various cues found on their ballot by indirectly changing what information is readily available, their engagement with the contests, and general disposition.

Among the diverse range of voting methods to see widespread use across electoral systems today, voting by-mail in particular has become an increasingly popular alternative to the traditional practice of in-person polling. As its name implies, voting by-mail is a straightforward process where participants have their ballots delivered to them in advance of an election, via a

designated postal carrier, for them to complete and return it at their discretion. A consequence however of the increased convenience of removing the need for voters to be physically present on election day to participate is that voting by-mail also dramatically changes the contexts that participation takes place in by giving users nearly absolute freedom over the circumstances in which they complete their ballot. Despite this loss of control, electoral systems across the world have greatly expanded their by-mail voting services over the last several decades in response to popular demand and to bolster turnout. This expansion has been especially notable within the United States where, following the state of Oregon first adopting mail ballots as their default voting method for all elections in 2000, eight states now automatically distribute mail ballots to all registered voters (Voting Outside the Polling Place: Absentee, All-Mail and other Voting at Home Options, 2022). Yet while becoming increasingly widespread and promising to transform the basic act of participation, there have so far been few attempts by researchers to earnestly explore the extent to which voting by-mail actually shapes voter decision-making like with other aspects of ballot design.

In this study, I explore the influence voting methods have on voter decision-making, and subsequently electoral outcomes, by analyzing the effects by-mail voting has had on two commonly observed electoral phenomena that are known to be heavily influenced by ballot design:

The primacy effect: a tendency for alternatives placed at the top of ballot lists to receive a disproportionately larger vote share.

The incumbency advantage: where candidates running for reelection tend to receive an increased vote share due to their unique status.

Each phenomenon has additionally been found to be dependent on the behavior and psychology of voters when participating, and so are likely to be sensitive to the contextual changes introduced when voting using a mail ballot. I hypothesize that as its use increases, the convenience-enhancing benefits of by-mail voting will contribute to a lower number of votes attributable to the primacy effect, and similarly reduce the vote advantage enjoyed by incumbent candidates. Assessing these relationships is accomplished using an extensive dataset comprised of 109 statewide elections from the state of California,[1] which has seen a regular expansion of by-mail voting use and services over an extended period (Kim et al. 2015). Using this data, each hypothesis is separately examined using an array of linear and non-linear statistical modeling techniques to determine how each phenomenon has been affected by increasing by-mail voting usage over time.

In the following chapters, I first examine the voter decision-making process and how it can impact the results of elections. I next provide an overview of the electoral phenomena being studied and why voting by-mail specifically should be expected to reduce their impact on election outcomes. Then I discuss the conditions necessary for effectively measuring the phenomena and why the state of California was selected as the source for the project's data. This is followed by a review of the data used in the various analyses, with each electoral phenomenon then studied in its own dedicated section that explores their particular manifestation in the state, research design, and overall results. The final chapter then serves to assess the impact by-mail voting has had overall on Californian election outcomes, and evaluate the significance of these findings. As will ultimately be demonstrated, the rise of by-mail voting has apparently had a

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[1] California was ultimately chosen as the sole data provider for this project due to its electoral system uniquely allowing for the interactions between voting by-mail and both phenomena to be analyzed simultaneously over an extended period. See also Chapter 3 for further details.

pronounced, yet inconsistent, marginal influence over the behavior of Californian voters that raises many provocative questions about the systemic impact of voting methods which the existing literature is so-far unprepared to answer.

The Mechanics of Choice

Before exploring the relationship between voting by-mail and the studied phenomena, it is first necessary to establish how voters make their decisions, and why these processes can subsequently impact election outcomes. Every day, people are confronted with a continuous series of choices as they navigate the rigors or society and daily living. While the vast majority of these choices are about trivial matters that are quickly decided upon and forgotten about, some occasionally present highly consequential dilemmas that require thorough consideration of their immediate and long-term effects. In either instance, the person choosing must inevitably devise some method for meaningfully evaluating their options and ultimately select those they think are best. For scholars, this seemingly mundane activity raises two pressing questions; what *are* these methods of evaluation, and how exactly do they help qualify one option as being better than another?

When conceptualizing choice, one of the most compelling and perennially useful methods has been as a straightforward cost-benefit analysis. Usually identified as rational-choice based decision-making, the approach presents actors as making decisions by weighing the costs and benefits of their available options, along with considering any relevant conditional modifiers, and choosing the ones that provide the greatest margin between benefits and costs (Downs 1957). This process has been especially appealing in behavioral research since it serves to causally link a person's preferences to their choices by making those preferences the underlying motivation behind their decisions; so that if someone perceives the benefits of x as being superior

to *y*, they would then choose *x* over *y* due to their derived preference for the benefits of *x*. (Satz & Ferejohn, 1994). Additionally, it provides a convenient normative framework for what someone *should* choose in a given situation, since if each option has a known measurable value that can be positioned relative to their preferences, and to each other, they can be objectively organized from most to least optimal (Harsanyi, 1969). In utilizing this process however, there also exists the uncanny possibility for people to rationally engineer seemingly paradoxical situations where they lack the information necessary to relate their preferred outcomes to the options available to them.

A limitation with the rational choice model is that despite relying on preferences as the causal mechanism for decision-making, the model does not offer much insight into how or why preferences are themselves formed. From a functional perspective this is not an issue, since knowing where a preference came from is ultimately unnecessary for making a decision as long as options can be related to a person's established preferences (Downs 1957, Blais, 2000). However, this does mean that rational choice also necessarily presumes that a person making a decision knows enough about the options arrayed before them to make a meaningful comparison between those, and their preferences. Such an assumption though is frequently observed as being at odds with how people typically behave in elections, since most voters willingly participate with highly variable knowledge of the disparate alternatives and issues they are expected to consider (Shugart et al. 2005).

As conceived within the core rational choice framework, voters participating in elections are implicitly expected to do so with enough information to reasonably assess the merits of the alternatives presented to them, and subsequently choose the ones which best suit their interests. In practice however, voters actually tend to enter with only a limited understanding of the issues

at-hand and with constraints on how much time they can, or want, to dedicate towards rectifying

their information gaps before making a selection (Selb, 2008). This disparity then results in

voters having a highly uneven distribution of information that, at-best, leaves them with

sufficient information for some contests while lacking it in others (Kim et al., 2015). Yet despite

the obvious risk that it may negatively impact their ability to make preferential decisions, voters

regularly decide to participate with minimal information about a contest, or its contestants, as a

rationally made choice.

     Like for any other action, acquiring information is always done at some cost for voters.

Additionally, the nature of such costs differ for every individual and can take the form of

tangible goods such as money, abstract relations such as social expectations, or even physical

exertion like sickness, injury, or bodily harm (Verba et. al. 1995, Lopez de Leon & Rizzi, 2014).

For all cases however, the one inescapably constant cost is time as every moment spent gathering

information is consequently at the expense of innumerable competing opportunities a voter may

otherwise engage in (Bowler et. al., 1992, Miller & Krosnick, 1998). When subsequently

balancing these assorted costs with the projected benefits of the information they intend to

gather, voters reasonably then aim to gather the minimal amount of information necessary to

make a decision that maximizes their preferential gains. Downs (1957) in particular identifies

three attributes that voters use to economize their information gathering; the potential cost the

voter attributes to making a wrong choice, the actual costs of acquiring new information, and the

probability that new information will change their existing preferences. Based on a voter's

evaluation of these attributes, they can then rationally decide if gathering information on a given

contest or topic will be worth the expenditure of their finite attention and resources.

While this strategy ultimately allows voters to effectively budget their limited attention and resources towards more preferred activities, it also means they will likely encounter contests where they lack the information necessary to effectively assess the value of the available choices. When optimally followed, voters are left with only sufficient knowledge on subjects they deem pertinent to their interests, but correspondingly deficient on any topics they determine to be insignificant or inconsequential. However, elections are frequently comprised of multiple contests that each represent a unique referendum on a wide array of affected policies and interests for voters to decide on. Consequently, voters are then frequently left without the knowledge necessary to make meaningful choices among the available alternatives. When encountering this situation, voters are then left with two immediately apparent courses of action since they can either decide to forfeit their choice by not selecting any option, or to utilize some form of supplementary indicator or measurement to help guide their decisions.

Faced with these two possible alternatives, voters are then compelled to consider two other key factors; how much effort are they willing to expend on reasoning out a choice, and do they ultimately feel obliged to actually make a choice. As with the information gathering process itself, participating in an election comes with associated costs that voters typically try to minimize, such as the physical and mental exertion needed to successfully participate. Generally, these costs are exceedingly small since the activity itself is decidedly non-strenuous, but despite this low cost, voters must still compare it against the similarly low benefits from participation since the likelihood of any one person's efforts being consequential to the outcome of an election are exceptionally low (Downs, 1957, Verba et. al., 1995, Blais, 2000). This unfortunate combination of low demands and low returns usually means that any sort of significant obstacle

voters encounter will likely then be met with the absolute minimum effort required to overcome it, or deter them from participating entirely.

The effect that these mundane costs to participation actually have on voter behavior is often remarkably subtle. Instead of directly modifying a voter's qualitative evaluation of alternatives, they serve to distract and agitate voters so that they are susceptible to making mistakes or encourage unconscious biases to inadvertently guide their actions (Augenblick & Nicholson, 2016). As ballots incorporate more contests or grow in complexity, they simultaneously place greater demands on a voter's energy, time, and patience. This not only impacts their preparatory activities such as researching candidates and issues, but also the total amount of time and effort needed to fully participate (Darcy & Schneider, 1989, Selb, 2008). Once voters make choices for the contests they are knowledgeable about and invested in, there is a compelling incentive to then save themselves further effort by simply skipping any remaining contests where the alternatives are unfamiliar or the consequences unknown. This incentive is typically found to be strongest for local and special elections, since the infrastructure providing information on them is correspondingly smaller-scale and their relevance to their constituents can be indirect, abstract, or so functionary as to only be noticeable following serious mismanagement (Darcy & Schneider, 1989, Kritzer, 2016).

Despite apparently offering a compelling rationale for why voters may decide to not engage with the contests on their ballot, research consistently finds that neither a lack of information nor high participatory costs serve to deter most voters. Instead, such deterrents are frequently overcome through voters' sense that their participation in elections is an essential duty as a citizen. While a person might easily find the objective value of voting on its own to not be worthwhile, they may still rationally conclude to do so because they have internalized through

family, friends, and institutions that voting is necessary and expected of them despite no such obligation factually existing (Blais, 2000, Dalton, 2017). This mindset of voting as a civic and moral good is frequently promoted by both state, and invested non-state, actors and institutions as part of ongoing attempts to ensure turnout remains high enough to maintain their legitimacy as representative entities (Cześnik, 2006). Voters are consequently then exposed to this advocacy regularly over the course of their education, socialization, and participation in other civic activities, and can subsequently internalize these messages into a conviction that their participation in elections is necessary regardless of their personal interest or relevant knowledge.

It can be easy to assume that such a method of persuasion might only have a marginal impact on voter behavior and participation. In actuality, studies frequently find duty to be one of, if not the most, compelling force bringing voters to engage with elections. These results have proven to be consistent over both space and time as works such as Blais (2000) demonstrating that duty was the predominant factor driving turnout in their surveys of Canadian voters, and Dalton (2017) returning similar results in their examination of American voter behavior. Highlighted throughout these works is that the sense of obligation instilled in voters from so many sources and so relentlessly throughout their lives leaves a lasting impact on a large portion of the voter population. This belief in the morality of voting can then rationally compel voters towards making decisions in contests where they are uncertain of which options best align with their interests.

Addressing Uncertainty

When voters' instilled sense of duty is discussed in the context of overall turnout, it is usually portrayed as a mainly positive force that gives voters the impetus needed to participate in what is the defining activity of democratic institutions (Blais, 2000). This civic-minded

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compulsion can occasionally become a detriment however when voters feel compelled by their obligation to make choices in contests that they are unfamiliar with. For voters faced with an uncertain contest on their ballot, their desires to avoid potentially selecting a bad alternative and finish participating faster can be overridden by their belief that not participating fully is a moral failure. It can also provide a sense of social or psychological fulfillment that satisfies voters' desires to contribute or reinforce their sense of belonging to their communities (Uhlaner, 1989, Devroe & Wauters, 2020). Regardless of the specific nature of this desire, some voters inevitably will not feel driven and happily leave their selection for a contest blank, while others will find their sense of duty is enough to motivate them to participate even when lacking the knowledge necessary to make a rational choice.

Having committed to participating despite not having enough prior knowledge about the available alternatives to readily make motivated or informed decisions, voters must then try to establish some viable means of guiding their choices. With this agenda in mind, voters look to resolve their information deficits by referring to any context clues and cursory information they can find that would allow them to utilize various relevant heuristic associations they have previously learned. These associations, formed from numerous past experiences and socialization, act as mental shortcuts for voters to connect subjects associated with them to certain ranges of actions or outcomes (Converse, 2006). Once identified, they can subsequently be used as a tentative basis for connecting a voter's policy preferences to the options available to them, however the amount of information they are capable of conveying is typically limited by their very nature as shortcuts. Most often, voters will turn towards heuristic cues like party affiliations, platform summaries, or work experience that are deliberately provided help uncertain participants gain at least some sense of the general policy preferences of competing

alternatives (Niemi & Herrnson, 2003, Binder et. al. 2015). These cues, especially party affiliation, are often informative enough for most voters to satisfactorily figure out their preferred alternative (Matson & Fine, 2006). However, these may still not be enough for especially uninformed or uncertain voters, or even be deliberately withheld specifically to prevent voters from making their judgments based solely on them (Brockington, 2003, Nemerovski, 2021).

For voters that find themselves in these situations, their next course of action is to apply more tangential associations learned from conventions and experiences in their daily lives to select an alternative (Matson & Fine, 2006, Devroe & Wauters, 2020). While navigating the rigors of living in modern society, voter cognition consciously and unconsciously educates them to associate specific acts and prompts with specific outcomes. When lacking other means to decide between alternatives in unfamiliar contests, voters can draw upon some of these associations to help formulate preferences. Often the metrics used follow the conventions observed by other ranked listings they encounter such as where alternatives are positioned on the ballot, or how alternatives are named (Edwards, 2015). The main drawback with this course of action is that these associations may not actually be relevant or meaningful since features like an alternative's position are often not placed by any deliberate order, nor can inferences from titles provide reasonable evidence of merit. Yet in these brief moments of indecision, these superficial evaluations offer at least *some* means for voters to come to a motivated choice even if it is not based on their rational interests.

During this process, the physical and cognitive demands of voting also work to shape which alternative voters are liable to choose. Since voters are inclined to avoid expending more effort on voting than they strictly need to, they can inadvertently let minor behavioral habits turn into slight biases for alternatives based on their strategic location on a ballot. Few studies

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examine such tendencies unfortunately, though Kim et al. (2015) demonstrates that, among other phenomena, voters significantly favor choosing alternatives that are closer to their dominant hand; providing some indication of the extent to which even casual physical traits can alter voting behaviors. Additionally, incidental obstacles on a ballot like a poor layout or the complexity of the language used can cause cognitive impairment among voters. Such impairments can lead to voters selecting the wrong alternative or failing to provide a valid selection in sufficient numbers to influence the overall outcomes of contests (Wand et al, 2001, Shue & Luttmer, 2009).

The depths of complexity that go into the seemingly simple task of choosing alternatives on a ballot ultimately helps present the seemingly cavalier behavior of voters in a more understandable light. Utilizing rationally derived deliberations, voters choose alternatives based on their perception that their chosen alternative will best align or promote their preferences. Voters participating with limited understanding typically do so knowing that they can make up for their information deficits by relying on cognitive shortcuts that can help them differentiate between various alternatives. When the most obvious or commonly helpful shortcuts fail however, voters instead turn to intuitions learned from other choices they make in their lives to come up with some criteria to base their decision on. The tenuousness of this is further compounded by the simple physical exertions and mental habits voters can have that unknowingly lead them to make casual selections or mistakes. While this process ends up being ultimately inconsequential for the individual voter merely looking to participate, the cumulative effects of these choices can manifest as systemic tendencies strong enough to decide the outcomes of elections.

CHAPTER 2

The Impact of Mail Ballots

Observing Behaviors in Outcomes

Having established how the rational voter decision-making process can occasionally lead to uncertain choices, the next step is to explore how this can generate phenomena like incumbency advantages or the primacy effect, and why voting by-mail could then alter this relationship.

When voters determine to make a choice in an election despite lacking substantive knowledge about their options, one common solution is to simply choose the alternative listed first on the ballot. This tendency is commonly referred to as the primacy effect, and occurs when voters apply the logic they see used in other ranked listings they encounter in their daily lives to infer that the alternatives on their ballot are somehow ranked by quality or merit. Such an assumption is frequently valid in non-electoral contexts, since the top of lists are often reserved for the highest quality or most prominent options due to them being the first place readers view and best remember (Geys & Heyndels, 2003, Lutz, 2010). Being cognizant of this, voters may then assume that the alternatives listed on their ballot also use this framework and subsequently choose the top-listed candidate because of its prominent position (Brockington, 2003). The likelihood of this occurring is further amplified by voters' physical and mental state, along with any time constraints incentivizing them to finish faster while still fulfilling their sense of civic duty (Augenblick & Nicholson, 2016).

Another approach commonly used by indecisive voters is to select incumbent office holders on the basis that they would inherently be the most qualified due to their presumed experience and success in a position. Incumbents in general benefit from several systemic

advantages due to their unique position such as a sizable name-recognition advantage, access to an established political network, greater media coverage, and the substantive achievements of their administration; although this latter element can easily become a hindrance since incumbents can be associated with their failures as well (Prior, 2006, Gordon & Landa, 2009). These advantages can often further extend to the ballot itself as incumbents are frequently labelled as-such on election ballots, or even deliberately placed at the top of ballot lists (Abramowitz, 1975, Eckles et al., 2014). These passive and deliberate advantages collectively serve to make the incumbent more prominent among voters relative to their competition, particularly in low-information or crowded contests where recognizability is a major factor (Eckles et al., 2014). In situations then where they lack any further knowledge or engagement with a contest, voters recognizing an incumbent can still then defer to them under the assumption they will continue to satisfactorily perform their duties.

Ostensibly, voters participating in a contest are expected to weigh the benefits of selecting alternatives that best promote their interests against their strategic chances of actually winning (Utych & Kam, 2014). However, systemic factors like primacy and incumbency can then alter these evaluations by subtly encouraging distracted, uninterested, or uninformed voters to choose based on intuitive familiarity instead of any strategic consideration or sincere alignment with interests (Lachat, 2011, Eckles et al., 2014). As a consequence, incumbents and top-ranked alternatives often then benefit from larger vote shares than what they would otherwise be expected to receive due to their heightened appeal among uncertain voters. The general ease and widespread applicability of these misguided heuristic associations further helps to ensure that their effects are both endemic to most elections and frequently large enough to alter their ultimate outcomes.

For the individual voter, the influence of these features on their decision-making is imperceptible and largely inconsequential to their immediate wellbeing. It is instead when their cumulative effects are scaled up to encompass the entire electorate that their influences become significant enough to consistently be decisive in the outcomes of all elections regardless of consequence (Gordon & Landa, 2009, Utych & Kam, 2014, Kim et al., 2015). Conscious of their potential and ubiquitous presence, researchers and election administrators have responded by identifying and implementing new features to help combat the influence of these phenomena on elections while also respecting voters' autonomy. Yet despite this ongoing attention, one aspect that remains noticeably under-examined is how the voting methods used in a contest might alter their impact even though there is a well-established body of literature connecting voting methods with other key voter behaviors.

Voting By-Mail

Among the components of electoral systems commonly examined by researchers, voting methods have come to be identified as one of the most powerful tools for influencing if and how voters participate (Karp & Banducci 2000). Academic interest has historically been directed towards how the introduction or alteration of different methods affects voter turnout by making participation more-or-less appealing to marginally-engaged voters (Southwell & Burchett, 2000, Alvarez et al. 2012). Recently though, there has been increasing interest in how voting methods also influence voter behavior *during* the act of voting itself since they can fundamentally change the contexts in which voters interact with their ballot. In both cases, much of this interest has been driven by state actors and administrators becoming more invested in learning about how the unique assortments of methods they employ are impacting their constituents.

Across the world today, the most common method of voting continues to be traditional in-person polling at designated sites on election days (Hansford & Gomez, 2010). However, the development of communications technology and infrastructure have increasingly enticed state election administrators to introduce alternative methods that make voting more convenient and accessible. Experimentation with new methods is often further backed by powerful political actors that sense their implementation will provide an electoral advantage over their opponents (Biggers & Hanmer, 2015). As a result, many states now offer expanded access to ballots for both national and local elections through services such as early voting programs, while others push the boundaries of convention by experimenting with holding elections online (Biggers, & Hanmer, 2015, Goodman & Stokes, 2020). Despite their promise of greater convenience and participation, most alternative methods remain tightly controlled and typically restricted to voters who are physically incapable of voting through conventional means (Patterson & Caldeira 1985). One of the few methods to have truly widespread use has been by-mail voting, which has become a regular feature among most electoral systems and even the primary voting method in several others.

While generally still restricted to specific classes of people, the ubiquity of by-mail voting across electoral systems has let it become a common subject for research into how changes to voting methods subsequently alter voter behaviors. As is the case with the broader literature on voting methods, academic focus on mail ballots has mainly been directed towards questions related to its effects on voter turnout. This interest is because, like with other alternative methods, its main appeal is to make voting more convenient for participants by allowing them to do so when and where it is convenient without having to be restricted to a voting booth. The results of this research have widely helped to confirm perceptions that mail

ballots do appreciably increase overall participation (Karp & Banducci, 2000, Alvarez et al., 2013). Additionally, they have been found to be particularly influential over *which* voters participate as they often attract an older, more informed, and more engaged user base compared to conventional in-person polling (Southwell & Burchett, 2000, Alvarez et. al. 2012). An often-overlooked commonality throughout these works however is that voting by-mail is shown to also manipulate numerous factors known to strongly influence how voters perceive and choose alternatives.

As its name implies, by-mail voting works by delivering ballots to voters through a postal service for them to complete at a moment and location of their choosing, before subsequently returning them by a deadline set prior-to, or on, the official election day. Returning a completed ballot is typically accomplished via the same service a voter received it from, but voters may also arrange for third parties to deliver their ballot in their stead, or choose to deliver it in-person at designated collection sites. To ensure that there is a sufficient delivery and return window, mail ballots are usually delivered well in advance of an election. A consequence of this accommodation though is that this inadvertently has the effect of giving by-mail voters an extended period in which to interact with their ballot prior to voting which may be leveraged into a circumstantial and informational advantage.

By providing greater flexibility for how and when voters interact with their ballot, by-mail voting places its users in a better position to make meaningful selections in unfamiliar contests. In contrast to conventional in-person voting, where ballots can only be directly interacted with at designated polling sites on specified election days, voters using mail-in ballots are able to interact with their ballot well in advance and in circumstances of their choosing (Southwell & Burchett, 2000). On its own though, physically having the ballot in-hand earlier

does *not* offer voters any substantive advantage since both by-mail and in-person voters have the same deadline of election day to research and evaluate alternatives. Additionally, both in-person and by-mail voters are equally capable of utilizing supplementary resources such as sample ballots and voting guides that are often freely provided well before the actual election day. The actual benefit instead lies in how by-mail voting offers greater flexibility over when participation occurs, and more opportunities to process information at critical junctures when making decisions.

As a consequence of their efforts to economize their information-gathering, voters usually participate in elections with significant gaps in their knowledge about the contests, candidates, or issues they are ultimately expected to provide input on. Faced with this limitation, voters still committed to making a choice in contests they are not prepared for are compelled to seek out some meaningful relevant information from any available source (Eckles et al., 2014). For in-person voters, their options for resolving information gaps are constrained by the resources immediately accessible to them, such as any guides or notes they brought, or what can be readily found online. If these resources prove insufficient or are unavailable however, or are simply left unutilized, a voter is then left with what they can surmise from their ballot. By-mail voters meanwhile are not restricted in this manner by virtue of them participating outside of the polling place and in whatever context they deem appropriate; leaving them to freely consult any resources they wish while filling out their ballot. Their greatest advantage though is they can devote considerably more time to any last-minute research, and even postpone making a decision for extended periods until it is convenient to do so.

Voters must also reconcile their participation with other commitments and activities they intend to engage in. Since both the costs and benefits are generally quite low, participating in

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elections is typically a low priority in most voter's schedules in favor of more pressing or

desirable activities. Consequently, preparing and participating in elections is then frequently

allotted only the bare minimum amount of time voters deem necessary and often at odds with

more pressing concerns that they might rather be doing at any given moment. When voters then

encounter unexpected obstacles, such as contests where they are unsure about which alternative

to choose, they must assess how the additional time and effort needed to resolve this problem

affects their intended allotment of time and attention, and if they are subsequently willing to

make that sacrifice (Shugart et al. 2005, Selb, 2008). For in-person voters, the scheduling

commitment and opportunity costs for participation are considerable since they must be

physically present at the polling site within the fixed period when voting is available. They are

also under pressure to complete their participation in one session since ballots cannot easily be

revised once they are submitted or the voter leaves the polling site. Voting by-mail in contrast

reduces these costs dramatically by having ballots delivered to voters in advance and allowing

them the opportunity to then take materially longer to complete their ballot. Users are also free to

break their participation into multiple sessions so they can participate whenever it is most

suitable to do so.

Lastly, voters must contend with the physical and mental exertion of participating in

elections. While rarely being more than a trivial task for voters, participation does always require

at least some amount of effort to retrieve, complete, and return a ballot regardless of the specific

method used. Depending on how strenuous or distracting this process ends up being, voters may

then be more or less capable, or willing, to fully engage with the material on their ballot. When

participating in-person, voters always experience at least some fatigue from travelling to the

polling site, interacting with election administrators, waiting in any potential queue, interacting

with their ballot, and finally departing. Throughout this process, voters may be additionally subjected to circumstantial inconveniences like long wait times, poor weather, or poor facilities that extend how long participation takes and induce further fatigue. Along with deterring participation entirely,[2] such physical inconveniences can also serve to impair voters' judgment and incentivize them to finish participating faster without taking care to make sound decisions. Voting by-mail again helps to mitigate these issues by simplifying the voting process to having ballots delivered directly to the voter and returned at their convenience, which has the dual effect of reducing the overall amount of effort needed to participate and lowering exposure to potential negative conditions since they can effectively participate in whatever circumstance they prefer (Southwell & Burchett, 2000).

The conveniences and experiential improvements provided through by-mail voting are not without drawbacks however. Alongside the substantial logistical and administrative burden of operating a separate high-capacity vote-processing chain, having ballots delivered and retuned outside of controlled locations introduces serious security vulnerabilities that can be exploited to manipulate election results. At one end it makes input fraud by the end-user potentially easier since ballots can be intercepted by malicious actors and completed in someone else's name, or withheld from their intended recipient as was the case in France in 1975 (Lott, 2020). Having ballots delivered can also inadvertently eliminate ballot secrecy for voters in vulnerable situations, since their choices might be monitored or controlled. This latter reason has been of particular concern for administrators and has led to the vast majority of systems still keeping

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[2] The impact of inclement weather on voter turnout is particularly ambiguous. Earlier works such as Knack (1994) find weather has no impact on participation rates, but later works such as Gatrell & Bierly (2002) and Gomez et al. (2007) identify weather as causing substantial, often greater than 1%, and electorally consequential shifts in overall turnout.

access to mail ballots highly regulated, or even restricting services even more in some instances (Lott, 2020).

At the other end of the process, it creates more potential avenues for institutional-level actors to commit transmission and output fraud such as by either simply not delivering ballots to targeted voters in the first place, or withholding them from final counting (Brand, 2010, Lott, 2020). This is particularly troublesome for institutions that suffer from low public trust or general instability, and incentivizes reliance on conventional, but highly visible, in-person polling for increased transparency and legitimacy (Brand, 2010) While fraud security is the most prominently discussed issue with mail voting systems, there are also service limitations that can negate its convenience to some voters. One major issue is that by-mail voting inherently requires users to have access to a consistent mailing address to deliver or return ballots, which can limit their use among impoverished or transient populations that are already underrepresented under conventional in-person voting. In systems where postage is not automatically paid for, the cost of postage can also act as a deterrent to low-engagement or impoverished voters who are unwilling to effectively pay to vote. These factors then contribute to mail ballot users skewing towards being wealthier and older and can often lead to further representative and distribution biases as the already most engaged segments of the population are mobilized even more efficiently (Southwell & Burchett, 2000, Alvarez et. al. 2013).

Despite introducing potential security and accessibility costs, the conveniences of voting by-mail are substantial enough where it remains an appealing option for election engineers searching for ways to improve the overall quality of electoral systems. For administrators and researchers alike, these benefits are of note primarily for their ability to entice voters into participation, but these same features are also such that they should have a significant effect on

voter decision-making (Southwell & Burchett, 2000). By giving voters the freedom to vote where and when they want, mail ballots offer improved access to information, greater control over the conditions in which participation occurs, and reduces exposure to fatigue inducing complications compared to traditional in-person polling. These benefits should then be expected to reduce the incentives for voters to make arbitrary or superficial choices when engaging with uncertain contests, since such decisions are heavily reliant on voters being uninformed, distracted, and incentivized to finish participating quickly to begin with. Yet as the next chapter demonstrates, literature on this particular type of interaction is sparse due to the highly specific circumstances required for studying mail voting alongside behavior-driven electoral phenomena like incumbency or primacy effects.

CHAPTER 3

Measurements and Sources

Measuring Electoral Phenomena

People have been aware that electoral institutions predictably influence voter decision-making for effectively as long as organized elections have existed (Riker, 1986). Yet until the mid-20th century, interested parties were largely incapable of determining the extent and significance of their influence because they lacked the means to effectively measure them. With the advent of modern data storage and analytical tools, researchers and election administrators have since been able to develop an impressive variety of methods for capturing the effects different electoral features have on voters. Now faced with an abundance of methodologies such as sample surveys, experimental models, aggregated data analyses, or even case studies, it can often prove challenging to then determine what measurements are appropriate for any given situation. Fortunately, insights from the existing literature help this project to establish an effective means for capturing how using by-mail voting can change election outcomes through their influence on primacy and incumbency effects.

There are currently very few scholarly works where the intersecting relationships between voting methods and electoral behavioral phenomena are explored in detail. This is largely because in order to effectively observe how changes in voting methods subsequently influence phenomena like candidate primacy and incumbency advantages, the highly specific conditions needed for studying both components have to be satisfied simultaneously. While these conditions are demanding, they are fortunately not contradictory and allow for studying both primacy and incumbency effects simultaneously within the same dataset. Despite there being minimal research examining them together in such a manner, each subject individually has a

sizable literature that outlines effective observation methods, and lays out the strategy used here for studying them in-tandem with the effects of by-mail voting.

Between primacy, incumbency, and mail ballots, the primacy effect is by-far the most difficult to capture since it requires an election to randomize the ranking of alternatives on ballots so that the performance of an alternative at one position can be compared against its performance at another (Miller & Krosnick, 1998). This criterion in-turn prompts consideration of two key factors; where are the studied elections taking place, and how is an alternative's performance being measured. In most cases, performance is captured using the vote share that an alternative receives when ranked at different positions. This is most often seen as percentages relative to their expected or observed totals (Flis & Kaminski, 2022, Jankowski & Frank, 2022), but can also be done as the propensity of given alternatives to win (Edwards, 2015), or as deviations from estimated null distributions of votes (Meredith & Salant, 2013). A suitable electoral setting meanwhile must uniformly employ some form of randomization scheme so that alternatives are not systematically placed in the same positions on ballots, and yet also do so in a manner that allows users of a given ballot can be identified (Miller & Krosnick, 1998). Additionally, the chosen setting should offer multiple elections for study and with different ballot placement combinations over the same groups of voters so that the primacy effect can be distinguished from the influence of specific ballot listings (Jankowski and Frank 2022). While numerous works have developed creative solutions to this challenge, such as through controlled experiments (Kim et al., 2015), most utilize natural experiments out of pragmatism and to benefit from being able to observe the phenomenon under real conditions (Miller & Krosnick, 1998, Flis & Kaminski, 2022).

Measuring incumbency advantages is overall less situationally restrictive than with primacy effects, but is most effectively accomplished at a considerably larger scale. Consequently, this is typically accomplished through observing multiple elections over a given space or time and then comparing candidate performance in elections with incumbents against elections over an open seat (Gordon & Landa, 2009).[3] This straightforward approach comes with a major limitation however, as it results in the observed elections either not all occurring in the same location, having the same voters, or hosting the same candidates. Controlling for these serious empirical issues has led existing studies to develop several creative solutions that negate at least one of these drawbacks. In most cases, studies resolve either the temporal or spatial components by examining incumbent vote shares in geographically constant areas with shifting boundaries over time (Desposato & Petrocik, 2003) or surveying fixed populations over several elections and asking respondents who they voted for (Prior, 2006), but candidate-oriented solutions also exist by capitalizing on the nature of proportionally-based systems and examining the ratio of votes needed to obtain a seat (Golden & Picci, 2015). The sheer variety of approaches ultimately makes identifying suitable electoral systems relatively easy, since at least one solution is likely be viable as long as enough information is available.

Despite the well-established research methods for both of the studied phenomena, they are rarely incorporated alongside by-mail voting because of its own empirical demands that must be met to differentiate its unique impacts from other voting methods. The most pressing concern is usually finding an electoral system where by-mail voting has seen prolonged use among a significant portion of the voting population. Because it is typically restricted to specific classes

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[3] While it is technically feasible to observe incumbency advantages in a controlled experimental setting, this approach is uncommon as the impact of incumbency on candidate performance is known to be highly dependent on influences from circumstantial and contextual factors, both before and during elections, that are difficult to replicate outside of a natural setting (Gordon & Landa, 2009).

of qualified voters, studies of mail-voting usually focus on a common pool of select locations, largely within the U.S., where it is more widely accessible (Patterson & Caldeira, 1985, Alvarez et al., 2012). Scholars must also consider how exactly mail ballots are made available, as locations where mail ballots are restricted, or conversely hold elections entirely by-mail, have to be distinguished from those where voters freely choose their preferred method so that any user selection biases can be accounted for (Alvarez et al., 2013). Finally, any prospective locale must maintain extensive and detailed voting data records that clearly distinguish between the voting methods used by participants. Quite often such detailed information is simply not kept or not made available to the public, and so many otherwise viable electoral systems have to unfortunately be dismissed (Pasek et al., 2014).

These circumstance-dependent conditions have led studies employing measurements of mail-ballot use to rely on two distinct approaches for capturing their effects. Most favor aggregate comparisons of mail-ballot usage against the total number of participants since it can often readily be gathered from election records with minimal effort (Alvarez et al., 2013, Pasek et al., 2014). This approach also has the benefit of being able to observe the effects of by-mail voting holistically and over extended periods of time, although at the expense of usually lacking individualistic details. A smaller number of studies instead utilize surveys or experimental models where the voting methods used are tied directly to each unique respondent (Kim et al., 2015). This approach offers a number of compelling advantages as it allows researchers to collect more intimate data about voters that can be used to better gauge their characteristics, motives, and psychology while participating. Yet while better able to trace the behavior of voters directly to their voting methods, the expense and limited scope of these methods keep these from being more widely used. Due to these limitations, the approach used for any given study

ultimately becomes a byproduct of the opportunities and specifics surrounding the particular relationship being examined.

Given the unique empirical demands of each element of the study, it may then initially seem improbable that any electoral system would have the overlapping rules and conditions necessary for measuring the impact of by-mail voting on primacy and incumbency simultaneously. In practice though, most systems are able to satisfy the bulk of the conditions noted above as a matter of basic records keeping and so only a few key features actually need to be looked for in potential sources. At the systemic level, a viable source must offer by-mail voting services to a large enough portion of the population to draw meaningful empirical conclusions, and then also randomize the positions of alternatives on ballots in a manner that variations are still traceable to either populations or places. At the administrative level, all that is needed is information about the incumbency status, number, and vote shares of candidates over multiple elections. The main challenge then is finding a system where voters have both expanded access to mail ballots, and the rules pertaining to primacy, incumbency, and by-mail voting have remained stable over time.

Mail Ballot Use in the United States

The most pressing concern when selecting a location for study was if and how they offered mail ballots to voters. Globally, it is exceedingly rare for states to offer mail-voting services outside of when voters are physically incapable of participating in-person (Lott, 2020). Even within the United States, where voting by-mail is relatively common overall, many states still require valid excuses before issuing mail ballots and debates over its use remains intensely politicized. Given this limited pool of potentially viable options, it was quickly determined that the state of California was the optimal location for studying the interaction between by-mail

voting and the targeted electoral phenomena. In particular, California benefitted from an extremely fortuitous combination of three inter-related factors; the decentralized nature of the U.S. electoral system, the subsequently haphazard development of by-mail voting services within states, and the unique features of the Californian electoral system.

While often discussed in the context of its currently rising prominence, the concept of voting by-mail extends back to the establishment of centrally administered postal services and integrated distribution networks throughout the 19th century (Perlman & Schuster, 2016). Up until the 20th century though, the use of mail-in ballots was effectively a novelty restricted to voters physically prevented from appearing at polls in-person such as citizens overseas, those serving with the military, or the seriously ill (Patterson & Caldeira 1985). Additionally, its use was restricted to only a handful of western democracies during this early period, as the rudimentary nature of postal infrastructure meant that swift and efficient processing of large numbers of mail ballots was not regularly feasible. Political corruption, low professionalization, and a lack of oversight also meant that there were often pressing concerns of postal ballots being fraudulently altered, lost, or deliberately withheld by malicious actors (Perlman & Schuster, 2016). Due to these limitations, it would not be until the development of modern technologies and infrastructures that the regular mass-use of by-mail voting became a truly viable option.

Compared to its peers, the proliferation by-mail voting in the United States has been particularly notable for its irregular development across the country and over time. Uniquely, election administration in the U.S. is almost entirely decentralized so that each state effectively operates their own independent electoral system. This administrative freedom is often further localized by state governments delegating large amounts of authority to county and district overseers on exactly how elections are conducted in their specific area. Inevitably, this has

resulted in the usage and restrictions on specific features like by-mail voting being extremely variable between states, or even localities within states (Parker & Przybylski, 1993). This variety however has also made the U.S. a popular subject for studying electoral systems since almost any phenomenon or relationship can be observed somewhere.

In line with development elsewhere during the same period, the United States saw its first use of mail ballots during the mid-19th century with the onset of its civil war. Mass conscription saw millions of eligible voters deployed far away from their designated polling precincts, compelling both states and the federal government to provide mail ballots to facilitate their participation. Following the end of the war, by-mail voting would remain largely limited to military personnel and only two states would ultimately implement absentee voting programs for general use by the turn of the century (Patterson & Caldeira 1985). The combined effects though of rapid industrialization, improving communications infrastructure, powerful social reform movements, and the disruption caused by the world-wars saw a rapid expansion of by-mail voting as state governments sought to accommodate their growing and increasingly mobile populations. By the 1970s, all states had adopted some form of absentee voting service for qualifying residents and some even began experimenting with expanding access to the general public in an effort to reduce administrative costs and reinforce declining turnout (Alvarez et al. 2012).

Initial forays into making voting by-mail widely accessible were at first limited to expanding the roster of acceptable excuses for obtaining a mail ballot, but progressively moved towards eliminating the need for an excuse entirely and simply providing ballots by-mail to any voter who asked. This gradual loosening of restrictions suddenly escalated though in 1998 when the state of Oregon passed a ballot measure to conduct all of its future elections using only mail-

in ballots (Southwell, 2004). Following Oregon's success with its mail-only system, other states began experimenting with using mail ballots as the primary voting method in their elections as well, although largely still retaining the option for voting in-person (Alvarez et al. 2012). Throughout the 2000's and 2010's, voting by-mail would become progressively more commonplace as more states loosened restrictions or prepared to transition towards mail ballots being the default option for all voters. However, the sudden onset of the coronavirus pandemic towards the end of 2019 would prompt many states to accelerate their plans and abruptly expand their programs statewide, and compel others to create their own programs to mitigate public gatherings during the crisis (COVID-19 and 2020 Primary Elections 2020).

Figure 1.
Mail Ballot Accessibilty Across the United States

Note: Oregon does not accommodate in-person voting outside of county clerk offices. Vermont hosts all-mail elections only for statewide general elections. Rhode Island requires an excuse before obtaining a mail ballot, but accepts any unspecified reason as valid. [4]

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[4] See "Voting Outside the Polling Place: Absentee, All-Mail and other Voting at Home Options" (2022).

In the wake of the coronavirus pandemic, nearly half of all U.S. states now employ mail ballots as the default voting method in at least some elections. As illustrated in Figure 1., the states of California, Colorado, Hawaii, Nevada, Oregon, Utah, Vermont,[5] and Washington, in particular have gone the furthest by now providing mail ballots to voters automatically for all elections. Two more states, Nebraska and North Dakota, allow individual counties to decide whether or not to distribute mail ballots to all voters, while another thirteen have also begun experimenting in some special elections or districts (Voting Outside the Polling Place: Absentee, All-Mail and other Voting at Home Options, 2022). It should be noted though that in-person voting remains an option for all voters in these locations should they have a specific need or preference to.[6] For the remaining states, mail ballots continue to be a specialty option, though only 16[7] still require a valid excuse to obtain a mail-in ballot while the rest provide them freely to any voter upon request (Voting Outside the Polling Place: Absentee, All-Mail and other Voting at Home Options, 2022). As a consequence then of this unparalleled variety and widespread use, U.S. elections are frequently chosen for studies of by-mail voting since it is often only a matter of selecting *where* to draw data from rather than determining whether the data exists in the first place.

Electoral Phenomena in California

With the United States established as being particularly hospitable for studying the effects and interactions of by-mail voting, the next question is what does the state of California offer that makes it specifically suited for examining mail voting's effects on primacy and

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[5] The state of Vermont conducts by-mail elections for statewide general elections only.

[6] The state of Oregon maintains no in-person voting accommodations outside of county clerk offices.

[7] The state of Rhode Island requires an excuse for a mail-in ballot, but the list of excuses is expansive enough to where functionally any voter can declare a valid reason to obtain one (Voting Outside the Polling Place: Absentee, All-Mail and other Voting at Home Options, 2022).

incumbency advantages. The greatest advantage California provides is that the unique setup of the state's electoral system allows for all three targeted electoral phenomena to be studied simultaneously. The state additionally maintains an extensive and highly detailed election record that allows for the impact of by-mail voting on these phenomena to be traced back over an impressive forty-four-year period; covering a range prior to the initial relaxation of mail voting laws to the state's first wholly by-mail election. This massive collection of accessible elections data has made the state a popular setting for electoral systems research and all of the specific features examined in this study (Lascher, 2005, Salka, 2005, Pasek et al., 2014). These advantages in convenience and scale stem largely from the evolution of a few strategic parts of the elections code.

Like with all U.S. states, elections in California are governed by an extensive elections code that outlines in exacting detail how every aspect of a state-facilitated election should be prepared and conducted. The California election code is particularly notable though for having a unique emphasis on transparency and awareness of candidate biases that inadvertently makes it attractive for studies of voter behavior and electoral systems. Another element is that the state followed an especially gradual approach to expanding by-mail voting services that happened to coincide with a period where the rest of the code remained largely consistent. This makes the state also a frequent subject for studies of mail ballots since their effects can be more easily isolated from those of other systemic factors. Lastly, many of the critical features that make the code so favorable to research have been in place for an extended period of time, allowing for comparisons between a large number of elections over time.

While often thought of as a more contemporary concern, state statutes addressing incumbent candidate labelling can actually trace their origins back to the first half of the 20th

century. In 1931, the California state legislature completed a major overhaul of the elections

code intended to improve the overall information available to voters and bolster election

integrity. As part of these revisions, ballots for statewide elections would from then-on include

brief descriptions of candidate professions alongside their name and political party affiliation,

with defending candidates given the exclusive right to label themselves as the incumbent.[8] While

informed and engaged voters likely already knew which candidate in a given election, if any,

was incumbent, the intent was to systematize this information so that it was available to every

participating voter (Nemerovski, 2021). It also inevitably had the effect of making incumbents

readily identifiable to uncertain voters who were more inclined to defer their choices to the

current office holder. Subsequent changes would alter the exact placement, word limits, and

acceptable nomenclature, but the rule would effectively remain unchanged through the last major

revision in 1994.[9]

This longevity and systemic visibility provide three major advantages when studying the

effects changes elsewhere in the system have on the incumbency advantage. First, having

labelled incumbents ensures that all participating voters are equally aware of their presence in a

given contest. While likely being detrimental for electoral competitiveness, this is helpful when

contrasting against contests with no incumbent since more of the difference can then be

attributed to their presence or absence. The application of these measures to all statewide

elections also guarantees that the entire voting population is subject to the same treatment across

the entire state. Finally, the longevity and consistency of this particular aspect of the code

provides interested researchers with nearly a century of potential cases for comparison thanks to

the Statement of Vote publishing detailed records after every election. This latter feature is

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[8] CAL. Stats. 1931, c. 931 § 4.
[9] CAL. Stats. 1994, c. 920 § 13107.

especially appealing because it helps ensure that there are enough instances where incumbents are present and absent for any given contest researchers may be interested in.

State interest in mitigating primacy effects has had a similarly extensive history, but unlike incumbency, the relevant code has been significantly revised over time. Prior to 1911, the state effectively gave the Secretary of State full discretion on how candidate names were ordered on ballots for statewide elections.[10] During the 1911 legislative session though, the elections code was altered so that candidate names from then on would rotate across districts by first ordering candidates alphabetically in District 1 and then moving the top candidate to be last in every subsequent district.[11] This created the effect of forcing each alternative to move up one position for each district and rotating places until the order in all 80 Assembly Districts was determined. While considerably less susceptible to individual biases than the previous method, this new approach still inherently gave a systematic advantage to candidates with names starting at the higher-end of the alphabet.

In 1976, the code received a major revision so that the initial order for candidates was determined by a "randomized alphabet."[12] Under this scheme, the Secretary of State would randomly draw letters until a completely new alphabet was created based on the order these letters were drawn (Randomized Alphabet, 2020). Candidates in Assembly District 1 would then be sorted according to this list and then have the top-listed alternative moved to last place for each subsequent district.[13] This served to significantly improve the variability in candidate listings by introducing a randomized element to the order scheme where previously it was

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[10] CAL. STATS. 1903, c. 134 § 1.
[11] CAL. STATS. 1911, c. 225 § 1.
[12] CAL. STATS. 1975, c. 1158 § 30.
[13] In instances where candidates or alternatives share the same initial letter, or letters, placement is then determined by the next subsequent unique letters according to the randomized alphabet variant of a given district (Randomized Alphabet, 2023).

effectively predetermined by circumstance. Some potential for bias remains though, as the

process can still give candidates that happen to be higher in the initial listing disproportionately

more districts whenever the total number of candidates cannot be evenly apportioned.[14]

However, the process used for *making* the initial listing is sufficiently random that candidates

cannot leverage this into a meaningful systemic advantage (Pasek et al., 2014).

    As noted earlier, it is essential that an electoral system randomize candidate name-

placement on ballots and simultaneously distribute them according to a traceable coherent

process (Miller & Krosnick, 1998). California's "randomized alphabet" method, while in

actuality only pseudo-random, creates results that are close enough that they can be reasonably

assumed to not obscure how candidate performance differs between districts where they are

listed first, and listed later. By distributing ballots via Assembly Districts, the state also creates a

coherent pattern for identifying the order in which candidates appear for any district by cross-

referencing the initial order used in District 1. Another significant benefit is that district

boundaries are drawn to cover approximately equal portions of the population so that all

candidates are listed at the top of the ballot for a similar number of voters. The consistency of the

code over time is relevant here as well. Having been in place in its current form for over 46

years, there is a large body of elections to draw from thanks to the extensive record-keeping in

the state's Statements of Vote.

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[14] While present, the impact of this bias is exceedingly minimal. The maximum number of competitors ever listed on a statewide election ballot has been 8. Leading to the greatest bias the process has generated thus-far being the first 3 candidates being top-listed one additional time.

Figure 2.

Mail Ballot Use in California per Election Year.
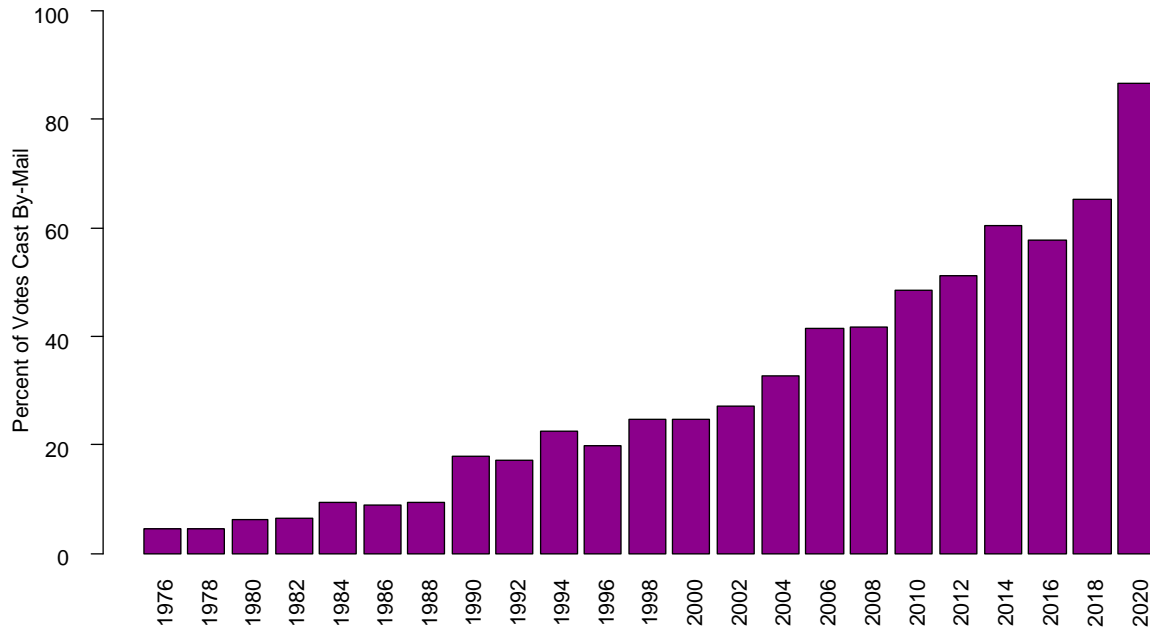
While rarely being pioneering in its use, California's uniquely gradual expansion of vote by-mail services, with one notable exception, makes the state well suited for examining the longitudinal effects of mail ballot use. As Table 1. illustrates, the state closely conformed to the broader trends across the United States by only offering mail voting services sparingly throughout the 19th and 20th centuries. It was only in 1978, after similar relaxations in other states proved to be successful, that the code governing absentee voting was revised so that any voter would be able to request a mail ballot without the need to first provide a qualifying excuse.[15] The initial reaction from voters was limited, but as Figure 2. highlights, usage of mail ballots would from then-on steadily increase over time. The next major development occurred in 2002 when the state started allowing voters to register as permanent by-mail voters and automatically delivering ballots to them.[16] The same revision also allowed some of the most sparsely-populated

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[15] CAL. STATS. 1978, c. 77.
[16] CAL. STATS. 2001, c. 922.

counties to hold elections entirely by-mail, since their populations were so small and scattered that it was more sensible to deliver ballots directly than provide facilities for mass in-person voting. The experience gained from these counties would subsequently prove extremely valuable in the following years when the practice was to be expanded.

Table 1.
Developmental History of By Mail Voting in California

Year	Statute	Effect
1864	CAL. STATS. 1864, c. 272.	First established procedure for residents serving with the US military to vote by mail.
1923	CAL. STATS. 1923, c. 283.	Permanently enabled registered voters to request mail ballots with a qualifying excuse.
1978	CAL. STATS. 1978, c. 77.	Allowed all registered voters to request mail ballots without a qualifying excuse.
2001	CAL. STATS. 2001, c. 922.	Allowed residents to register as permanent absentee voters.
2016	CAL. STATS. 2016, c. 832.	Created a progressively expanding list of counties approved to distribute mail ballots automatically.
2021	CAL. STATS. 2021, c. 312.	Officially revised the state elections code to send mail ballots to all registered voters by default.

In 2016 the state would enact the Voters Choice Act, which would over time let an incrementally expanding number of counties choose to conduct their elections with mail ballots as the default voting method.[17] Most counties quickly moved to adopt all-mail elections when given the opportunity, and Figure 2 again shows that mail ballot use subsequently rose dramatically in the following elections as a result. This gradual implementation of all-mail elections was abandoned in 2020 however, following the onset of the COVID 19 epidemic. In response to the crisis, the state adopted an emergency measure to have all elections provide mail

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[17] CAL. STATS. 2016, c. 832.

ballots to participants by default to help mitigate exposure to the virus. In 2021, this measure was made permanent so that all future statewide elections would be conducted primarily through mail ballots and abruptly completing the state's transition to an all-mail electoral system similar to those found in neighboring states.[18]

The slow expansion of mail voting services over time, punctuated by a sudden mass-adoption, makes California a uniquely convenient location for studying the impact of mail ballot use in a variety of contexts. As summarized in Table 1., by-mail voting in the state has evolved from traditional restricted availability, to voluntary use, to a mixture of all-mail and voluntary counties, and finally to universal by-mail voting. For long-term observations, this helps by providing a full spectrum from near-minimal to near-total use so that its effects at different stages of saturation to be compared. For spatial observations, the nearly twenty-year period where only select counties with all-mail voting were present allows for direct comparisons between full and voluntary usage within the same elections and electoral system. Since each county is obliged to create and maintain records of the methods used by participating voters, it is also possible to conduct such analyses down to individual precincts in many instances. California thus provides a highly desirable combination of detail and scale for studying by-mail voting through both the state's Statements of Vote records, the sheer number of elections covered, the variation in implementation, and overall number of participants.

While there are several states that could potentially be used to examine the relationship between by-mail voting and either primacy or incumbency effects, the ability of California's electoral system to accommodate studying all three of these subjects simultaneously makes it the best source of data for this study. The state's unique balance in scale and contextual variety

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[18] CAL. ELEC. § 3000.5.

within a single system also helps in controlling for the many different types of intervening factors that could otherwise disguise or distort the effects of mail ballot use. Consequently, it will then be significantly easier to attribute any observed changes in voter behaviors to changes in mail ballot use. In the next chapter, I will first detail exactly how I gathered and organized the necessary election data from various state and local archives, before then providing an overview of how this data was then applied to discern whether the increasing use of mail ballots has had any appreciable impact on primacy effects or incumbency advantages in California elections.

CHAPTER 4

Data and Methods

Collating Sources

Having identified California as likely the best source for the data needed in this study, the

next task was to develop a strategy for actually acquiring the highly varied and specific

measurements needed for observing voting by-mail's impact on primacy and incumbency

advantages. This initially posed a serious challenge since the information necessary for

measuring mail ballots, primacy, and incumbency, particularly for elections held prior to modern

digital record-keeping, would likely take considerable time and effort to acquire. Given there

were also potentially decades of viable elections available, even mere collating information into

a usable dataset would similarly be a serious undertaking. Fortunately, collection and

organization were greatly facilitated by the assistance of Pasek et al. (2014), who in their own

study of primacy effects had created an extensive panel data set of California statewide elections

held between 1976 and 2006. When contacted about the project, they generously provided access

to their longitudinal data on 76 historical elections with every participating candidate tracked

throughout all eighty State Assembly Districts across 34 unique measurements.

Utilizing the data obtained from Pasek et al. (2014) as a starting point, I then expanded

their original work with more recent elections to create a continuous dataset of all California

statewide elections held from 1976 to 2020. Information for elections held since 2006 was

mainly gathered from the California Statewide Database maintained by the Secretary of State,

but was also supplemented by the localized Statements maintained by each county registrar of

voters and the United States Decennial Census. In total, another 33 elections were added to the

existing Pasek dataset for a final combined count of 109 elections across a 44-year period.

Continuing the format already established in the Pasek et al. (2014), the expanded dataset used the candidates participating in a given election as the basic unit of measurement so that each entry corresponded to a candidate's unique descriptive and electoral statistics within each of the 80 representative districts of the California State Assembly. As an example for what this meant in practice, if an election happened to have 5 candidates participating, there would subsequently be five entries for each Assembly District. While this inevitably resulted in the descriptive information for each candidate being repeated 80 times, it allowed for candidate performance to be tracked across districts with fixed characteristics while contextual features such as ballot positions, local party registration, and voting method usage could fluctuate.

Employing Existing Measurements

As a product of their own research agenda, many of the measurements found within the Pasek data set were readily applicable to this study. This included all of the core variables not related to mail ballot use and essential controls such as the position of a contest on the ballot, candidate party affiliations, or the total number of votes cast in each election. Additionally, some useful election-level measurements from the cross-sectional portion of their study, such as if an election had an incumbent present at all, were incorporated into the district-level data set to expand its comprehensiveness. In total, 24 variables created by Pasek et al. (2014) were utilized throughout the project with only superficial coding changes for consistency. The format of these variables was then closely adhered to when adding data from the more recent elections to ultimately create a seamless transition between the older and newer entries.

Table 2.[19]
List of Variables Incorporated from Pasek et al. (2014)

Variable	Original Label	Modifications	Values
Ballot Position	*ballot position*		Candidate position on ballot. (1 to "lowest")
Contest Position	*Order of Contest on Ballot*		1 to the maximum number of contests on ballot.
District	*district*		Assembly district a candidate is competing in. (1 to 80)
Has Incumbent	*Contest has Incumbent*	Changed from a categorical to numeric value.	Candidate is competing in a contest with an incumbent. (0 to 1)
Is Incumbent	*Incumbent*	Changed from a categorical to numeric value.	Candidate incumbency status. (0 to 1)
Is Presidential Year	*Presidential Year*	Changed from a categorical to numeric value.	Did a contest coincide with a presidential election. (0 to 1)
National	*Nationalized Contest*	Changed from a categorical to numeric value.	Was a candidate competing for a national-level position (0 to 1)
Party	*part2*		Categorical label for each party.
Race	*race2*		Categorical label for each contest.
Registration [Party]	*reg_[party]*		Number of a party's registered voters in a district. (10 variables in total)
Second Race	*second_race*		Were two contests for the same position present on a ballot. (0 to 1)
Total Registered	*total registered*		Total number of registered voters in a district.
Total Votes Cast	*totals*		Total number of votes cast in a district.
Votes Received	*votes*		Total number of votes a candidate received in a district.
Vote Share	*percent*		Percentage of total votes in a district a candidate received.
Year	*year*		Year a contest took place in.

For every stage of the study, the core dependent variable was the measurement "Vote Share." Per its design in Pasek et al. (2014), this variable simply recorded the votes candidates received in a district as a percentage of the total votes cast therein. Using this measurement as a

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[19] A complete list of variables used in the project, and details of their construction, can be found in the appendix at the end of the study.

gauge of a candidate's electoral success, it was then paired alongside at least one variable capturing either a candidate's position on a ballot or incumbency status to determine what impact, if any, they had on a candidate's performance in a district. Correspondingly, the primacy effect was captured through the "Ballot Position" variable, which tracked the ballot position of candidates along a range starting at "1" for the top position and increasing for subsequent positions up to the total number of listed candidates for an election. Throughout the study, this term would be employed as either a continuous scale or as a categorical variable to respectively assess both overall trends and the performative differences between specific positions. Incumbency used the similarly aptly-named "Is-Incumbent" variable, which worked as a simple binary indicator checking if a competing alternative is the incumbent candidate for a given contest (1), or not (0).[20] Like with the dependent variable, the core independent variables remained largely unaltered when expanding the data to include information from the more recent elections, with only the incumbency measurement being changed from "incumbent" or "non-incumbent" to a binary numeric value.

Accompanying these measurements were several control variables designed to account for various candidate, spatial, electoral, and contest-specific circumstances that could potentially interfere with accurately capturing voter behaviors or their derived outcomes. As with the core variables, these mostly followed their original design laid out in the Pasek data set with some alterations made in specific instances for consistency and to better accommodate the inclusion of more recent elections data. Candidate-specific measurements included their party identification, the race they were participating in, and if they were participating in a contest where an incumbent was also competing. Spatial measurements at the district level included the total

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[20] While functionally identical, the original coding found within Pasek et al. (2014) categorized candidates as either "incumbent" or "non-incumbent."

number of votes cast, the total number of registered voters, and the number of registered voters belonging to each party. To account for situational effects unique to any particular election, the total number of contests on a ballot, the position of a given contest on the ballot, the year a contest took place, and the total number of contestants running in a particular election were also used. Lastly, two contest-specific measurements were included that checked for if they took place during a presidential election year or if they were for a national-level position.

Incorporating New Measurements

While providing many of the essential measurements for the project, the data from Pasek et al. (2014) still lacked several that would need to be manually assembled before any analysis could begin. Fortunately, most could be readily derived from the existing data set or were easily accessed public knowledge; although others would ultimately require extensive research into public records to fully realize. Overall, 13 new measurements were incorporated alongside those used from Pasek et al. (2014) for a final count of 37 unique measurements across each entry. These added measurements are outlined in Table 3., and primarily serve to incorporate additional time, circumstantial, and socioeconomic factors that would likely contribute to by-mail voting's potential and overall impact on voters.

Table 3.[21]
List of Original Variables Added to Pasek et al. (2014)

Variable	Values
Hi Vis	Election was for Governor, US President, or US Senate. (0 to 1)
Median Household Income	Estimated median household income of residents within an Assembly District.
Percent College25	Estimated percentage of district voters over the age of 25 that were 4-year college graduates.
Percent Highschool25	Estimated percentage of district voters over the age of 25 that were high school graduates.
Percent Turnout	Votes cast as a percentage of the total number of registered voters in a district.
Registered Other	Total number of registered voters in a district that were neither Democrat or Republican.
Percent VBM	Percent of votes cast in a district using mail ballots.
Top Two Primary	Election occurred before or after the adoption of the Top Two primary system (0 to 1)
VBM Percent	The percentage of votes cast in a district that were via mail ballots.
1976 - 1978	Election held before no-excuse mail ballot access. (0 to 1)
1980 - 2000	Election held with no-excuse mail ballots. (0 to 1)
2002 - 2014	Election held with no-excuse mail ballots and permanent absentee registration. (0 to 1)
2016 - 2018	Election held after implementation of Voters Choice Act. (0 to 1)
2020	Election held with mail ballots as default. (0 to 1)

Critically, the Pasek data set did not contain district-level measurements of mail ballot use, and creating this essential variable would require the number of both in-person and by-mail voters in each Assembly District for each election covered. Since counties were usually divided among several Assembly Districts, I would further require this information for each county *within* each District to generate their summed values. Following the strategy used in Pasek et al. (2014), I first searched for this information in the Statements of Vote published by the California

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[21] A complete list of variables used in the project, and details of their construction, can be found in the appendix at the end of the study.

Secretary of State. The Statements themselves proved to be largely summative, but their accompanying Supplements did contain tables breaking down the votes cast in each county by Assembly District. Unfortunately, these tables only covered Presidential, US Senate, and Gubernatorial elections and did not fully distinguish between voting methods at the district level as needed. To fill in these gaps, alternate sources would have to be sought out.

I next turned to the information available in the California Statewide Database, which archives the raw precinct-level data used in creating the Statements of Vote. These records fortunately had precincts both associated with Assembly Districts and subdivided by voting methods, which allowed for complete entries to be assembled for all districts from 2020, the most recent election used in the study, back to 2004. Unfortunately, entries prior to 2004 did not have a means to distinguish by-mail from in-person voters so another source was needed for earlier contests.[22] With this resource exhausted, I then began contacting the Registrar of Voters for each of California's fifty-eight counties to arrange access to their locally retained county-level Statements of Vote and associated records.

Collecting data from individual county offices proved to be a uniquely complex process. Like with the state, counties generally did not have election records prior to the early 2000's readily available. While most had at least some of the needed Statements scanned and available for online viewing, few were from elections earlier than 1990, and several had none accessible at all. Santa Clara, San Diego, and Ventura counties were notable exceptions though for having all of their Statements back to the 1960's fully scanned and uploaded for public access.

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[22] Prior to 2008, counties were not required to distinguish between in-person and by-mail ballots at the precinct level and instead would typically count them together by shared ballot type. After 2008, mail votes were only to be counted in separate absentee districts. See McCue (2011). During the 2006 and 2004 elections, counties reported their mail votes in separate precincts or in separate reports using their normal precinct identifiers. Prior to 2004, only normal precinct identifiers were used and mail votes only reported at the aggregate county level.

Additionally, elections data from counties that were continuously placed within a single district were unnecessary since their county-level results were never subdivided and thus could be used instead. For the remaining counties, I first attempted to arrange for copies of their missing statements to be made and delivered to me. If this could not be done, I then scheduled appointments to view the documents in person and record their contents manually.[23] Unfortunately, retention policies varied considerably across counties and so in several instances records no longer existed before a certain election year; most often the mid-1980s.

Having at this point no more concrete records available from state and county sources, the only remaining option was to develop a model for creating estimated values for the remaining missing entries. For contests where district-level data was available, but mail ballot counts were absent, I first divided the number of recorded votes from a given county in a district by the total number of votes from that county as a whole. The result was then multiplied by the total number of by-mail votes cast in the county to create a proportional estimate of the number of by-mail votes cast in that district. The number of in-person votes was then derived by subtracting the estimated number of mail voters from the total number of district votes. In contests where even district counts were unavailable, percent estimates of a county's district totals were first made by dividing the district totals from the last and lowest-order contest they were available, typically either governor or senate contests, against the county's total number of votes from that contest. This percentage would then be multiplied against the county's total in-person and by-mail vote counts for the missing contests to create whole-number estimates of the county's participation statistics in a given district.

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[23] Arrangements could not be made for Riverside County, so only their existing published records were used.

With these estimates in place, I finally then had a complete and reasonably accurate count of the number of in-person and by-mail votes from each county, within each Assembly District, for every California statewide election held between 1976 and 2020. The values for each district were then added to the dataset respectively as the measurements "IP" for in-person voters and "VBM" for by-mail voters, which were subsequently converted into percentages to create the measurements "Percent IP" and "Percent VBM."

In addition to voting method usage, 12 other variables were created using information from California legislative history records and the US Decennial Census (Prior Statewide Elections 2020, Census of Population and Housing, 2022). Because the income and educational attainment of voters is known to affect both their knowledge of, engagement with, and participation in politics, three variables were created using measurements from the 1980, 1990, 2000, 2010, and 2020 editions of the Decennial Census of Population and Housing (2022) to help capture their potential influence over candidate primacy and incumbency advantages (Verba et. al. 1995). Education in particular is frequently associated with voters being less likely to employ the types of heuristic aids when selecting candidates that encourage primacy and incumbency advantages (Verba et. al. 1995, Eckles et al., 2014, Kim et al., 2015), and so was incorporated through two variables; first as the percent of district residents over the age of twenty-five with at least a high-school education, and then as the percent of district residents over the age of twenty-five with at least a four-year college education.[24] Income levels were similarly measured through the average median household income of residents in each district to capture how it is typically associated with greater political awareness and acumen (Verba et. al.

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[24] The census measurements of residents over twenty-five was specifically used since it covered the largest portion of the voting-age population while also being continually recorded since 1976 with no substantive changes to how it was measured.

1995). All three measures were created by first converting the county-level measurements from a given census edition into percentages, then applying them to the total number of votes from each county within each Assembly District for an election year, and then taking their averages to create mean percentages for each district. This process was then repeated for each election year using the census data collected closest to when an election occurred, so that an approximation could then be made for the socioeconomic conditions during each election covered by the study.

Alongside education and income, a further 9 variables were created to help capture miscellaneous time and contextual effects that may affect the overall impact of mail ballot use. First, a series of 5 simple binary variables were created to account for specific legislative periods governing mail ballot accessibility, with "1976-1978" noting if an election occurred when voters were required to provide a valid excuse to request a mail ballot, "1980-2000" covering if an election occurred when voters could request a mail ballot without an excuse, "2002-2014" noting if an election occurred when residents could register as permanent by-mail voters, "2016-2018" covering if an election occurred after the adoption of the Voter's Choice Act, and "2020" noting if an election occurred following the state's transition to all-mail elections. Similarly, the variable "Top Two Primary" was made to note if an election occurred after the implementation of the titular Top Two primary election format in 2010. To better represent the impact of third parties, the variable "Registered Other" measured the combined percentage of persons registered in a district with any political party other than Democrat or Republican. These percentages were combined since many third-parties were not present for every election, and often suffered from low individual percentages. Next, the variable "Hi Vis" noted if a contest was for the positions of Governor, President, or Senator since these contests regularly experienced higher voter turnout.

Lastly, "Percent Turnout" recorded the number of votes cast as a percentage of the total number of registered voters in a district.

Common Methodological Elements

Using the assembled combined dataset, it was now possible to conduct dedicated analyses on how voting by mail had affected both primacy and incumbency advantages while drawing from a single electoral system. In the following chapters, I sequentially examine primacy and then incumbency to determine how voting by-mail has affected each of their influence on election outcomes. However, since both phenomena stem from similar behavioral patterns and share the same panel data set, their analyses also follow a similar methodology. I begin each chapter by reviewing the respective literatures on each phenomenon and analyzing the specifics of their potential relationship with by-mail voting. The phenomena are then examined through a series of fixed-effects linear regression models to test for the hypothesized relationships and quantify their scale and statistical significance in the presence of intervening variables. Afterwards, the relationships are then re-modeled using non-linear LOESS regressions to better visualize the effects of mail voting on each phenomenon, and explore if preexisting voter characteristics may be influencing the results observed in the linear models.

While each chapter utilizes its own unique series of models with specific configurations for observing their respective relationships, several key elements are common throughout. For the linear regressions, the measurement "Vote Share" always acts as the dependent variable with either the "Ballot Position" or "Is Incumbent" measurements present to directly capture the effects of primacy and incumbency on candidate performance. The "Percent VBM" variable then performs the same function for the direct effects of mail ballot use, however the percent of mail ballot users will not have a meaningful independent effect on candidate vote shares since it is

hypothesized to only have an indirect effect through altering voter behaviors. Instead, its main function is to be used as part of interaction terms alongside the "Ballot Position," "Is Incumbent," and assorted control variables so that the impact of mail voting can be measured through its impact on these other variables that have a direct connection to candidate performance. Accompanying the core terms are different combinations of control measurements to account for their potential interference with the core relationships. For all models, the terms "Has Incumbent," "Party," "Total Contestants," "National," "Race," "Second Race," and "Top Two Primary" are always present along with all of the registration, education, income, and time period terms. Once completed, the results of each model are then evaluated in relation to the findings of the existing literature, and of each other, for final conclusions.

After the linear models, both chapters then transition to the second stage of the analysis where the relationships between "Percent VBM," "Vote Share," and either "Ballot Position" or "Is Incumbent" are modelled non-linearly to observe any irregularities in voter behaviors. In particular, the existing literature on by-mail voting strongly suggests that it attracts a self-selecting population that are likely to use it when given the opportunity (Alvarez et al., 2012). Yet the same characteristics that distinguish this population, higher education, political engagement, and age, are also attributed as being significant underlying factors for voter's susceptibility to primacy and incumbency advantages (Lachat, 2011, Eckles et al., 2014, Kim et al., 2014). Because of this, there exists a reasonable possibility that the impact of by-mail voting on these phenomena has fluctuated as California has opened up access to mail ballots over time before culminating in its complete statewide adoption in 2020. As mail ballot use has become more ubiquitous, these self-selecting characteristics should then become less prominent within

the by-mail voter population and consequently become less effective drivers of by-mail voter behavior.

To test for this possibility, each of the studied relationships are subjected to several LOESS regressions to discern their potential impact on the linear models. This non-parametric method allows for fitting a curved regression line to a scatter plot by individually plotting the best fit between points at exceptionally small intervals so that curves can then form that are highly responsive to local fluctuations in the plot. Using this method, the average vote shares obtained by candidates at different values of the either "Ballot Position" or "Is Incumbent" variables are plotted against the percentage of by-mail voters in a district. By monitoring the trajectories of these fitted lines for sudden fluctuations or reversals, it is then possible to detect if indirect factors like self-selection tendencies might be misconstruing the results of the linear regressions. Alternative explanations for various fluctuations can also then be tested by restricting the data along different parameters such as election types, election years, or party affiliations to see if the inclusion or exclusion of different factors eliminates or changes the trajectories of the fitted lines. Like with the linear models, the results of these plots are finally then assessed for their impact and significance before moving on to the ultimate concluding analysis.

CHAPTER 5

Mail Ballots and Primacy Effects

The Primacy Effect

I began my investigation into the contextual effects of voting by-mail by examining its impact on the primacy effect. In the context of political science, the primacy effect refers to the tendency for alternatives placed in the topmost position on a ballot to receive more votes than if they were otherwise listed lower. This effect has been found to be widespread across electoral systems as research has identified its influence in everything from city council elections to national legislatures (King & Leigh, 2009, Meredith & Salant, 2013), and from first-past-the-post to proportional representative systems (Faas & Schoen, 2006, Ho & Imai, 2008, Flis & Kaminski, 2022). When conceptualizing why this ostensibly irrational phenomenon occurs, researchers commonly apply theories developed within the rational-choice and broader voter-behavioral literature on how voters rationally seek to economize their time, resources, and energy. In pursuance of these rational goals, voters may then inadvertently place themselves into situations where they are left without sufficient information to make more than an arbitrary decision.

When voters are faced with such situations, many then select the alternatives listed at or near the top of the ballot since these tend to be the first they see, remember most clearly, and the ones they typically associate with high quality due to the common literary practice of listing the best, or most desirable, alternatives first (Brockington, 2003, Edwards, 2015). This is further reinforced by political contests in some instances also deliberately ranking alternatives according to specific criteria such as by listing incumbent candidates first or listing parties in a particular

order (Niemi & Herrnson, 2003, Flis & Kaminski, 2022). These assumptions are typically misguided however, since the ranking of alternatives in the majority of political contests are actually intentionally designed so that the placement of alternatives has no intrinsic significance (Brockington, 2003, Edwards, 2015). Regardless of how the alternatives are actually ordered, some voters inevitably let their intuition and experience guide their choices and select the top-ranked alternative on their ballot for expediency and under the assumption that the top alternative has some inherent superiority over their lower ranked counterparts.

Through this mechanism, top-ranked alternatives have been consistently found to enjoy a substantial boost to their overall vote shares compared to when they are listed elsewhere lower (Miller & Krosnick, 1998, King & Leigh, 2009, Flis & Kaminski, 2022). The scale of this effect has been additionally found to be significant enough in several elections to have potentially swayed their overall outcomes and has likely influenced many more beyond these (Hamilton & Ladd, 1996). In practice though, the impact of the primacy effect can vary dramatically as research has shown it to be highly sensitive to contextual factors such as the prominence of an election and voter-specific factors like education, political engagement, or overall cognition (Miller & Krosnick, 1998, Pasek et. al. 2014, Webber et. al. 2014). Additionally, different studies have reported effects ranging from effectively none, to as high as fifteen percent more votes from being listed at the top of the ballot (Devroe & Wauters, 2020). Given this high sensitivity to moderating factors, researchers and political actors have frequently experimented with ways to reduce the advantage enjoyed by top-ranked alternatives such as by randomizing the order of alternatives across ballots (Pasek et. al. 2014, Edwards, 2015). However, research in other areas, like voting methods, indicate that broader systematic changes may also have a mitigating influence on the primacy effect.

Voting By-Mail

Through its ostensible influence on voter information gathering and the conditions in which voters participate, it should be expected that voting by-mail would have a noticeable impact on the primacy effect as well. However, few attempts have been made to study this relationship due to the highly specific circumstances required for observing the primacy effect and its relation to mail voting simultaneously. Studying the primacy effect at-minimum requires an election, or elections, where the ballot position of alternatives varies by some traceable mechanism such as by districts or similar administrative areas (Miller & Krosnick, 1998, Edwards, 2015). These elections must then also track the voting methods used by participants along this same mechanism so that both can be associated with a specific area or population.

In recent years, two articles have managed to meet these challenges and successfully analyze the relationship between mail voting and the primacy effect, with mixed results. In Pasek et. al. (2014), the authors were able to incorporate measurements of by-mail voting into their broader study of moderating influences on the primacy effect in California elections. Their results indicated that while the usage of mail ballots had some impact on the primacy effect, its influence was weak and limited to down-ballot elections where information and engagement were low. Jankowski and Frank (2022) meanwhile were able to conduct a dedicated study of mail-voting and the primacy effect using municipal elections data from the German state of Hamburg. Their results showed the use of mail ballots having a much stronger impact on the primacy effect, with top-placed alternatives experiencing a three percent drop in vote shares among by-mail voters. Together, both studies demonstrate that by-mail voting has some influence over the primacy effect, but that its scale and significance remains uncertain. Given these findings, it is reasonable to expect that further analysis should similarly reveal at least some

detectable connection between the primacy effect and the use of mail ballots and help clarify how strong this connection is.

Research Design and Results

In this project's attempt at analyzing the effects of mail ballot use on the primacy effect, I began with a series of fixed-effects regressions that would capture the relationship through multiple configurations of varying complexity. To start, I established a base regression modelling only the core relationship between a candidate's vote shares and their position on the ballot. Per their design in Chapter 4, the *Vote Share* variable would represent the percentage of the total votes a candidate received, with the *Ballot Position* variable then tracking their position as a numeric value, with 1 being the topmost. At this stage, the *Ballot Position* term would be used as a simple ordinal variable ranging from one, the topmost position, to eight, the lowest, with the results then showing the average change in vote shares as a candidate's position progressed from the top to the bottom. While the term would later be utilized as a factor to directly capture the impact of specific positions, this initial configuration would provide a convenient means for assessing how declining placement impacts overall candidate performance in one term, and allow interactions in the following models to be applied to a single measurement. Viewing the results in Table 4., the model showed an impressive 2 percent decline in vote shares as a candidate's ballot position moves from top to bottom that provided a strong signal that the primacy effect was a relevant factor in California elections.

Table 4.

Effect of Ballot Positioning on Vote Shares

	Vote Share	
Predictors	Estimates	CI
Ballot Position	-2.1528 ***	-2.2922 – -2.0133
Observations	41040	
R2 / R2 adjusted	0.022 / 0.020	

* p<0.05   ** p<0.01   *** p<0.001
Note: Confidence Intervals are reported at the 95 percent level.

With the independent effects of the core variables established, the next step was to introduce the measurement for mail ballot use and other control variables that would help capture any candidate and district-level contextual effects that may alter voter perceptions or agency. As outlined in Chapter 4, by-mail voting would be measured through the *Percent VBM* variable, which tracked the percent of mail ballot users in a district. While mail ballot use would have no meaningful independent relationship with candidate vote shares on its own, its inclusion as an independent variable would be necessary for when later incorporating it into interaction terms alongside the *Ballot Position* variable so that its impact on overall vote shares could then be observed through its influence over the primacy effect. The other controls, such as a candidate's party affiliation, were included as they were expected to have a naturally powerful causal influence over candidate vote shares, while others, such as if voters needed an excuse to vote absentee, were added due to their likely broader systemic influence. This model would subsequently act as the main benchmark of comparison and point of departure for later versions by establishing the impact of the primacy effect in the presence of confounding factors, but before introducing any interactions between it and mail ballot use.

The results of this model, seen in Table 5., now showed candidate vote shares dropping by only 0.09 percent as they moved down positions. While this reinforced the conclusion from Table 4. that the primacy effect was having a distinct influence on candidate performance, the dramatic reduction of its impact served to demonstrate its actual impact compared to other

known contributors. Unsurprisingly, party identification was found to be the predominant factor in determining candidate vote shares while others such as incumbency status, whether a contest had an incumbent, and the total number of contestants also exhibit sizable influences. Contests for Superintendent of Public Instruction were also specifically found to affect vote shares differently from other contests, but this was also expected due to it uniquely being a nonpartisan binary contest. Lastly, the number of by-mail voters now showed a 0.01 percent drop in candidate vote shares, which while lacking direct interpretive utility, did provide some basic indication that its effects on voter behaviors would be limited. Ultimately, the results indicated that the subsequent influence of by-mail voting on the primacy effect, whether found to be large or small, would likely not have an impact large enough to substantially alter the overall course of elections.

Table 5.
Base Effects on Vote Shares with No Interaction Terms

| Predictors | Vote Share | |
	Estimates	CI
Ballot Position	-0.0928 **	-0.1502 – -0.0353
VBM Percent	-0.0132 *	-0.0256 – -0.0007
Race [Superintendent]	-5.4823 ***	-7.3317 – -3.6330
Is Incumbent	6.7655 ***	6.4232 – 7.1078
Has Incumbent	-1.1649 ***	-1.3837 – -0.9462
Party [American Independence]	-49.0131 ***	-49.3565 – -48.6696
Party [Green]	-47.7118 ***	-48.1464 – -47.2772
Party [Independent]	-41.0598 ***	-41.7960 – -40.3236
Party [Libertarian]	-48.3701 ***	-48.7185 – -48.0217
Party [Natural Law]	-48.6399 ***	-49.2458 – -48.0341
Party [Peace and Freedom]	-48.7931 ***	-49.1412 – -48.4451
Party [Reform]	-47.7103 ***	-48.4640 – -46.9567
Party [Republican]	-11.4560 ***	-11.7581 – -11.1538
Total Contestants	-0.7802 ***	-0.9253 – -0.6352
Observations	41040	
R2 / R2 adjusted	0.860 / 0.860	

*p<0.05   ** p<0.01   *** p<0.001*

Note: Confidence Intervals are reported at the 95 percent level.
Regression additionally included the terms National, Second Race, Reg Dem, Reg Rep, Reg Decline, Reg Other, Median Household Income, Percent Highschool 25, Percent College 25, 1976-1978, 1980-2000, 2002-2014, 2016-2018, 2020, Top-Two Primary, and further Race terms for President, Governor, Lt Governor, Treasurer, Secretary of State, Controller, Insurance Commissioner, and Attorney General.

Following the results from Table 5., the next model added an interaction term to observe how the primacy effect changed as the use of mail ballots increased. This would be measured through the interaction term *Ballot Position * VBM Percent*, which would show the effect of *Ballot Position* on vote shares while the percentage of by-mail voters simultaneously increased. It was expected that while the *Ballot Position* term alone would still be associated with declining vote shares, the observed effect should be more pronounced due to the presence of the interaction term isolating it from the theorized moderating influence of *VBM Percent*. The interaction term itself then was expected to show a positive association as rising mail ballot use worked to counteract the effects of lowering ballot positions.

Unsurprisingly, given the low impact of the VBM Percent in Table 5., the results in Table 6. showed the *Ballot Position * VBM Percent* term having effectively no impact on vote shares, with a meager 0.0017 percent increase as candidate positions declined and mail ballot use rose. For its part, the *Ballot Position* term now showed the primacy effect causing a more noticeable 0.13 percent reduction in vote shares. Since the presence of the interaction term altered the variable to be conditional on there being zero by-mail voters, this at least supported the possibility that the absence of mail ballots contributed to a stronger primacy effect.
The minimal impact from immediate results as mail ballot use increased more compellingly suggested though that voting by mail had no substantial impact on election outcomes through its influence on the primacy effect.

Table 6.

Base Interaction between By-Mail Voting and the Primacy Effect

Predictors	Estimates	CI
	Vote Share	
Ballot Position	-0.1364 **	-0.2340 – -0.0388
VBM Percent	-0.0182 *	-0.0336 – -0.0028
Ballot Position * VBM Percent	0.0017	-0.0014 – 0.0048
Race [Superintendent]	-5.5583 ***	-7.4127 – -3.7039
Is Incumbent	6.7642 ***	6.4219 – 7.1065
Has Incumbent	-1.1626 ***	-1.3814 – -0.9438
Party [American Independence]	-49.0164 ***	-49.3599 – -48.6729
Party [Green]	-47.7169 ***	-48.1516 – -47.2822
Party [Independent]	-41.0341 ***	-41.7717 – -40.2964
Party [Libertarian]	-48.3747 ***	-48.7232 – -48.0262
Party [Natural Law]	-48.6376 ***	-49.2435 – -48.0317
Party [Peace and Freedom]	-48.7984 ***	-49.1466 – -48.4503
Party [Reform]	-47.7061 ***	-48.4598 – -46.9524
Party [Republican]	-11.4568 ***	-11.7589 – -11.1547
Total Contestants	-0.7852 ***	-0.9305 – -0.6399
Observations	41040	
R2 / R2 adjusted	0.860 / 0.860	

* p<0.05   ** p<0.01   *** p<0.001

Note: Confidence Intervals are reported at the 95 percent level.
Regression additionally included the terms National, Second Race, Reg Dem, Reg Rep,
Reg Decline, Reg Other, Median Household Income, Percent Highschool 25, Percent
College 25, 1976-1978, 1980-2000, 2002-2014, 2016-2018, 2020, Top-Two Primary, and
further Race terms for President, Governor, Lt Governor, Treasurer, Secretary of State,
Controller, Insurance Commissioner, and Attorney General.

Having found voting by-mail to not significantly impact vote shares through the primacy effect, I next tested how much the relationship was potentially being affected by influences from the other control variables. Since many of the included factors, such as a candidate's party affiliation, obviously affected their performance among voters, it was likely that they would similarly influence how impactful ballot positioning or voting by-mail could be on voter decision-making. Additionally, these factors might also indicate unique situations where the effects of voting by-mail on the primacy effect are more pronounced. For example, it could be that the impact of voting by-mail on the primacy effect may be weaker for incumbents due to their unique notoriety among voters. To address these possibilities, I created two extra models that added interactions for predictors that demonstrated a compelling (p<0.01) influence over candidate vote shares in Table 6. alongside the already present variables. The first model would

examine how competing factors were indirectly influencing the main *Ballot Position * VBM Percent* interaction by having both the *Ballot Position* and *VBM Percent* variables interacting with the other terms separately. The second would then examine the influence these factors had *on* the main interaction by introducing a further layer of three-way interactions between *Ballot Position*, *VBM Percent*, and the control terms.

   The results of the first revised model in Table 7. still showed the *Ballot Position * VBM Percent* term causing an insubstantial 0.0023 percent increase in vote shares as candidate positions decreased and voting by-mail increased, while the *Ballot Position* variable itself now showed a substantially larger 0.4 percent drop in vote shares from the primacy effect. This further supported that even with many major contributing variables held at fixed values, the impact of voting by-mail on the primacy effect was not consequential to election outcomes. Additionally, the lack of appreciable change in the *Ballot Position * VBM Percent* term indicated that the influences of the other variables were largely not interfering with its performance from either the *Ballot Position* or *VBM Percent* terms and that its impact was simply quite limited. The added interactions for their part unsurprisingly showed significant effects across most of the included terms and generally reinforced the notion that their influences over candidate performance were much more potent. The only notable distinction being that while the primacy effect was itself not significantly impacted by candidate party affiliations, the number of mail ballot users did have a significant impact on candidate performance by party as the *VBM Percent * Party [Independent]* term showed independent candidates benefiting the most with 0.6 percent more votes for every percentile increase in the number of by-mail voters. This in-turn supported the possibility that mail ballot users were exhibiting tendencies borne out of self-selecting characteristics, rather than from unique benefits of the method itself.

Table 7.
By-Mail Voting and the Primacy Effect with Competing Interactions

Predictors	Vote Share	
	Estimates	CI
Ballot Position	-0.4478 *	-0.8660 – -0.0297
VBM Percent	0.0376 *	0.0043 – 0.0710
Ballot Position * VBM Percent	0.0023	-0.0011 – 0.0057
Ballot Position * Race [Superintendent]	-1.9818 **	-3.1723 – -0.7914
Ballot Position * Is Incumbent	-0.7663 ***	-0.9696 – -0.5629
Ballot Position * Has Incumbent	0.1984 **	0.0753 – 0.3215
VBM Percent * Race [Lieutenant Governor]	-0.0331 **	-0.0536 – -0.0125
VBM Percent * Race [Treasurer]	-0.0366 ***	-0.0578 – -0.0155
VBM Percent * Party [American Independence]	-0.0698 ***	-0.0888 – -0.0508
VBM Percent * Party [Green]	-0.0918 ***	-0.1158 – -0.0678
VBM Percent * Party [Independent]	0.6224 ***	0.5811 – 0.6637
VBM Percent * Party [Libertarian]	-0.0496 ***	-0.0687 – -0.0305
VBM Percent * Party [Peace and Freedom]	-0.0722 ***	-0.0908 – -0.0536
VBM Percent * Party [Reform]	-0.1609 **	-0.2698 – -0.0521
VBM Percent * Party [Republican]	-0.0465 ***	-0.0607 – -0.0323
VBM Percent * Is Incumbent	-0.1279 ***	-0.1439 – -0.1120
VBM Percent * Has Incumbent	0.0167 **	0.0044 – 0.0291
Observations	41040	
R^2 / R^2 adjusted	0.866 / 0.865	
	* $p<0.05$ ** $p<0.01$ *** $p<0.001$	

Note: Confidence Intervals are reported at the 95 percent level.

Regression additionally included the terms National, Second Race, Reg Dem, Reg Rep, Reg Decline, Reg Other, Median Household Income, Percent Highschool 25, Percent College 25, 1976-1978, 1980-2000, 2002-2014, 2016-2018, 2020, Top-Two Primary, and further Race terms for President, Governor, Secretary of State, Controller, Insurance Commissioner, and Attorney General. Interaction terms also included Total Contestants.

With the requisite two-way interactions in-place, the next revised model added a tier of three-way interactions to observe the effects of the controls directly on the *Ballot Position * VBM Percent* term. Given that the findings from Table 7. showed minimal variation, it was expected that isolating the direct influence of the control terms on the core interaction would now produce a stronger reaction. While the results in Table 8. proved this assumption to be correct, with *Ballot Position * VBM Percent* exhibiting a substantially larger 0.01 percent increase to candidate vote shares as ballot positions declined and mail ballot use increased, the effect was still resoundingly insignificant with a *p*-value of 0.27.[25] The *Ballot Position* variable

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[25] The p-value of Ballot Position * VBM Percent never dropped lower than 2 throughout every iteration of the study.

itself also grew to a more impressive 0.7 percent reduction in candidate vote shares, so that the moderating influence from mail ballots was still insubstantial relative to the primacy effect as well. Surprisingly, few of the three-way coefficients actually returned significant results as only Republican or incumbent candidates had any noticeably significant impact on the relationship. Even with the effects of the control variables conditioned to their minimum values, the results then still supported the conclusion that the minimal impact mail ballot use did have on the primacy effect was ultimately insignificant towards the overall performance of competing political candidates.

Table 8.
By-Mail Voting and the Primacy Effect with 3-Way Interactions Added

Predictors	Vote Share	
	Estimates	CI
Ballot Position	-0.7964 *	-1.5048 – -0.0879
VBM Percent	0.0204	-0.0368 – 0.0775
Ballot Position * VBM Percent	0.0125	-0.0098 – 0.0347
Ballot Position * Is Incumbent	-0.4705 **	-0.8206 – -0.1205
VBM Percent * Race [Lieutenant Governor]	-0.0622 **	-0.1023 – -0.0220
VBM Percent * Party [American Independence]	-0.0644 **	-0.1060 – -0.0228
VBM Percent * Party [Green]	-0.0873 **	-0.1403 – -0.0343
VBM Percent * Party [Independent]	0.5574 ***	0.4703 – 0.6445
VBM Percent * Party [Peace and Freedom]	-0.0666 **	-0.1072 – -0.0259
VBM Percent * Party [Republican]	-0.0706 ***	-0.0992 – -0.0419
VBM Percent * Is Incumbent	-0.1039 ***	-0.1362 – -0.0716
(Ballot Position * VBM Percent) * Party [Republican]	0.0099 *	0.0007 – 0.0191
(Ballot Position * VBM Percent) * Is Incumbent	-0.0108 *	-0.0209 – -0.0007
Observations	41040	
R2 / R2 adjusted	0.866 / 0.865	

* $p<0.05$ ** $p<0.01$ *** $p<0.001$

Note: Confidence Intervals are reported at the 95 percent level.
Regression additionally included the terms National, Second Race, Reg Dem, Reg Rep, Reg Decline, Reg Other, Median Household Income, Percent Highschool 25, Percent College 25, 1976-1978, 1980-2000, 2002-2014, 2016-2018, 2020, Top-Two Primary, and further Race terms for President, Governor, Treasurer, Secretary of State, Controller, Insurance Commissioner, Superintendent, and Attorney General. Interaction terms at all levels also included Total Contestants and Has Incumbent.

While the conclusions of the first series of models pointed to the influence of voting by-mail on the primacy effect being overall inconsequential, a weakness of the methodology was that the measurement used to capture the primacy effect only represented the average change

across *all* positions as a candidate's position declined. Despite being useful for presenting a broad overview of the effect, arranging the *Ballot Position* measurement as a single continuous grade from the top to the bottom of the ballot list meant it could not distinguish the relative advantage being listed first conferred over specific lower positions, and was thus incapable of showing what would usually be considered the core relationship of the primacy effect. It additionally meant that the effects of individual positions were hidden, so that it was impossible to tell how specific positions contributed to the overall direction of the averaged measurement. To address these issues, I reimplemented the models with *Ballot Position* changed into a categorical term that split each ballot position into separate binary variables that checked when a candidate was (1) or was not (0) in a given position. The effects of these on vote shares was then recorded as their deviation from the average vote share received in position one; so that if the *Ballot Position [two]* term returned an estimate of *-1*, it would indicate that candidates placed second on a ballot were receiving one percent fewer votes on average than when listed at the top.

The results from these revised models in Table 9. confirmed that there was a substantial amount of variation hidden within the trends identified in the preceding versions as the specific differences between each position and position one was found to be consistently greater than the average decline seen in the earlier regressions. Starting with the revised base model in the leftmost column, the results reaffirmed the presence of the primacy effect with a clear trend of candidate vote shares progressively lowering the farther they were from position one. This reached a nadir at position five, which was associated with a 0.6 percentage point drop in vote shares from when a candidate was in position one, but past this point the trend started to deteriorate until inverting completely into an *increase* in vote shares by position eight. The abrupt decline of the effect past position five uniformly corresponded to the increasing rarity

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among these lower positions within the dataset, with position eight being impacted the most since only the 1996 presidential election managed to have such a relatively large number of candidates qualify for listing.

Table 9.

Impact of By-Mail Voting on the Primacy Effect, by Position

Predictors	Vote Share			
	Base Model	**Plus Main Interaction**	**Plus Control Interactions**	**Plus 3-Way Interactions**
	Estimates			
Ballot Position [two]	-0.2638	-0.4021	-0.1143	-1.7435
Ballot Position [three]	-0.3657 *	-0.4459	-2.7456 *	-3.0390
Ballot Position [four]	-0.4875 **	-0.7436 **	-1.5389	-2.5929
Ballot Position [five]	-0.6265 ***	-0.8148 **	-2.4385	-5.2549 *
Ballot Position [six]	-0.3593	-0.4913	-3.0738	0.9131
Ballot Position [seven]	-0.2722	-0.8117	-5.9276	-4.2479
Ballot Position [eight]	0.6766	1.4093	-5.6855	32.9135 *
VBM Percent	-0.0131 *	-0.0176 *	0.0300	0.0119
Ballot Position [two] * VBM Percent		0.0047	0.0089	0.0468
Ballot Position [three] * VBM Percent		0.0027	0.0010	-0.0418
Ballot Position [four] * VBM Percent		0.0104	0.0137	0.0085
Ballot Position [five] * VBM Percent		0.0073	0.0086	0.1114
Ballot Position [six] * VBM Percent		0.0051	0.0138	-0.1765
Ballot Position [seven] * VBM Percent		0.0251	-0.0418	-0.4297
Ballot Position [eight] * VBM Percent		-0.0404	-0.0163	-1.9033 **
(Ballot Position [three] * VBM Percent) * Is Incumbent				-0.0644 *
(Ballot Position [four] * VBM Percent) * Is Incumbent				-0.0713 *
(Ballot Position [five] * VBM Percent) * Is Incumbent				-0.0720 *
R^2 / R^2 adjusted	0.860 / 0.860	0.860 / 0.860	0.866 / 0.865	0.866 / 0.865
Observations	41040			

*p<0.05   ** p<0.01   *** p<0.001*

Note: Regressions additionally included the terms Has Incumbent, Race, Party, National, Second Race, Reg Dem, Reg Rep, Reg Decline, Reg Other, Median Household Income, Percent Highschool 25, Percent College 25, 1976-1978, 1980-2000, 2002-2014, 2016-2018, 2020, and Top-Two Primary. Interaction terms at all levels also included Total Contestants, Race, Party, Is Incumbent, and Has Incumbent.

When subsequently reintroducing the *Ballot Position * VBM Percent* interaction, the results of the second column again showed the *Ballot Position* terms all having substantially

strengthened effects on vote shares. One notable change however was that the presence of the interaction caused positions six and seven to now more closely resemble the intensifying pattern seen with positions two through five, which suggested that voting by-mail may be more impactful for at least these lower positions. As before though, the actual impact of *Ballot Position * VBM Percent* remained insubstantial across positions and at most showed a 0.02 percentage point reduction of the vote share advantage conferred by the primacy effect for candidates in position seven. Despite the results being universally larger and suggestive of a stronger impact from by-mail voting than what was seen in the earlier models, their effect was still functionally indistinguishable from zero and not enough to meaningfully influence overall candidate performance.

When reintroducing the other two-way interactions involving *Ballot Position* and *VBM Percent* in the third column, the results continued to show stronger effects from the *Ballot Position* variable and showed a much more consistent decline in vote shares through to position eight. Contrary to the previous versions though, position two saw its impact weaken considerably while the other positions showed their effects intensifying to between 1 and 5 percentage point decreases relative to position one. As with the earlier model in Table 7. though, the introduction of the competing interaction terms did not appreciably alter the impact of the *Ballot Position * VBM Percent* terms and further reinforced that the observed results were largely representative of by-mail voting's impact on the primacy effect. Tracking changes by position also revealed that the direction of the effect was not entirely consistent either as position seven now showed voting by-mail *increasing* the vote share difference caused by the primacy effect, while the similar effect from position eight weakened.

In the final column, the three-way interactions were then reapplied to the *Ballot Position * VBM Percent* terms to directly observe how the controls impacted by-mail voting's influence over the primacy effect. Similar to what was seen previously in Table 8., the results showed the effects of the *Ballot Position * VBM Percent* interactions intensifying by an order of magnitude, but the direction of the effects now varied considerably across positions. Notably, positions three, six, seven, and eight now all showed increasing mail ballot use helping to intensify the primacy effect, which signaled that their influence was especially dependent on the presence of at least some of the control terms. Contrary to this implication however, only candidate incumbency was found to have a consistent influence over multiple positions as incumbents in positions three, four, and five did progressively worse as the number of by-mail voters increased. Ultimately, the results still signified that the observed impact of mail ballots on the primacy effect across positions was insubstantial even when accounting for the influence the control variables have on the relationship.

Taken as a whole then, it was apparent from the results of both the initial and revised regression models that voting by mail's influence on elections was negligible and held no explanatory power. Whether measured along a continuous spectrum or through the relationship between individual positions, increasing mail ballot use caused no discernable change to the performance of the primacy effect, which itself only had a marginal impact of 0.1 to 0.5 percentage points. Lacking any influence over what was already in-practice a marginal effect to begin with, it could then be concluded that voting by-mail was not noticeably altering the course of elections through manipulating the primacy effect. Some consolation could be found however in that while increasing mail ballot usage did not counteract primacy effects, its overall null influence meant it was not exacerbating them either.

While the results of the so-far indicated that rising mail ballot use did not substantively influence elections through altering the primacy effect, another possibility was that the relationship may be non-linear and fluctuate depending on mail ballot usage. Preceding research of mail ballot users has shown it to attract a strongly self-selective user-base with characteristics that closely coincide with those found to reduce individual susceptibility to the primacy effect, such as higher education and political engagement (Miller & Krosnick, 1998, Boehmke et. al. 2012, Alvarez et. al. 2013). This relationship could then theoretically manifest as mail ballot use initially having a greater impact on the primacy effect that eventually dissipates as the number of by-mail voters continues to grow and resulting in what appears to be an overall near-zero effect. A further implication was that there would be a critical threshold where the addition of more by-mail voters would no longer contribute to its influence as they would not sufficiently exhibit the characteristics of self-selective users. Eventually, the primacy effect would reappear as the population of by-mail voters becomes more representative of the voting population as a whole. To test this theory, I created a series of non-linear LOESS regressions that modelled the average vote shares obtained at each ballot position while the percentage of by-mail voters increased in district elections. While only capable of modeling the specific relationship between the core variables of interest, the regressions would capable of depicting any irregularity in the interaction that was hidden within the results of the preceding regressions.

The results of the first attempt in Figure 3. immediately revealed the presence of four distinct tiers of behavior across ballot positions. In the first tier, positions one and two were closely matched in vote shares and responsiveness to mail ballot use as both initially showed slight declines that abruptly reversed to become steep inclines as the percentage of by-mail voters increased past approximately 20 percent, before arcing down again after approximately 80

percent of votes are cast by-mail. In the second tier, positions three, four, and five initially had

similarly sized vote shares but experienced gradual declines that saw them converge at around

the 25 percent mark and maintain a virtually indistinguishable flat trajectory from then on. In the

third tier, position six started with a distinctly lower vote share than the preceding positions and

held to a relatively flat trajectory until experiencing a gradual rise after the 25 percent mark that

saw it converge with the positions in the second tier by the 30 percent mark until arcing

downwards after the 80 percent mark. The fourth tier consisting of positions seven and eight

were mainly united by their brevity and divergent behavior from the preceding positions, with

the former bowing slightly downwards before rapidly rising after around the 25 percent mark,

and the latter showing a precipitous rise and fall between the ten to twenty-seven percent marks.

Two observations immediately stood out among the results; first was that vote shares

trended towards equalization up to where approximately 25 percent of votes are cast by mail, and

second was that some factor unique to the first two ballot positions was obviously causing their

vote shares to sharply diverge from all other positions. Given that the latter issue was exclusive

to the two highest positions on the ballot, the likely culprit behind the behavior was California's

adoption of the Top-Two primary system. Since 2012, all California statewide elections except

for US President have operated under what has become known as a "Top Two" format where

only the two most popular candidates from an open primary are printed as choices on the

subsequent general election ballot (Primary Elections in California, 2023). As a consequence of

this change, elections held after 2012 have systematically added more instances in the dataset

where the number of ballot alternatives was limited to just two options. If data from these

elections was then graphed alongside preceding elections, it would then appear as the top two

positions exhibiting an increase in vote shares relative to the other positions, when in reality they

are simply the only positions available to choose from. This factor was previously controlled for in the linear models using the binary Top Two Primary term that checked if an election occurred before (0) or after (1) the implementation of this system, but accounting for it in the LOESS models required manually partitioning the dataset.

Figure 3.

Unmodified Impact of Voting by-Mail on the Primacy Effect
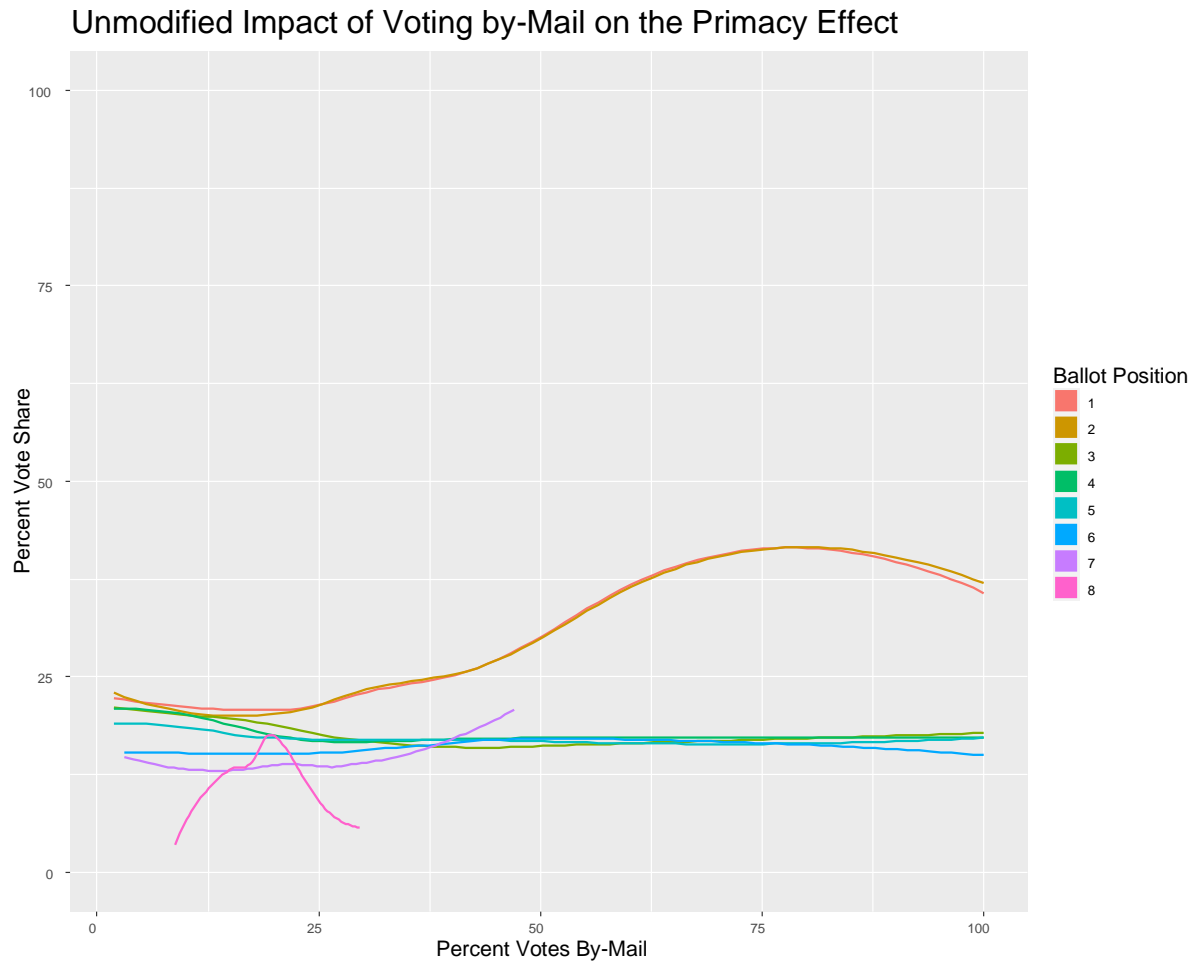
The results in Figure 4. showed that restricting the data to elections held prior to the implementation of the Top-Two primary resulted in the performance of positions one and two much more closely resembling the behaviors found among the lower ballot positions. As expected, this break in the data only affected positions one and two and confirmed that it was their overrepresentation in subsequent elections causing their odd behavior in Figure 3. These

positions now also mimicked the behavior seen among the lower positions where their vote

shares started to equalize as they approached the 25 percent threshold. However, both maintained

a distinct advantage over all lower positions through to the end of the model. As a consequence

though of the Top-Two primary being enacted before many of the elections with the highest rates

of mail ballot usage occurred, the figure additionally showed the trajectories of each position

wildly diverging past the 50 percent threshold due to the progressive lack of data. This

correspondingly made interpretation past this point increasingly untenable, and highlighted that

this distinction in the dataset was providing only a partial depiction of the relationship.

Figure 4.

Impact of Voting by-Mail on the Primacy Effect without Top-Two
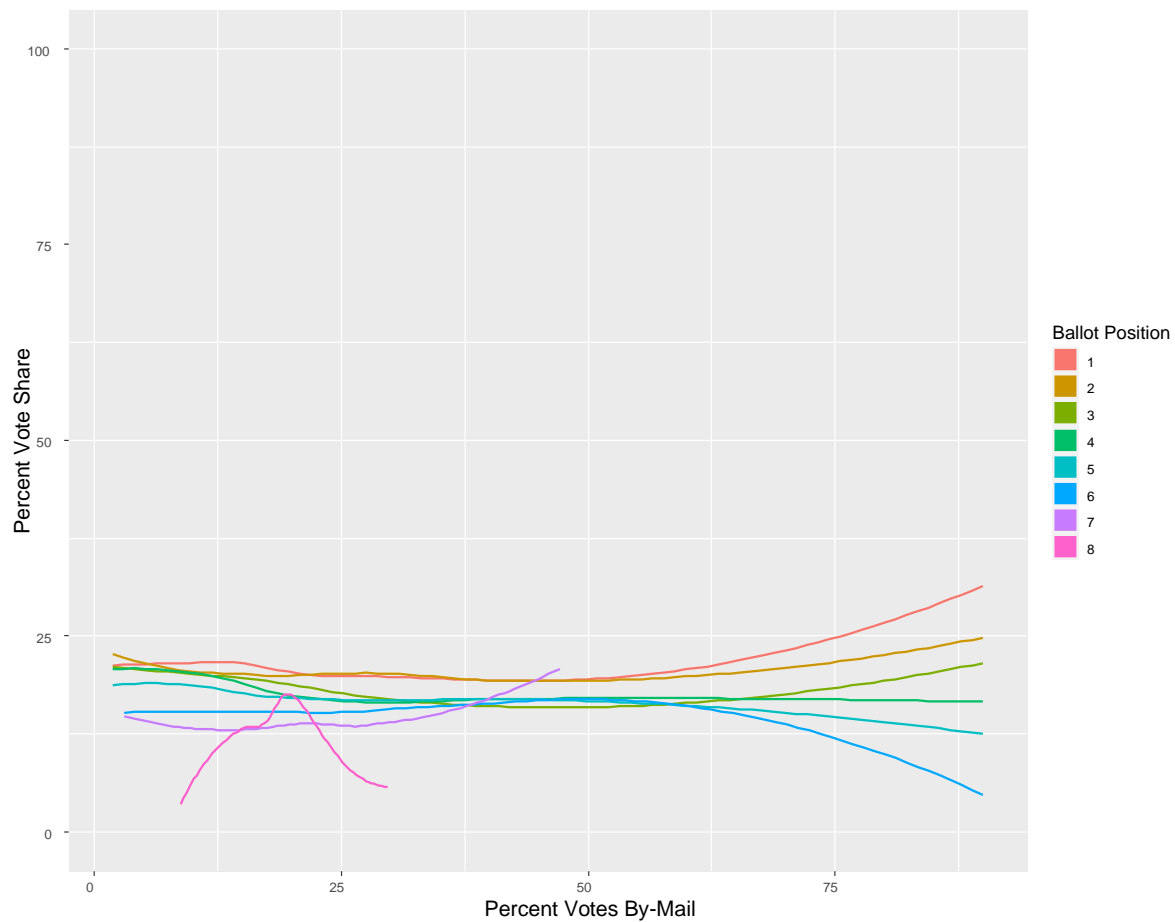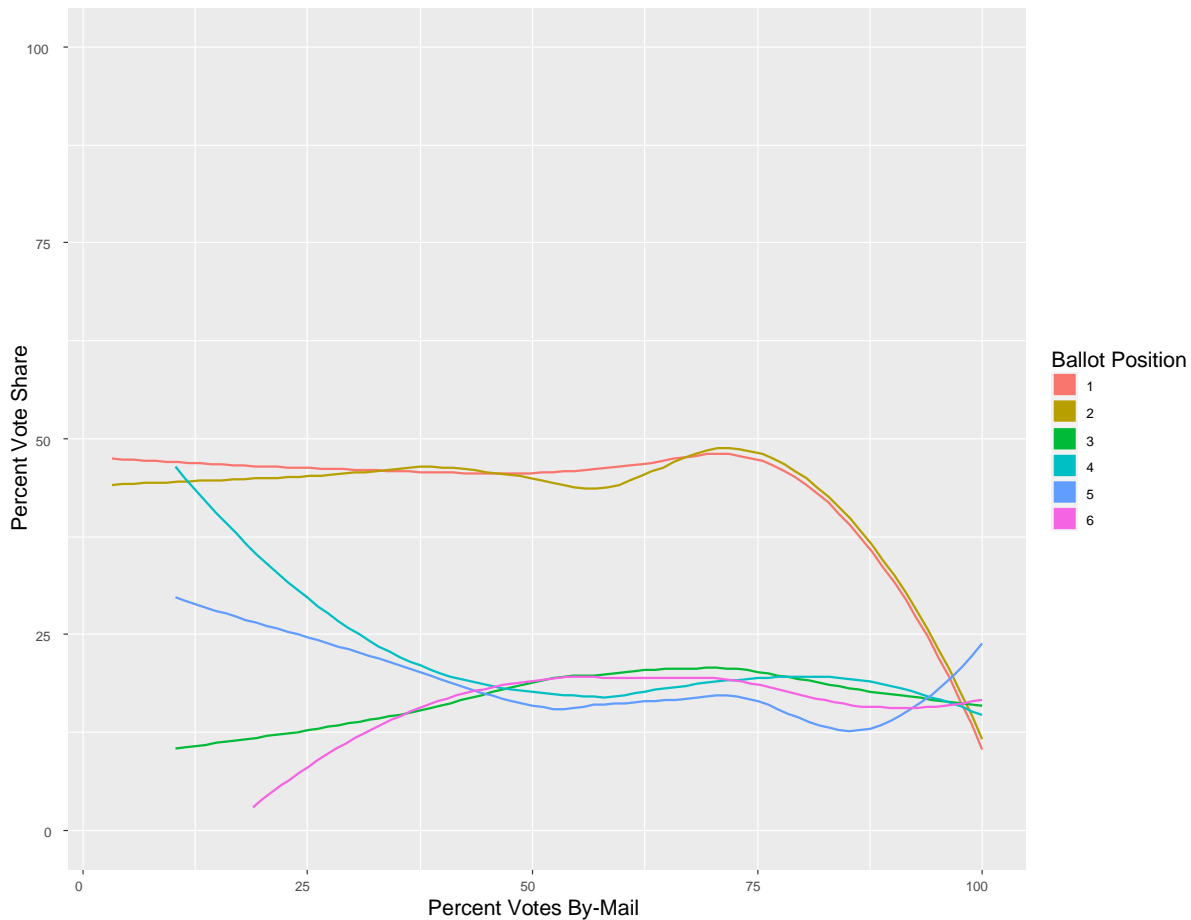Primary Elections

Figure 5.

Impact of Voting by-Mail on the Primacy Effect with only
Top-Two Primary Elections

When subsequently examining elections held after the implementation of the top-two

system in Figure 5., the results showed positions one and two again having a stark superiority in

vote shares over all lower positions. However, both positions experienced a precipitous decline

at approximately the seventy-five percent mark that coincided with the sudden mass-adoption of

mail ballots for the 2020 elections. Such a noticeable drop demonstrated that the restriction to

two ballot alternatives was dramatically impacting the performance of the positions, since the

only statewide contest to list more than two alternatives in this portion of the data was for the US

Presidency. For their part, the lower positions exhibited a much greater range of behaviors due to

their relative rarity in this portion of the data. As expected from the previous figure, limiting the data to only post Top-Two primary elections also resulted in extreme variation from all positions as mail ballot use approached zero. This especially impacted the lowest four positions due to their relative scarcity in elections with such low mail ballot use. Since the results showed positions one and two clearly responding to the 2020 elections, it was then apparent that the distinction that actually needed to be made was on the number of contestants listed on the ballot itself.

Based on the observations from the preceding figures, two further models were created that separated elections into binary and multi-candidate groups. For the former, this included all non-presidential elections held after 2012 plus all prior elections comprised of just two candidates. The latter model subsequently included all remaining elections held prior to 2012 and all elections for the US Presidency since 2012. When first viewing the results for the binary contests in Figure 6., the model showed them having almost no reaction to the proportion of by-mail voters and maintaining highly consistent average vote shares throughout. Additionally, it consistently showed position one having a stable advantage over position two, outside of a brief exchange at around the 74 percent threshold, which demonstrated that while the primacy effect itself had an appreciable presence, the hypothesized impact of rising mail ballot use did not.

Figure 6.

Impact of Voting by-Mail on the Primacy Effect in Binary Contests
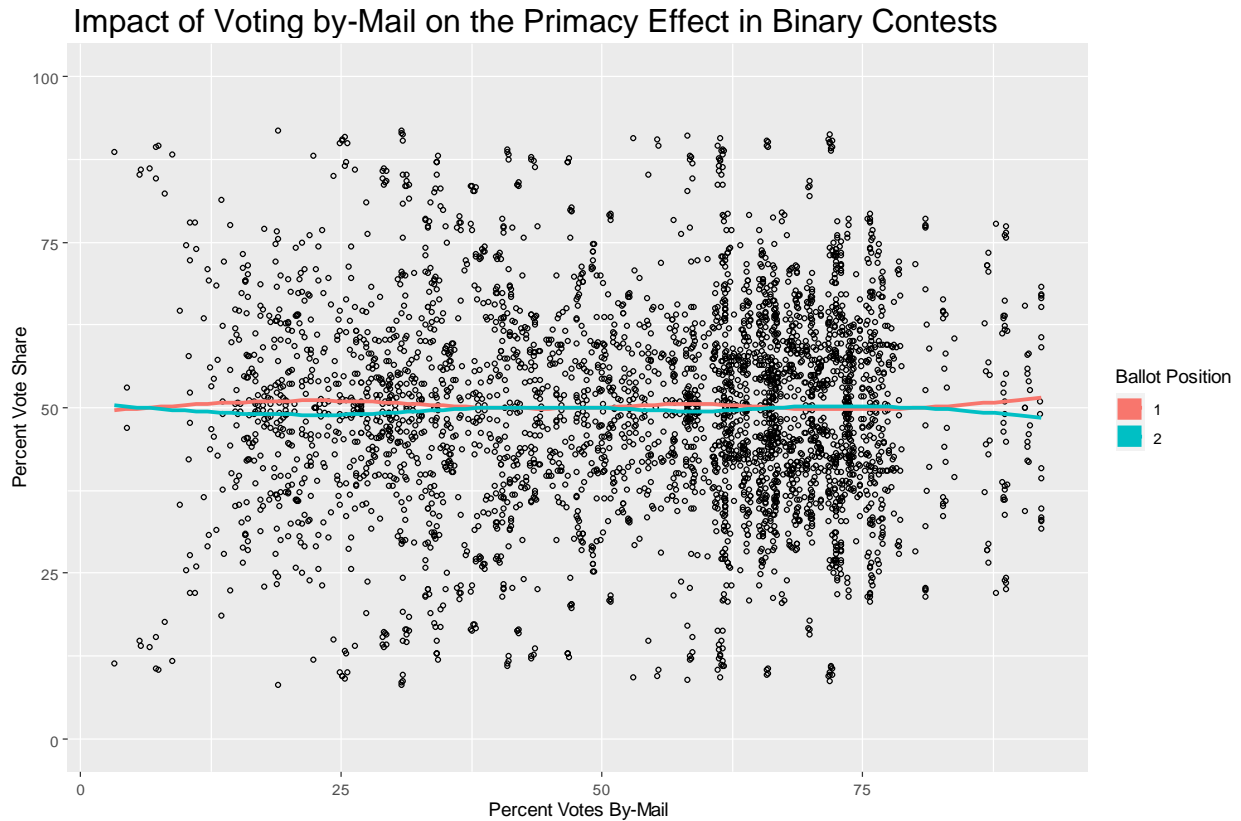

In contrast, Figure 7. reaffirmed the observations of Figure 3. and showed the rising use

of by-mail voting corresponding with a gradual equalization of vote shares across positions as

mail ballot use approached between 25 and 30 percent of votes cast. Positions one through five

in particular exhibited highly coordinated patterns of behavior where their average vote shares

declined between three to four percent as the proportion of by-mail voters rose, until levelling off

at around the 25 percent threshold. Past this, these positions maintained roughly equal vote

shares of between 16 to 17 percentage points that exhibited a much less distinct hierarchy

compared to before the threshold. Even with the Y-axis deliberately rescaled to emphasize the

differences between positions, the model still showed position one having a distinctly reduced

advantage over the other positions following the initial decline towards the critical 25 percent

threshold. This ultimately suggested that mail ballot use was indeed having an impact on the

scale of the primacy effect, but that this effect was highly conditional and limited up to this prominent threshold of between 25 to 30 percent of voters.

Figure 7.

Impact of Voting by-Mail on the Primacy Effect in Non-Binary Contests
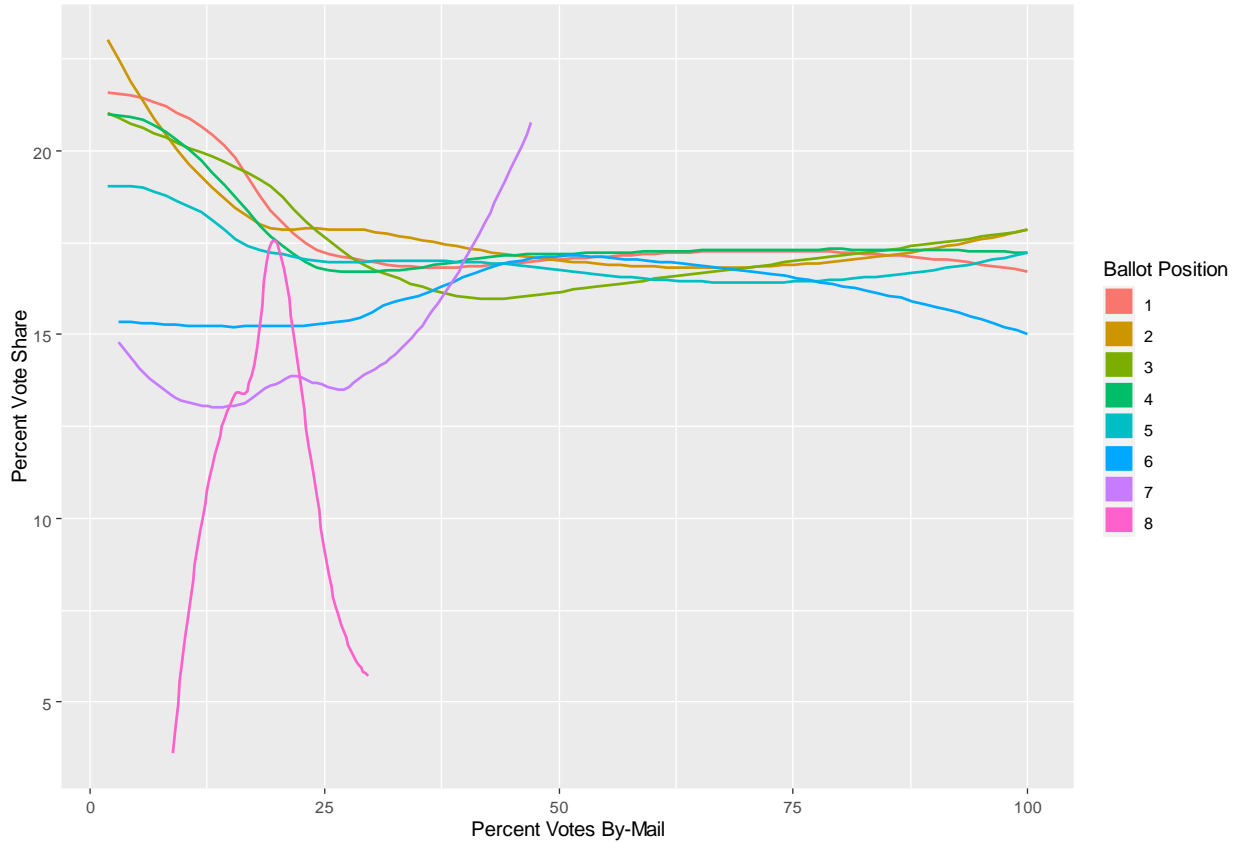
While the observations from Figure 7. pointed to by-mail voting having a specific window of influence over the behavior of the primacy effect, it was questionable if this behavior was truly representative of their relationship. In particular, it was possible that the observed behavior prior to the 25 percent threshold was being caused by the systemic pressures from the total number of contestants like what was observed from binary choice contests in Figure 6. To test for this, I created additional separate models for each specific level of total ballot

contestants. The results in Figures 8. and 9. showed that in all cases[26], the performance of the positions at each level no longer responded to the proportion of by-mail voters and maintained a largely consistent hierarchy of decreased vote shares as positions lowered. Instead, each configuration maintained a set level of vote shares proportionate to the total number of contestants listed. While some fluctuations and exchanges could be observed throughout each instance, the lack of an observable equalization like that seen in the combined model in Figure 7. indicated that neither of the hypothesized non-linear effects from rising mail ballot use were present.

From the assorted visualizations provided by the LOESS regressions, several conclusions could now be reached about the nature of the interaction between mail ballot use and the primacy effect. The models first showed that while there was some variation hidden within the original linear regressions, with the vote shares of all ballot positions fluctuating to some degree as the proportion of by-mail voters increased, the behavior of each variable was largely stable and satisfactorily representative of a linear relationship. However, it was also visually confirmed that by-mail voting had no consistent influence on ballot position performance under any conditions. Outside of extremely minor and situational instances, further increases in mail ballot use showed little to no effect on vote shares across ballot positions and ultimately demonstrated that the near-zero results of the linear models accurately represented the average overall impact across all elections and ballot positions. The results subsequently rejected that self-selection or contextual influences were meaningfully affecting the relationship at all and added further compelling evidence that the primacy effect was overall immune to changes in voting method usage.

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[26] No election in the dataset had exactly three contestants listed on the ballot.

Figure 8.

Impact of Voting by-Mail on the Primacy Effect with Four to Five Contestants

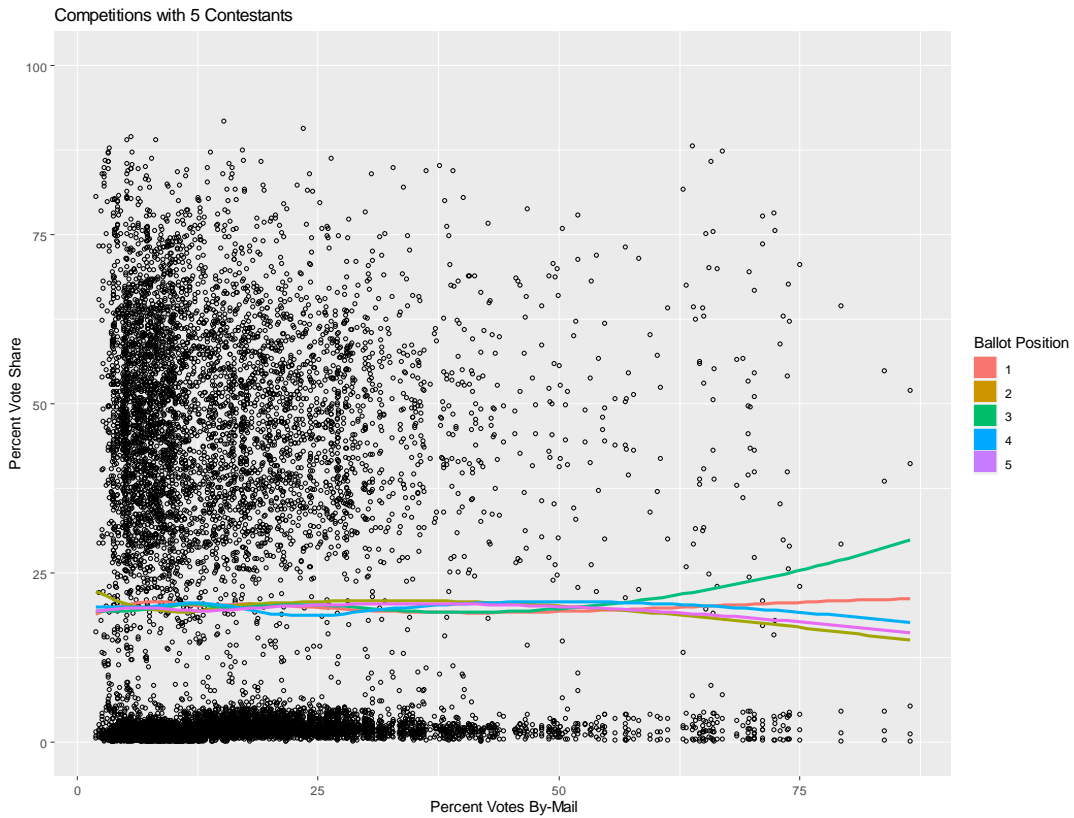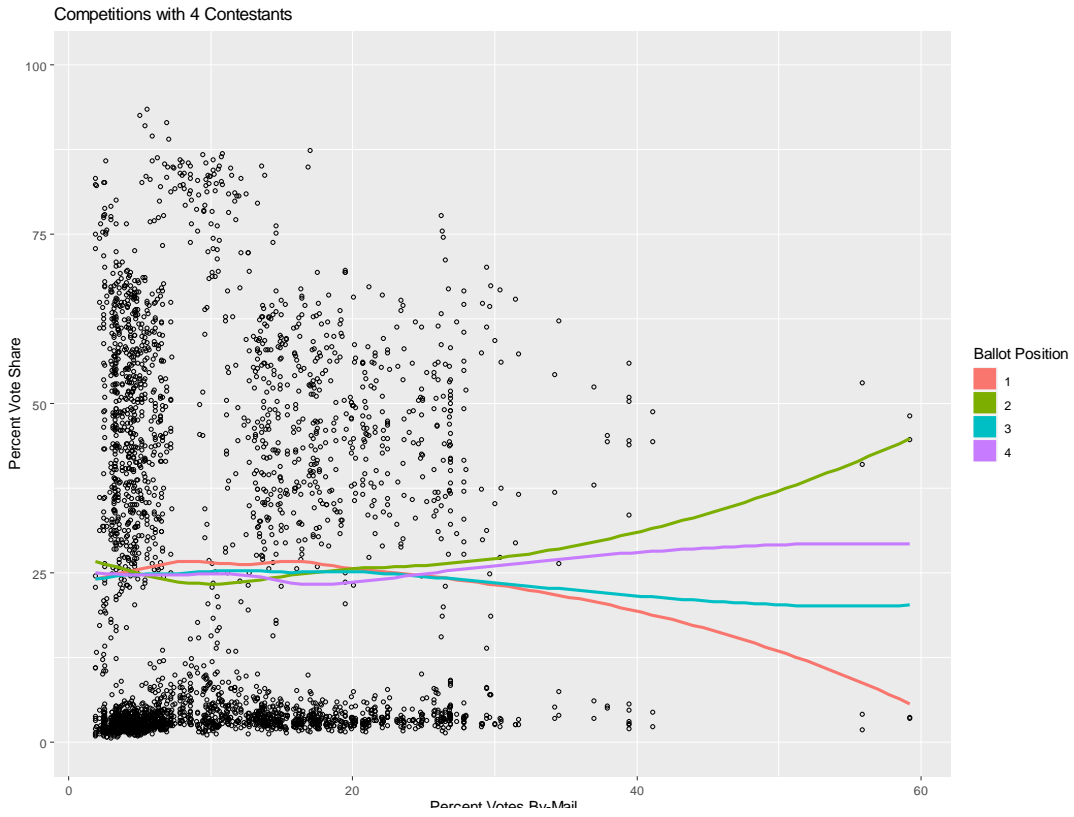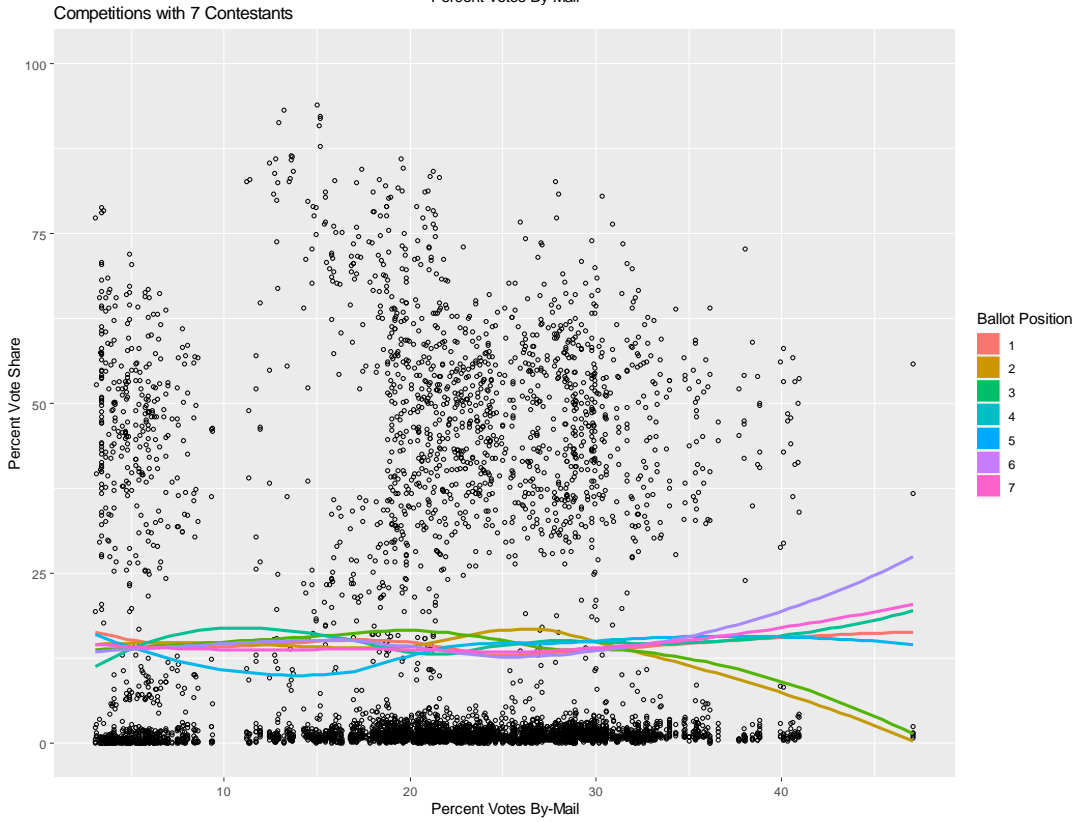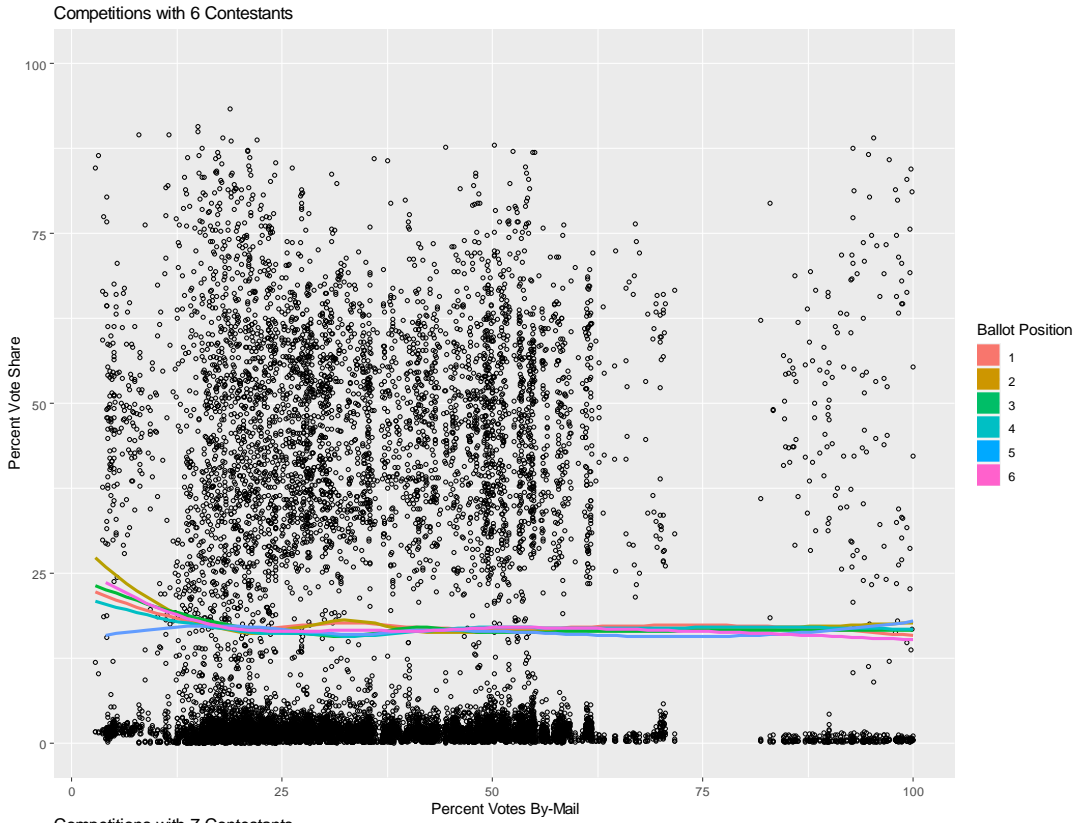Competitions with 4 Contestants

Competitions with 5 Contestants

Figure 9.

Impact of Voting by-Mail on the Primacy Effect with Six to Seven Contestants

Competitions with 6 Contestants

Competitions with 7 Contestants

Concluding Discussion

       In this chapter, I examined the extent to which the growing use of mail ballots in California may have meaningfully reduced the influence of the primacy effect on statewide election outcomes. The results of my analysis demonstrated voting by-mail to have no substantive impact on a candidate's overall performance and subsequently rejecting the initial hypothesis that its rising use over time would have a consequential impact on elections through manipulating the primacy effect. The results from the linear models were initially promising by showing the primacy effect itself to create a marginal, yet decisive, 0.1 to 0.8 percentage point vote share advantage when candidates were listed first on a ballot. However, increasing use of mail ballots was found to have no substantive impact on this phenomenon one way or the other. This ultimately corroborated the conclusions drawn by Pasek et. al. (2014) that any influence voting by-mail may have over the primacy effect is ultimately too weak to be consistently meaningful on its own merits.

       The findings of the linear regressions were further supported when visually depicting the relationship through a series of non-linear models, which showed candidate vote shares remaining largely constant across positions as the usage of mail ballots increased. While variations did regularly appear throughout different configurations of the data, these largely corresponded to conspicuous gaps in mail ballot use caused by abrupt changes in availability or a relative lack of data points compared to more densely populated portions of the plots. Any disparities that did appear within populated sections further tended to support the resilience of the primacy effect by showing a distinct hierarchy with position one consistently being near or at the top. These observations served to reject the secondary hypothesis that the effects of voting by-mail may be inadvertently caused by self-selection biases from users, as there was no

meaningful variation to begin with. However, the overall weakness of the results means that this later possibility cannot be definitively ruled out for the marginal instances where by-mail voting is relevant.

While ultimately rejecting the main hypotheses being tested, the models still offered some productive insight about voter behavior within elections with high rates of mail ballot use. In particular, by showing an effectively null relationship with the primacy effect, the results provided tentative evidence that the increasing use of voting by-mail has at-least not had a negative influence on voter behavior, nor seriously changed how voters choose alternatives at all. This lack of a consequential electoral impact could then be considered an overall positive outcome, as it signifies the use of mail ballots is not unduly influencing elections one way or the other. However, the mechanical limitations to the study does mean there is a reasonable possibility the effects of voting by-mail might be stronger in other electoral contexts. Existing research of California elections have similarly found it to generate a smaller primacy effect, which is largely attributable to the state's deliberate efforts to curb its influence on voters (Ho & Imai, 2008, Pasek et. al., 2014). It is then probable that in electoral settings that promote larger primacy effects, the impacts of voting by-mail may correspondingly become large enough to appreciably influence the course of elections. The results are also inconclusive about if and how the contextual changes brought about through voting by-mail affect voter perceptions or behaviors, since the lack of any distinguishable trends makes definitive conclusions one way or the other unwarranted. Taking all of these observations into account, it is reasonable to expect that further research into this relationship will continue to show voting by-mail having no real influence over the primacy effect, but more favorable settings may reveal a more substantial overall impact on elections.

CHAPTER 6

Mail Ballots and Incumbency Advantages

The Incumbency Advantage

Having found voting by-mail's influence on primacy effects to be inconsequential, I next turned to investigate if mail ballot use influenced candidate incumbency advantages any differently. Like with the primacy effect, incumbency advantages are largely theorized to occur as the result of voter uncertainties and information gaps incentivizing them to select candidates based on their familiarity and not on rational assessments of their performance or qualities. In this case, voters facing the prospect of an uncertain choice in an election may decide to select the candidate that is the current holder of the contested position under the assumption that their preexisting experience, or implicit prior electoral successes, would make them the most suitable (Gordon & Landa, 2009). This bias is subtly encouraged by multiple systemic factors favoring incumbents such as ballots often specifically identifying incumbents, deliberately placing them at the top of ballot listings, and enhanced name-recognition among voters (Abramowitz, 1975, Eckles et. al., 2014). Incumbents also generally benefit from an improved campaigning infrastructure that allows them to amass funds through pre-established political networks, grants them easier access to media coverage, and enables them to gain credit for the achievements of their administration (Prior, 2006, Gordon & Landa, 2009). This latter advantage frequently acts as a hinderance however, since incumbents can similarly become easily associated with the failings of their administration as well (Gordon & Landa, 2009). Together, these largely abstract advantages have been shown to provide incumbents concrete electoral gains over their competitors by enabling them to better stand out in crowded, highly competitive, or low-information contests where familiarity with voters is critical (Eckles et. al., 2014).

While seemingly benefiting from decisive advantages in theory, another common observation among studies of incumbency is that its effect on candidates is extremely sensitive to changes in the electoral environment and to voters. At the systemic level, factors such as district magnitude, term lengths, and the specific electoral formulas used have all been found to dramatically alter the advantages of incumbency. Among these, single-member first-past-the-post style elections for long-term seats generate the strongest advantages, while multi-member proportional elections for short-terms seats are known to create incumbency *disadvantages* (Carey et al., 2000, Ariga, 2015). These institutional modifiers are further accentuated by the characteristics and disposition of the voters themselves as their knowledgeability, engagement, and sense of personal connection with the incumbent can substantially influence the intensity of the effect (Desposato & Petrocik, 2003, Hood & McKee, 2010). A further implication has been that the efficacy of incumbency advantages is heavily dependent on an incumbent's personal ability to leverage its advantages in their favor, since the fickle attention and superficial knowledge of those voters most easily swayed by incumbency are also the most likely to change (Gordon & Landa, 2009). This deep reliance on both voter knowledge and the fundamental arrangement of elections should then make the incumbency advantage particularly susceptible to changes caused by the increasing use of mail ballots due to their effects on voters' access to information and mitigation of circumstantial pressures.

Voting By-Mail

Given its improved convenience and information accessibility compared to conventional in-person voting, voting by-mail should theoretically instigate noticeable changes in the vote share advantages enjoyed by incumbent candidates. Yet even more so than with the primacy effect, few works have explored this connection despite it being more conceptually approachable

and logistically feasible. As detailed in Chapter 3, studies of incumbency advantages have been both varied and expansive due to them fundamentally requiring only a sufficient number of elections with and without incumbents present to compare (Gordon & Landa, 2009). However, such examinations are typically not done in locales, or at a level of detail, conductive to simultaneously examining the effects of voting methods due to the latter's greatly restricted use. As such, it has been exceedingly rare for studies of incumbency to consider the intersecting effects of voting methods, and those that have incorporated it have done so only as a means to observe more conventional interactions when other options won't suffice.

The extent to which the existing literature addresses the relationship between voting by-mail and incumbency is best embodied by the incidental glimpse provided in the article by Frank et al. (2022). In their work, the authors examined how a sudden increase in voter turnout following the onset of the novel coronavirus epidemic in 2020 consequently affected incumbent vote shares in Bavarian municipal elections. Crucially, this sharp increase in turnout was facilitated by Bavarian election officials abruptly switching to an all-mail ballot distribution scheme in between election rounds, which simultaneously provided the study a unique instrument for assessing the specific impact of turnout in a controlled setting and a surreptitious demonstration of how mail ballot use affected incumbency through turnout. From their analysis, it was determined that the switch to holding elections entirely by-mail increased turnout in the affected elections by around 10 percent, which subsequently greatly benefited incumbents by conferring a 3.4 percent increase to their vote shares over their competitors. While their research was explicitly focused on turnout, their results strongly support the presence of a dynamic relationship between mail ballot use and incumbent vote shares through the former's ability to make the act of participation more convenient.

In contrast to the observations from Frank et al. (2022) though, it was expected in this study that increasing mail ballot use in California would show an overall reduction to incumbent candidate vote shares due to the unique features of the California electoral system. As noted in Chapter 4, California offers several structural advantages that systematically favor incumbent candidates. In particular, the combined effects from the widespread use of single-member first-past-the-post contests, frequent elections, and a long-standing policy of systematically labelling incumbents on ballots often gives incumbents a massive vote share advantage over competitors (Desposato & Petrocik, 2003, Nemerovski, 2021). Consequently, the informational and contextual advantages of voting by-mail may then encourage voters to be less deferential towards incumbents. Also unlike the Bavarian elections used in Frank et al. (2022), California has made mail ballots widely available to voters for over 40 years, which should help to reduce the confusion that the sudden change in format brought about by the coronavirus pandemic may have otherwise caused voters. As such, California should then provide both an ideal setting for observing a strong incumbency advantage, and progressively counteract its effects as mail ballot use increases across elections.

Research Design and Results

Following the same format established in Chapter 5, I began my investigation of the relationship between voting by-mail and incumbency with a series of fixed-effects regression models that would progressively add more variables and interactions in stages. The first model would again simply examine only the basic relationship between a candidate's vote shares and incumbency status. As before, the dependent variable would be the *Vote Share* term encapsulating the number of votes a candidate received in a district as a percentage of the total votes cast, while the *Is Incumbent* measurement would check if a candidate was incumbent (1) or

non-incumbent (0). The results in Table 10. show incumbency predictably having a massive

influence over candidate performance, as incumbents received on average 37 percent more votes

than non-incumbents. This was before the introduction of mail ballot use and competing control

terms however, and their presence would inevitably serve to weaken the initial findings.

Table 10.
Effect of Incumbency on Vote Shares

Predictors	Vote Share	
	Estimates	CI
Is Incumbent	37.0682 ***	36.4317 – 37.7048
Observations	41040	
R2 / R2 adjusted	0.241 / 0.240	

* p<0.05   ** p<0.01   *** p<0.001
Note: Confidence Intervals are reported at the 95 percent level.

Having established the base relationship between candidate incumbency and vote shares, I

next reintroduced measurements for mail ballot usage and other control terms to observe how

their presence interfered with the effects from incumbency before adding any interactions.

Mail ballot use was again measured using the *Percent VBM* variable, which continued to merely

record the percent of votes cast by-mail in a district for each election. Also like with the primacy

effect, this measurement would only become meaningfully interpretable when interacting

through terms like *Is Incumbent* since its influence would only indirectly impact voter decision-

making rather than overtly changing candidate performance. This would again be supplemented

by a range of control terms, although candidate-specific factors like party affiliation and the

contest they were participating in were expected to have the greatest impact on voter behavior.

However, an additional term *Percent Turnout* was also included that would measure the total

number of votes cast as a percentage of the total number of registered voters within each district.

This new variable was created to help account for the observations made in Frank et al. (2022)

that fluctuations in turnout can substantially impact candidate performance, with the expectation

that higher turnout elections should favor incumbent candidates more due to the influence of otherwise low-engagement voters. This particular model would again ultimately act as the base configuration that subsequent versions would build off-of as they progressively introduce more layers of complexity.

The results for the initial model in Table 11. showed all terms closely resembling their observed behaviors in Table 5. from the previous chapter, which was to be expected since the only difference between the two was one extra term. Though now greatly reduced from the preceding model, *Is Incumbent* still showed a substantial 6.7 percent increase in vote shares for incumbents over non-incumbent candidates. In reality though, this dropped to a 5.6 percent increase after accounting for the counteracting effects from the overlapping *Has Incumbent* term, which showed a sizable 1.1 percent decline in vote shares across all candidates in elections where an incumbent was present. Together, these results strongly indicated that incumbent candidates were systematically diverting vote shares from their competitors in the elections where they were present. This was further reinforced by the high degrees of statistical significance and tight confidence intervals suggesting that the effect was consistent across circumstances and contests. The remaining control terms all also demonstrated similar levels of impact and significance to what had been seen previously, with candidate party affiliation and contests for Superintendent of Public instruction being by-far the most pronounced. Lastly, *VBM Percent* again showed only a 0.01 percent decrease in candidate vote shares that continued to signal that it would have a minimal influence on voters. Unlike with primacy effects though, the substantial influence incumbency had on candidate performance raised the potential for even a relatively modest effect from increasing mail ballot use to have a consequential impact on election outcomes.

Table 11.

Base Effects on Vote Shares with No Interaction Terms

Predictors	Vote Share	
	Estimates	CI
Is Incumbent	6.7629 ***	6.4205 – 7.1053
Has Incumbent	-1.1643 ***	-1.3831 – -0.9455
VBM Percent	-0.0131 *	-0.0256 – -0.0005
Ballot Position	-0.0932 **	-0.1507 – -0.0357
Race [Superintendent]	-5.4932 ***	-7.3454 – -3.6409
Party [American Independence]	-49.0156 ***	-49.3592 – -48.6721
Party [Green]	-47.7150 ***	-48.1497 – -47.2803
Party [Independent]	-41.0806 ***	-41.8173 – -40.3439
Party [Libertarian]	-48.3723 ***	-48.7209 – -48.0238
Party [Natural Law]	-48.6465 ***	-49.2537 – -48.0394
Party [Peace and Freedom]	-48.7951 ***	-49.1435 – -48.4466
Party [Reform]	-47.7172 ***	-48.4720 – -46.9624
Party [Republican]	-11.4585 ***	-11.7607 – -11.1563
Total Contestants	-0.7803 ***	-0.9254 – -0.6351
Percent Turnout	-0.0014	-0.0178 – 0.0149
Observations	41034	
R2 / R2 adjusted	0.860 / 0.860	

*p<0.05   **p<0.01   ***p<0.001*

Note: Confidence Intervals are reported at the 95 percent level.
Regression additionally included the terms National, Second Race, Reg Dem, Reg Rep, Reg Decline, Reg Other, Median Household Income, Percent Highschool 25, Percent College 25, 1976-1978, 1980-2000, 2002-2014, 2016-2018, 2020, Top-Two Primary, and further Race terms for President, Governor, Lt Governor, Treasurer, Secretary of State, Controller, Insurance Commissioner, and Attorney General.

Having reestablished the base effects of the terms on vote shares, the next model

subsequently introduced the main interaction term *Is Incumbent * VBM Percent* to observe any

difference in vote shares between incumbent and non-incumbent candidates as the proportion of

by-mail voters increased. Similar to with the primacy effect, I expected that the presence of the

interaction holding the number of by-mail voters at zero would cause the base *Is Incumbent*

predictor to have a greater impact on vote shares, while the interaction would then

correspondingly show incumbent vote shares declining alongside rising mail ballot use. The

results of the model in Table 12. ultimately confirmed these assumptions as the effect of the *Is*

Incumbent term increased by nearly three percentage points to a 9.4 percent vote share advantage

for incumbents. This observation was then corroborated by the *Is Incumbent * VBM Percent*

interaction showing rising mail ballot use corresponding to a marginal yet highly significant 0.09 percentage point decrease in incumbent vote shares. While initially appearing inconsequential, the construction of the *Vote Share* term meant this drop represented the change in incumbent votes for each 1 percent increase in the number of mail ballot users. So that at the point where 100 percent of votes are cast by-mail, the effect would correspond to an approximate 9 percent decrease in votes for incumbents.

Table 12.

Base Interaction between By-Mail Voting and Incumbency Advantages

Predictors	Vote Share	
	Estimates	CI
Is Incumbent	9.4033 ***	8.9098 – 9.8968
Has Incumbent	-1.0983 ***	-1.3160 – -0.8807
VBM Percent	0.0023	-0.0100 – 0.0145
Is Incumbent * VBM Percent	-0.0946 ***	-0.1074 – -0.0818
Ballot Position	-0.0943 **	-0.1517 – -0.0370
Race [Superintendent]	-6.0495 ***	-7.8892 – -4.2098
Party [American Independence]	-48.8214 ***	-49.1650 – -48.4778
Party [Green]	-47.7139 ***	-48.1473 – -47.2805
Party [Independent]	-40.6347 ***	-41.3719 – -39.8975
Party [Libertarian]	-48.2392 ***	-48.5873 – -47.8912
Party [Natural Law]	-48.4472 ***	-49.0533 – -47.8412
Party [Peace and Freedom]	-48.6258 ***	-48.9740 – -48.2776
Party [Reform]	-47.4981 ***	-48.2510 – -46.7451
Party [Republican]	-11.4273 ***	-11.7288 – -11.1259
Total Contestants	-0.9012 ***	-1.0211 – -0.7812
Reg Other	0.1756 **	0.0507 – 0.3006
Percent Turnout	0.0040	-0.0204 – 0.0283
Observations	41034	
R2 / R2 adjusted	0.861 / 0.861	

*p<0.05   **p<0.01   ***p<0.001*

Note: Confidence Intervals are reported at the 95 percent level.
Regression additionally included the terms National, Second Race, Reg Dem, Reg Rep, Reg Decline, Median Household Income, Percent Highschool 25, Percent College 25, 1976-1978, 1980-2000, 2002-2014, 2016-2018, 2020, Top-Two Primary, and further Race terms for President, Governor, Lt Governor, Treasurer, Secretary of State, Controller, Insurance Commissioner, and Attorney General.

With the results from Table 12. indicating that mail ballot use has a surprisingly powerful influence over incumbent performance, to where it nearly negates the incumbency advantage at high percentages, the next step was to test the resilience of the relationship in the presence of

competing interactions. As with the primacy effect, it was expected that factors like party affiliation or specific contests would greatly influence incumbent candidate performance and even impact the effect mail ballot use had on it. To test for this, I again created a pair of models that incorporated additional interactions comprised of predictors that showed a robust level of statistical significance (p<0.01) in Table 12.[27] The first model would again incorporate additional competing interactions made up of the *Is Incumbent* and *VBM Percent* terms to observe how their presence interfered with the main *Is Incumbent * VBM Percent* interaction. The second would correspondingly then add a layer of three-way interactions between *Is Incumbent*, *VBM Percent*, and the control terms to test the latter's' influences upon the main interaction.

In contrast to the behaviors observed previously in Chapter 5, the results of the first model in Table 13. showed both the *Is Incumbent* and *VBM Percent* terms having numerous sizable and significant competing interactions. Unsurprisingly, the *Is Incumbent* interactions showed incumbency to be highly sensitive to the type of contest a candidate was participating in, the number of voters registered with a 3rd party, the number of competitors in a contest, and a candidate's party affiliation. Additionally, incumbent performance was found to decline as voter turnout improved unlike the observations made in Frank et al. (2022). The *VBM Percent* interactions similarly showed modest effects from nearly all candidate party affiliations and political contests, however these were consistently negative compared to the more variable findings among the Is Incumbent interactions. The only exception was that the vote shares of independent candidates grew by 0.6 percent for every percentile increase in mail ballot use, which suggested that part of the reason mail ballots negatively impacted incumbents was that their users were more inclined to choose non-conventional candidates. For its part, the main Is

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[27] *Percent Turnout* was also included despite lacking initial significance based on the findings of Frank et al. (2022).

Incumbent * VBM Percent interaction now showed an even more substantial 0.12 percentage

point drop in incumbent vote shares for every percent increase in by-mail voting, which further

supported that the rising use of by-mail voting in elections had meaningfully helped reduce

incumbent performance.

Table 13.
By-Mail Voting and Incumbency with Competing Interactions

Predictors	Vote Share	
	Estimates	CI
Is Incumbent	27.8192 ***	25.1931 – 30.4453
VBM Percent	0.0098	-0.0442 – 0.0639
Is Incumbent * VBM Percent	-0.1240 ***	-0.1443 – -0.1037
Is Incumbent * Race [Attorney General]	2.5309 ***	1.2789 – 3.7829
Is Incumbent * Race [Controller]	5.0359 ***	3.9321 – 6.1398
Is Incumbent * Race [Governor]	3.6752 ***	2.5120 – 4.8384
Is Incumbent * Race [Lieutenant Governor]	-5.5424 ***	-6.6784 – -4.4064
Is Incumbent * Race [Secretary of State]	2.1797 ***	1.1717 – 3.1877
Is Incumbent * Race [Superintendent]	-8.9422 ***	-10.7424 – -7.1421
Is Incumbent * Race [Treasurer]	3.1442 ***	2.0058 – 4.2826
Is Incumbent * Party [Republican]	3.4723 ***	2.6878 – 4.2568
Is Incumbent * Total Contestants	-1.7255 ***	-1.9924 – -1.4587
Is Incumbent * Reg Other	-0.4890 ***	-0.7630 – -0.2151
Is Incumbent * Percent Turnout	-0.1562 ***	-0.1871 – -0.1254
VBM Percent * Race [Attorney General]	-0.0424 ***	-0.0638 – -0.0210
VBM Percent * Race [Governor]	-0.0351 **	-0.0572 – -0.0130
VBM Percent * Race [Insurance Commissioner]	-0.0548 ***	-0.0813 – -0.0282
VBM Percent * Race [Lieutenant Governor]	-0.0415 ***	-0.0623 – -0.0206
VBM Percent * Race [President]	-0.0326 **	-0.0559 – -0.0093
VBM Percent * Race [Treasurer]	-0.0291 **	-0.0505 – -0.0076
VBM Percent * Party [American Independence]	-0.0613 ***	-0.0803 – -0.0424
VBM Percent * Party [Green]	-0.0824 ***	-0.1063 – -0.0586
VBM Percent * Party [Independent]	0.6740 ***	0.6350 – 0.7131
VBM Percent * Party [Libertarian]	-0.0452 ***	-0.0642 – -0.0263
VBM Percent * Party [Peace and Freedom]	-0.0675 ***	-0.0859 – -0.0491
VBM Percent * Party [Reform]	-0.1658 **	-0.2734 – -0.0582
Observations	41034	
R2 / R2 adjusted	0.869 / 0.868	

*p<0.05   ** p<0.01   *** p<0.001*

Note: Confidence Intervals are reported at the 95 percent level.
Regression additionally included the terms Ballot Position, Has Incumbent, National, Second Race, Reg Dem, Reg Rep, Reg Decline, Median Household Income, Percent Highschool 25, Percent College 25, 1976-1978, 1980-2000, 2002-2014, 2016-2018, 2020, Top-Two Primary, and a Race term for President. Interactions terms also included Ballot Position.

With the effects of the *Is Incumbent * VBM Percent* term found to be robust in the

presence of competing interactions involving its component predictors, the next model

reintroduced a layer of three-way interactions to see how the core interaction performed under

specific conditions. Given that most of the *Is Incumbent* interactions in Table 13. showed positive vote share advantages for incumbents far stronger than the counteractive effect of the *Is Incumbent * VBM Percent* term, it was now expected that most of the resulting three-way terms would show overall positive effects as well. In effect, these competing circumstantial factors were expected to override the moderating influence mail ballots had on incumbency. The results in Table 14. ultimately proved this to be true, as all but one of the significant three-way interactions showed incumbent vote shares now increasing alongside mail ballot use. Holding so many terms at their minimal value also caused the *Is Incumbent * VBM Percent* term to grow in strength to a 0.8 percentage point decline in incumbent vote shares as mail voting increased, which signified that the control terms were greatly moderating its effect. As a whole then, the results of the three-way interactions strongly indicated that the contextual sensitivity of the incumbency advantage was greatly affecting the influence voting by-mail had where it could even help incumbents under some conditions.

Table 14.
By-Mail Voting and Incumbency with 3-Way Interactions

Predictors	Vote Share	
	Estimates	CI
Is Incumbent	54.3635 ***	49.2025 – 59.5245
VBM Percent	0.1430 ***	0.0849 – 0.2011
Is Incumbent * VBM Percent	-0.8850 ***	-1.0123 – -0.7578
Is Incumbent * Race [Lieutenant Governor]	-12.7709 ***	-14.6016 – -10.9401
Is Incumbent * Race [President]	3.6249 ***	1.7299 – 5.5200
Is Incumbent * Race [Superintendent]	-30.1604 ***	-33.9669 – -26.3538
Is Incumbent * Party [American Independence]	-12.8773 ***	-19.9807 – -5.7738
Is Incumbent * Party [Republican]	3.1336 ***	1.7474 – 4.5198
Is Incumbent * Total Contestants	-3.3592 ***	-3.9312 – -2.7871
Is Incumbent * Reg Other	0.8056 ***	0.3699 – 1.2412
Is Incumbent * Percent Turnout	-0.4688 ***	-0.5236 – -0.4140
VBM Percent * Race [Superintendent]	-0.1306 ***	-0.1717 – -0.0895
VBM Percent * Race [Treasurer]	-0.0389 ***	-0.0618 – -0.0159
VBM Percent * Party [American Independence]	-0.0630 ***	-0.0825 – -0.0436
VBM Percent * Party [Green]	-0.0880 ***	-0.1121 – -0.0638
VBM Percent * Party [Independent]	0.6817 ***	0.6423 – 0.7211
VBM Percent * Party [Libertarian]	-0.0501 ***	-0.0696 – -0.0307
VBM Percent * Party [Peace and Freedom]	-0.0690 ***	-0.0880 – -0.0501
VBM Percent * Party [Reform]	-0.1801 ***	-0.2873 – -0.0729
VBM Percent * Party [Republican]	-0.0236 **	-0.0406 – -0.0066
VBM Percent * Reg Other	0.0140 ***	0.0078 – 0.0201
VBM Percent * Percent Turnout	-0.0019 ***	-0.0026 – -0.0013
(Is Incumbent * VBM Percent) * Race [Attorney General]	0.1070 ***	0.0520 – 0.1621
(Is Incumbent * VBM Percent) * Race [Controller]	0.1344 ***	0.0831 – 0.1856
(Is Incumbent * VBM Percent) * Race [Governor]	0.1532 ***	0.0949 – 0.2115
(Is Incumbent * VBM Percent) * Race [Insurance Commissioner]	0.2065 ***	0.1221 – 0.2909
(Is Incumbent * VBM Percent) * Race [Lieutenant Governor]	0.3148 ***	0.2584 – 0.3713
(Is Incumbent * VBM Percent) * Race [Secretary of State]	0.0914 ***	0.0418 – 0.1411
(Is Incumbent * VBM Percent) * Race [Superintendent]	0.6141 ***	0.5238 – 0.7043
(Is Incumbent * VBM Percent) * Party [American Independence]	0.2762 **	0.0985 – 0.4539
(Is Incumbent * VBM Percent) * Total Contestants	0.0259 ***	0.0124 – 0.0394
(Is Incumbent * VBM Percent) * Reg Other	-0.0605 ***	-0.0730 – -0.0480
(Is Incumbent * VBM Percent) * Percent Turnout	0.0126 ***	0.0111 – 0.0141
Observations	41034	
R2 / R2 adjusted	0.870 / 0.870	

* p<0.05   ** p<0.01   *** p<0.001

Note: Confidence Intervals are reported at the 95 percent level.
Regression additionally included the terms Ballot Position, Has Incumbent, National, Second Race, Reg Dem, Reg Rep, Reg Decline, Median Household Income, Percent Highschool 25, Percent College 25, 1976-1978, 1980-2000, 2002-2014, 2016-2018, 2020, Top-Two Primary, and Race terms for both President and Insurance Commissioner. Interaction terms at all levels also included Ballot Position.

One of the more notable findings among the three-way interactions in Table 14. was from the interaction between *Is Incumbent*, *VBM Percent*, and *Percent Turnout,* as unlike with its preceding two-way terms it now showed a slight, yet highly significant, 0.01 percent increase in vote shares for incumbents as both mail voting and turnout increased. In the preceding two-way interactions in Table 13., the *Is Incumbent * Percent Turnout* term showed incumbent vote shares decreasing by a sizable and significant 0.15 percent for each percent increase in voter turnout, which grew to an even larger 0.46 percent drop in Table 14. These latter results were peculiar as they contradicted the observations made in Frank et al. (2022) that incumbent vote shares should improve as turnout increases, under the logic that influxes of erstwhile uninformed or unengaged voters would favor incumbents. Their observations however were predicated on a sudden influx of voters caused by an unprecedented switch to a by-mail only format, where in-person voting was wholly forbidden, in response to the coronavirus pandemic in 2020. Seeing then that the results corroborated those of Frank et al. (2022) only when mail ballot use was factored in alongside turnout, it suggested that at least part of the effect they were observing was actually due to the influence from mail ballots themselves.

Table 15.
By-Mail Voting and Incumbency with Incumbent Elections Only

	Vote Share			
Predictors	Base Model Estimates	Plus Main Interaction	Plus 2-Way Interactions	Plus 3-way Interactions
Is Incumbent	7.8634 ***	10.5287 ***	34.2400 ***	63.5034 ***
VBM Percent	-0.0118	0.0111	-0.0055	0.3048 ***
Is Incumbent * VBM Percent		-0.0951 ***	-0.1693 ***	-1.0335 ***
Is Incumbent * Race [Attorney General]			2.8076 ***	0.7941
Is Incumbent * Race [Controller]			5.3722 ***	1.3680
Is Incumbent * Race [Governor]			3.9634 ***	1.6699
Is Incumbent * Race [Lieutenant Governor]			-6.6945 ***	-13.4863 ***
Is Incumbent * Race [Secretary of State]			2.1509 ***	-0.3223
Is Incumbent * Race [Superintendent]			-11.7768 ***	-38.8822 ***
Is Incumbent * Race [Treasurer]			2.6834 ***	1.5146
Is Incumbent * Party [American Independence]			-4.3950 ***	-17.1950 ***
Is Incumbent * Party [Republican]			2.1893 ***	0.6216
Is Incumbent * Total Contestants			-1.9831 ***	-3.9763 ***
Is Incumbent * Reg Other			-0.4805 ***	1.1301 ***
Is Incumbent * Percent Turnout			-0.1855 ***	-0.5186 ***
(Is Incumbent * VBM Percent) * Race [Controller]				0.1306 ***
(Is Incumbent * VBM Percent) * Race [Governor]				0.1506 ***
(Is Incumbent * VBM Percent) * Race [Insurance Commissioner]				0.1672 ***
(Is Incumbent * VBM Percent) * Race [Lieutenant Governor]				0.2984 ***
(Is Incumbent * VBM Percent) * Race [President]				-0.0883 **
(Is Incumbent * VBM Percent) * Race [Secretary of State]				0.0920 ***
(Is Incumbent * VBM Percent) * Race [Superintendent]				0.8158 ***
(Is Incumbent * VBM Percent) * Party [American Independence]				0.3581 ***
(Is Incumbent * VBM Percent) * Reg Other				-0.0742 ***
(Is Incumbent * VBM Percent) * Total Contestants				0.0341 ***
(Is Incumbent * VBM Percent) * Percent Turnout				0.0139 ***
R^2 / R^2 adjusted	0.866 / 0.866	0.867 / 0.867	0.876 / 0.876	0.879 / 0.879
Observations			24155	

* p<0.05   ** p<0.01   *** p<0.001

Note: All regressions additionally included the terms Has Incumbent, Ballot Position, Race, Party, National, Second Race, Reg Dem, Reg Rep, Reg Decline, Reg Other, Median Household Income, Percent Highschool 25, Percent College 25, 1976-1978, 1980-2000, 2002-2014, 2016-2018, 2020, and Top-Two Primary. Interaction terms at all levels also included Total Contestants, Race, Party, Ballot Position, Reg Other, and Percent Turnout.

Having so far found compelling evidence for increasing mail ballot use leading to a consequential reduction of incumbent vote shares, one lingering issue was that the existing models contained an implicit bias by not distinguishing between incumbent and non-incumbent elections within the dataset itself. To account for this, two additional series of models were created that utilized different methodological approaches to distinguish the electoral advantages of incumbents. For the first series, the dataset was simply restricted to only contain elections that actually had an incumbent candidate present under the logic that mail ballot use could otherwise not be affecting incumbent performance if there was no incumbent competing to begin with. The results in Table 15. unsurprisingly showed the impact of the *Is Incumbent * VBM Percent* interactions largely behaving as in the preceding models, with the main interaction by-itself showing a similar 0.09 percent decrease in vote shares for every percent of votes cast by mail. This effect again increased dramatically as both the two and three-way interactions were added, though the size of mail voting's impact was noticeably greater due to the absence of open-seat elections. This pattern was also reflected in the supplementary interactions as most experienced an approximate 20 percent increase in their effect over their earlier counterparts. Overall, the universally greater impact observed across all *Is Incumbent* terms indicated that the effects of incumbency itself were considerably stronger and more volatile than originally presented, but also indicated that the influence of by-mail voting was substantially greater than initially assumed.

Table 16.
Effect of By-Mail Voting on Vote Shares Between Incumbents and Non-Incumbents

Predictors	Incumbents *Estimates*	Vote Share		
		Non-Incumbents		
		Combined Elections	**Incumbent Elections**	**Open Seat Elections**
		Estimates		
VBM Percent	-0.1476 ***	0.0039	0.0297 ***	0.0009
Has Incumbent		-1.3416 ***		
1976 - 1978	5.5651 *	-2.2281 ***	-1.2593	1.2360
1980 - 2000	12.8479 ***	-2.5079 ***	-2.6718 ***	0.9256
2002 - 2014	9.6135 ***	-2.4447 ***	-2.4697 ***	0.2600
2016 - 2018	7.3972 ***	-1.2848 *	-2.9419 ***	1.5052
Observations	5039	35995	19116	16879
R^2 / R^2 adjusted	0.397 / 0.384	0.860 / 0.859	0.861 / 0.860	0.856 / 0.855

* p<0.05   ** p<0.01   *** p<0.001

Note: All regressions additionally included the terms Ballot Position, Race, Party, National, Second Race, Reg Dem, Reg Rep, Reg Decline, Reg Other, Median Household Income, Percent Highschool 25, Percent College 25, 2020, Top-Two Primary, and Percent Turnout.

In the second series of models, the dataset was instead split between incumbent and non-incumbent candidates to allow for a direct comparison of the effects from mail ballot use on each group. While this design would no longer enable the types of interaction terms used throughout the rest of the study, it did mean that the effects of voting by-mail could now be directly assessed through the *VBM Percent* term since the data would already be restricted to specific groups of candidates. When first looking at incumbent candidates, the leftmost column of Table 16. showed the *VBM Percent* term causing a 0.14 percent decrease in incumbent vote shares comparable to the results of the *Is Incumbent * VBM Percent* interactions seen earlier. In contrast, the effects of the *VBM Percent* term on non-incumbent candidates in the three rightmost columns showed either a minor increase in vote shares, or were functionally indistinguishable from zero. Starting with their general performance across all elections in the second column, the performance of non-incumbent candidates were apparently unaffected by rising mail ballot use as the *VBM Percent* term only showed a 0.0039 percent increase to their vote shares. When further split between open-seat elections and those with an incumbent present however, the two

rightmost columns showed non-incumbent candidates competing in elections with an incumbent gaining a 0.02 percent increase in vote shares as mail ballot use increased, while those in open elections saw no substantive change. Moreso than with the earlier models, these results demonstrated that not only was rising mail ballot use having a strong and specific effect on incumbent candidates, but was also directly benefitting non incumbents at the formers expense.

The results from the models also now revealed divergent behaviors between incumbents and non-incumbents over time. In elections held before 1980, incumbent candidates enjoyed a more modest 5.5 percent increase in vote shares over their competitors. Their performance improved dramatically however during the 20-year period between 1980 and 2000, where they received on average 12.8 percent more votes than their opponents. This advantage declined somewhat though after 2012, dropping to a 9.6 percent advantage, and further still to a 7.3 percent advantage after 2016. In contrast, non-incumbent candidate performance was largely consistent across the same periods with a mild 1 to 2 percent disadvantage when competing against incumbents. Given this combination of high variability from incumbents and relative stability from non-incumbents, the results of this portion of the models suggested that some factor unique to these periods was uniquely altering the performance of the former group. While this could ostensibly be due to the rules governing mail ballot use, the results could also just as easily signal that the characteristics of exactly *who* was voting in an election was a relevant factor.

Based on the results of both the initial and revised regression models, increasing mail ballot use was found to consistently have a direct and substantial effect on incumbent vote shares as hypothesized. Corresponding to an approximate 0.1 percentage point reduction to incumbent vote shares per percentage of votes cast by mail, mail ballots, especially at high or near-complete

saturation, stood to then substantially reduce or almost negate the arbitrary vote share advantage enjoyed by incumbents. The results from the revised models in Tables 15. and 16. further revealed that this effect was likely caused by features inherent to by-mail voting, as only the vote shares of incumbents specifically were found to be affected by rising mail ballot use to the direct benefit of non-incumbents. However, they also gave evidence that some of this effect may be driven by the characteristics of mail ballot users themselves rather than the method they were using. Regardless of the specific origin of the effect, the findings thus-far indicate that greater consideration may need to be given towards the consequences of large-scale mail ballot use due to its apparent bias against incumbents. However, the restriction of the data to one electoral system and the inherent volatility of incumbency advantages means that the explanatory power of the findings are limited outside of the context of California.

In light of the fixed effects regressions indicating that who had access to mail ballots may be influencing incumbent vote shares, I once again explored the possibility that that the characteristics of mail-ballot users themselves were actually driving the relationship instead. As with the primacy effect in Chapter 5, voter characteristics such as age, education, and political engagement that have been found to determine who most frequently makes use of mail ballots, also closely align with those theorized within the existing literature to reduce voter deference towards incumbents (Gordon & Landa, 2009). It was thus possible that while the preceding models showed a statistically significant association between the incumbency advantage and mail ballot use, the effect could be disproportionately driven by self-selecting users who were less inclined to vote for the incumbent regardless. Such behavior would most likely then manifest as an initially strong negative association between by-mail voters and incumbent vote shares that would then gradually dissipate as greater portions of the voter population switches to

mail ballots until either being greatly reduced or disappearing entirely. I again tested for this eventuality using a series of non-linear LOESS regressions to visualize the average vote shares of incumbents and non-incumbents as the percentage of mail ballot users gradually increased across elections. While still offering only a limited capacity for modelling multivariate relationships, this method would allow for any substantive fluctuation or irregularity among the user-base to be easily detected as peaks and valleys.

Starting with modeling the base relationship between mail ballot use, incumbency, and vote shares across all elections, the results in Figure 10. demonstrated a clear convergent trend between incumbents and non-incumbents as mail ballot use increased. Additionally, both candidate types showed noticeable fluctuations in their behavior that could indicate self-selection among mail ballot users was driving these trends, with incumbents in particular showing two major fluctuations throughout the course of the model. While incumbent vote shares initially experienced a sharp decline as mail ballot use rose, the trend abruptly flattened once approximately 22 percent of votes were by-mail and started gradually recovering after 45 percent until transitioning back to a downward arc once approximately 70 percent of votes were from mail ballots. In contrast, non-incumbents maintained a consistent gradual increase in vote shares until experiencing a precipitous increase at 45 percent of votes cast by-mail before arcing downward again after 80 percent votes by-mail. While still providing compelling illustrative evidence of the cumulative impact growing mail ballot use was having on incumbent and non-incumbent performance, the sharp decline and gradual recovery of incumbent vote shares suggested that the effect could be attributable to the early mail ballot users exhibiting a bias that weakens and eventually dissipates as more users switch methods. However, the mutual rise of both incumbent and non-incumbent vote shares at around the 45 percent threshold and the

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initially sharp decline in incumbent vote shares mirrored behaviors seen with the primacy effect

in Chapter 5 that indicated the total number of contestants could instead be skewing the

relationship.

Figure 10.

Impact of Voting by-Mail on Incumbency Across All Elections
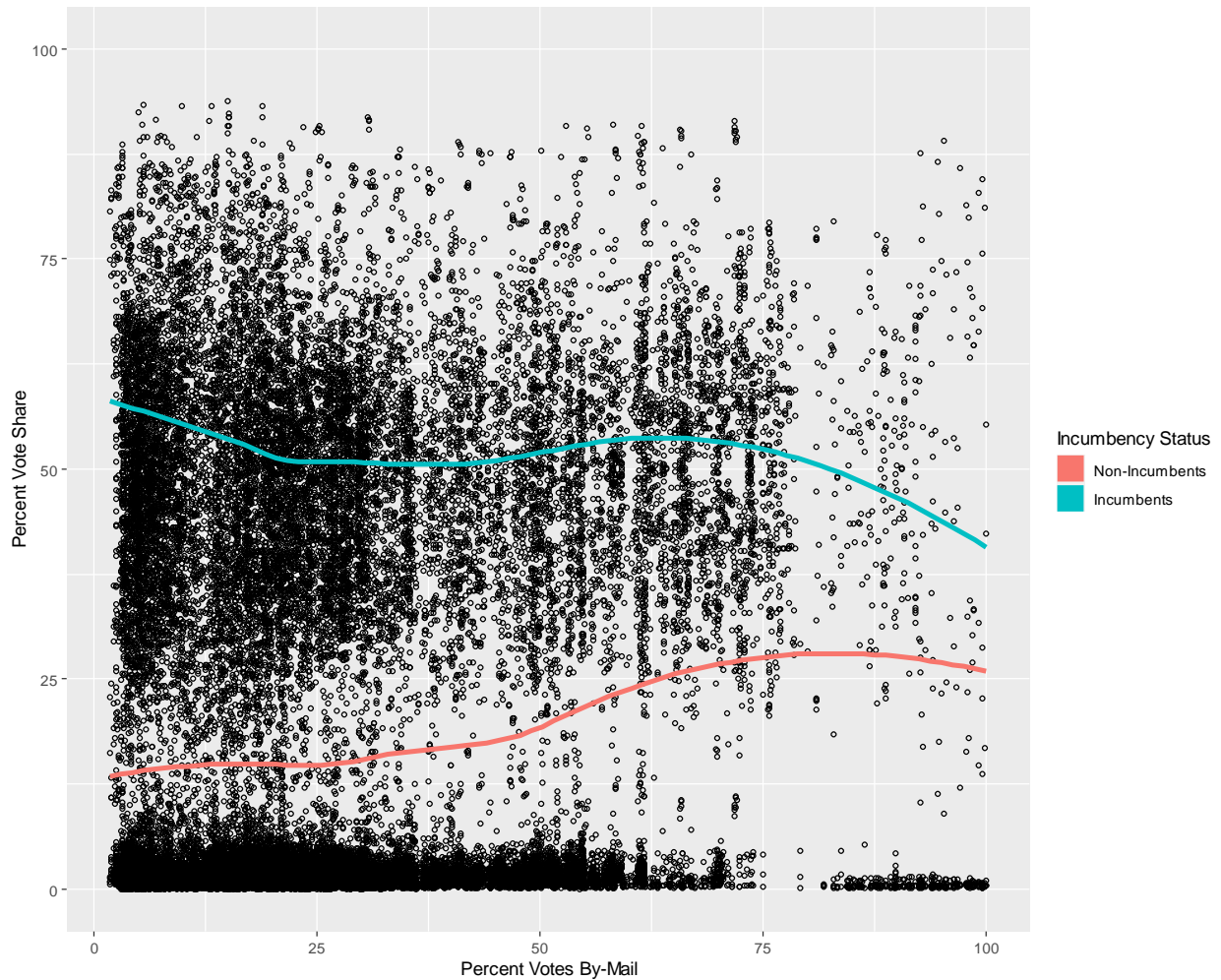
Given the observations from the base model, a new version was created that again

explored the possibility that the number of competitors may have inadvertently misrepresented

the overall effectiveness of mail ballot use on incumbent performance. As previously done with

the primacy effect, several models were created that examined contests with different numbers of

candidates listed on the ballot; the results of which in Figure 11. ultimately revealing that a

considerable amount of variation was indeed dependent on the number of competing candidates present. Notably, contests with two, six, and seven competitors all exhibited wave-like patterns among incumbents that contradicted the sharp initial decline seen with the aggregated model in Figure 10. However, the far more common contests with four and five candidates retained the early steep decline in vote shares, which indicated that this behavior may overall *not* be due to the number of contestants. Disaggregating by contestants also helped to better illustrate the likely cause for the slight upward arc seen after approximately half of votes were by-mail, as the front-loaded nature of the data meant that the number of instances trailed of considerably after the 50 percent threshold. This correspondingly gave greater emphasis to the comparatively fewer elections past this point, most of which were binary elections that naturally skewed towards having higher vote shares, and led to the slight recovery observed in Figure 10.

Figure 11.

Impact of Voting by-Mail on Incumbency by Number of Contestants
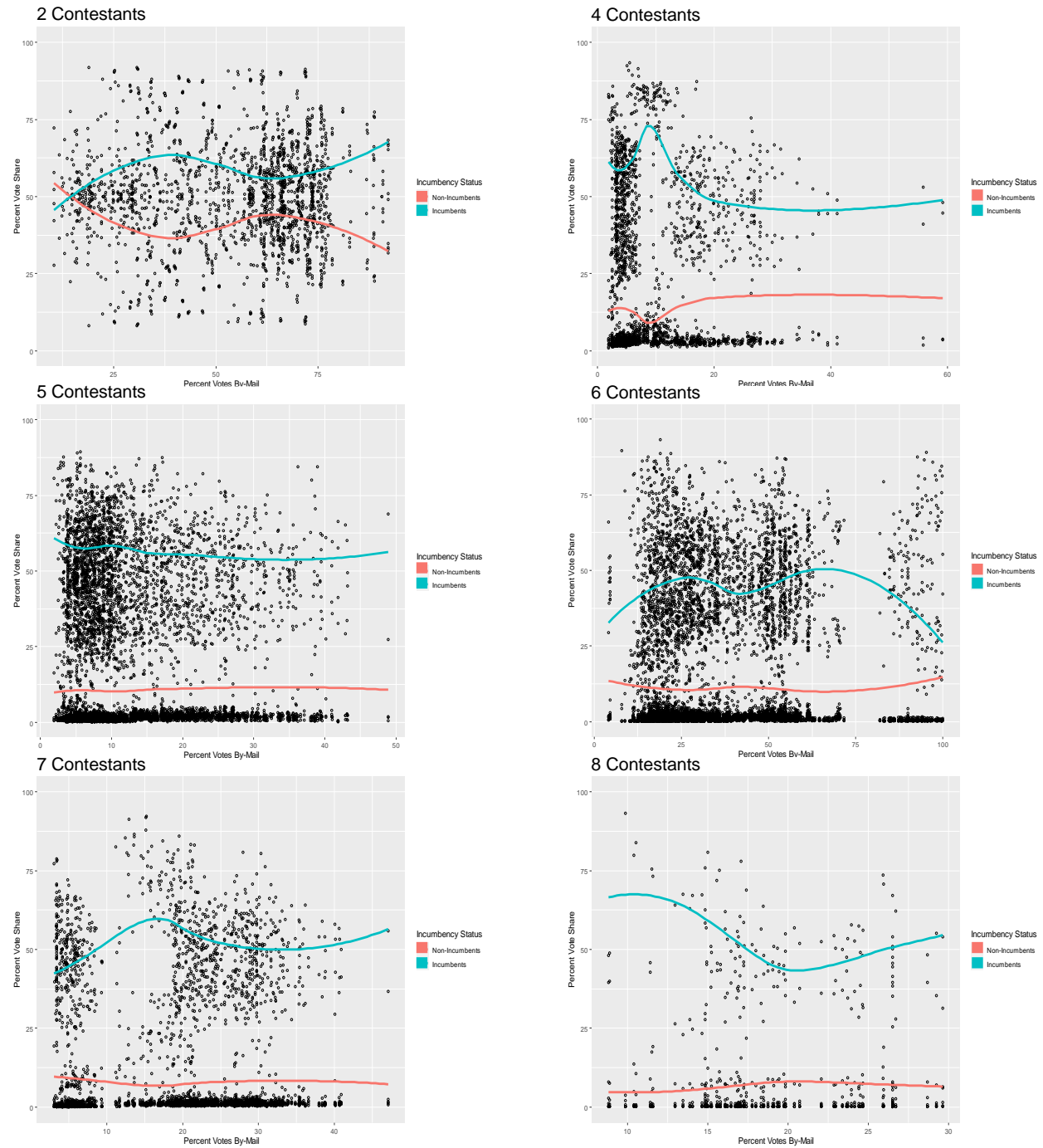
While largely supportive of mail ballot use having a consistent effect on incumbent vote shares across non-binary contests, a lingering issue highlighted from dividing the model by number of contestants was that the performance of non-incumbents was still being mischaracterized by the presence of third-party challengers. Despite being a constant feature of most elections, the mechanics of the first-past-the-post system used in California typically meant that alternatives outside the Democratic and Republican parties rarely receive more than single-digit vote shares. Consequently, the average vote share for non-incumbents seen in the preceding figures were continuously lower than incumbents due to the downward pull from these numerous third-parties. By removing third-party candidates from the model in Figure 12., the results immediately showed the vote shares of non-incumbents rising dramatically to be much more competitive with incumbents, while the mild mirroring in their effects further emphasized the predominance of the two main political parties on the ultimate outcome of these elections. Additionally, the shallow upward arc for non-incumbents observed at the 45 percent mark in Figure 10. largely vanished and now presented a more linear upward trend as mail ballot use increased. This in-turn helped reestablish that the observed behavior in the preceding models was, at least for non-incumbents, likely from the use of mail ballots themselves and not the characteristics of self-selective users.

Figure 12.

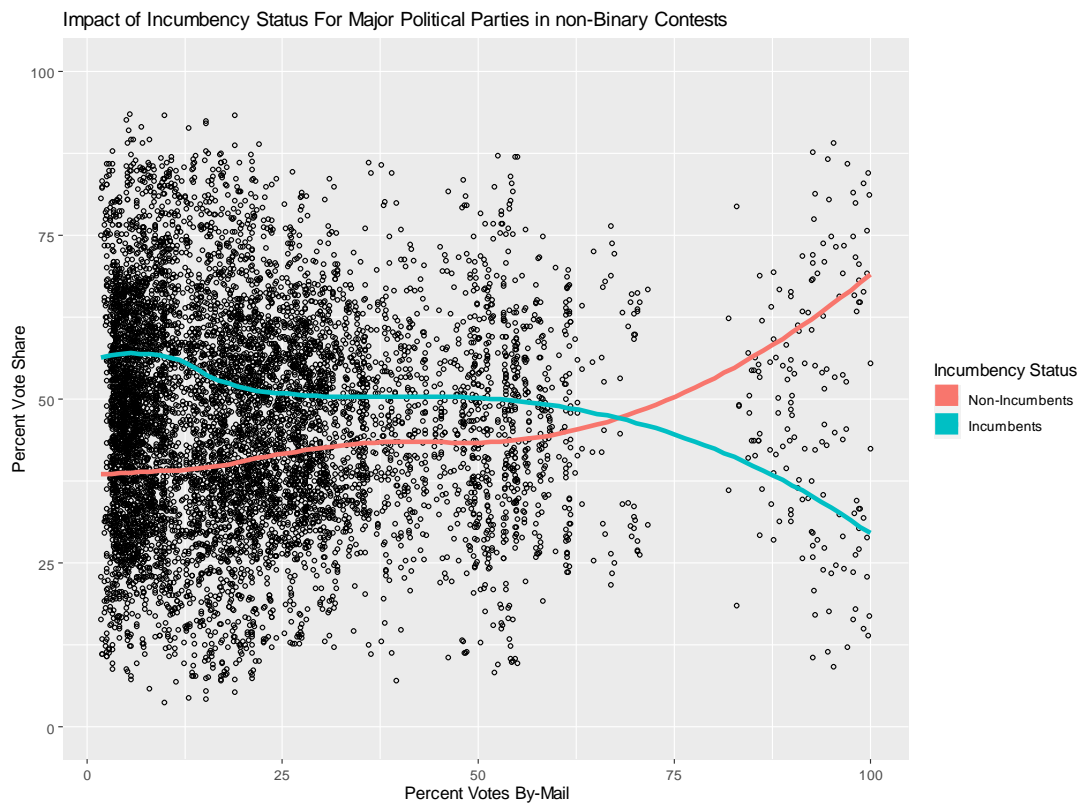Impact of Voting by-Mail on Incumbency for Major Political Parties
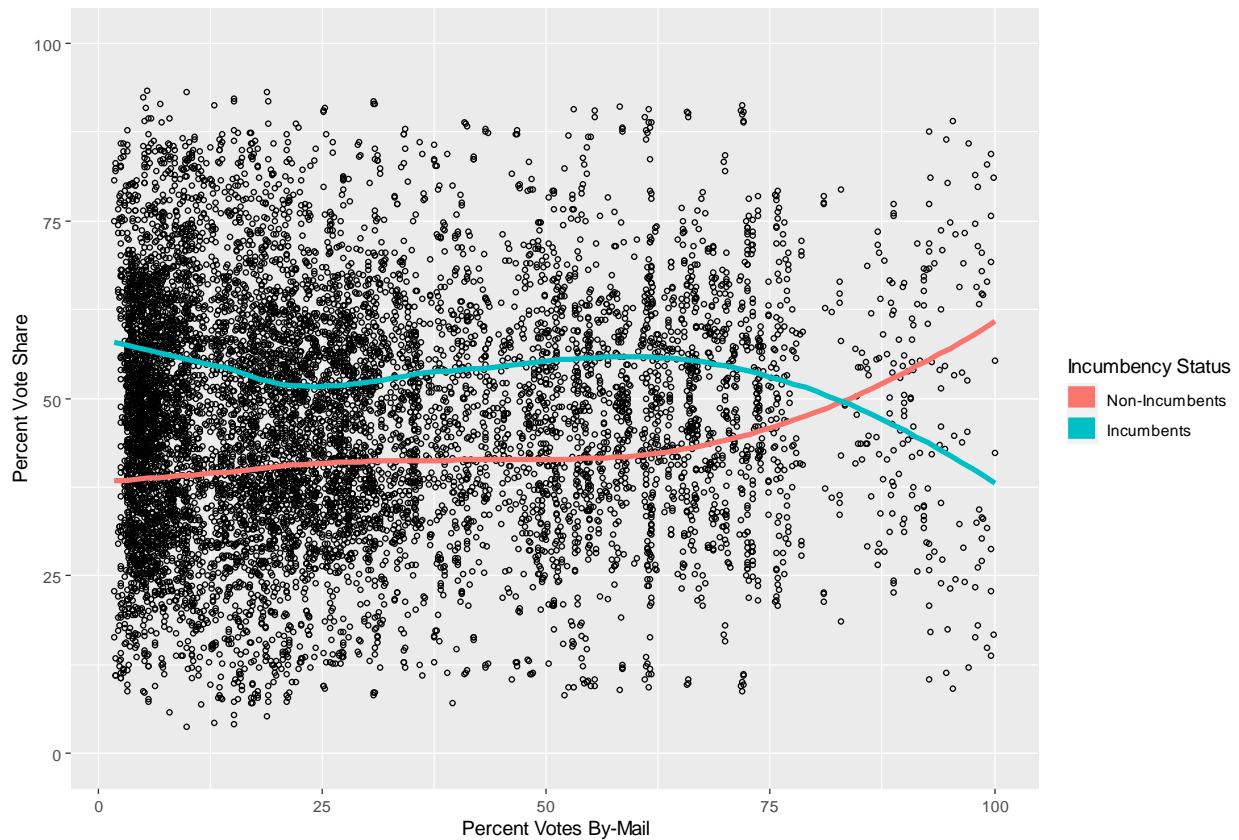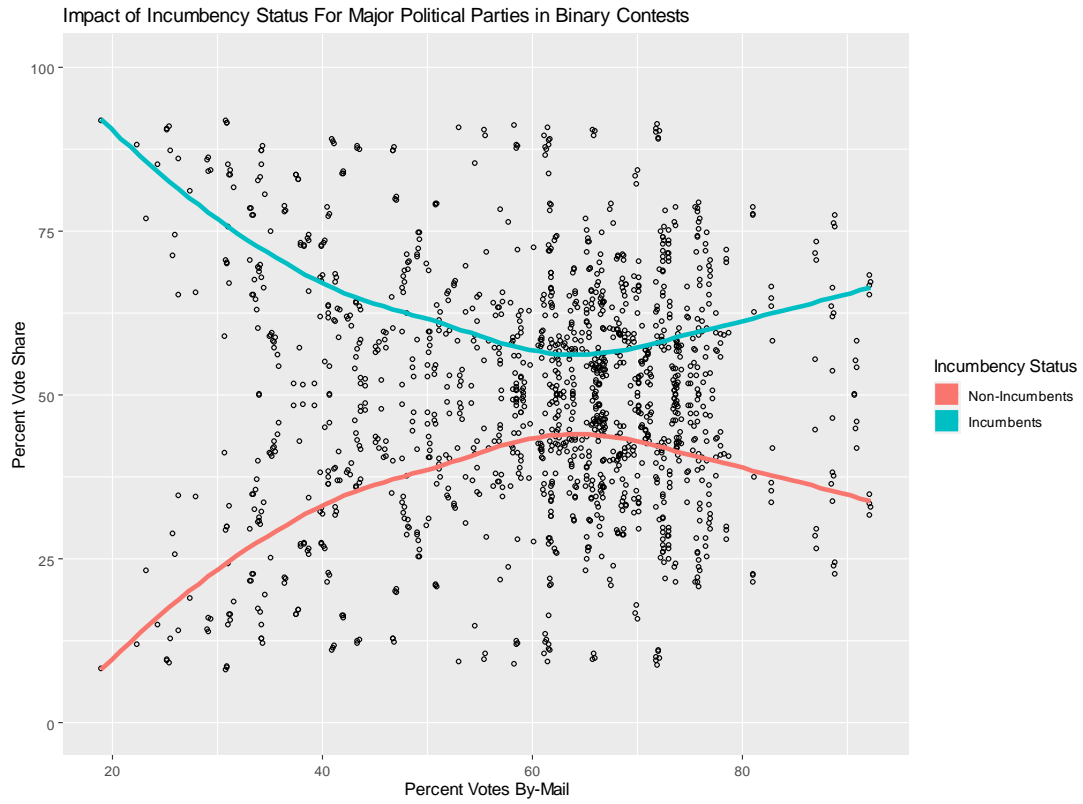

Given the impact of the changes made in the prior two models, a final composite model was developed that combined the previous modifiers to observe how by-mail voting affected incumbency when restricted by both party and the number of contestants. As anticipated, the results in Figure 13. showed both binary and multi-candidate contests having more linear equalizing trajectories as the number of by-mail voters increased. Binary contests in particular now exhibited a radically different pattern of behavior compared to when third-party challengers were included as incumbents experienced a steep downward trend that rebounded once approximately 65 percent of votes were cast by-mail, while non-incumbents correspondingly demonstrated the opposite. Multi-candidate contests meanwhile had a less symmetrical

relationship, but still showed incumbents steadily losing vote shares to non-incumbents until eventually being overtaken at approximately 70 percent votes by-mail.

Both instances however suffered from precipitous declines in observations towards the 70 and 80 percent thresholds that didn't begin to recover until mail ballot use started to reach 85 to 90 percent. Given the location of this gap, the likely causes were the implementation of the Top-Two primary election format in 2012 and the adoption of all-mail elections in response to the novel coronavirus epidemic in 2020. These dual changes inadvertently led to an extreme polarization in the concentration of contest types at the same time that mail ballots were becoming predominant in California elections that manifested in the data as a sudden concentration of binary contests, and corresponding absence of multi-candidate contests, between the 60 to 80 percent marks. While ultimately further helping to establish that the effects of by-mail voting stemmed from the method and not the users, the results also highlighted a serious gap in the upper reaches of the dataset that would require additional elections to before the relationship could be conclusively proven despite indicating that the gap would likely continue to narrow.

Figure 13.

Impact of Voting by-Mail on Incumbency by Contest for Major Parties

Impact of Incumbency Status For Major Political Parties in Binary Contests

Impact of Incumbency Status For Major Political Parties in non-Binary Contests

Overall, the results from the LOESS regressions strongly supported increasing mail ballot use having an independent effect on the incumbency advantage that was likely not the direct product of self-selective behavior from users. While initially showing substantial non-linear variation in candidate vote shares as the number of mail ballot users increased, controlling for the number of competitors and party effectiveness largely eliminated these fluctuations and indicated that the remaining variation was likely caused by a systematic gap in the data created by the implementation of the top-two primary format and sudden adoption of all-mail elections. With these intervening factors accounted for, the results then largely corroborated the earlier findings of the linear models and showed a stable negative correlation between increasing mail ballot use and incumbent vote shares, and a corresponding a positive correlation among non-incumbents. The results however also highlighted that there remains considerable uncertainty about the ultimate fate of the relationship due to the aforementioned gap in the dataset hindering their accuracy towards the upper limits of mail ballot use. Fortunately, the trajectories for the regressions largely continued to show a convergent pattern following the gap, which at least suggested that future elections will likely reinforce and straighten the existing trends.

Concluding Discussion

In this chapter, I investigated how the increasing use of by-mail voting in California elections may have impacted the competitive vote share advantage typically enjoyed by incumbent candidates. As with the primacy effect in Chapter 5, it was expected that the improved participatory control mail ballots offered to voters would allow them to be more discerning in their candidate selection and consequentially lead to incumbent vote shares declining as mail ballot use increased. The results ultimately confirmed this hypothesis and found incumbent candidates had their vote shares decline by approximately 0.1 percentage points

for every percent of votes cast using mail ballots. While only marginal at lower concentrations, the implications of this relationship meant that the effect on election outcomes would continue to rise until almost negating the incumbency advantage entirely when nearing 100 percent use. The various linear regression models used in the analysis further showed this effect to be robust even when accounting for the competing influences from other highly determinative contributing factors such as party affiliations and contest type. Accounting for their direct influences on the main relationship however also reinforced the observations in the established literature by showing the effect to be highly sensitive to contextual factors.

The findings of the linear models were then corroborated by observations from the non-linear LOESS models, which ultimately showed the vote share gap between incumbents and non-incumbents closing at a consistent rate as the number of by-mail voters increased. Various configurations of these models, utilizing different partitions in the dataset, also demonstrated that most of the variation in the relationship was explainable through the number of competitors and the party affiliation of candidates, which ultimately rejected the secondary hypothesis that the observed effects of mail ballots may have been the result of self-selective tendencies among its most frequent users. What little variation remained though was likely the product of gaps in the data caused by major systemic changes in how California elections were conducted, which served to reduce the explanatory power of the models until additional elections data could be added. Additionally, the effects from parties and competition reinforced that like with the incumbency advantage itself, the influence of mail ballots *on* incumbents was sensitive to contextual factors and could be rendered more or less effective depending on the specific circumstances. While unable to identify exactly which characteristics may be responsible for the observed relationship, the overall linear behaviors depicted in the models offered support for the effects being the product

of the specific features inherent to mail ballots themselves and not exogenous factors acting through them.

Despite the accumulated findings offering strong support for the main hypothesis, the practical limitations of the study also strongly encouraged caution when attempting to extrapolate beyond the specific circumstances of California elections. As already noted, the comparatively low number of instances in the dataset at the upper limits of mail ballot use weakened the explanatory power of the models. Even though the latest results in the dataset from the 2020 elections, where mail ballots were first used as the default voting method statewide, indicated that the established relationship would continue into future elections, it was apparent that several more election cycles worth of data would be needed to fill in the gap created by the sudden jump to having 80 percent or more votes cast by mail. Additionally, the California electoral system provides uniquely favorable conditions for incumbents due to the combined effects of first-past-the-post contests, recurrent low-engagement elections, and tradition of explicitly labelling incumbents on ballots. So while mail ballots could be concluded to have a pronounced effect in California, it remains uncertain if they will have a similar impact in other systems less advantageous to incumbents.

Even with these limitations in mind though, the findings still harbored consequential implications for how the use of by-mail voting could affect election outcomes under at least some conditions. At the most immediate level, they indicated that the mere usage of mail ballots could directly alter incumbent electoral performance by reducing their vote shares to a degree that could seriously impact their chances for winning reelection. Additionally, this influence was likely the product of how voting by-mail itself fundamentally altered the act of participation since while the specifics behind this mechanism remaining uncertain, the observed behaviors

were generally supportive of extant theories within the literature on how elements like voting methods should impact voter behaviors. Taken together, these observations strongly supported that mail ballots could be effectively employed as a tool to help mitigate systemic biases favoring incumbents, although likely varying in strength across systems. However, the mere presence of this effect also signified that mail ballots were having a hereto unknown influence that was unintentionally altering election outcomes to a considerable degree. While this could be considered to have been beneficial in California since it ostensibly encouraged more competitive elections by redistributing votes away from systemically favored incumbents, the high variability of incumbency advantages across systems and the largely unknown behavioral effects of mail ballots means that it is possible that widespread use of voting by-mail may lead to undesirable systemic *disadvantages* for incumbents, or challengers, in different circumstances.

Given the implications of the findings, it is apparent that further research is needed to explore the effects and consequences of by-mail voting on incumbency advantages within more diverse environments and variable circumstances. One of the most pressing questions prompted by the results is if the effects are consistent within systems that are typically less favorable to incumbent candidates and parties, such as multi-member districts with proportional representation (Carey et al., 2000). Even further, the effects of by-mail voting need to be tested within systems known to generate an incumbency disadvantage since it is unknown if the effects of mail ballots actually promote an equilibrium between incumbents and non-incumbents, or consistently generate biases against incumbents regardless of context (Ariga, 2015). Another agenda is to determine which specific features of voting by-mail are responsible for changing voter perceptions towards incumbents. While the existing literature would suggest that enhanced

information access and reduced time pressures are the most likely culprits,[28] the current lack of

direct work on this relationship leaves open the possibility that other factors could be

responsible. In this vein, examining the intersecting effect of directly labelling the incumbent on

mail ballots could be especially productive since this was a key information advantage offered to

all California incumbents that other systems may not provide consistently, or at all. Despite that

any one of these topics will likely prove to be a considerable undertaking on their own,

addressing them will be essential for establishing a more comprehensive understanding of this

hereto underexamined relationship.

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[28] See Desposato & Petrocik (2003) and Hood & McKee (2010).

CHAPTER 7

Conclusions

Research Overview

As voting by-mail continues to experience heightened public interest in the lingering wake of the coronavirus pandemic, it has become increasingly necessary to develop a better understanding of the deeper behavioral consequences of its use. However, existing research has primarily focused only on identifying characteristics of likely users, and assessing its effectiveness at improving voter turnout (Karp & Banducci 2000, Alvarez et al., 2013). In this study, I sought to fill the gap in this literature by exploring how voting by-mail may also influence how voters evaluate their options through manipulating two notorious electoral phenomena known to be highly dependent on both ballot design and voter perceptions; the primacy effect and the incumbency advantage. It was theorized that by providing users greatly enhanced control over where they participate, when they participate, and what information is accessible to them, increasing mail ballot use would help reduce the impact both effects have on candidate electoral performance. I tested this hypothesis by examining over 100 California statewide elections to assess how the gradual proliferation of mail ballots had changed voter responses to both phenomena over time. Analysis of these elections ultimately indicated that while mail ballot use appeared to have no meaningful impact on the primacy effect, it did exert a highly consequential influence over incumbent candidate performance.

I first examined both phenomena through a series of fixed-effects regressions to observe the effect voting by-mail had when controlling for various competing factors known to also influence their impact on elections. When tested for its impact on primacy effects, it was found that increasing mail ballot use had no substantive impact, positive or negative, on candidate vote

shares as their ballot position declined. Yet when examined against incumbency advantages, each percentile increase in mail ballots was found to reduce incumbent vote shares by sizable 0.1 to 0.2 percentage points, which was enough at high concentrations to appreciably negate most the inherent vote share advantage typically enjoyed by incumbents. However, the high volatility of the incumbency advantage, combined with its sensitivity to many other competing contextual factors, meant that the applicability of this finding outside of California was somewhat limited.

Following the linear analyses, the effects of by-mail voting on primacy and incumbency were then reexamined using a series of non-linear LOESS regression models to better visualize their relationships, and test whether the self-selective characteristics of mail ballot users were potentially influencing the results. Alongside visually confirming the relationships seen with the linear models, the results ultimately showed that the characteristics of mail ballot users were likely not relevant factors in voting by-mails impact on either phenomenon. For the primacy effect, the flat and stable trajectories shown by models reinforced that mail ballot use did not noticeably affect candidate vote shares across any position, especially when correcting for the total number of competitors. With incumbency, the models similarly showed that once corrected for the influence of third-party candidates and the total number of contestants, increasing mail ballot use corresponded to a clear and consistent reduction in incumbent vote shares and corresponding rise among non-incumbents. These findings also revealed though that the combined systemic shocks from the adoption of the top-two primary system in 2012 and the sudden implementation of all-mail ballot elections in 2020 left a sizable gap in the dataset that interfered with the accuracy of the models at higher percentages of mail ballot users. This in-turn helped reinforce that the observed behaviors held limited explanatory power outside of the

context of California, even though the overall findings did strongly indicate voting by-mail was having an electorally consequential influence through manipulating incumbency advantages.

Behavioral Consequences of By-Mail Voting

Assessing the results in their entirety, it would appear that voting by-mail does have a consistent behavioral impact on voter decision-making, however, the overall electoral consequence of this effect is inconsistent and highly dependent on the circumstances surrounding any given election. When examining its impact on primacy effects, increasing use of mail ballots was found to have effectively zero relationship with the number of votes candidates received due to their position on a ballot and subsequently no influence on election outcomes through them. In contrast, rising mail ballot use was found to greatly reduce the vote share advantage enjoyed by incumbent candidates over their competitors, to where it almost entirely negated the electoral advantage of incumbents at high percentages. The inconsistent impact from by-mail voting on these effects then leads to three critical questions; what specific factor, or factors, of by-mail voting allow it to influence voter behaviors, why do mail ballots only meaningfully impact incumbency, and what are the implications of the accumulated findings for mail ballots, voting methods, and the overall conduct of elections?

Unfortunately, the results provide few definite answers for this first question due to the mechanical limitations of the study and the current lack of supporting research, but do suggest at some likely possibilities. The main issue is that the aggregate panel data used for the analyses, while suitable for detecting and quantifying the strength of the effects mail ballots were having on the examined phenomena, lacks the granularity necessary to definitively establish what features of voting by-mail may actually be responsible for changing voter preferences. At-best, the non-linear LOESS regressions used offer some negative evidence that the inherent

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characteristics of voters were not the driving cause for the relationship, but cannot offer any deeper inferences beyond that. The results themselves also provide some indication that it was the experiential changes introduced through voting by-mail altering voter behaviors by generally behaving as hypothesized according to the underlying theory that the convenience of mail ballots would incentivize more engaged voting. Determining what specifically was enabling by-mail voting to affect voter decision-making would thus ultimately require a new research agenda centered around survey or controlled experimental data that could better trace individualized responses to specific conditions. However, doing so at a large enough scale and over a suitable number of elections will likely continue to pose a challenge as widely-accessible mail ballots remain a novelty in most electoral systems.

When addressing the second question of why voting by-mail only had an electorally consequential effect on incumbency, the findings are able to provide a more robust series of probable explanations. By-far the most likely explanation is that the underlying heuristic associations responsible for each phenomenon are heavily dictating both their overall electoral impact and reactivity to mail ballot use. While both phenomena were individually found to have consequential effects on candidate vote shares, it was plainly apparent that the advantage from being an incumbent was considerably greater than that conferred from being listed first on the ballot. This is not surprising as, while widespread and impactful on its own merits, the primacy effect is generally considered to be an abstract influence on voters since it manifests from an inferred assumption that most often holds no actual informational significance. In contrast, the incumbency advantage occurs due to a candidate's status as the incumbent title-holder providing some concretely assessable, if superficial, information to voters; with the distinction then made specifically more prominent in California due to the state systematically identifying incumbent

candidates for all statewide elections (Nemerovski, 2021). Consequently, incumbency is a more prominent heuristic and carries more informational weight for voters that leads it to being more often utilized for making decisions than the more subtle influence from primacy effects. However, voting by-mail may then only be influencing incumbency precisely *because* it is so prominent and meaningful to voters, which makes it a blatant enough heuristic for voters to proactively apply the greater discretion afforded through voting by-mail to make more rigorous assessments.

Another possibility is that some combination of systemic factors are specifically causing voter perceptions of incumbent candidates to be more strongly influenced than their perceptions about candidate positioning. Since the results of the study ultimately showed several variables having significant third-tier interactions with the relationship between by-mail voting and both phenomena, it is reasonable to consider that any of these, or some hereto unidentified elements, may be disproportionately affecting either or both of them. This may of course instead be due to something unique about the setup of the California electoral system in particular, but could also be an inherent consequence of one or several features commonly shared among many similar systems. Lastly, it is also reasonable to consider that the impacts of candidate incumbency on voters are simply more sensitive to the influence of mail ballot usage than those of the primacy effect. As demonstrated both in the extant literature and throughout the study, numerous structural, systemic, and circumstantial factors can all dramatically change how, and to what extent, incumbency in particular influences candidate vote shares. The primacy effect by comparison is found to be a much more stable, if generally less impactful, influence that is most affected by a relatively limited set of systemic and ballot-design features. Consequently,

increased mail ballot usage could then merely be impacting incumbency because it is more reactive in the first place.

When lastly considering what the findings then ultimately signified for by-mail voting and elections as a whole, the scope of the conclusions were again narrowed by a limitation with the dataset. In this case, the issue is that the dataset utilized in the study only contains instances from one electoral system. While it is desirable, even necessary, to examine multiple elections from within the same electoral system, having only instances from within California restricts the generalizability and replicability of the study's key findings to it and other similar electoral systems. Yet despite how necessary expansion to new contexts is for corroborating the study's findings, attempts to replicate it in other locales will inevitably need to overcome the same logistical challenges discussed in Chapters 3 and 4 that led this study to utilize California in the first place. In particular, the continued restrictions placed on mail ballot access under most electoral systems precludes many theoretically viable settings for observing either phenomenon, let alone both simultaneously. Navigating around these issues will likely require creative utilization of small-scale cases, or capitalizing on opportunistic disruptions such as those caused by the coronavirus pandemic to observe the relationships on a case-by-case basis; both of which suffer from their own unique problems with context and temporality that would have to be reconciled.

Even being considerate of the projects data limitations however, the combined results of the analyses still offer compelling implications for how voting by-mail, and potentially other alternative voting methods, can have consequential and lasting effects on the behavior of an electorate. Most pertinently, the results strongly signify that the act of voting by-mail does indeed instigate a meaningful change to how voters utilize certain heuristics. The progressively

stronger counteractive effect found on incumbent vote share advantages in particular indicated that voting by-mail incentivizes voters to be more discerning in their candidate evaluations and rely less on superficial information found directly on the ballot. However, the contrasting zero-impact on the primacy effect also pointed to the relationship being inconsistent and highly dependent on the specific natures of the phenomena being examined. For instance, it is uncertain how voting by-mail may impact voter behaviors towards other common heuristic aids such as names, professional titles, or gender, but their mechanical similarity to how the incumbency advantage operates suggests that they would react similarly to rising mail ballot usage. Conversely, the impact of mail ballots on behaviors derived from systemic design choices such as ballot rolloff or overall readability, may be expected to show less impactful results more reminiscent of the primacy effect.

Given that voting by-mail appears then to have a highly variable effect on voter decision-making that has hereto gone unobserved, a serious reevaluation of its role in elections and best implementation practices are needed. While somewhat encouraging a more competitive electoral environment in one instance, its apparent inconsistency within, and in all likelihood across, electoral systems prompts the very real possibility that voting by-mail could also inadvertently harm the quality of elections under the right conditions by exacerbating behaviors that ultimately hinder competition. One such possible scenario was outlined already in Chapter 6, where it was postulated that the moderating effects of voting by-mail on incumbency could potentially also serve to intensify incumbency disadvantages in electoral systems already biased against them. In the current absence of additional research to establish a tentative pattern of influence, these potentially unintended outcomes should then prompt reactions from election administrators, researchers, and candidates alike. For administrators and researchers, the results should prompt

greater interest in, and consideration of, how mail ballot accessibility is impacting voter behaviors beyond its typical purview of turnout and selection bias; as it is clear that its effects reach well beyond merely who and how many voters are participating. For candidates it signifies that, like with numerous other elements before it, they will need to adapt their campaign strategies to account for the behavioral impact that voting by-mail may have on their chances of success and react accordingly to amplify or mitigate its influence.

Beyond their immediate significance towards voting by-mail, the implications of the study may similarly apply to other alternative voting methods as well. Unsurprisingly, mail ballots have not been the only alternative to conventional in-person polling to see increasing use in recent decades, with technologies such as the internet and cellphones now also being employed in limited capacities across multiple electoral systems (Alvarez et al., 2009, Goodman & Stokes, 2020). Although generally still only used at the experimental level, use of online voting in particular has experienced considerable growth in recent years to where it is now employed as a fully viable alternative method in several states including Estonia[29], Pakistan, France, and Switzerland (Alvarez et al., 2009). Like with by-mail voting though, the primary intent when introducing these digital methods has been to promote voter turnout by offering them greater control over where and when they participate. Yet given their mechanical resemblance to by-mail voting in how they cede control over the voting experience to the voter, they are likely to similarly reduce the need to rely on the heuristic cues found directly on the ballot itself; potentially having an even greater impact due to online voting allowing participants to seamlessly gather information from the internet while participating.

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[29] Estonia uniquely remains the only state to fully utilize internet-based online voting as a publicly accessible alternative in national constituency-level contests.

The same principles may further extend to some of the unique services intended to improve the in-person polling experience as well. Alongside exploring alternative methods using new technology, most electoral systems have also sought to enhance their existing in-person polling with supplementary services that help make them more convenient and accessible for voters. Some features such as early voting programs have rapidly become commonplace as the convenience of being able to vote before the official election day, in some cases up to weeks in advance, has proven to be extremely popular with voters and relatively easy to implement using existing voting infrastructure (Gronke et al., 2007). At the same time, other, more radical, services like drive-thru voting have seen experimental use at the local level to accommodate disabled voters or those who could otherwise not easily leave their vehicle to participate (Bundy, 2003). Like with by-mail voting, these services fundamentally alter the context in which voting takes place by allowing voters more ways to participate in ways that are optimal for *them* and greater access to outside information at the penultimate decision-making moment. Consequently, these and other comparable features are in all likelihood causing similar behavioral changes among voters and could potentially be strong enough to appreciably influence election outcomes.

Alongside their immediate practical implications, the results also highlight a broader need to reexamine the role of voting methods within electoral systems as a whole. Every election is ultimately enabled by some method, or methods, for voters to express their preferences, but while existing research has thoroughly established voting methods as a means to change the overall composition of an electorate, the results of this project demonstrate that they additionally change how voters actually perceive and evaluate their alternatives. By showing voting methods to have some expanded capacity to directly influence what voters choose, the study reveals a latent gap in the electoral systems literature that cannot be satisfactorily rectified without further

exploration into what kinds of behavioral impacts such methods have, and towards what ends. Such an agenda however will require researchers to be more conscientious of voting methods as a comprehensive service, comprised of numerous mutable and interdependent features, that is capable of affecting voters throughout its execution, rather than just as a tool with a singular purpose of manipulating voter turnout.

Implications Beyond California

As illustrated throughout this study, voting is not an activity that occurs in isolation and instead exposes participants to a number of confounding circumstances that can reduce or accentuate their ability to make sincere and informed decisions. Because they are the mechanisms that facilitate participation, voting methods then present the unique dynamic of being both absolutely indispensable, but also invariably changing the circumstances affecting voters through their design and implementation. By tracing how different voting methods shape the circumstances surrounding participation, researchers can then begin to isolate the effects from specific methods or their component factors to develop a sense for how certain configurations systematically affect voter behaviors. Fully realizing such a program will then enable answering most, if not all, of the various lingering questions left open from the results of this project, and enable making comparative assessments about how different implementations seen throughout the world ultimately preform relative to each other.

Given the vital service voting methods provide in every electoral system, understanding their consequences for voter decision-making is also a universally pertinent issue not localized to any one particular place or instance. Even within systems where access to non-traditional in-person polling is highly restricted, contingencies always exist to enable some special classes of voters, such as state agents serving overseas, to participate despite being in a context

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fundamentally different from their compatriots; whether in-person at a consulate, remotely via a mail ballot, or through the internet (Brand, 2010, Ireland, 2018). By accommodating even trivial portions of their population in such a manner, most electoral systems are still then faced with the dichotomy of having distinct groups of voters experiencing elections under fundamentally different conditions. Yet without further knowledge about how different voting methods affect voter perceptions in different contexts, it is impossible to accurately determine how these groups may be systematically affecting the overall outcomes of the systems they are a part of.

Taken in their entirety, the main contribution of this project then lies in revealing that voting by-mail, and by extension voting methods as a service, has the capacity to influence voter decision-making beyond whether or not they merely participate. The unique benefits offered through mail ballots, while ostensibly to improve voter accessibility, also appears to encourage them to be less responsive towards certain heuristic cues such as candidate incumbency status or their listed position on the ballot; although the latter not enough to seriously affect election outcomes. This variability indicates that the scope and intensity of the effects from voting methods are likely to change depending on the method and electoral system being examined, but the lack of an existing literature on the topic hinders any further development until more information can be made available. Such an empirical gap has considerable implications given that voting methods are an integral part of all electoral systems, and for how researchers, administrators, and candidates should subsequently view their role in the outcomes systems produce. Regardless of how it is ultimately accomplished, further research within, and between, electoral systems will be an essential next step if there is to be a better understanding of the specific dynamics between by-mail voting and the targeted electoral phenomena, and the relationship between voters and their voting methods more generally.

REFERENCES

Abramowitz, A. (1975). Name Familiarity, Reputation, and the Incumbency Effect in a
   Congressional Election. *The Western Political Quarterly*, 28(4), 668–684.

Alvarez, R., Beckett, D., & Stewart, C. (2013). Voting Technology, Vote–by–Mail, and Residual
   Votes in California, 1990—2010. *Political Research Quarterly*, 66(3), 658–670.

Alvarez, R., Levin, I., & Sinclair, J. (2012). Making Voting Easier: Convenience Voting in the
   2008 Presidential Election. *Political Research Quarterly*, 65(2), 248–262.

Alvarez, R., Hall, T., & Trechsel, A. (2009). Internet Voting in Comparative Perspective: The
   Case of Estonia. *PS: Political Science & Politics*, 42(3), 497–505.

Ariga, K. (2015). Incumbency Disadvantage under Electoral Rules with Intraparty Competition:
   Evidence from Japan. *The Journal of Politics*, 77(3), 874–887.

Augenblick, N., & Nicholson, S. (2016). Ballot Position, Choice Fatigue, and Voter Behavior.
   The Review of Economic Studies, 83(2), 460–480.

Biggers, D., & Hanmer, M. (2015). Who Makes Voting Convenient? Explaining the Adoption of
   Early and No–Excuse Absentee Voting in the American States. *State Politics & Policy
   Quarterly*, 15(2), 192–210.

Binder, M., Childers, M., & Johnson, N. (2015). Campaigns and the Mitigation of Framing
   Effects on Voting Behavior: A Natural and Field Experiment. *Political Behavior*, 37(3),
   703–722.

Blais, A. (2000). *To Vote or Not to Vote: The Merits and Limits of Rational Choice Theory*.
   Pittsburgh, PA: University of Pittsburgh Press.

Boehmke, F., Branton, R., Dillingham, G., & Witmer, R. (2012). Close Enough for Comfort? The Spatial Structure of Interest and Information in Ballot Measure Elections. *The Journal of Politics*, 74(3), 827–839.

Bonneau, C., & Cann, D. (2015). Party Identification and Vote Choice in Partisan and Nonpartisan Elections. *Political Behavior*, 37(1), 43–66.

Bowler, S., Donovan, T., & Happ, T. (1992). Ballot Propositions and Information Costs: Direct Democracy and the Fatigued Voter. *Western Political Quarterly*, 45(2), 559–568.

Brand, L. (2010). Authoritarian States and Voting from Abroad: North African Experiences. *Comparative Politics*, 43(1), 81–99.

Brockington, D. (2003). A Low Information Theory of Ballot Position Effect. *Political Behavior*, 25(1), 1–27.

Bundy, H. (2003). Election Reform, Polling Place Accessibility, and the Voting Rights of the Disabled. *Election Law Journal: Rules, Politics, and Policy*, 2(2), 217–240.

CAL. ELEC. § 3000.5. Retrieved From https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=ELEC&sectionNum=3000.5

CAL. STATS. 1864, c. 272. Retrieved From: HTTPS://CLERK.ASSEMBLY.CA.GOV/SITES/CLERK.ASSEMBLY.CA.GOV/FILES/ARCHIVE/STATUTES/1864/1863_64.PDF#PAGE=85

CAL. STATS. 1903, c. 134 § 1. Retrieved From: HTTPS://CLERK.ASSEMBLY.CA.GOV/SITES/CLERK.ASSEMBLY.CA.GOV/FILES/ARCHIVE/STATUTES/1903/1903.PDF#PAGE=212

CAL. STATS. 1911, c. 225 § 1. Retrieved From:

HTTPS://CLERK.ASSEMBLY.CA.GOV/SITES/CLERK.ASSEMBLY.CA.GOV/FILES/ARCHIVE/STATU

TES/1910_11/1911.PDF#PAGE=456

CAL. STATS. 1923, c. 283. Retrieved From:

HTTPS://CLERK.ASSEMBLY.CA.GOV/SITES/CLERK.ASSEMBLY.CA.GOV/FILES/ARCHIVE/STATU

TES/1923/23VOL1_CHAPTERS.PDF

CAL. STATS. 1931, c. 931 § 4. Retrieved From:

https://clerk.assembly.ca.gov/sites/clerk.assembly.ca.gov/files/archive/Statutes/1931/31v

ol1_Chapters.pdf#page=1935

CAL. STATS. 1975, c. 1158 § 30. Retrieved From:

https://clerk.assembly.ca.gov/sites/clerk.assembly.ca.gov/files/archive/Statutes/1975/75V

ol2_Chapters.pdf#page=240

CAL. STATS. 1978, c. 77. Retrieved From:

https://clerk.assembly.ca.gov/sites/clerk.assembly.ca.gov/files/archive/Statutes/1978/78V

ol4_Summary.pdf

CAL. STATS. 1994, c. 920 § 13107. Retrieved From:

https://clerk.assembly.ca.gov/sites/clerk.assembly.ca.gov/files/archive/Statutes/1994/199

4_Vol_3.pdf #page=1054

CAL. STATS. 2001, c. 922. Retrieved From: http://www.leginfo.ca.gov/pub/01–

02/statute/ch_0901–0950/ch_922_st_2001_ab_1520

CAL. STATS. 2016, c. 832. Retrieved From:

https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB450

CAL. STATS. 2021, c. 312. Retrieved From:

https://custom.statenet.com/public/resources.cgi?id=ID:bill:CA2021000A37&ciq=ncsl15

&client_md=80a190966fbdabf0fda093291c4f6072&mode=current_text

Carey, J., Niemi, R., & Powell, L. (2000). Incumbency and the Probability of Reelection in State

Legislative Elections. *The Journal of Politics*, 62(3), 671–700.

Converse, P. (2006). Democratic theory and electoral reality. *Critical Review*, 18(1), 297–329.

COVID–19 and 2020 Primary Elections. (2020). Retrieved from:

https://www.ncsl.org/research/elections–and–campaigns/state–action–on–covid–19–and–

elections.aspx

Cześnik, M. (2006). Voter Turnout and Democratic Legitimacy in Central Eastern Europe.

Polish Sociological Review, 156, 449–470.

Darcy, R., & Schneider, A. (1989). Confusing Ballots, Roll–Off, and the Black Vote. *The

Western Political Quarterly*, 42(3), 347–364.

Desposato, S., Petrocik, J. (2003). The Variable Incumbency Advantage: New Voters,

Redistricting, and the Personal Vote. *American Journal of Political Science*, 47(1), 18–

32.

Devroe, R., & Wauters, B. (2020). Does High on the Ballot Means Highly Competent?

Explaining the Ballot Position Effect in List–PR Systems. *Acta Politica*, 55(3), 454–471.

Downs, A. (1957). An Economic Theory of Political Action in a Democracy. *Journal of Political

Economy*, 65(2), 135–150.

Eckles, D., Kam, C., Maestas, C., & Schaffner, B. (2014). Risk Attitudes and the Incumbency

Advantage. *Political Behavior*, 36(4), 731–749.

Edwards, B. (2015). Alphabetically Ordered Ballots and the Composition of American Legislatures. *State Politics & Policy Quarterly*, 15(2), 171–191.

Faas, T., & Schoen, H. (2006). The Importance of Being First: Effects of Candidates' List Positions in the 2003 Bavarian State Election. Electoral Studies, 25(1), 91–102.

Flis, J., Kaminski, M. Party–related primacy effects in proportional representation systems: evidence from a natural experiment in Polish local elections. *Public Choice* 190, 345–363 (2022).

Frank, M., Stadelmann, D., & Torgler, B. (2022). Higher turnout increases incumbency advantages: Evidence from mayoral elections. *Economics & Politics*, 1–27.

Gatrell, J., & Bierly, G. (2002). Weather and Voter Turnout: Kentucky Primary and General Elections, 1990–2000. *Southeastern Geographer*, 42(1), 114–134.

Geys, B., & Heyndels, B. (2003). Ballot Layout Effects in the 1995 Elections of the Brussels' Government. *Public Choice,* 116 (1/2), 147–164.

Golden, M., & Picci, L. (2015). Incumbency Effects under Proportional Representation: Leaders and Backbenchers in the Postwar Italian Chamber of Deputies. *Legislative Studies Quarterly*, 40(4) 509–538.

Gomez, B., Hansford, T., & Krause, G. (2007). The Republicans Should Pray for Rain: Weather, Turnout, and Voting in U.S. Presidential Elections. *The Journal of Politics*, 69(3), 649–663.

Goodman, N., & Stokes, L. (2020). Reducing the Cost of Voting: An Evaluation of Internet Voting's Effect on Turnout. *British Journal of Political Science*, 50(3), 1155-1167.

Gordon, S., & Landa, D. (2009). Do the Advantages of Incumbency Advantage Incumbents? *The Journal of Politics*, 71(4), 1481–1498.

Hamilton, J., & Ladd, H. (1996). Biased ballots? The impact of ballot structure on North

      Carolina elections in 1992. *Public Choice*, 87(3–4), 259–280.

Hansford, T., & Gomez, B. (2010). Estimating the Electoral Effects of Voter Turnout. *The*

      American Political Science Review, 104(2), 268–288.

Harsanyi, J. (1969). Rational–Choice Models of Political Behavior vs. Functionalist and

      Conformist Theories. *World Politics*, 21(4), 513–538.

Herrnson, P., Hanmer, M., & Niemi, R. (2012). The Impact of Ballot Type on Voter Errors.

      American Journal of Political Science, 56(3), 716–730.

Ho, D., & Imai K. (2008). Estimating Causal Effects of Ballot Order from a Randomized Natural

      Experiment: The California Alphabet Lottery, 1978–2002. *Public Opinion Quarterly*,

      72(2), 216–240.

Hood, M., & McKee, S. (2010). Stranger Danger: Redistricting, Incumbent Recognition, and

      Vote Choice. *Social Science Quarterly*, 91(2), 344–358.

Ireland, P. (2018). The limits of sending–state power: The Philippines, Sri Lanka, and female

      migrant domestic workers. *International Political Science Review*, 39(3), 322–337.

Jankowski, M., & Frank, T. (2022). Ballot Position Effects in Open–List PR Systems: The

      Moderating Impact of Postal Voting. *Acta Politica*, 57, 320–340.

Kaminski, M. (1999). How Communism could have been saved: Formal Analysis of Electoral

      Bargaining in Poland in 1989. *Public Choice*, 98(1), 83–109.

Karp, J., & Banducci, S. (2000). Going Postal: How All–Mail Elections Influence Turnout.

      Political Behavior, 22(3), 223–239.

Kim, N., Krosnick, J., & Casasanto, D. (2015). Moderators of Candidate Name–Order Effects in Elections: An Experiment: Moderators of Candidate Name–Order Effects. *Political Psychology*, 36(5), 525–542.

Kimball, D., & Kropf, M. (2005). Ballot Design and Unrecorded Votes on Paper–Based Ballots. *The Public Opinion Quarterly*, 69(4), 508–529.

King, A., & Leigh, A. (2009). Are Ballot Order Effects Heterogeneous? *Social Science Quarterly*, 90(1), 71–87.

Knack, S. (1994). Does rain help the Republicans? Theory and evidence on turnout and the vote. *Public Choice*, 79(1/2), 187–209.

Kritzer, H. (2016). Roll–Off in State Court Elections: The Impact of the Straight–Ticket Voting Option. *Journal of Law and Courts*, 4(2), 409–435.

Lachat, R. (2011). Electoral Competitiveness and Issue Voting. *Political Behavior*, 33(4), 645–663.

Lascher, E. (2005). Constituency Size and Incumbent Safety: A Reexamination. *Political Research Quarterly*, 58(2), 269–278.

Lau, R., & Redlawsk, D. (2001). Advantages and Disadvantages of Cognitive Heuristics in Political Decision Making. *American Journal of Political Science*, 45(4), 951–971.

Lopez de Leon, F., & Rizzi, R. (2014). A Test for the Rational Ignorance Hypothesis: Evidence from a Natural Experiment in Brazil. *American Economic Journal*, 6(4), 380–398.

Lott, J. (2020). Why Do Most Countries Ban Mail–In Ballots? They Have Seen Massive Vote Fraud Problems. *SSRN Electronic Journal*. 1–152.

Lutz, G. (2010). First Come, First Served: The Effect of Ballot Position on Electoral Success in Open Ballot PR Elections. *Representation*, 46(2), 167–181.

Matson, M., & Fine, T. (2006). Gender, Ethnicity, and Ballot Information: Ballot Cues in Low–

    Information Elections. *State Politics & Policy Quarterly*, 6(1), 49–72.

McCue, K., (2011). "Creating California's Redistricting Database."

    https://statewidedatabase.org/d10/Creating%20CA%20Official%20Redistricting%20Data

    base.pdf

Meredith, M., & Salant, Y. (2013). On the Causes and Consequences of Ballot Order Effects.

    Political Behavior, 35(1), 175–197.

Miller, J., & Krosnick, J. (1998). The Impact of Candidate Name Order on Election Outcomes.

    Public Opinion Quarterly, 62(3), 291–330.

Nemerovski, P. (2021). Occupational Hazard: a Critique of California Elections Code §

    13107(a)(3). *Journal of Legislation*, 48(1), 86–123.

Niemi, R., & Herrnson, P. (2003). Beyond the Butterfly: The Complexity of U.S. Ballots.

    Perspective on Politics, 1(2), 317–326.

Parker, P., & Przybylski, J. (1993). "It's in the Mail": Present Use and Future Prospects of Mail

    Elections. *State and Local Government Review*, 25(2), 97–106.

Pasek, J., Schneider, D., Krosnick, J., Tahk, A., Ophir, E., & Milligan, C. (2014). Prevalence and

    Moderators of the Candidate Name–Order Effect. *Public Opinion Quarterly*, 78(2), 416–

    439.

Patterson, S., & Caldeira, G. (1985). Mailing In the Vote: Correlates and Consequences of

    Absentee Voting. *American Journal of Political Science*, 29(4), 766–788.

Perlman, E., & Sprick–Schuster, S. (2016). Delivering the Vote: The Political Effect of Free

    Mail Delivery in Early Twentieth Century America. *The Journal of Economic History*,

    76(3), 769–802.

Primary Elections in California (2023). Retrieved From:

> https://www.sos.ca.gov/elections/primary–elections–california

Prior, M. (2006). The Incumbent in the Living Room: The Rise of Television and the

> Incumbency Advantage in U.S. House Elections. *The Journal of Politics*, 68(3), 657–673.

Prior Statewide Elections. (2020). Retrieved From https://www.sos.ca.gov/elections/prior–

> elections/prior–statewide–elections

Publications. Census of Population and Housing. (2022). Retrieved From

> https://www.census.gov/prod/www/decennial.html

Randomized Alphabet. (2023). Retrieved From: https://www.sos.ca.gov/elections/randomized-

> alphabet

Reilly, S., & Richey, S. (2011). Ballot Question Readability and Roll–Off: The Impact of

> Language Complexity. *Political Research Quarterly*, 64(1), 59–67.

Riker, W. (1986). *The Art of Political Manipulation*. New Haven, CT: Yale University Press.

Salka, W. (2005). Term Limits and Electoral Competition: An Analysis of California Legislative

> Races. *State and Local Government Review*, 37(2), 116–126.

Satz, D., & Ferejohn, J. (1994). Rational Choice and Social Theory: *Journal of Philosophy*,

> 91(2), 71–87.

Selb, P. (2008). Supersized votes: Ballot length, uncertainty, and choice in direct legislation

> elections. *Public Choice*, 135(3/4), 319–336.

Shue, K., & Luttmer, E. (2009). Who Misvotes? The Effect of Differential Cognition Costs on

> Election Outcomes. *American Economic Journal*, 1(1), 229–257.

Shugart, M., Valdini, M., & Suominen, K. (2005). Looking for Locals: Voter Information

> Demands and Personal Vote–Earning Attributes of Legislators Under Proportional

Representation. *American Journal of Political Science*, 49(2), 437–449.

Southwell, P. (2004). Five Years Later: A Re–Assessment of Oregon's Vote by Mail Electoral

Process. PS: *Political Science & Politics*, 37(1), 89–93.

Southwell, P., & Burchett, J. (2000). Does Changing the Rules Change the Players? The Effect

of All–Mail Elections on the Composition of the Electorate. *Social Science Quarterly*,

81(3), 837–845.

Uhlaner, C. (1989). "Relational goods" and participation: Incorporating sociability into a theory

of rational action. *Public Choice*, 62(3), 253–285.

Utych, S., & Kam, C. (2014). Viability, Information Seeking, and Vote Choice. *The Journal of

Politics*, 76(1), 152–166.

Verba, S., Schlozman, K., & Brady, H. (1995). *Voice and Equality: Civic Voluntarism in

American Politics*. Cambridge, MA: Harvard University Press.

Voting Outside the Polling Place: Absentee, All–Mail and other Voting at Home Options (2022).

Retrieved From https://www.ncsl.org/research/elections–and–campaigns/absentee–and–

early–voting.aspx

Wand, J., Shotts, K., Sekhon, J., Mebane, W., Herron, M., & Brady, H. (2001). The Butterfly

Did It: The Aberrant Vote for Buchanan in Palm Beach County, Florida. *American

Political Science Review*, 95(4), 793–810.

Webber, R., Rallings, C., Borisyuk, G., & Thrasher, M. (2014). Ballot Order Positional Effects in

British Local Elections, 1973–2011. *Parliamentary Affairs* 67(1), 119–136.

APPENDIX

List of Variables Used in Analyses

Ballot Position: Original label *ballot_position*. As outlined in Chapter 4, a variable tracking the listed position of a candidate on a ballot within a given district during a given election; with the topmost position coded as (1) and subsequent positions assigned increasing values corresponding to their progressively lowering placement. The ultimate result being that the lowest ranking position in a given election always has the highest value.

Ballot Position * VBM Percent: An interaction variable for tracking the combined effect of a candidate's ballot position and the percent of by-mail voters in a district on vote shares. With values corresponding to the simultaneous increase in the percent of mail voters and lowering of ballot positions as-per the "Ballot Position" variable.

Contest Position: Original label *Order of Contest on Ballot*. A variable tracking the order in which a contest appeared on a ballot for a given election. With the first contest to appear being coded as (1) and subsequent contests assigned increasing values based on the order they appeared. Since positions are highly static, it is treated as a categorical variable with results being reported as the variation in vote shares from position 1.

District: Original label *district*. A variable indicating the Assembly District a candidate participated in. Ranging from 1 to 80, with Assembly District 1 coded as (1) and Assembly District 80 coded as (80). Since all contests in the dataset are statewide, all candidates competed in all districts.

Has Incumbent: A binary variable for if an election had an incumbent candidate competing (1) or not (0).

Is Incumbent: Original label *Incumbent*. A dummy variable for if a candidate was the incumbent in a given contest (1) or not (0).

Is Incumbent * VBM Percent: An interaction variable for tracking the combined effect of a candidate being the incumbent in an election and the percent of by-mail voters in a district on vote shares. With values corresponding to the increase in the percent of mail voters when a candidate is an incumbent.

Is Presidential Year. A binary variable tracking if a given election occurred during a presidential election year (1) or not (0).

Median Household Income: The estimated median household income of residents within an Assembly District. Derived from the average median household income across the constituent counties within a given district.

National: A binary variable tracking if a given election was for either US President or Senator (1) or not (0).

Party: Original label *part2*. A categorical variable tracking the political party that a given candidate was a member of. Results in all models are reported as the variation in vote shares from the Democratic Party.

Percent College25: The estimated percent of residents over 25 years old with at least a 4-year college degree within an Assembly District. Derived from the average across the constituent counties within a given district.

Percent Highschool25: The estimated percent of residents over 25 years old with at least a high school degree within an Assembly District. Derived from the average across the constituent counties within a given district.

Perm Allowed: A binary variable indicating if an election took place following the introduction of permanent registration as a by-mail voter in 2002. With elections held during and after 2002 coded as (1) and before as (0).

Race: Original label *race2*. A categorical variable tracking the elected position that a given candidate was competing for. Results in all models are reported as the variation in vote shares from US Senate elections due to occurring during both presidential and gubernatorial election years, and their fixed position relative to all other contests; with them always being placed before the Superintendent of Public Instruction, but after all other contests.

Registered Declined: Original label *reg_decline*. The percent of voters that declined to disclose their party registration within a district for a given election.

Registered DEM: Original label *reg_dem*. The percent of voters that were registered members of the Democratic party within a district for a given election.

Registered Other: The percent of voters that were registered members of a third-party within a district for a given election.

Registered REP: Original label *reg_rep*. The percent of voters that were registered members of the Republican party within a district for a given election.

Second Race: Original label *second_race*. A dummy variable for if a contest for an elected position occurred simultaneously with another of the same position (1) or not (0).

Top Two Primary: A binary variable indicating if an election occurred before (0) or after (1) the implementation of the top two primary system for all statewide elections following passage of Proposition 14 in 2010. While passed prior to the 2010 general election, it was not implemented in statewide elections until the 2012 election cycle.

Total Contestants: A numeric variable tracking the number of contestants competing in a given election.

VBM Percent: The percentage of by-mail voters within an Assembly District for a given election. Chapter 4 outlines the process used for assembling this variable in detail.

1976-1978: A binary variable indicating if an election took place prior to the implementation of no-excuse mail voting in 1979. With elections held before 1979 coded as (1) and after as (0).

1980-2000: A binary variable indicating if an election took place after the implementation of no-excuse mail voting in 1979, but before permanent absentee voting registration was introduced in 2002. With elections held between 1980 and 2000 coded as (1) and all others as (0).

2002-2014: A binary variable indicating if an election took place after permanent absentee voting registration was introduced in 2002, but before the implementation of the Voters Choice Act in 2016. With elections held between 2002 and 2014 coded as (1) and all others as (0).

2016-2018: A binary variable indicating if an election took place the implementation of the Voters Choice Act in 2016, but before mail ballots became the default voting method statewide in 2020. With elections held between 2016 and 2018 coded as (1) and all others as (0).

2020: A binary variable indicating if an election occurred before (0) or after (1) 2020, when mail ballots began being used as the default voting method across all districts for statewide elections.