Ballot Position, Choice Fatigue, and Voter Behavior

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Abstract

In this paper, we examine the effect of "choice fatigue" on decision making. We exploit a natural experiment in which voters face the same contest at different ballot positions due to differences in the number of local issues on their ballot. Facing more decisions before a given contest significantly increases the tendency to abstain or rely on decision shortcuts, such as voting for the status quo or the first listed candidate. We estimate that, without choice fatigue, abstentions would decrease by 8%, and 6% of the propositions in our dataset would have passed rather than failed.

Keywords: Contextual Choice, Choice Fatigue, Voter Participation

JEL Classification Numbers: D3, D72

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1 Introduction

Do people find the pure act of decision making to be exhausting or effort consuming? If so, how do peoples' decisions change after they have just made other decisions? In this paper, we examine this effect, which we call "choice fatigue," in an important field environment. We exploit a natural experiment that generates conditionally random variation in the number of decisions a voter must make before reaching a specific contest on the ballot. We provide evidence that making more decisions prior to a particular decision increases the likelihood of abstention as well as the reliance on heuristics (such as choosing the status quo) in decision making.

Decisions in many economic domains are made in sequential order and therefore might be affected by choice fatigue. The effect of cognitive load on different decisions has been discussed in other recent work in behavioral economics and consumer psychology. For example, Levav et al. (2010) find that German car buyers customizing an Audi are more likely to rely on defaults after making more complicated decisions, Danziger et al. (2011) find that judges make harsher decisions as the number of cases since a break increases, and Iyengar and Kamenica (2010) find that employees at firms with more investment options in their 401(k) plan allocate more money to bond funds and less money to equity funds.

Similarly, in the voting literature, many have noted that voters are less likely to cast a vote as they move down the ballot, a phenomenon known as "roll-off." (Burnham 1965; Bowler and Donovan 2000; Bowler et al. 1992; Selb 2008). While this effect might be due to fatigue, it also might be due to the fact that contest saliency generally decreases with ballot position (Bowler et al. 1992; Bullock and Dunn 1996). Additionally, some have suggested that choice fatigue might cause people to vote differently (Bowler and Donovan 2000; Selb 2008), although the evidence is mixed (Mueller 1969). As these studies simply correlate ballot length and aggregate votes (or voter intent) on contests across many elections, the result might be due to differences in the types of contests that appear on long ballots. Therefore, although there has been much work on the subject, the effect of fatigue on voting has never been convincingly causally identified.

Ideally, one would address these questions with a field experiment in which similar voters are presented with the exact same contest at random ballot positions.[1] Then it would be possible to determine the pure behavioral impact of shifting ballot position: Are voters more

[1]Darcy and Schneider (1989) note that very irregular positioning in a 1986 Oklahoma election (caused by the introduction of new optical technology) led to an increase in roll-off. However, they attribute the effect to voter confusion rather than fatigue. Therefore, the ideal experiment to isolate the effect of fatigue would involve a randomization of position that does not violate voters' expectations and cause confusion.

likely to abstain on a contest if it is presented further down the ballot? Furthermore, if they do choose to vote, would they vote differently? Unfortunately, given that ballot ordering is determined by legislated rules, a field experiment would be nearly impossible to implement.[2]

Rather than running a field experiment, our paper solves this identification problem by exploiting similar variation found in a natural experiment in California. As a result of ballot ordering rules, Californian voters in the same county can see the same contest at different ballot positions as a result of differences in the number of local contests in the voter's precinct which appear early on the ballot. These differences can be seen as random shocks to a contest's ballot position, particularly when controlling for precinct voting behavior over time.

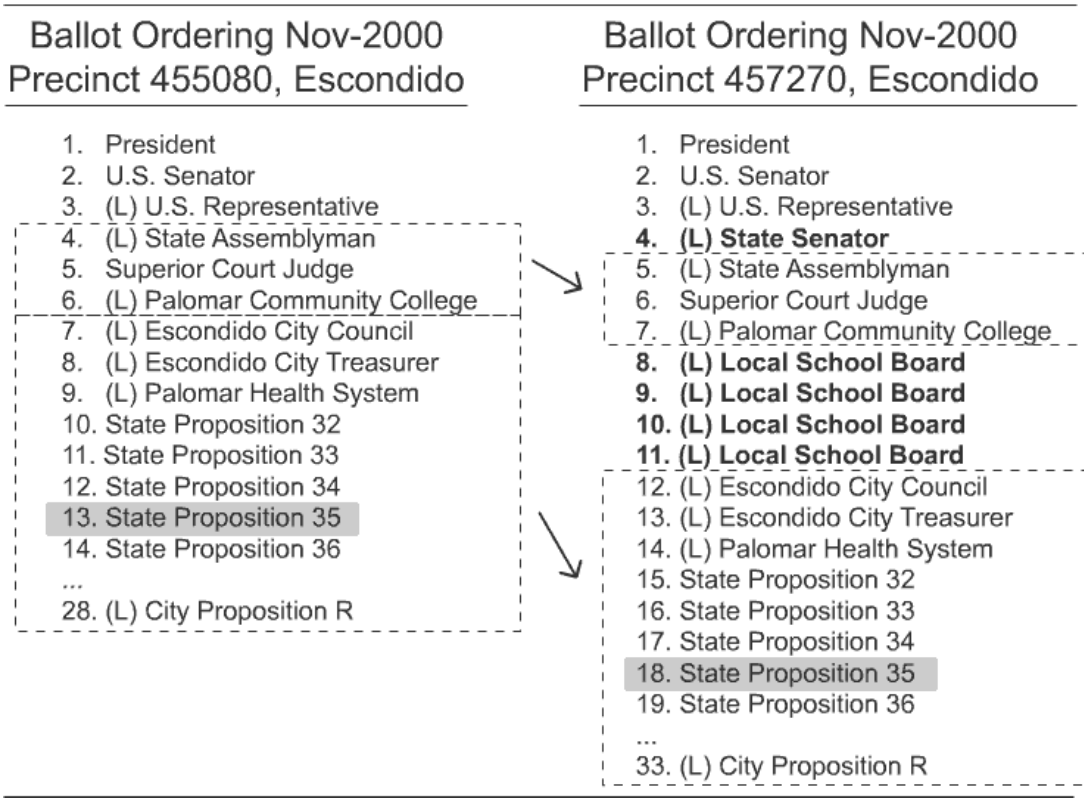
To understand our source of variation, consider Proposition 35, a California statewide ballot measure in the 2000 general election concerning the use of private contractors in public works projects.[3] This proposition appeared on every ballot in the state. However, because of the differences in the number of contests in the overlaying local political jurisdictions in which each voter lives, Proposition 35 appeared at different ballot positions for different voters. For example, the ballot ordering for two precincts in the City of Escondido in San Diego are shown in Figure 1, with local contests preceded by "(L)." The voters in these precincts voted on the same contests, with the exception of five local contests (shown in bold) which appear relatively early on the ballot in Precinct 457270, but not in Precinct 455080. As a result of these local contests, voters in Precinct 457270 saw three contests one position later than those in Precinct 455080, and 22 contests (including Position 35) five positions later. As a result of similar variation in local contests, voters in the 1,508 polling precincts of San Diego saw Proposition 35 listed anywhere between ninth and nineteenth on the ballot, with mean position of 15.8 and standard deviation of 2.1.

Foreshadowing the general results of our paper, as Proposition 35 moved down the ballot in different precincts, the choice behavior of voters in those precincts changed. The left and middle panels in Figure 2 shows a positive and significant association between the ballot position of Proposition 35 and the percentage of no votes (the status quo) and percentage of *undervotes* (abstentions conditional on appearing to vote) in the respective precincts. The right panel of Figure 2 provides a placebo result, showing that no such positive relationship exists across the same precincts in undervotes for the US Senator race, which was the last contest appearing at a common ballot position across the precincts. For reference, the

[2]Some states have begun to randomize candidate ordering *within* a contest (see Koppell and Steen (2004)), but there has been little discussion of randomizing ballot ordering across contests.

[3]The title of the proposition that appeared on the ballot is "Public works projects. Use of private contractors for engineering and architectural services."

Figure 1: Ballot orderings for two precincts in the November 2000 election

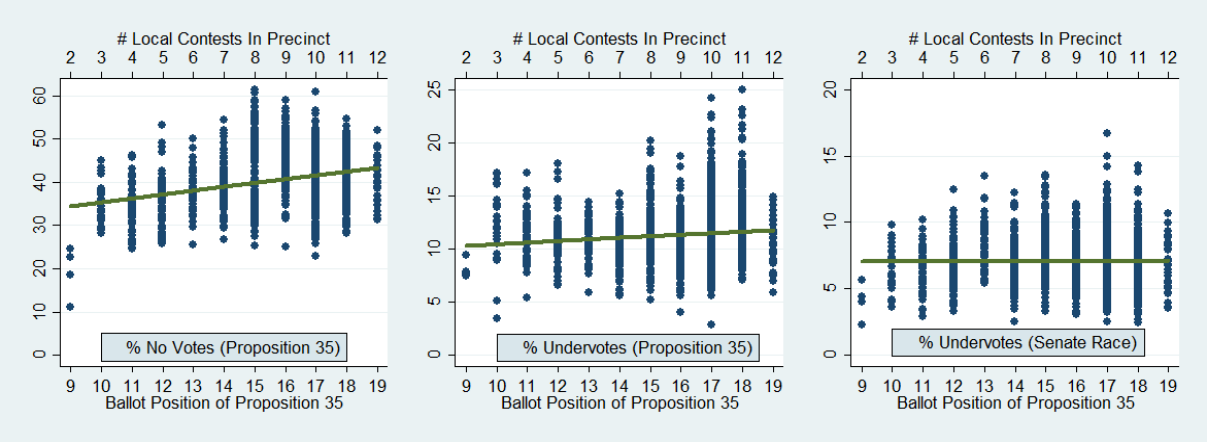


Notes: Local contests are preceeded by (L). Precinct 457270 has five more local contests (in bold) than Precinct 455080, shifting the common contests (in the dotted boxes) down the ballot. For example, Proposition 35 (highlighted), which is discussed in the text, moved from ballot position 13 to 18.

number of local contests that appear early in the ballot, which is perfectly correlated with the ballot position of Proposition 35, is shown in the upper x-axis.

The within-contest variation in ballot position driven by local contests allows us to include contest fixed effects in our specifications, removing the effects of unobservable contest characteristics that are likely correlated with ballot position and voter behavior. However, data on only one election leaves open the possibility that certain precinct-level unobservable characteristics might lead to both a higher number of local contests and more undervotes (or no votes). To address this concern, we use data from multiple elections, which allows us to include precinct fixed effects in our specifications, controlling for all stable precinct characteristics. Our final dataset includes nearly one million precinct-level observations of voting outcomes and ballot ordering for every option for every federal, statewide, and local contest for every primary and general election between 1992 and 2002 in every San Diego

Figure 2: Three precinct-level outcomes given the ballot position of Proposition 35



Notes: Each dot represents a precinct-level observation. There is a statistically-significant position relationship between the position of Proposition 35 and no votes (left panel) and undervotes (middle panel) for Proposition 35, but no relationship with undervotes in the senate race (right panel). The number of local contests appearing early in the ballot, which drives the variation in ballot position of Proposition 35, is shown in the upper x-axis.

precinct.

Across all contests in our dataset, we find that lowering a given contest by one position on the ballot increases precinct-level undervotes by 0.11 percentage points. Given the average ballot position (15.7) and level of undervotes of contests in our data (21.6%), this suggests that choice fatigue is responsible for 8% of undervotes in these contests. We also find that voters are more likely to use decision shortcuts as they become fatigued. For example, in statewide and local propositions (yes-no decisions), lowering a given proposition by one position increases votes for the status quo (no votes) by 0.12 percentage points.[4] In statewide and local office races (multi-candidate decisions), lowering a given contest by one position increases the tendency to vote for the first candidate listed (the most commonly-studied effect of candidate ordering) for that contest by 0.06 percentage points. To understand the economic impact of these results, consider that the average proposition is presented 26.7 positions from the top of the ballot. This estimate suggests that the percentage of no votes would decrease by an average of 3.2 percentage points if these contests appeared at the top of the ballot, a natural non-fatigued baseline. Therefore, given the ballot position of each proposition, we calculate that *24 (6%) of the propositions in our dataset would have passed*

[4] Although some states have propositions in which a yes vote is the status quo, a no vote always maintains the status quo for California propositions.

rather than failed if voters did not experience choice fatigue.[5] Furthermore, we calculate that this status-quo effect is nearly tripled in contests with no campaign expenditures, in which voters are likely making decisions only when they enter the voting booth.

Even with precinct- and contest-level fixed effects, our identification strategy cannot capture precinct characteristics that vary with time. Perhaps most concerningly, a higher number of local contests in a given precinct might drive changes in the composition of people that turn out to vote. For example, if voters who are more likely to abstain are also more likely to turn out in elections with more local contests, our results could be spurious.[6] We provide evidence against these composition effects by running placebo regressions in the vein of above US Senator race example. We find that there is no significant positive relationship between the number of local contests in a precinct and undervotes (or the tendency to vote for the first candidate) in top-of-the-ballot contests with no ballot position variation.[7,8]

We note a few caveats about our main conclusions. First, as we only observe precinct-level aggregate voting behavior, we cannot observe correlations in individual behavior across contests. For example, our abstention results might be driven by voters who choose to leave the voting booth entirely once fatigued and consequently abstain from all later contests, rather than voters who have an increased tendency to abstain on each individual later contest. Second, as voters likely (correctly) believe that later contests are less important on average, they might rationally choose to abstain from all later contests even if they are aware that local contests cause some randomness in position (see Kamenica (2008) for a discussion of a similar form of contextual inference in product markets). It is harder, however, to rationalize changes in option choice with this explanation. Third, as we study option choice conditional on voting in given contest, we cannot rule out that some of the changed behavior is driven by a selection effect from increased abstentions. However, given that the status-quo effects are slightly larger than the abstention effects, simple calculations suggest that all of the conditional voting behavior cannot be due to selection. Fourth, although we interpret our

[5] Of course, it not possible to place every contest at the top of the ballot. However, if ballot ordering of contests were randomized (as it now commonly the case with candidate ordering within contests), the effects of fatigue would be equally spread across contests and therefore less likely to cause large changes in outcomes, rather than being focused on contests which happen to appear on the bottom of the ballot.

[6] One might reasonably expect the opposite effect, which would bias our results downward: Voters who are likely to abstain from individual contests are more likely to abstain from the entire election when facing more local contests.

[7] A similar test is not possible with "no" votes, as there are no early contests of this type with no ballot position variation.

[8] We note that, as our variation is not truly random, there is still a concern that a higher number of local contests on a ballot causes turnout by voters who exhibit standard behavior on early contests on the ballot – where there are less undervotes in general – but are more likely to abstain (and vote for the status-quo or the first candidate) on later contests.

results on propositions as an increased tendency to vote for the status quo when fatigued, this effect might simply reflect an increased tendency for fatigued voters to vote no, regardless of meaning (as suggested by Kamenica (2012)). As voting no and voting for the status quo are always equivalent in our dataset, we cannot distinguish between these interpretations.

To better understand the relevance of this paper's research contribution, the next section discusses the relevant previous literature on decision making and roll-off. Section 3 discusses the dataset and our empirical strategy. The empirical results are broken into two categories. In section 4, we investigate the effect of choice fatigue on undervotes, which represents the "decision to decide." In section 5, we discuss the effects of choice fatigue on the actual decision, given that a decision was made. The implications of the results for political economics and theories of decision making, as well as practical concerns for the design of electoral institutions are discussed in section 6.

2 Previous Literature

The central hypothesis of this paper is that a contextual variable, the number of previous decisions made in the choice environment, can affect decision outcomes. As we are concerned with the effect of this variable on both abstentions and the decision itself, we will review the relevant literature in both of these areas. In both cases, given that the application in this paper is voter decision making, we first discuss relevant research in this area and later cover more broadly motivating work in consumer psychology and economic choice.

The Effect of Fatigue on "Deciding to Decide"

Three explanations are offered in the existing literature on the effects of ballot composition on participation in individual contests: information, confusion, and fatigue. Within this body of work, the fatigue effects cannot be disentangled from other factors because of methodological limitations that disallow any sort of causal inference. We discuss two representative papers here.[9]

First, Darcy and Schneider (1989) study the 1986 Oklahoma gubernatorial general election in which the new use of fill-in-the-bubble optical voting technology by three counties placed the high-salience US Senator contest in obscure or unusual places on the ballot. This drop in ballot position led to 3 to 7 percentage points more undervotes in comparison to the

[9]Other references include: Burnham (1965), Bullock and Dunn (1996), Bowler and Donovan (2000), Nicholson (2003), and Selb (2008).

counties using lever machines.[10] Given that the choice of using optical voting technology is endogenous and that the author's main hypothesis is that the irregular positioning led to confusion, it is difficult to draw a predictive conclusion about the effects of fatigue. However, the authors do present an example of how the relative position of a contest on the ballot may be important for voter choice.

Second, Bowler et al. (1992) discuss how voter fatigue may influence abstentions. They follow Downs (1957) and Magleby (1984, 1989) in arguing that voting is driven by a cost-benefit analysis, leading voters to resort to cheap decisions (such as abstaining) in some contests. The paper regresses roll-off on the ballot position of California propositions from 1974-1988 and finds that roll-off rises and then falls with ballot position. However, as a proposition's position is determined by the order in which it qualified, less important propositions are likely to appear lower on the ballot. Therefore, it is not possible to separately identify the effects of ballot position and saliency. In fact, these limitations point to the advantage of our approach, which allows us to control for all proposition-specific characteristics by looking at changes in ballot order of the same proposition.

Apart from fatigue, several authors look directly at the role of information in abstention. For example, Coupe and Noury (2004) use data from a survey experiment to find the "pure" effect of information on the decision to abstain. Although not an application based on empirically observed voter choice behavior, their conclusions are intuitive and suggest that those with less information about a particular survey question are more likely to abstain. Wattenberg et al. (2000) use survey data and argue that voters with less information are more likely to abstain. They characterize voters as "treat[ing] voting as if it were a test, picking out the questions that they can answer."

As there are many economic environments in which sequential decisions are made in a choice environment, there is previous work in behavioral economics and consumer psychology on the role of similar contexts in decision making. For example, Boatwright and Nunes (2001) provide additional evidence that decisions made sequentially can be affected by the attributes of individual choices. They find in a natural experiment at an online grocer that reductions in the assortment within 42 product categories increase sales by an average of 11%. Iyengar and Lepper (2000) spearheaded the literature in choice overload, finding that reductions in the variety of jams (and separately, chocolates) in a tasting booth lead to more sales, a finding supported by research in other contexts.[11] These examples suggest that

[10] The data analysis is relatively informal, with no standard errors are given or hypothesis tests performed.

[11] Other references in this literature include Bertrand et al. (2010), and Gourville and Soman (2005). Furthermore, theoretical arguments (Kamenica 2008) and experimental evidence (Seuanez-Salgado 2006) exist for why consumers may prefer smaller choice sets over larger ones.

larger decision sets can lead decision makers to abstain from making a decision. Dhar (1997a, 1997b) finds that preference for a "no-choice" option (choice deferral) increases when there is no single alternative in the choice set that has a clear advantage.

Effect of Fatigue on Decisions

For motivation on understanding how voters' decisions are affected by choice fatigue, it is first useful to discuss the literature on voter choice in low information environments. Having no information about candidates or a proposition does not imply that voters will choose a candidate randomly. Instead, there are many contest characteristics available to them that they can use to make a low-information decision about how to vote. Cues that may affect voter decisions are candidate ordering (Ho and Imai 2008; Meredith and Salant 2013; King and Leigh 2009; Koppell and Steen 2004; Krosnik et al. 2004; Miller and Krosnick 1998), ballot configurations/design (Walker 1966), and candidate cues such as gender (McDermott 1997), ballot designation/incumbency (McDermott 2005), race/ethnicity (Washington 2006; Engstrom and Caridas 1991; Vanderleeuw and Utter 1993) and partisanship (Sniderman, Brody, and Tetlock 1993). Additionally, these effects may be exacerbated without other cues (Miller and Krosnick 1998). Our goal is not to examine the effect of these cues on decisions, but how these types of characteristics might *interact with fatigue* to affect voter decision making. We examine the effect of fatigue on selecting the status-quo choice or the first-listed candidate (the so-called "primacy effect"), as these are arguably the cues that require the least effort to determine.[12] In the second analysis, we focus on the discontinuous effect of being listed first rather than a continuous effect of ballot position as virtually all of the papers about candidate ordering focus on this effect.[13]

A few papers have noted a relationship between ballot length and the tendency to vote for the status-quo choice. Bowler and Donovan (2000) show that there is a relationship between aggregate no votes on propositions in past Californian and Oregonian elections and the number of propositions in that election. Similarly, Selb (2008) uses a random-effects

[12] Candidates are listed in a particular order, and this order is observed with virtually no effort. Similarly, the status quo option on propositions is always "no," and requires no effort to determine. On the other hand, to make a decision based on the candidates' gender, the voter must read each candidate's name, determine the candidate's likely gender, and compare these likelihoods across candidates. In this case, it might be reasonable to expect fatigue to cause people to take this costly action less, rather than more.

[13] Miller and Krosnick (1998) and Krosnik et al. (2004) focus on the effect of being listed first or the differential effect of being listed first versus last, although they commonly focus on contests with only two candidates. King and Leigh (2009) use a dataset with an average of 6 candidates per ballot, but report the effect of being listed first only. Ho and Imai (2008) similarly focus all of their analysis on the effect of being listed first. Koppell and Steen (2004) and Meredith and Salant (2013) package many of their main results in terms of being listed first, but also report the effect over multiple positions.

heteroskedastic probit model on Swiss survey data about self-reported voting intention on propositions to find a marginally significant increase in the number of no votes when the ballot contains more propositions.[14] As this data is aggregated up to the election level, it is difficult to draw causal conclusions.

More broadly, previous research has examined the effect of cognitive exertion on the ability to make decisions and the potential resulting bias in observed choice in a variety of domains (Section 3.1 of Kamenica (2012) provides a comprehensive review of these studies). For example, Levav et al. (2010) study the sequencing of car customization decisions in a field experiment with Audi car buyers. Customers are randomly assigned to treatments in which the first 8 of 67 decisions over car attributes are ordered either in increasing or decreasing order of the number of attributes available for each decision. The paper finds that customers in the "Hi-Lo" treatment (decisions with more alternatives first) are more likely to take the default choices (and spend more) than those in the "Lo-Hi" (decisions with fewer alternatives first) treatment. Danziger et al. (2011) study judicial decisions throughout the day, finding that the likelihood of a favorable decision drops consistently as judges make more decisions without a break. This is perhaps the closest study to ours in a different domain: Given plausibly random ordering of decisions in a field domain, the study finds that people make different choices as the number of previous choices rises.

Complementing the evidence in political science, economics and marketing, survey researchers have examined similar issues with regard to how survey respondents behave as they navigate through a survey. Using terminology from Simon (1956), Krosnick (1999) describes survey subjects as falling into two categories: optimizers and satisficers. Although optimizers are thorough in their decision making, other types of people are less thoughtful as they provide responses to questions. Krosnick describes these people as "agree[ing] merely to provide answers, with no intrinsic motivation toward high quality." These "respondents may satisfy their desires to provide high-quality data after answering a few questions, and become increasingly fatigued and distracted as a questionnaire progresses." As a result, these respondents rely more on shortcuts such as choosing the status quo or "no opinion" for questions appearing later on in a questionnaire (Yin 1989).

Baumeister et al. (1998) provides an interesting theory for these results, suggesting that willpower is similar to muscle strength and can be depleted by use. In the case of voting, it might be that self-control is required to expend cognitive energy in order to make thoughtful decisions and fulfill one's perceived civic duty. More recently, Baumeister and co-authors

[14] Interestingly, Selb notes that "this relatively weak finding casts some doubts on Bowler and Donovan's previous results."

have suggested that willpower corresponds to blood glucose levels, implying that it can be replenished with rest (Baumeister 2002) or simply consuming a glucose drink (Gailliot, Baumeister, Nathan, Maner, Ashby, Tice, Brewer, and Schmeichel 2007). Taken literally, this implies that choice fatigue in voters could be lowered by providing with sugary drinks in the voting booth.

3 Data and Empirical Strategy

Dataset

As we discuss in detail in section 3, our identification strategy exploits precinct-level variation in the number of local contests that appear on a ballot for a given election. Given this variation, voters in different precincts see contests that appear later on the ballot in different ballot positions. Therefore, our analysis uses a dataset with precinct-level election results and ballot ordering.

We focus on San Diego because of data availability and the large variation across precincts and elections in the number of overlaying local political jurisdictions.[15] The raw data comes from the Statement of the Vote published by the San Diego Registrar of Voters, which contains the turnout levels for each precinct as well as the number votes placed for each potential option for each contest for a each precinct.[16] Therefore, for example, it is easy to determine the percentage of voters for a given contest in a given precinct that did not vote on that contest but did show up to vote. The presentation of the data across elections is unfortunately not uniform, requiring manual construction of identifiers for contests, candidates, and jurisdictions.

For every precinct-contest observation, we infer the ballot position from the rules in §13109 of the Elections Code of the California State Constitution, which dictate ballot ordering across the state.[17] The code requires that federal, statewide, and local offices always appear above the statewide propositions, which in turn appear above the local propositions.

[15] Obtaining electronic or paper files proved difficult in other counties, mainly for lack of preservation of records and limitations on public access. Other counties have records, but would not exhibit the necessary variation to identify ballot position effects. For example, San Francisco does have electronic precinct-level data, but lacks special districts within the City and County required to observe the same contest at different positions on the ballot.

[16] The data source can be obtained at: http://www.sdvote.com/

[17] Charter cities and counties are allowed flexibility in their elections code. Of the 4 charter cities in our dataset, the only deviation from the state elections code that is relevant to our dataset is discussed later in the paper: the City of San Diego rotates city contest candidates in a slightly different way than the state elections code.

Statewide propositions are further ordered by type and listed in the order in which they were qualified for the ballot.[18,19] As a result of this ordering, voters in different precincts can face different numbers of local contests early in the ballot for a given election, leading to variation in the ballot position of later common contests.[20] Note that top-of-the-ballot contests (such as Governor, President, Secretary of State, etc.) always appear at the same position for all voters, as there are no preceding local contests.

The final result is a novel dataset of participation, voting outcomes, and ballot position for every option for every federal, statewide and local contest on the primary and general election ballot between 1992 and 2002 in every San Diego precinct.[21] As undervotes and yes-no votes are determined at the contest-level, the analysis in section 4 and 5 collapses this precinct-contest-option-level dataset to the precinct-contest-level.

Table 1 contains summary statistics of the data, with the contest-level section broken down by contest type. Consistent with the ordering outlined above, the average ballot position increases from offices to state and local propositions. A significant amount of office contests do not have any variation in ballot position (and have relatively little variation when they do), because they commonly appear before all of the local contests that cause variation. For example, in the example ballots in Figure 1, US Representative appears at the same ballot position and State Assemblyman changes by only one position, even though the precincts differ by five local races. Local propositions have less variation than state propositions because they commonly appear on ballots in precincts which share similar local contests. For example, more than 90% of the precincts that voted on City Proposition R (the final contest in Figure 1) shared the four of the five bolded local contests in the figure. Finally, note that all statewide propositions and judicial offices appear on all San Diego ballots, and therefore contain the most precinct-level observations per contest.

[18] §13115 of the California Elections Code states that proposition types appear on the ballot in the following order: bond measures, constitutional amendments, legislative measures, initiative measures, and referendum measures.

[19] A proposition qualifies for the ballot when the Secretary of State approves the submission of the required number of signatures petitioning to put the proposition on the ballot. The number of signatures required is 5% and 8% of the number of votes in the previous gubernatorial general election for initiatives and constitutional amendments, respectively.

[20] Variation in the ballot across precincts arises from differences in the following contest-types: State Senator, County Board of Education Members, Community College Board Members, Unified School Board Members, High School Board Members, Elementary School Board Members, Board of Supervisors, Mayor, City Council, Other City Offices, Other District Offices.

[21] Originally, we collected data from the 2004 and 2006 elections as well. However, the turnout data for these elections are unreliable because of an aggregation of absentee and polling voters, with the exception of the California judicial retention questions from the 2006 general election.

Table 1: Summary statistics

Election-Level				
# Elections	13			
Avg. # Registered Voters	1,336,038			
Avg. # Voting Precincts	1,510			
Contest-Level	State/Local Offices	State Judges	State Props	Local Props
Total # Contests	1,234	54	124	242
Total # County-Wide Contests	109	54	124	14
Avg. Ballot Position (BP)	11.4	18.6	24.7	33.1
Avg. % Undervotes	18.2%	39.0%	9.6%	16.3%
Avg. % Yes	-	-	46.3%	48.1%
Total # Contests w/ σ(BP)>0	911	54	124	226
Avg. σ(BP) given σ(BP)>0	0.69	0.47	2.02	1.19
Total # Observations	390,441	111,206	242,750	78,674
Candidate-Level				
Total # of Candidates	3,459			
Avg # of Candidates per contest	2.8			

Notes: Ballot position is represented by the shorthand "BP" and standard deviation "σ" As our data is at the precinct-level, all averages are taken across precincts.

There are a few issues with the data. For example, in primary elections, members of different parties face different ballots. This creates two issues. First, common contests with party-specific options (such as the Democratic or Republican nominees for President) are reported separately for each party, while results for contests with the same options across parties (such as propositions) are presented only in aggregate. For consistency, we similarly aggregate the party-specific results when examining undervotes.[22,23] Second, it is possible for voters from different parties in the same precinct to face a different number of initial party-specific contests (most commonly arising from relative rare "third" parties not participating in all contests), creating variation in the ballot position of later common contests. In these cases, we calculate the average ballot position for common contests as the registration-weighted average of the ballot position across parties. Concerningly, this creates an additional source of across-precinct variation in the average ballot position of contests

[22] An earlier version of this paper did not aggregate these contests with no effect on the qualitative conclusions in each section.

[23] We do not perform this aggregation when focusing on the tendency to vote for the first candidate in a contest, as this analysis requires candidate-specific fixed effects, which vary across parties.

which is driven by the party-composition of the precinct, rather than the number of local contests in the precinct. However, party-composition accounts for less than 0.5% of the ballot position variation in our dataset and does not occur in general elections, which we analyze separately in one of our specifications.

Finally, there is an issue with the exact mapping of absentee precincts to polling precincts as absentee precincts are defined as the collection of voters with an identical ballot for that election. Unfortunately, the ballot type will not necessarily map to a unique voting precinct because other surrounding voting precincts might share that ballot type for a given election. Therefore, rather than map the absentee precinct to a specific voting precinct over time, we map it to a small collection of precincts with consistently similar ballot types. Consequently, our absentee precincts are slightly more aggregated than our voting precincts.

Empirical Strategy

Previous papers have noted a relationship between ballot position and voting behavior, such as an increase in the tendency to undervote when facing contests that are lower on the ballot (Burnham 1965; Bowler and Donovan 2000; Bowler et al. 1992; Selb 2008). Unfortunately, unobservable contest characteristics, such as contest saliency, are correlated with both voter behavior and ballot position, leading to an endogeneity problem that presumably biases the results in the direction observed in these studies. Controlling for these factors is extremely difficult using observable contest characteristics. In this paper, we exploit precinct-level variation in the number of earlier local contests on the ballot, which causes different voters to see the *same contest* at a *different ballot position*. This allows the inclusion of contest fixed effects in our analysis, which fully control for all observable and unobservable contest-specific factors that might affect voting behavior. The inclusion is a key contribution of this paper as it allows us to untangle the effect of choice fatigue from the many explanations for voter behavior in a particular contest on the ballot.

Even with contest fixed-effects, there is still a concern that our source of variation – the number of local contests in a precinct – is correlated with voter behavior. For example, it might be that the precincts with voters that abstain more (and vote more for the status quo and the first candidate) also tend to have more local offices on the ballot. In this case, voters will behave differently for contests that appear relatively further down the ballot as a result of precinct differences rather than position effects. Fortunately, our data contain precinct observations from multiple elections, allowing the use of precinct fixed effects that capture all constant precinct-level factors that might affect voter behavior.

Finally, the length of the ballot might drive different types of voters to show up to vote. Note that ballot length across precincts *within* the same election is highly correlated with the number of early local contests in each precinct, which in turn drives ballot position of later contests. For example, in the stylized ballots shown in Figure 1 in the introduction, Precinct 457270 has five more early local contests than Precinct 455080, which drives the majority of contests to appear five positions later and the ballot length to be five contests longer. As a result, we control for the ballot length minus the number of early local contests on the ballot. Later in this section, we discuss the selection issue within elections in more detail and provide an alternative placebo regression which addresses the concern more comprehensively.

Controlling for contest and precinct fixed effects as well as ballot length, the main analysis in the paper regresses three different precinct-level outcomes for each contest on the ballot position of that contest (with standard errors clustered at the precinct-level). For each outcome variable, we break the results by contest-type (offices, propositions, etc.), election-type (general and primary), and voter-type (polling and absentee), as well as restricting the analysis to only county-wide contests. In section 4, the outcome variable is the percentage of voters in precinct that abstain from making a decision on a contest (conditional on turning out to vote). Section 4 focuses on the percentage that vote no on propositions (conditional on turning out to vote) – a decision to maintain the status quo. In this case, we also include a specification that includes an interaction of total campaign expenditures with ballot position, where we interpret expenditures as a rough proxy for the pre-election attention devoted to a given contest.[24] Finally, in section 5, we use the precinct-option-contest-level to study the likelihood of voting for the first listed candidate in a given contest (conditional on placing a vote in the contest), a commonly-studied behavioral tendency in the voting literature. In this case, another natural experiment permits the addition of candidate-specific fixed effects: for almost all elected offices on the ballot, the ordering of candidates is determined by the drawing of a random alphabet by the Secretary of State.[25] These fixed

[24] The expenditures data were taken from California Secretary of State's Cal-Access database as well as past issues of the now-defunct "*Campaign Finance Reports*" series.

[25] For some of these offices, candidates are rotated across specific subsets of precincts within the office's political jurisdiction. For statewide contests (for example, Insurance Commissioner), county-wide contests (for example, Sheriff), congressional or State Board of Equalization districts, the candidates are backward-rotated (first moves to last, second moves to first, third moves to second, etc.) across State Assembly districts. The statewide contests are rotated throughout all of the state's assembly districts, whereas the other rotation contests are only rotated through those assembly districts which appear within the county. There is no rotation otherwise, except for two special cases. The first is charter cities and counties with elections codes that are potentially different from the state's. In San Diego County, the only relevant deviation from the state's elections code is the City of San Diego, which forward-rotates city office candidates across city council districts. The other exception is when a State Assembly or State Senate district appears in more than one county. In this case, a random alphabet is drawn in each county to determine the candidate ordering. All other contests are not rotated and follow the random alphabet drawn by the Secretary of State.

effects control for all candidate-specific observables and unobservables, increasing precision and alleviating any concerns about the endogeneity of candidate position. In the resultant three-way (precinct, contest, and candidate) fixed-effects specification, we focus on the coefficient on the *interaction* of ballot position with candidate ordering. That is, while we confirm that candidates randomly placed first within a contest receive a larger vote share, our main concern is whether this effect is increasing as the contest moves down the ballot (and voters become more fatigued).

Concerningly, precinct-level changes over time are not captured in our analysis. If these changes are correlated with both voter behavior and the number of local contests in a precinct, our effect could be spurious. There are three ways this might occur. First, as we discuss above, the composition of people who vote might change due to our primary source of exogenous variation. Specifically, if a higher number of local contests drives people who abstain more (and vote more for the status quo and the first candidate) to show up to vote, our effects would be driven by selection. Second, the composition of precincts might change over time. For example, a group of precincts might become wealthier and more educated over time (perhaps by gentrification). If this change leads to more local contests in the precinct and also leads to more voters who exhibit behaviors associated with fatigue, our effects would actually be driven by changing demographics rather than voter fatigue. We briefly note that the opposite effect might be more natural in both cases: voters in precincts with consistently more local contests and voters who show up given more local contests would seem to be *less likely* to exhibit fatigue-related behaviors. In fact, if anything, we find evidence in this direction in the placebo regressions discussed below. Third, precinct borders may change over time and thus the across-election dimension of the data may not be tracking a consistent unit of observation. For instance, the precinct "ALPINE 553110" in the 1992 primary might have slightly different geographical boundaries than the precinct with the same label in the 1998 general election. This may be especially true in the 2002 elections (which account for 15% of our data), which took place after the usual post-2000 Census redistricting.[26] Conversations with the San Diego Registrar of Voters have suggested that these precinct boundaries changes are not a significant problem because they are primarily used to keep the number of registered voters within a precinct roughly equal and new boundaries stay geographically and demographically close to the old boundaries.[27] In this case, the expected direction of bias is less clear.

To address the concern of time-varying precinct characteristics, we perform a simple

[26] A similar issue is the change in the set of overlaying political districts with the 2000 Census redistricting.

[27] Similarly, there is an issue of attrition and creation of precincts over the dataset because of population growth.

placebo analysis focusing on top-of-the-ballot contests which have no ballot position variation (such as the US Senator contest discussed in the introduction). As there are no propositions at the top of the ballot, we can only run this analysis for the abstention and first-candidate outcomes. For the analysis, we regress these two voter outcomes for these contests on the number of local contests in the precinct (which drives the ballot position variation in later contests), controlling for the same precinct- and contest-level fixed effects as in our main analysis. As the position of these contests is constant across precincts, choice fatigue should not play a role in this analysis. Therefore, if these placebo results mirror our main results, our conclusions are likely driven by time-varying precinct characteristics that cause a spurious relationship between the number of local contests and voter behavior. As we show below, this is not the case: the effect is near-zero for abstentions and negative for first-candidate effects. This placebo regression still leaves some possibility of endogeneity. Specifically, it is possible that a higher number of local contests on a ballot causes turnout by voters who exhibit standard behavior on early contests on the ballot, but are more likely to abstain (and vote for the status-quo and the first candidate) on later contests. There is no credible solution to this concern in our data, although we believe this specific selection effect is unlikely.[28]

4 Choice Fatigue and the "Decision to Decide"

In this section, we focus on how the number of previous decisions in the electoral choice environment affects a voter's decision to *participate* in voting on a particular contest, ignoring the actual decision made. As discussed in previous sections, this is accomplished by analyzing a natural experiment in which different voters see the same contest in different ballot positions because of differences in the number of contests in the overlaying local political jurisdictions in which a voter lives. Column (1) in Table 2 provides our baseline specification. The coefficient on ballot position implies that moving a particular contest down one position (thus increasing the number of decisions a voter makes before observing this contest by one) increases the number of undervotes by .110 points, which is highly statistically significant. Given that an average contest in the dataset appears at ballot position 15.7, this estimate suggests that undervotes would decrease by an average of nearly 2 points if these contests appeared at the top of the ballot. As the average level of undervotes is 21.6%, this suggests that choice fatigue is responsible for 8.0% of total undervotes. Column (2) shows that this effect is relatively stable (0.126) when focusing only on county-wide contests, which removes

[28] Composition effects for any voting experiment are deep-rooted: any random manipulation known to voters before showing up to vote could lead to composition effects which confound analysis of voting behavior.

Table 2: Regressions of undervotes on ballot position

Dependant variable: Perc. Undervotes	(1) All Contests	(2) Only Countywide	(3) Separating Contest-Type	(4) Separating Election-Type	(5) Separating Voter-Type
Ballot Position (BP)	0.110***	0.126***			
	(6.59)	(7.30)			
BP - State Prop			0.119***		
			(6.93)		
BP - Local Prop			0.117***		
			(4.39)		
BP - Offices			0.167***		
			(4.99)		
BP - State Judge			−0.491		
			(1.93)		
BP - General				0.163***	
				(6.84)	
BP - Primary				0.042	
				(1.90)	
BP - Polling					0.103***
					(6.21)
BP - Absentee					0.160***
					(9.06)
Observations	823,072	586,566	823,072	823,072	823,072

Notes: Linear regressions of undervotes (percentage of voters who turn out to vote but choose not to make a decision on a specific contest) on the ballot position ("BP") of the contest in a precinct. All specifications include contest, precinct fixed effects, and a control for the ballot length (minus local contests). t-statistics are shown in parentheses (all standard errors are clustered at the precinct-level). * p<0.05, ** p<0.01, *** p<0.001.

any concern that are results are driven by contests that endogenously appear in certain precincts.

Column (3) cuts the results by contest type. The results for local propositions and statewide propositions have very similar point estimates of 0.117-0.119 points, while the estimate for offices is slightly higher (0.167) – all of these coefficients are highly statistically significant. However, the estimate for judicial races is (borderline) statistically insignificant and strongly negative (-0.491). The imprecision is due to the lack of variation in ballot position in these races (seen in Table 1), which is a result of judicial races appearing near the top of the ballot and therefore prior to most local contests. Unlike the rest of the coefficients in this table, this coefficient is highly sensitive, ranging from negative to positive depending on the precise specification, which makes us reluctant to draw strong conclusions.[29]

[29] In fact, in a previous version of this paper, which used a slightly different specification (different precinct fixed effects for each type and no control for ballot length), the judicial coefficient was the *largest* in the table.

The specification in Column (4) estimates primary- and general-election ballot position coefficients. The primary coefficient is positive (0.042), but not significantly different from zero, implying that the majority of the effects of choice fatigue occur in general elections (where the coefficient is 0.163). This is perhaps not surprising if, as described in Brockington (2003), primary voters are more motivated than general election voters and high motivation mediates the effects of choice fatigue.

Finally, Column (5) separates the sample by the absentee status of voters. Somewhat surprisingly, the coefficient for the absentee voters is slightly higher (0.160) than voters that vote in polling places (0.103). One might predict a smaller or negligible choice fatigue effect for absentee voters, as they have more time to vote, potentially more information at their disposal, and have been characterized as of a higher socioeconomic status and more politically active (Karp and Banducci 2001). As we will see in the following section, the difference between absentee voters and polling-place voters is neglible in the other two outcomes. Our dataset does not allow us to determine the precise reason for this effect, although selection effects presumably play a role (absentee status is usually self-chosen by the voter).

To ensure that these results are not driven by any change in composition caused by the number of local contests in a precinct, we run a placebo analysis (discussed in detail at the end of section 3) by regressing the percentage of undervotes on the number of local contests, focusing on top-of-the-ballot contests that have no ballot position variation. The results are shown in Columns (1) and (2) of Table 3. We find little evidence of a positive effect: the coefficient on the number of local contests is a statistically insignificant 0.0120 overall, which changes to 0.0067 when focusing on county-wide contests. This result provides additional confidence that there is not a spurious positive association between the number of local contests and abstention behavior that drives our results.

5 Choice Fatigue and Choice Across Alternatives

The previous section analyzed the effect of the number of previous decisions on the "decision to decide." Although this result provides evidence of choice fatigue, the economic impact is unclear. If voters who choose to abstain vote similarly to those who choose to vote, the abstentions will not affect the result of the contest. Consequently, in this section, we look at the changes in the actual decisions made by voters (conditional on making a decision) as they become fatigued by previous choices. Specifically, we examine the impact of fatigue on the likelihood of making decisions that maintain the status quo (voting no on propositions) or are extremely easy to process (voting for the candidate that is listed first).

Table 3: Placebo analysis for top-of-the-ballot contests using the number of local contests in a precinct

Dependant variable:	Perc. Undervotes		Candidate vote share	
	(1) All Contests	(2) Only Countywide	(3) All Contests	(4) Only Countywide
Local contests on ballot (LC)	0.0120	0.0067		
	(0.69)	(0.36)		
Appears First (F)			1.530***	1.662***
			(13.92)	(13.99)
Local contests*First (LC*F)			−0.0565***	−0.0799***
			(5.08)	(6.76)
Observations	137,388	87,480	932,736	841,268

Notes: Right Panel: Placebo test mirroring the analysis in Table 2: Linear regressions of undervotes (percentage of voters who turn out to vote but choose not to make a decision on a specific contest) on the number of local contests in a precinct("LC"), focusing on top-of-the-ballot contests with no ballot position variation. Left Panel: Placebo test mirroring the analysis in Table 5: Linear regressions of the vote share of a candidate (percentage of voters who for a given candidate conditional on placing a vote) on the binary variable of the candidate appearing first in the candidate list in a precinct ("F") as well as the interaction of the candidate appearing first with the number of local contests in a precinct ("LC*F"), focusing on top-of-the-ballot contests with no ballot position variation. All specifications include contest, precinct fixed effects, and a control for the ballot length (minus local contests). t-statistics are shown in parentheses (all standard errors are clustered at the precinct-level). * p<0.05, ** p<0.01, *** p<0.001.

The Effect of Fatigue on Maintaining the Status Quo in Propositions

In this section, we analyze the impact of fatigue on the tendency to vote no on propositions. In California, a no vote on statewide and local propositions always represents maintaining the status quo. Therefore, choice fatigue might increase the tendency to vote no (which represents the familiar status quo) rather than yes (which represents an ambiguous outcome that requires cognitive effort to understand) for propositions. Alternatively, choice fatigue might lead voters to be unhappy and generally more likely to vote no, regardless of the meaning.

Column (1) in Table 4 provide our baseline estimate for the effect of ballot position on the tendency to vote no, implying that moving a particular contest down one position increases the number of no votes by 0.119 points, which is strongly statistically significant. Given that an average proposition race in our dataset appears at ballot position 26.8, this estimate suggests that no votes would decrease by an average of 3.2 points if these contests appeared at the top of the ballot. Given the average ballot position of each proposition, we calculate

Table 4: Regression of "no" votes (the status quo) on ballot position for propositions

Dependant variable: "No" Votes	(1) All Contests	(2) Only Countywide	(3) Separating Contest-Type	(4) Separating Election-Type	(5) Separating Voter-Type	(6) Including Expenditures
Ballot Position (BP)	0.119***	0.122***				
	(5.96)	(6.04)				
BP - State Prop			0.095***			
			(4.65)			
BP - Local Prop			0.258***			
			(8.17)			
BP - General				0.192***		
				(6.81)		
BP - Primary				0.025		
				(1.00)		
BP - Polling					0.122***	
					(6.25)	
BP - Absentee					0.113***	
					(4.92)	
BP - No Contributions						0.308***
						(12.84)
BP - Positive Contrib.						0.006
						(0.27)
Observations	521,424	272,697	521,424	521,424	521,424	521,424

Notes: Linear regressions of "No" votes (percentage of voters who vote "No" on a proposition conditional on placing a vote) on the ballot position ("BP") of the proposition in a precinct. Column (6) includes the interaction of ballot position and a binary variable of positive campaign expenditures spent for or against each proposition. Standard errors in parentheses (all standard errors are clustered at the precinct-level). All specifications include contest, precinct fixed effects, and a control for the ballot length (minus local contests). t-statistics are shown in parentheses (all standard errors are clustered at the precinct-level). * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

that *24 (more than 6%) of the propositions in our dataset would have passed rather than failed* if the proposition was presented to voters as the first contest on the ballot. As in the previous section, Column (2) focuses on county-wide contests, leading to a virtually identical coefficient (0.122).

Column (3) compares the coefficients for local and state propositions. The coefficient on local propositions is much higher (0.258) than that for state propositions (0.095), which might reflect the fact that local propositions are often less important and less discussed prior to an election. Similarly, Column (4) displays primary- and general-election coefficients. As with the estimated coefficients on the effect of choice fatigue on undervotes in section 4, the coefficient for the general elections is significantly higher (0.192) than the coefficient for primary elections (0.025). Again, this suggests that the high motivation associated with primary voters reduces the effects of choice fatigue. However, we stress that the results for

primary elections, unlike the rest of the results in this section, are not robust to changes in specification – depending of the form of fixed effects, sample, and controls, the coefficient ranges from significantly positive to significantly negative (although always lower than general elections). This is potentially due to the aggregation issues caused from members of different parties observing different contests, which are discussed in detail in section 3. The impact of absentee status is shown in Column (5). In this case, there is little change between the coefficient for absentee voters (0.113) and polling voters (0.122).

Finally, Column (6) compares the coefficients for propositions with no campaign expenditures to those with positive expenditures. The coefficient for the 75% of propositions with zero expenditures is relatively large at 0.308, while there is virtually no impact of ballot position on races with positive expenditures.[30] Higher campaign expenditures presumably lead voters to be exposed to the propositions through mailings and television advertisements. As a result, voters will likely have already made a decision about these propositions prior to showing up at the voting booth and therefore are will not be affected by choice fatigue. Conversely, when voters have little exposure to an issue prior to voting, they are seemingly more likely to make a decision when in the voting booth, which allows voting-day choice fatigue to affect their decision. This suggests that the estimates in previous sections are conservative, as they include situations in which voters have previously made a decision and therefore are not subject to choice fatigue.

In the previous section, we established that the likelihood of placing a vote changes with ballot position. If voters who are likely to abstain when fatigued would have been more likely to vote yes than an average voter, there would be a mechanical increase in the percentage of no votes due to simple selection. While we cannot credibly separately identify this selection effect, the magnitude of our results suggest that, even in the most extreme case, selection would account for only around half of the no-vote effect for an average proposition.[31]

[30] Expenditures on individual measures average $1.2 million, with a standard deviation of $1.7 million. The effect of additional expenditures beyond zero is statistically significant, although economically small (0.002 for every $1 million spent).

[31] Consider an average proposition at ballot position 30 that would have ~10% undervotes and ~50% yes votes when placed on the top of the ballot. Our results suggest that the percentage undervotes increase by 3.3 points due to ballot position. If all of the abstaining voters would have voted yes, the percentage of no votes would mechanically increase by 1.9 points. However, our results imply that the percentage of no votes will increase by 3.6 points.

The Effect of Fatigue on Voting for the First Candidate

As opposed to the yes-no options of propositions, voters participating in elected office contests vote for one or more candidates. In this section, we will analyze the effect of choice fatigue on the tendency to choose the first candidate in the ordering, presumably the lowest-effort decision shortcut possible and, as we discuss above, the most studied candidate order effect in the literature.

Column (1) in Table 5 provides our baseline estimation. First, this estimation confirms previous findings in the literature that appearing first in the intra-contest ordering has a highly significant positive impact on the candidate's vote-share (0.44 points). Second, it demonstrates that choice fatigue has a significant impact on the tendency to use this shortcut: Moving the contest down one position increases the expected vote-share of the first candidate by 0.065 points. Given that the average ballot position of office contests is 11.4, this estimate suggests that the first candidate receives, on average, an additional 0.74 points because of choice fatigue. Again, we focus on county-wide contests in Column (2), confirming the stability of the coefficients (0.401 and 0.073) given this restricted sample.

Column (3) estimates a separate coefficient for state (0.80) and local offices (0.62), finding little economic difference. In contrast to the findings above, Column (4) has a higher coefficient (0.92) for primary elections instead of general elections (0.45). Finally, Column (5) separates the effect for polling and absentee voters, finding no significant difference in the effect across different types of voters.

As in the case of undervotes, we are able to run a placebo analysis to test if these results remain when focusing on contests with no ballot position variation. The results are shown in Columns (3) and (4) of Table 3. In elections with no variation, we find a much larger effect of appearing first in these contests (1.51 points) with this effect slightly (but statistically-significantly) *reduced* by 0.056 (3.7%) for each additional local contest in a precinct, which changes to 1.65 points and -0.80 for county-wide contests. If anything, this provides evidence for a selection effect that biases against our results. For example, it might be that people who suffer from choice fatigue are less likely to show up for elections with more local contests, although we are cautious to draw strong conclusions about this selection effect given the lack of a similar result in the undervote placebo regression.

Table 5: Regressions of candidate vote share on appearing as the first candidate and the interaction of appearing first with ballot position

Dependant variable: Candidate vote share	(1) All Contests	(2) Only Countywide	(3) Separating Contest-Type	(4) Separating Election-Type	(5) Separating Voter-Type
Appears First (F)	0.443***	0.401***	0.393***	0.392***	0.443***
	(7.86)	(6.79)	(6.34)	(7.10)	(7.86)
Ballot Pos.*First (BP*F)	0.0649***	0.0725***			
	(11.98)	(13.18)			
BP*F - State Offices			0.0798***		
			(9.35)		
BP*F - Local Offices			0.0624***		
			(11.42)		
BP*F - General				0.0453***	
				(6.63)	
BP*F - Primary				0.0924***	
				(15.90)	
BP*F - Polling					0.0637***
					(12.88)
BP*F - Absentee					0.0701***
					(6.61)
Observations	1,154,508	1,036,327	1,154,508	1,154,508	1,154,508

Notes: Linear regressions of the vote share of a candidate (percentage of voters who for a given candidate conditional on placing a vote) on the binary variable of the candidate appearing first in the candidate list in a precinct ("F") as well as the interaction of the candidate appearing first with the ballot position of the contest in a precinct ("BP*F"). All specifications include candidate, contest, precinct fixed effects, and a control for the ballot length (minus local contests). t-statistics are shown in parentheses (all standard errors are clustered at the precinct-level). * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

6 Discussion and Conclusion

Discussion

As our result directly concerns voting behavior, we discuss several theoretical and practical implications relevant to this context. If voters' decisions are distorted by choice fatigue, elections will not elicit the true preferences of voters. There are three potential ways to deal with this issue. First, as the average behavioral change on each contest increases with the length of the ballot, elections officials may either limit the length of ballots or hold more frequent elections. As an example, Canada holds national and local elections on separate dates and Switzerland holds referendums every 3 to 4 months (Selb 2008). Conversely, our result clearly cautions against policies intended to lengthen the ballot. For example, a theoretical result by Besley and Coate (2008) finds that there are welfare gains to the unbundling of

policies from candidates through additional contests, but does not consider the possibility costs from choice fatigue. Second, given the finding in Danziger et al. (2011) that breaks between decisions allowed judges to "refresh," officials may want to promote policies that allow electoral decision to take place over a longer period of time. This might be accomplished by promoting the use of absentee ballots (in which voters can make decisions over a long period of time) or heavily advertising the issues so that voters made decisions prior to entering the voting booth.[32] For example, voting in Oregon, Washington, and Colorado is exclusively conducted by mail. Third, given a set ballot length, elections officials could randomize the order in which the contests appear on the ballot (or at least randomize within each block of contest-types). Although this will not reduce the total amount of distorted decisions, it will spread the effect across more contests and therefore lower the likelihood of swaying non-marginal decisions. For example, in the case of propositions, our results suggest the percentage of no votes in a contest at the lowest position (around 35) will be swayed by more than 4 percentage points, while randomizing the order will distribute this effect equally across contests (and therefore only sway any result by at most 2 percentage points). For the similar issue of candidate ordering, a large body of previous work established a large bias towards the first-listed candidate (Miller and Krosnick 1998; Koppell and Steen 2004). As a response to this effect, a few states have begun to randomize candidate orderings across precincts in an election, suggesting that elections officials may be open to the idea of randomization.

Without randomization of ballot position, strategic actors have the incentive to exploit any control over the position of the contest. For example, citizens' initiatives appear in the order in which they qualify and thus it may be optimal for the group to qualify its proposition as early as possible if it wishes to minimize the no effect from voter fatigue. Similarly, these actors might consider proposition placement during elections with relatively fewer contests higher in the ballot. To the extent that it is desirable to remove these types of strategic motivations in the electoral process, simple randomization appears to be an easy and intuitive solution.[33]

Although our empirical results focus on voting behavior in one county in one state, we believe it is reasonable to extrapolate our conclusions and recommendations to other locations. First, there is no obvious reason that voters in San Diego would react differently

[32]The absentee suggestion is tempered by our findings that absentee voters are *more likely* to abstain as ballot position changes, although the effect is potentially due to selection (most absentee voters choose this status).

[33]It is possible to imagine situations in which this selection is desirable. As that choice fatigue lowers the likelihood of a proposition passing, it might be optimal to place the brunt of the effect on propositions that take longer to qualify for the ballot if this delay provides an additional signal of voters' intent.

from voters in other counties faced with a similar voting environment. Second, although California is well-known for having exceptionally long ballots, the relatively long length of the ballots in other states (Wheaton (2013) reports the average state ballot in 2010 included 17 offices and 5 propositions) and internationally (Selb (2008) notes that voters in Switzerland and Italy commonly face long and complicated ballots) suggests that the effect will not be isolated to one state.

Furthermore, given that the choice fatigue mechanism presumably generalizes to other decision environments, it might be reasonable to extrapolate the results to other environments. For example, firms or policy makers may choose to strategically order decisions or disseminate information in reaction to this behavior change. It is not unusual for consumers shopping online for electronics to be offered the possibility to compare the attributes of a handful of similar items. If consumers experience fatigue while comparing a long list of attributes, then a retailer may strategically place attributes at particular positions in the comparison sequence to mitigate or exacerbate fatigue. Conversely, a benevolent planner might place higher-stakes decisions at the beginning of the decision sequence to maximize the utility of the decision maker.

Conclusion

This paper isolates the effect of choice fatigue on voting behavior through a natural experiment in which the same ballot contest appears at different positions across voters. We are able to separate the effects of choice fatigue from other competing explanations of choice behavior as a result of this exogenous variation in the number of previous decisions made by the voter. We find that voters are more likely to abstain and more likely to rely on decision shortcuts, such as voting for the status quo or the first candidate listed in a race, as the ballot position of a contest falls. In terms of economic impact, we estimate that if an average contest was placed at the top of the ballot, undervotes would decrease by 8%, the percentage of no votes on an average proposition would fall by 3.2 points, and the percentage of votes for the first candidate would fall by 0.7 points.

The results have broad implications for economic choice and for the design of electoral institutions, which offer opportunities for future work. For example, this paper does not distinguish between decisions with different levels of complexity, which presumably affects the level of choice fatigue induced by making the decision. This suggests a possible interaction between for the fatigue effects documented here and the "choice overload" phenomenon discussed in Iyengar and Lepper (2000).

The fact that decision outcomes are dependent on the number of previous decisions made is presumably useful to creators of decision-making environments, such as a company or policy maker. For example, as we estimate that some contests would have different outcomes if placed at the top of the ballot, governments might consider enacting policies to limit the number of decisions on an individual ballot or act to encourage spreading these decisions over a longer time. Following a recent trend to randomize candidate ordering within contests, a straightforward and feasible policy solution is the randomization of contest ordering within an election.

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