Voting Experiences, Perceptions of Fraud, and Voter Confidence

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Abstract

Assuring voter confidence is important for the legitimacy of democratic elections. In this paper we take advantage of a large online survey of registered voters in a single election jurisdiction, Orange County (CA), that was implemented immediately after the November 2018 midterm elections, to test four hypotheses about the correlates of voter confidence. Our results show that voters who cast mail ballots are less confident about their own votes being counted correctly than in-person voters. For both types of voters, those who have poor experiences with the voting process are much less likely to report confidence in the election. We also find that voters who have strong concerns about election fraud are less likely to report being confident in the election. Our last result indicates that information from news and social media is associated with a decline in voter confidence in election administration at the national level. Given the many conversations about election fraud that have occurred since the 2016 presidential election, we conclude by discussing the implications of our results for future elections in the United States.

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1 Introduction

Scholars have long studied public trust in political institutions, and have examined how public trust may be associated with democratic legitimacy and stability (Citrin and Stoker, 2018). Of specific and recent concern to students of election administration and technology is public trust and confidence in the electoral process, or "voter confidence" (Atkeson and Saunders, 2007; Alvarez, Hall and Llewellyn, 2008). Over the past decade, evidence has steadily accumulated about the correlates of voter confidence in the electoral process, documenting associations with self-reported turnout (Alvarez, Hall and Llewellyn, 2008), election technologies (Alvarez and Hall, 2008; Alvarez, Katz and Pomares, 2011), and a voter's experience at the polling place (Hall, Monson and Patterson, 2009).

The concept of voter confidence is important to policy makers. Making sure that voters are confident and satisfied with the administration of elections is an important task for election officials; a recent study found that 82% of election officials surveyed agreed that voter education and satisfaction are part of their responsibilities (Adona et al., 2019). In 2008, the U.S. Supreme Court noted the importance of voter confidence in its decision upholding Indiana's strict voter identification policy, in the case of *Crawford v. Marion County Election Board* (Atkeson et al., 2014). Concerns about voter confidence were voiced in the recent U.S. Senate Intelligence Committee report on Russian interference in the 2016 U.S. election, which noted that one goal of the interference might have been an erosion of American voter confidence.[1]

In this paper, we study voter confidence with a large survey (over 6,400 respondents) fielded immediately after the 2018 general elections in Orange County, California. The survey was designed to evaluate the experiences of registered voters when they considered whether to participate in this election; and if they participated, the survey measured their reactions to the administration and technology used in the election, regardless of whether they voted in-person before the election, by-mail, or in-person on Election Day.

[1] `https://www.intelligence.senate.gov/sites/default/files/documents/Report_Volume2.pdf`.

Features of our survey provide three advantages in studying voter confidence. First, our large sample from a single election jurisdiction allows us to control for contextual factors like administrative practices, election regulations, and voting technologies. Second, we employ two batteries of survey questions measuring different aspects of voting experiences for in-person and by-mail voters, respectively, and apply an item response theory model to obtain composite measures of voting experiences that we incorporate in our analysis. Our large sample size ensures a large statistical power in testing our hypotheses without having to pool in-person and absentee voters. Third, in addition to a large number of questions about voter confidence and the voting experience, the responses from this survey are linked to the voter registration file from the county, providing voting validation information as well as other features that we can use in our analysis of voter confidence.

Using this survey, we test a number of important hypotheses about voter confidence, for various aspects of voter confidence (confidence in their own ballot's successful tabulation, as well as confidence in the election administration process at the county, state, and federal levels). Among the important results that we report below, one primary contribution is that we show that registered voters who follow the news closely, in particular those who are very active on social media, are less confident about elections at the county, state, and national levels (though not regarding their own ballot's tabulation). Second, we find that if a registered voter had a bad voting experience, that decreases their confidence at all levels. Similarly, voters who cast a ballot by-mail, or who believe that some election hacking may have occurred in local election administration, have lower confidence in their own ballot's tabulation and in election administration locally, but they do not attribute these concerns in their evaluation of their confidence in election administration at the state or federal levels. We also find that voters who believe that various types of election fraud have occurred (with the exception of voter impersonation) have reduced confidence for all levels of confidence. Each of these results has important implications for election administration and the study of voter confidence.

2 Voting Experiences, Attitudes, and Confidence

The 2000 presidential election, one of the closest U.S. presidential elections in history, sparked innovations and reforms in election administration, as it led to the passage of the *Help America Vote Act* (2002). This election also led to the growth of a great deal of academic research on election administration and voting technology by scholars in social and computer science. One of these important research areas regards the public's understanding of how elections are conducted, their knowledge of the technologies used in election administration, and their confidence in the electoral process. These aspects of public opinion had been understudied prior to 2000, but before the end of that decade, a number of scholars began studying voter evaluations of the electoral process (Atkeson and Saunders, 2007; Alvarez, Hall and Llewellyn, 2008).

The earliest work focused on examining the association between voter confidence and various voter and contextual features. Two very important patterns emerged from early studies. First, contextual features regarding a voter's experience have been shown to be associated with voter confidence; those who vote by-mail, or who have a bad experience in a polling location, report lower confidence (Alvarez, Hall and Llewellyn, 2008; Atkeson and Saunders, 2007; Hall, Monson and Patterson, 2009). Also, some studies have shown that the type of voting technology used by a voter in a polling place can be associated with voter confidence (Stein et al., 2008; Alvarez, Katz and Pomares, 2011). In general, the literature has shown that election administration is an important correlate of voter confidence. The voting experience of voting-by-mail voters, however, has received less attention. Understanding their experiences with getting, marking, and returning the ballots is important in light of the reduced confidence of voting-by-mail voters seen in past work, and as more states make voting by mail more accessible.

More recently, research has focused on voter perceptions and attitudes, and how those are related to confidence in election administration. Early research on voter confidence found that a voter's party identification was correlated with their reported confidence in

election administration (Alvarez, Hall and Llewellyn, 2008). Subsequent research noted that the correlation between partisanship and confidence was more complex, often interacting with whether the party the voter identified performed well in the particular election, a so-called "winner's effect" (Sances and III, 2015; Sinclair, Smith and Tucker, 2018). Other demographic features are often found to be important correlates of voter confidence as well, in particular the voter's racial and ethnic identification (Alvarez, Hall and Llewellyn, 2008).

Other scholars have looked at the relationship between voter perceptions of fraud, procedures argued to mitigate certain forms of election fraud (like voter identification policies), and voter confidence. This research has found that attitudes about the prevalence of election fraud in a jurisdiction, or direct observation of potential fraud, is correlated with voter confidence (Atkeson, 2014). But results regarding whether opinions about measures like voter identification policies are associated with voter confidence is mixed, as some studies find little association (King, 2017), while others argue for an association (for example, conditional on partisanship (Bowler and Donovan, 2016)). While past research has typically focused on voter's overall perceptions of fraud, distinguishing different types of voter and election fraud may be more policy-relevant, as voters in different states may perceive some but not other kinds of fraud to be more likely. Understanding different types of fraud also informs the effectiveness of different measures intended to boost voter confidence.

Following the lead of more recent research on voter confidence (e.g., Atkeson 2014) we measure voter confidence in the electoral process at different levels of administration. This allows respondents in our survey to better attribute their confidence to different aspects of election administration: to their own ability to obtain and cast a ballot, to the election process in Orange County, the State of California, and nationally. As recent research has shown, a voter may be highly confident that they cast their ballot correctly and that it would be tabulated as they intended, but not be confident that the same is true in other counties or states (Atkeson, 2014).

Based on this past literature, we distil four important hypotheses that we focus on in our

analysis in this paper:

Hypothesis 1: Bad voting experiences will be associated with reduced voter confidence.

Hypothesis 2: Voters who voted by-mail will have reduced confidence.

Hypothesis 3: Voters who believe that election or voter fraud is rampant will also have lower confidence.

Hypothesis 4: Voters who follow the news closely or are active on social media will have lower confidence.

Additionally, our fifth and sixth hypotheses are that, dependent on the level at which we measure confidence, these same factors will vary:

Hypothesis 5: Voter experiences and mode of voting will have a stronger association with their confidence that their own ballot was counted as intended, and in confidence regarding election administration in their county.

Hypothesis 6: Voter opinions about the prevalence of election or voter fraud will be more strongly correlated with their confidence in the state or nation's election administration, and voters who use social media will be less likely to be confident in the state or nation's election administration.

In the next sections of our paper, we discuss the data and methods that we use to test these hypotheses, thereafter we discuss the results from our analyses.

3 Data

As part of a larger project studying election integrity in Orange County (California), we obtained the voter registration data files from the County. In California, voters can provide

contact information (like a telephone number or email address) when they register to vote. Of the approximately 1.6 million voter registration records in the County in the 2018 general election, over 530,000 of those records were associated with an email address. We used all of the records with email addresses for our survey.

In association with the Orange County Registrar of Voters (OCROV), we built a self-completion online survey that included questions on voter confidence, in-person or by-mail voting experiences, perceptions of voter fraud and computer hacking, social media use, as well as basic demographic questions.[2] We invited registered voters (via email) to participate in our voter experience survey between Thursday, November 8, 2018, and Tuesday, November 13, 2018. From 531,777 invites to all registered voters with email addresses, we received 6,952 complete responses.

We match each survey response to the corresponding registered voter using the official voter registration file and voter history file we were provided by OCROV.[3] We drop 37 responses for which we cannot determine age, gender, or race/ethnicity from self reports and administrative records, and then restrict attention to 6489 responses from registered voters who were confirmed to have voted in the November 2018 General Election.[4]

This survey provides important data for our detailed study of voter confidence. First, previous studies of attitudes about election administration using national or statewide samples often fail to adequately control for cross-county variance in election regulations, procedures, and technologies. For instance, a voter may have a bad experience (or perceptions of fraud) and low confidence in the vote count both due to certain election procedures in their county. By having a dataset with broad coverage of a single election jurisdiction, we

[2]The survey took about 12 to 15 minutes to complete (the median duration was 13 minutes), and was provided in English.

[3]Most responses can be linked back to registered voters by email addresses alone. In cases of ambiguity, we further match responses to voters according to age and gender from self reports and administrative records.

[4]Restricting our sample to only those who we can confirm as actual voters who participated in this election achieves two important goals. First, one of the important goals of our analysis is to conduct a detailed analysis of the voting experience, which requires restricting our analyses to only those who actually turned out to vote. Second, by using turnout validated by the administrative record, we also eliminate potentially noisy or biased reports from respondents who might provide answers to our voting experience questions, but who did not actually vote.

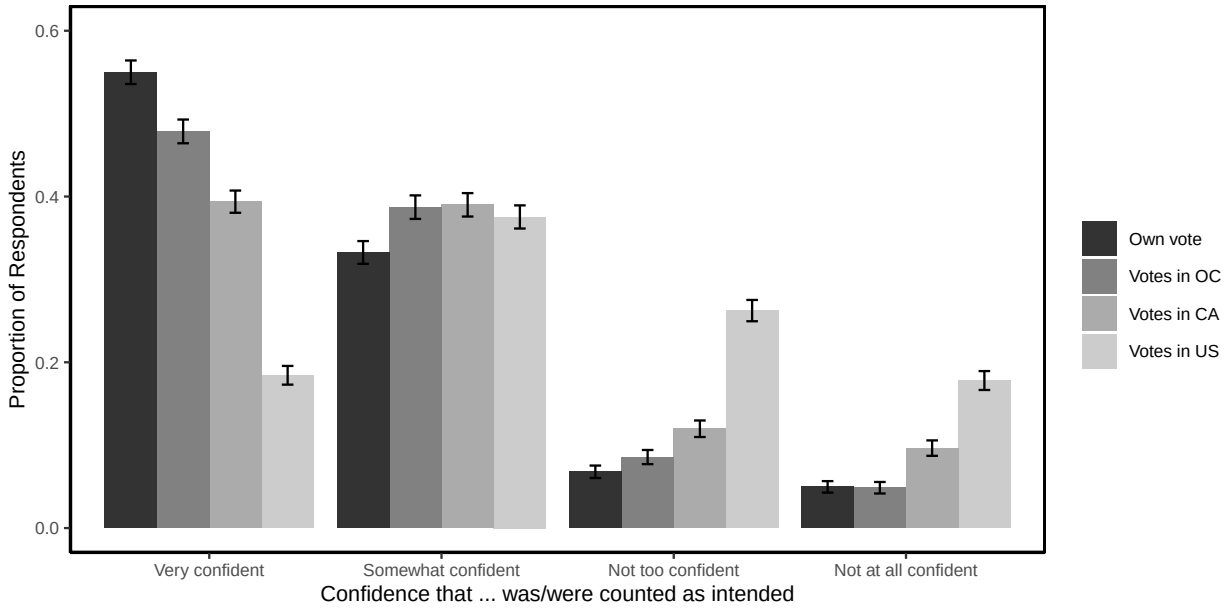

Figure 1: Distribution of Voter Confidence

eliminate cross-jurisdiction variations of this sort. Second, this research design allows us to match survey respondents directly to administrative data, so that we can add features from the administrative data to our analysis and validate self-reports of voter turnout.[5]

Due to the nature of voluntary participation, young voters and voters registered with the Democratic party are somewhat over-represented in our survey sample, compared to the population of Orange County voters who participated in the November 2018 General Election.[6] Voters of different genders and race/ethnicity groups are reasonably well represented in the sample. To make our analysis representative of Orange County registered voters, we constructed survey weights via a raking procedure that accounts for age, gender, race/ethnicity, party registration, permanent absentee ballot status, and city of residence. These survey weights are incorporated into the results we report later in this paper.

We measure voter confidence at four different levels, following previous research (Atkeson

[5]Another reason for conducting the survey using the official voter file is a practical consideration. Commercial pollsters are generally unable to recruit a large sample (representative or not) from a single county like ours from their online panels, and the cost would have been prohibitive even if they were.

[6]A detailed examination of important demographic and administrative features of our survey respondents is presented in the online appendix.

et al., 2014). Our outcomes of interest are measures of voters' confidence about their own vote, votes in Orange County, the State of California, and nationally, being counted correctly. In particular, we asked respondents *Thinking about vote-counting in the General Election. How confident are you that ... was/were counted as intended?* Respondents were given the following options: *Not at all confident*, *Not too confident*, *Somewhat confident*, *Very confident*, and *I don't know*.[7] As Figure 1 shows, most voters were very confident or somewhat confident that their vote and votes in Orange County were counted as they intended (88% and 87%, respectively). The same voters, however, are less confident about vote counting at state and national level, with 22% and 44% voters feeling not too or not at all confident. We take a closer look at voter confidence by demographics and individual characteristics in the supplementary materials. While voter confidence is similar across most demographic groups, we find registered Democratic voters are much more confident compared to registered Republicans about vote counting at all levels.

For ease of interpretation, we present results in terms of binary responses—(very or somewhat) confident versus not (at all or too) confident—in the main text and present alternative analysis using ordinal responses in the online appendix.

4 Empirical Models and Methods

In order to test our hypotheses about voter confidence at different levels, we estimate four logistic regression models: $Pr(Y_i = 1|X_i) = logit^{-1}(\alpha + \beta X_i)$. Dependent variable Y_i is an indicator of whether voter i is confident that their own vote (votes in Orange County, votes in California, or votes in the U.S.) are counted as intended. Independent variables X_i include a voter's voting experience, news following and social media usage/exposure, perceptions of election or voter fraud, perceptions of election hacking, demographic and

[7]To mitigate the effect due to question formats, we randomly assign respondents to a grid format and non-grid format of the questions. To mitigate the effect due to the ordering of the response options, we randomly assign respondents to the ascending order and the descending order of confidence. We present results in the main text pooling different formats and response option orders.

political characteristics, first time voter status, and congressional district fixed effects, that we detail below (summary statistics can be found in the online appendix).

Since the interactions with electoral processes are dramatically different for voters who cast their ballots in person and by mail, we asked different questions regarding voting experiences depending on the mode of voting. Specifically, for voters who voted in person, we measure their voting experiences with various questions on the difficulty of finding their polling place, problems with voter registration, whether polling place was open, waiting time, problems with voting equipment, as well as poll worker performance. For voting-by-mail voters, instead, we assess their voting experiences by inquiring whether they encountered problems in getting, completing, or returning their ballot. For our main analysis, we analyze the two types of voters separately. Our large sample size ensures a large statistical power in testing our hypotheses without having to pool in-person and absentee voters. We also estimate and present in the online appendix alternative models that pool all voters regardless of their modes of voting, which allow us to compare the difference in voter confidence by mode of voting.

In addition to voting experiences, information from traditional and social media may play an important role in shaping voters' beliefs about election integrity. We included a few questions in our survey regarding news following and social media usage/exposure: how often voters follow news and public affairs, whether they use Twitter, and for those who use Twitter, whether they received concerning messages about election integrity, discussed negative experiences with the election process, or discussed concerns with election integrity.

The employment of batteries of questions on in-person and by-mail voting experiences as well as social media usage/exposure allows us to measure the underlying subjects in a comprehensive manner. To analyze such types of data in a principled way, we use the state-of-the-art hierarchical item response theory models (Zhou, 2019) to estimate latent scores along these three dimensions. Details about our implementation can be found in the online appendix.

Given the many conversations about potential election or voter fraud in the 2016 Presidential General Election, we asked voters about their perceptions of six types of election or voter fraud: people voting more than once, ballot stealing and tampering, voter impersonation at the polls, non-citizen voting, voter impersonation through absentee ballots, and officials manipulating vote counts. Also discussed since the same election is the attempted computer hacking by foreign government agents. We included in our model voters' perceptions about computer hacking at both local and national levels. Demographic and political characteristics — age, gender, education, race/ethnicity, marital status, home ownership, income, registered party, permanent absentee status, and voting for the first time — from a combination of survey responses and corresponding administrative records, are also included in the models.

As with other research involving survey data, we need to deal with missing data as a result of item nonresponse.[8] In this paper, we employ multiple imputation, using a bootstrapping based Expectation Maximization algorithm (Honaker and King, 2010) to handle item nonresponse.[9] Results from alternative missing data methods — listwise deletion and hot-deck imputation (Cranmer and Gill, 2013) — are available in the online appendix.

5 Results

We estimate the logistic regressions specified in the previous section and present the average marginal effects of our main variables of interest in Figure 3-6 (see the online appendix for full results in a table format). Figures 3 and 4 present results about the voter's confidence in

[8]Most item nonresponses occurred in a potentially sensitive question about household income, as 1,187 out of 6,489 respondents chose "rather not say" or did not respond to that question. Between 186 and 248 responded "I don't know" or did not respond to the voter confidence questions. Race/ethnicity, waiting time, gender, and home ownership have 5%, 3%, 2%, 1% missing values, respectively. All other variables had fewer than 1% missing values. As income may be an important correlated of voter confidence, we prefer to include it in our model specifications, rather than risk omitted variable bias were we to exclude it from our model specifications because of missing data.

[9]The algorithm utilizes observed values in incomplete observations to inform the missing values, while taking uncertainty into account. Specifically, we generated five imputed datasets, conducted analyses on each of these datasets, and pooled the results using Rubin's rules (Rubin, 1987).

their own vote being counted as intended for in-person and by-mail voters, respectively, and Figures 5 and 6 show results regarding voter confidence in vote-counting in Orange County, in California, and nationwide.

We first test our hypotheses regarding the association between voting experience and voter confidence. Evident from Figures 3 and 4, a bad voting experience at the polls or with mail ballots dramatically raises a voter's concern that their vote may not be counted properly. A one-standard-deviation increase in the latent voting experience score reduces voter confidence by over 4% for both in-person and by-mail voters. Since administrative records indicate these voters' ballots were counted, we argue that the damage in voter confidence could have potentially been avoided by ensuring a smooth and satisfactory voting experience. Worst still, a voter's bad experience also raises their concern about election integrity more broadly as shown in Figure 5 and 6. The association between voting experience and voter confidence measured at the county, state, and national levels is almost as strong as about their own votes. Overall, we find strong support for Hypothesis 1 that bad voting experiences are associated with reduced voter confidence.

We now turn our attention to election or voter fraud. Figures 3 and 4 show that the perceptions of some, but not all, types of fraud are associated with a decrease in confidence in their vote being counted as intended, which include ballot stealing or tampering, non-citizen voting, and officials manipulating vote count. Believing that officials manipulate the vote counts commonly or occasionally reduces voter confidence by 13.0% and 11.8% for in-person and by-mail voters, respectively, which is the strongest correlate. Voters who perceive that ballot stealing, tampering, or non-citizen voting occur commonly or occasionally are also less likely to have confidence in their own vote being handled properly, by about 3% to 6%. The perceptions of these types of fraud also raise voters' concern about election integrity more broadly, evident from Figures 5 and 6. The correlation for manipulation of vote counts by election officials is the strongest at the national level, translating to a decrease of voter confidence by over 16% for believers of this type of fraud. Non-citizen

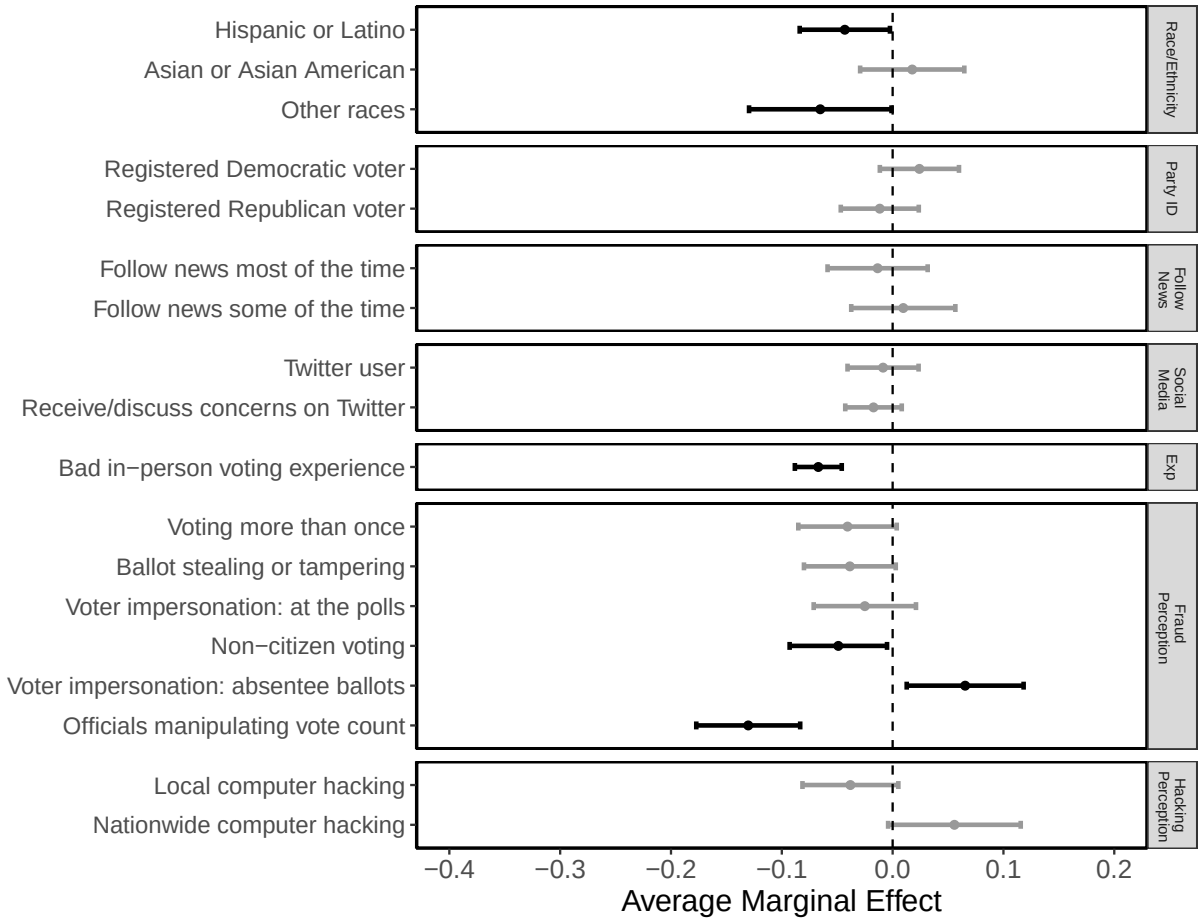

Figure 2: Confidence in Own Vote (In-Person, N = 2,396)

voting exhibits the strongest correlation with voter confidence at the state level, possibly reflecting the concerns of some voters' regarding illegal immigration along the southern border. Figures 3 through 6, however, also indicate that some types of fraud including voter impersonation at the polls, and through absentee ballots, are not associated with voter confidence at any level, despite many voters believing them to occur commonly or occasionally. The lack of association warrants further research (it could be that voters perceive that illegal ballots would be nullified after checks against the records). In sum, the results provide partial support for Hypothesis 3 and have important implications. In particular, fraud accusations can potentially have a damaging effect on voters' perceptions of election integrity and countering these claims is important in restoring voter confidence

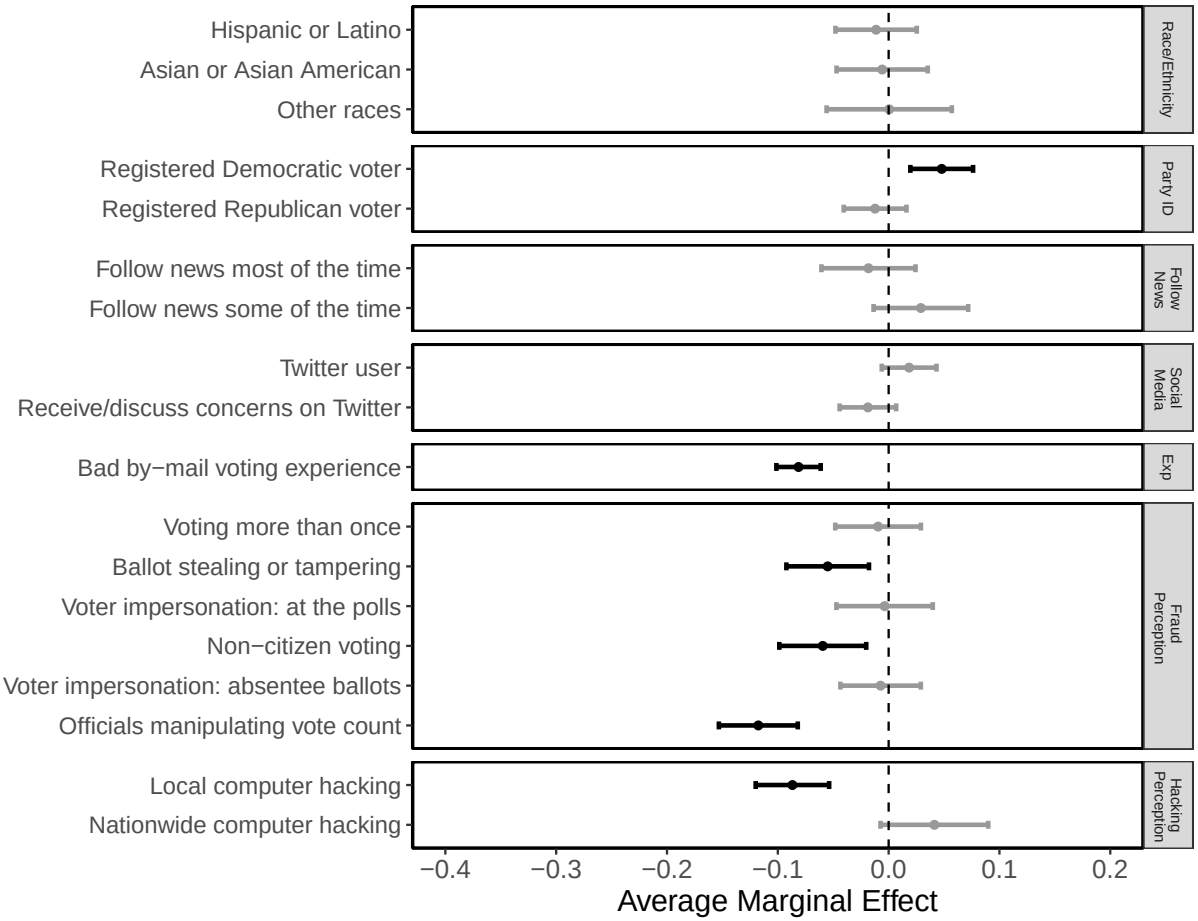

Figure 3: Confidence in Own Vote (By-Mail, N = 4,093)

in the legitimacy of American elections.

News following and social media usage exhibit more nuanced associations with voter confidence as the associations depend on the level at which confidence is measured. As we see in Figures 3 and 4, voters who follow what's going on in government and public affairs or discuss concerns about election integrity on Twitter are not different from other voters in terms of confidence in their own vote being counted properly. Figures 5 and 6 show, however, a clear discrepancy at the national level, and in some cases, at the state level. Voters who follow news about government and public affairs most of the time are over 10% more likely to be concerned about vote-counting nationwide, relative to those who follow news and public affairs only now and then or hardly at all. Remarkably, we find

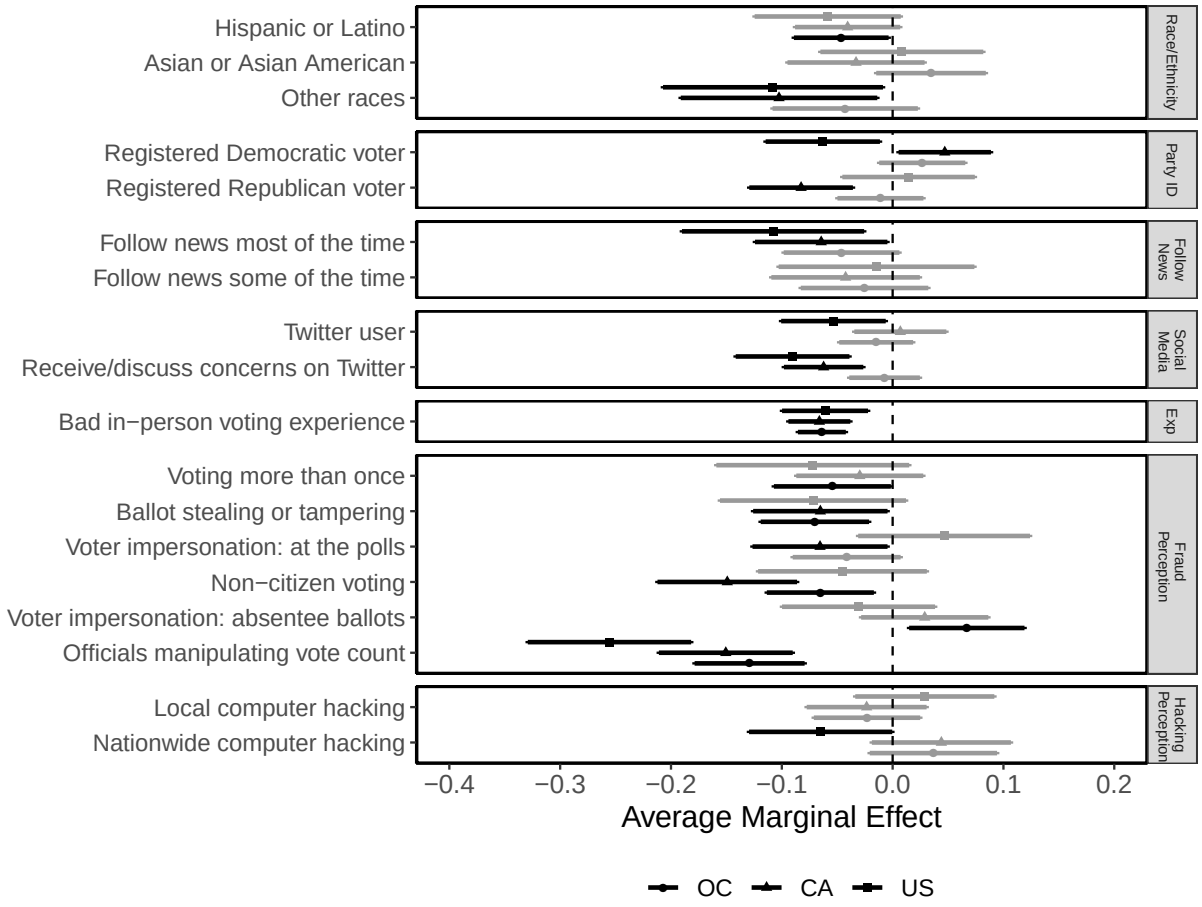

Figure 4: Confidence in Votes in OC, CA, and U.S. (In-Person, N = 2,396)

that simply using Twitter, a social media network, is associated with a decline of over 5% in a voter's belief that votes nationwide were counted as intended. Receiving concerning messages or discussing concerns regarding election integrity leads to a further decrease in voter confidence about vote counting in California or the United States, even though the confidence regarding own votes are largely unaffected. Thus, we infer from these results that voters who use social media or who follow the news are being exposed to content about election integrity, which then is associated with a heightened concern by these voters about election integrity in California, or nationwide.

The association between concerns about computer hacking and voter confidence also depends on the level at which voter confidence is measured. Voters who believe national

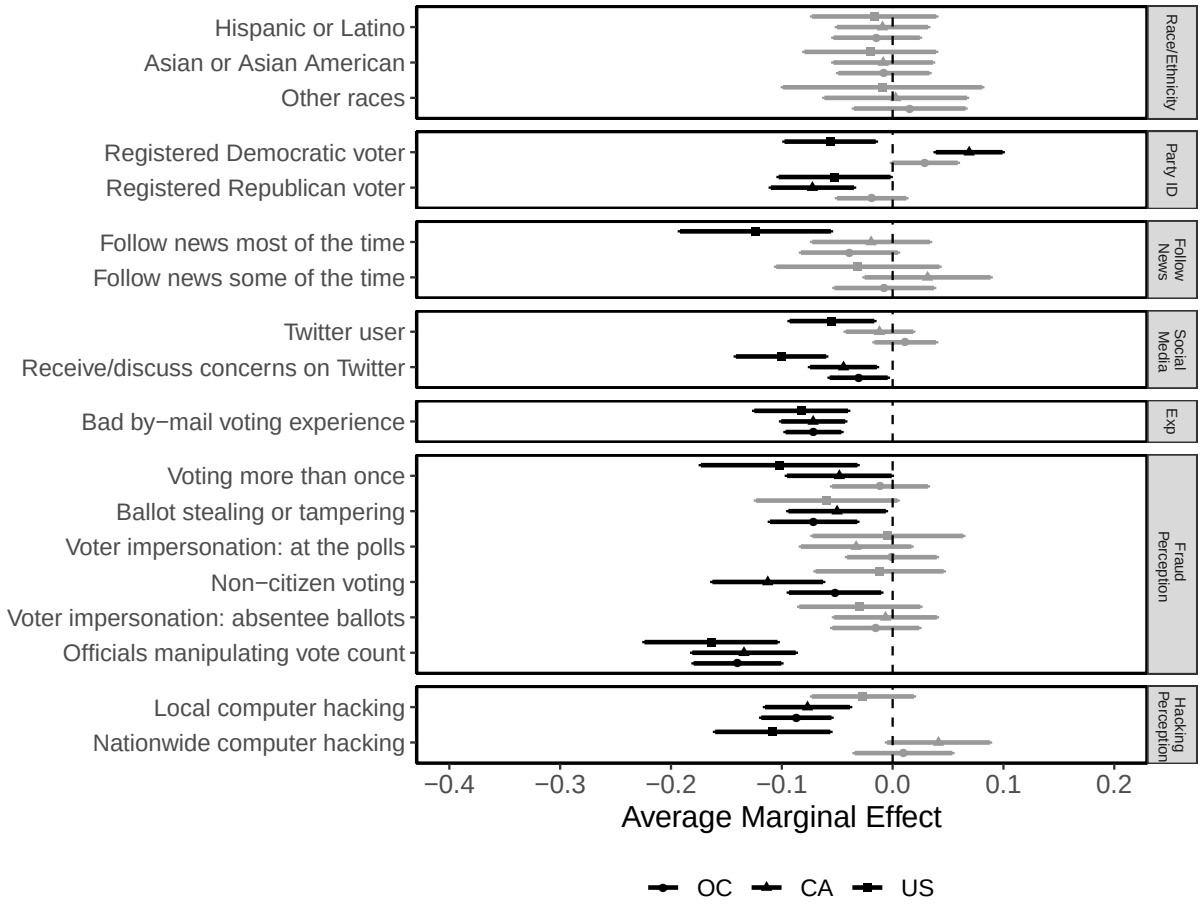

Figure 5: Confidence in Votes in OC, CA, and U.S. (By-Mail, N = 4,093)

computer hacking to be a problem in the 2018 elections are 6.5% and 10.8% more likely to be concerned about vote-counting nationwide, for in-person and by-mail voters, respectively. Perceptions of local computer hacking, meanwhile, tend to reduce voter confidence in their own vote, votes in Orange County and votes in California being counted as intended, especially for by-mail voters.

Finally, we examine the disparity between in-person and by-mail voters and look at demographic controls. In an alternative specification including votes of both voting modes (see the online appendices for details), we find that in-person voters are more likely to believe that their own votes are counted as intended and somewhat more confident about vote counting in Orange County. This finding is important as more counties and states, such

Table 1: Counterfactual Percentages of Respondents Confident About Votes Being Counted as Intended

	Own		OC		CA		US	
	No	Yes	No	Yes	No	Yes	No	Yes
In-Person Experience:								
Polling place difficult to find	89.7	84.2	88.5	83.4	80.8	75.8	55.4	50.4
Problem with voter registration	90.6	84.2	89.2	83.4	81.5	75.7	55.9	50.3
Polling place closed	89.6	86.1	88.4	85.1	80.8	77.5	55.3	52.0
Long waiting time	89.7	85.4	88.4	84.5	80.8	76.8	55.3	51.4
Problem with voting equipment	90.2	82.1	88.8	81.6	81.1	74.1	55.6	48.8
Poor pollworker performance	89.8	81.8	88.5	81.4	80.9	73.9	55.4	48.7
By-Mail Experience:								
Problem with getting ballot	90.3	78.2	89.2	79.4	83.9	74.8	57.9	47.0
Problem with completing ballot	90.2	77.1	89.2	78.2	83.9	74.0	57.8	45.8
Returning instructions hard to follow	90.0	79.2	89.0	79.9	83.7	75.4	57.7	47.5
Social Media (Twitter):								
Discuss negative experiences	90.9	89.7	89.4	88.0	84.3	81.0	52.8	45.2
Discuss concerns	91.2	88.5	89.8	86.6	85.1	77.7	54.2	38.1
Receive concerning messages	91.0	90.2	89.5	88.6	84.5	82.3	53.3	48.2

as Orange County, are moving towards heavier reliance on mail ballots. All else equal, most demographic variables are not correlated with voter confidence, with two notable exceptions, shown in Figures 3 through 6. Other than Asian American voters, voters of color are more concerned about election integrity if they went to vote in polling places. Democratic voters are more confident in their own votes being handled properly than both independents and Republicans, whereas Republican voters are less confident than the rest of the electorate in vote counting in the state of California.

While IRT latent scores provide useful summaries of voting experiences and social media usage, it is also of interest to investigate which underlying components are more relevant for voter confidence. One way to do so is to compare the discrimination parameters corresponding to different individual components in the IRT models. Here, we compute counterfactual IRT scores by changing each underlying component one at a time while keeping other components fixed, and in turn the counterfactual probability of confidence for each respondent via the estimated logistic regressions. Aggregating individual probabilities yields counter-

factual percentages of voters confident about votes being counted as intended at different levels, displayed in Table 1. We find that problems with pollworkers, voting equipment, and voter registration do the most damage to confidence for in-person voters, whereas long waiting times, and polling place that are closed, hurt less. Moreover, problems with getting, completing, and returning the ballots all tend to dramatically raise concerns about election integrity for by-mail voters. Our results also indicate that problems with receiving, marking or returning their mail ballots are associated with a much larger decline in voter confidence (in many cases twice as large) than in-person voting problems. Finally, as we expected, receiving concerning messages on Twitter about election integrity reduces voter confidence about vote-counting statewide and nationwide; the voters who discuss concerns about election integrity on Twitter have the lowest level of confidence.

6 Discussion

Using data from our post-election survey of registered voters in Orange County, CA, immediately after the November 2018 General Election, we tested a series of hypotheses about the associations between voter confidence and various voter and contextual features. Our dataset provides a new perspective into the study of voter confidence. By focusing on a single election jurisdiction, we examine the correlations between voter experiences, attitudes, and voter confidence, without having to try to control for differences in election rules, procedures, administration, or technologies across jurisdictions.

Second, our large-N survey allowed us to ask very detailed and nuanced questions about the survey experience, using complex survey logic. For example, we could ask only those who voted in-person detailed questions about that experience; similarly, those who voted by-mail were asked detailed questions about receiving, marking, and returning their ballot.

Finally, our study design allows us to match survey respondents directly to administrative data, so that we can add features from the administrative data to our analysis and we can

validate self-reports of voter turnout. By exploiting these advantages of our survey and addressing the associated methodological issues, we help to advance the literature studying voter confidence and attitudes about election administration.

Our analysis yields several main results. Each of these results has important implications for the academic study of election administration, and for election officials considering changing voting procedures and technologies. Voters who have bad voting experiences or concerns about manipulation and fraud have reduced confidence in the election. This is substantively significant — and election officials clearly need to strive to provide a strong positive voting experience to in-person and by-mail voters. Given that electoral manipulation and fraud have been headlines since 2016, our results imply that voters need to be convinced that U.S. elections are free and fair, and that those who are so convinced have confidence in election administration.

Finally, we found that voters in our sample who are frequent users of social media, in particular those who are more avid users of social media, often have lower confidence in election administration at the state and national level. While our observational study cannot determine causation, one hypothesis that could explain this correlation is that voters who are avid users of social media may be exposed to more information that reduces their confidence in election administration. Whether the information they are exposed to is fact or fiction, again, we cannot determine with our survey data. The connection between media use, especially social media use, and voter confidence needs additional study, so that academics, election officials, and policy makers can develop methods to improve the flow of factual information about the integrity of elections in the United States.

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Supplementary Material

A Item Response Theory

In the paper, we use hierarchical item response theory models (Zhou, 2019) to estimate latent scores for in-person voting experiences, by-mail voting experiences, and social media usage/exposure. Specifically, for each of in-person and by-mail voting experiences as well as social media usage/exposure, we use the demographic characteristics to model the mean and variance of the responses to a battery of questions, and obtain latent scores that can best explain these correlated responses.

The hierarchical item response theory models posit that the probability that voter i responds h to question k is a functions of latent preference θ_i:

$$\begin{aligned} Pr(Y_{ik} = h) &= P_{kh}(\theta_i) \\ &= \frac{\exp[h(\alpha_k + \beta_k \theta_i)]}{1 + \exp(\alpha_k + \beta_k \theta_i)}. \end{aligned}$$

In our case, $h \in \{0, 1\}$. Following Zhou (2019), we give θ_i a normal prior, and let μ_i and σ_i^2 depend on demographic variable sets x_i and z_i, respectively:

$$\begin{aligned} \theta_i &\sim N(\mu_i, \sigma_i^2), \\ \mu_i &= \gamma^T \tilde{x}_i \\ \log \sigma_i^2 &= \lambda^T \tilde{z}_i \end{aligned}$$

where $\tilde{x}_i^T = (1, x_i^T)$, $\tilde{z}_i^T = (1, z_i^T)$. In our specifications, the sets of demographic variables x_i and z_i include age, gender, education, race/ethnicity, marital status, home ownership, and household income.

B Measuring Voter Confidence

As noted in the text, we measure voter confidence at four different levels, following previous research (Atkeson et al., 2014). To mitigate the effect due to question formats, we randomly assign respondents to a grid format and non-grid format of the questions.

The grid format asks *Thinking about vote counting in the General Election. How confident are you that ... was/were counted as intended?* For each of *Your vote*, *Votes in Orange County*, *Votes in California*, *Votes nationwide*, respondents were given the following options: *Not at all confident*, *Not too confident*, *Somewhat confident*, *Very confident*, and *I don't know*.

The non-grid format asks four separate questions:

- *How confident are you that your vote in the General Election was counted as you intended?*
- *Think about vote counting throughout Orange County, and not just your own personal situation. How confident are you that votes in Orange County were counted as voters intended?*
- *Now, think about vote counting throughout California. How confident are you that votes in California were counted as voters intended?*
- *Finally, think about vote counting throughout the country. How confident are you that votes nationwide were counted as voters intended?*

Respondents were given the same five options as in the grid question.

To mitigate the effect due to the ordering of the response options, we randomly assign respondents to the ascending order and the descending order of confidence. We present results in the main text pooling different formats and response option orders.

C Respondent Composition and Summary Statistics

Figure 6 displays the important demographic and administrative features of our survey respondents, and for the population of Orange County voters who participated in the November 2018 General Election. Younger voters are somewhat over-represented in our survey sample, with 5.7% and 5.1% more respondents below the age of 30 and between 30 and 44 years old, respectively, compared to the population of voters. Voters of different genders and race/ethnicity groups are reasonably well represented in the sample. Our survey sample exhibits additional imbalances in party registration and permanent absentee ballot status. While 38.1% of voters who turned out in the November 2018 General Election registered with the Republican party in Orange County, only 24.1% of those who completed our survey are Republican voters. On the other hand, 45.0% of respondents registered with the Democratic party, compared to 34.8% in the population of voters. The disparities in terms of party registration present in our survey sample are expected given our knowledge about survey participation in general and consistent with other surveys with voluntary participation. Finally, 69.3% of 2018 General Election voters in Orange County are permanent vote-by-mail voters, whereas the percentage is 75.6% in our sample. The distribution of cities of residence for our sample tracks the population well.

To make our analysis representative of Orange County registered voters, we constructed survey weights and used them in our analysis. We use a standard calibration weighting procedure known as raking (Deville and Särndal, 1992; Deville, Särndal and Sautory, 1993). Our raking algorithm matches sample moments on age, gender, race/ethnicity, party registration, permanent absentee ballot status, and city of residence to their population counterparts, to produce weights that we use in our statistical analyses to produce representative results. These survey weights are incorporated into the results we report later in this paper.

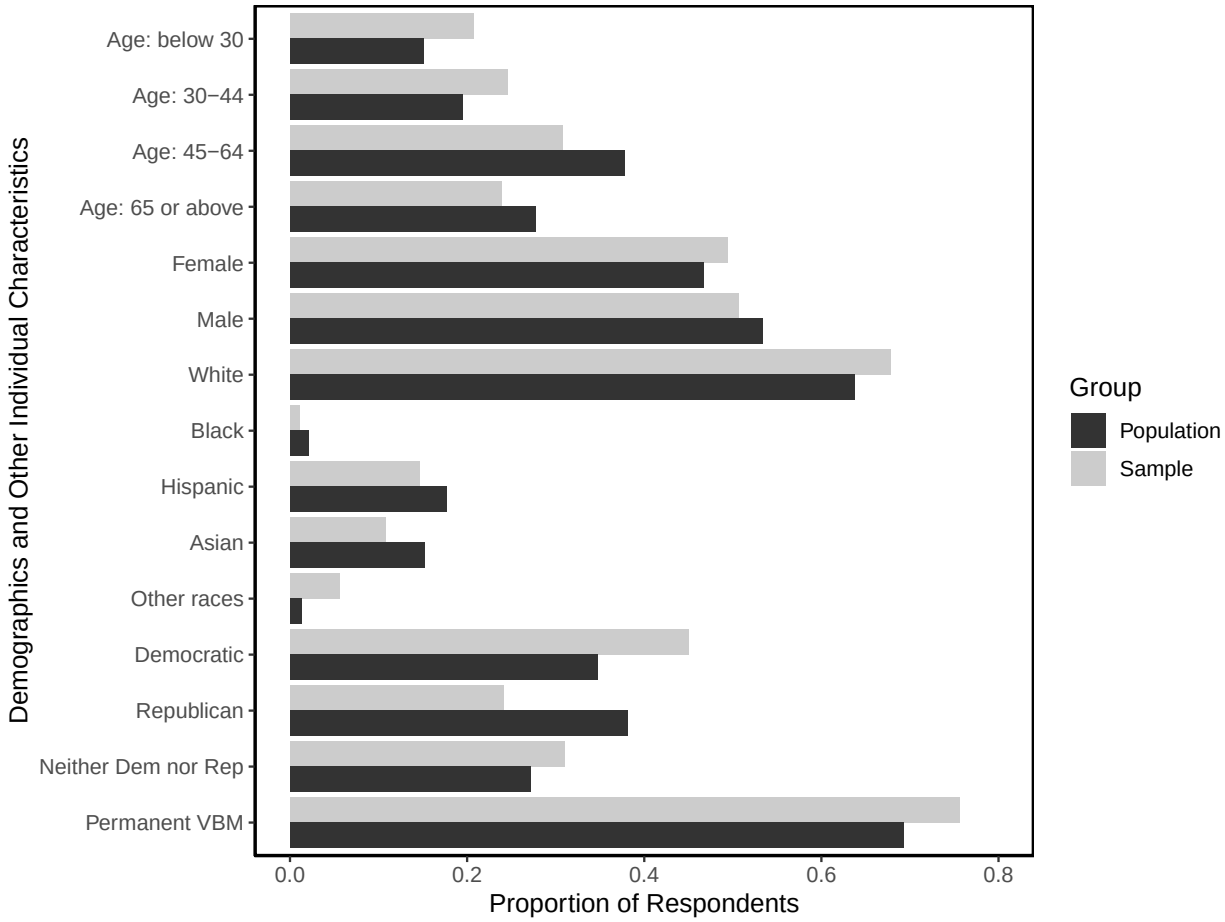

Figure 6: Respondent Composition of the Survey

Table 2: Summary Statistics (Part 1)

	Weighted Average	Std. Error
Voter Confidence:		
Confident: Own vote	0.882	0.005
Confident: Votes in OC	0.866	0.005
Confident: Votes in CA	0.784	0.006
Confident: Votes in U.S.	0.560	0.007
In-Person Experience:		
Polling place difficult to find	0.025	0.004
Problem with voter registration	0.127	0.008
Polling place closed	0.027	0.004
Long waiting time	0.028	0.004
Problem with voting equipment	0.054	0.006
Poor pollworker performance	0.023	0.004
By-Mail Experience:		
Problem with getting ballot	0.043	0.004
Problem with completing ballot	0.030	0.003
Ballot returning instructions hard to follow	0.019	0.003
Follow News:		
Most of the time	0.697	0.007
Some of the time	0.228	0.006
Social Media (Twitter):		
Twitter user	0.303	0.006
Discuss negative experiences	0.036	0.003
Discuss concerns	0.046	0.003
Receive concerning messages	0.078	0.004

Table 3: Summary Statistics (Part 2)

	Weighted Average	Std. Error
Preception of Fraud: Common/Occasional		
People voting more than once	0.280	0.006
Ballot stealing or tampering	0.254	0.006
Voter impersonation: at the polls	0.317	0.006
Non-citizen voting	0.382	0.006
Voter impersonation: absentee ballots	0.378	0.007
Official manipulating vote count	0.244	0.006
Preception of Fraud: Infrequent/Almost Never		
People voting more than once	0.554	0.007
Ballot stealing or tampering	0.553	0.007
Voter impersonation: at the polls	0.521	0.007
Non-citizen voting	0.481	0.006
Voter impersonation: absentee ballots	0.440	0.007
Official manipulating vote count	0.552	0.007
Perception of hacking: Major/Minor Issue		
local computer hacking	0.295	0.007
nationwide computer hacking	0.544	0.007
Perception of hacking: Not an Issue		
local computer hacking	0.393	0.007
nationwide computer hacking	0.173	0.005

D Complete Results Table

Table 4: Confidence about Own Vote Being Counted as Intended (Avg. Marginal Effects)

	In-Person	Std. Error	By-Mail	Std. Error
Age: 30-44	-0.035	0.023	-0.040	0.020
Age: 45-64	-0.020	0.022	-0.034	0.021
Age: 65 or above	-0.015	0.029	-0.006	0.022
Gender: Female	-0.001	0.015	0.008	0.013
Educ: Some college, but no degree	0.045	0.041	0.025	0.029
Educ: 2-year college degree	0.043	0.043	0.007	0.034
Educ: 4-year college degree	0.050	0.041	0.021	0.029
Educ: Postgraduate degree	0.054	0.043	0.012	0.033
Race/Ethnicity: Hispanic	-0.043	0.021	-0.011	0.019
Race/Ethnicity: Asian	0.018	0.024	-0.006	0.021
Race/Ethnicity: Other	-0.065	0.033	0.001	0.029
Party: Democratic	0.024	0.018	0.048	0.014
Party: Republican	-0.012	0.018	-0.012	0.014
First Time Voter	0.037	0.033	0.022	0.029
Permanent Absentee Voter	-0.032	0.014	0.044	0.023
Follow news: Most of the time	-0.014	0.023	-0.018	0.022
Follow news: Some of the time	0.010	0.024	0.029	0.022
Twitter user	-0.009	0.016	0.018	0.013
Receive/Discuss concerns on Twitter	-0.017	0.013	-0.019	0.013
Bad voting experience (IRT latent score)	-0.067	0.011	-0.081	0.010
Perception of fraud: common/occasional				
People voting more than once	-0.041	0.023	-0.010	0.020
Ballot stealing or tampering	-0.039	0.021	-0.055	0.019
Voter impersonation: at the polls	-0.025	0.024	-0.004	0.022
Non-citizen voting	-0.049	0.022	-0.059	0.020
Voter impersonation: absentee ballots	0.065	0.027	-0.007	0.019
Official manipulating vote count	-0.130	0.024	-0.118	0.018
Perception of hacking: major/minor issue				
local computer hacking	-0.038	0.022	-0.087	0.017
nationwide computer hacking	0.056	0.031	0.041	0.025
Own home	0.023	0.018	-0.019	0.014
Married/living with partner	-0.024	0.017	0.000	0.016
Income: Below $75,000				
Income: $75,000 to $124,999	0.028	0.024	0.000	0.017
Income: $125,000 to $174,999	0.012	0.025	-0.005	0.020
Income: $175,000 or more	0.026	0.026	0.021	0.020
Perception of fraud: not sure	Included		Included	
Perception of hacking: not sure	Included		Included	
Congressional district fixed effect	Included		Included	

Table 5: Confidence about Votes in OC Being Counted as Intended (Avg. Marginal Effects)

	In-Person	Std. Error	By-Mail	Std. Error
Age: 30-44	-0.048	0.024	-0.028	0.022
Age: 45-64	-0.049	0.022	-0.015	0.022
Age: 65 or above	-0.031	0.027	0.017	0.023
Gender: Female	0.012	0.016	0.007	0.016
Educ: Some college, but no degree	0.021	0.038	0.025	0.031
Educ: 2-year college degree	0.022	0.043	0.007	0.041
Educ: 4-year college degree	0.014	0.038	0.037	0.032
Educ: Postgraduate degree	0.026	0.040	0.045	0.037
Race/Ethnicity: Hispanic	-0.046	0.022	-0.014	0.020
Race/Ethnicity: Asian	0.035	0.025	-0.008	0.021
Race/Ethnicity: Other	-0.043	0.033	0.015	0.026
Party: Democratic	0.027	0.020	0.029	0.015
Party: Republican	-0.011	0.020	-0.019	0.016
First Time Voter	0.032	0.043	0.031	0.027
Permanent Absentee Voter	-0.006	0.016	0.034	0.023
Follow news: Most of the time	-0.046	0.027	-0.039	0.022
Follow news: Some of the time	-0.025	0.029	-0.008	0.023
Twitter user	-0.015	0.017	0.011	0.014
Receive/Discuss concerns on Twitter	-0.007	0.016	-0.031	0.013
Bad voting experience (IRT latent score)	-0.064	0.011	-0.071	0.013
Perception of fraud: common/occasional				
People voting more than once	-0.054	0.027	-0.011	0.022
Ballot stealing or tampering	-0.070	0.025	-0.071	0.020
Voter impersonation: at the polls	-0.041	0.025	-0.001	0.021
Non-citizen voting	-0.065	0.025	-0.052	0.021
Voter impersonation: absentee ballots	0.067	0.027	-0.015	0.020
Official manipulating vote count	-0.129	0.025	-0.140	0.020
Perception of hacking: major/minor issue				
local computer hacking	-0.023	0.024	-0.087	0.016
nationwide computer hacking	0.037	0.029	0.010	0.022
Own home	0.009	0.019	-0.027	0.013
Married/living with partner	-0.006	0.019	-0.008	0.015
Income: Below $75,000				
Income: $75,000 to $124,999	0.015	0.025	-0.018	0.018
Income: $125,000 to $174,999	0.003	0.025	0.013	0.019
Income: $175,000 or more	-0.005	0.027	0.025	0.018
Perception of fraud: not sure	Included		Included	
Perception of hacking: not sure	Included		Included	
Congressional district fixed effect	Included		Included	

Table 6: Confidence about Votes in CA Being Counted as Intended (Avg. Marginal Effects)

	In-Person	Std. Error	By-Mail	Std. Error
Age: 30-44	-0.024	0.030	-0.024	0.024
Age: 45-64	-0.017	0.031	-0.021	0.026
Age: 65 or above	0.008	0.038	-0.010	0.026
Gender: Female	0.016	0.019	0.037	0.016
Educ: Some college, but no degree	0.021	0.045	-0.008	0.036
Educ: 2-year college degree	0.017	0.052	-0.065	0.042
Educ: 4-year college degree	0.051	0.046	-0.014	0.035
Educ: Postgraduate degree	0.058	0.048	0.012	0.037
Race/Ethnicity: Hispanic	-0.041	0.024	-0.009	0.021
Race/Ethnicity: Asian	-0.033	0.032	-0.009	0.023
Race/Ethnicity: Other	-0.103	0.045	0.003	0.033
Party: Democratic	0.047	0.021	0.069	0.015
Party: Republican	-0.083	0.024	-0.072	0.019
First Time Voter	0.068	0.047	0.010	0.030
Permanent Absentee Voter	0.002	0.018	0.019	0.027
Follow news: Most of the time	-0.064	0.030	-0.019	0.027
Follow news: Some of the time	-0.042	0.034	0.032	0.029
Twitter user	0.007	0.021	-0.012	0.015
Receive/Discuss concerns on Twitter	-0.062	0.018	-0.044	0.015
Bad voting experience (IRT latent score)	-0.066	0.014	-0.072	0.015
Perception of fraud: common/occasional				
People voting more than once	-0.030	0.029	-0.048	0.024
Ballot stealing or tampering	-0.065	0.031	-0.050	0.022
Voter impersonation: at the polls	-0.066	0.031	-0.033	0.025
Non-citizen voting	-0.149	0.032	-0.113	0.025
Voter impersonation: absentee ballots	0.029	0.029	-0.006	0.024
Official manipulating vote count	-0.151	0.031	-0.134	0.024
Perception of hacking: major/minor issue				
local computer hacking	-0.023	0.028	-0.077	0.020
nationwide computer hacking	0.044	0.032	0.041	0.024
Own home	-0.014	0.021	-0.031	0.016
Married/living with partner	-0.021	0.021	0.010	0.015
Income: Below $75,000				
Income: $75,000 to $124,999	0.038	0.025	-0.002	0.019
Income: $125,000 to $174,999	0.041	0.028	-0.004	0.022
Income: $175,000 or more	-0.001	0.033	0.025	0.022
Perception of fraud: not sure	Included		Included	
Perception of hacking: not sure	Included		Included	
Congressional district fixed effect	Included		Included	

Table 7: Confidence about Votes in U.S. Being Counted as Intended (Avg. Marginal Effects)

	In-Person	Std. Error	By-Mail	Std. Error
Age: 30-44	-0.023	0.036	-0.007	0.032
Age: 45-64	0.018	0.038	0.024	0.031
Age: 65 or above	0.009	0.044	0.005	0.036
Gender: Female	0.011	0.024	-0.027	0.022
Educ: Some college, but no degree	-0.004	0.060	-0.013	0.046
Educ: 2-year college degree	-0.045	0.069	-0.097	0.054
Educ: 4-year college degree	0.029	0.060	-0.038	0.046
Educ: Postgraduate degree	0.011	0.061	-0.031	0.046
Race/Ethnicity: Hispanic	-0.059	0.034	-0.017	0.029
Race/Ethnicity: Asian	0.008	0.037	-0.020	0.030
Race/Ethnicity: Other	-0.108	0.051	-0.009	0.046
Party: Democratic	-0.063	0.026	-0.056	0.021
Party: Republican	0.014	0.030	-0.052	0.026
First Time Voter	0.022	0.053	0.082	0.043
Permanent Absentee Voter	0.030	0.023	-0.027	0.037
Follow news: Most of the time	-0.108	0.042	-0.124	0.035
Follow news: Some of the time	-0.015	0.045	-0.031	0.038
Twitter user	-0.053	0.024	-0.055	0.019
Receive/Discuss concerns on Twitter	-0.090	0.026	-0.101	0.021
Bad voting experience (IRT latent score)	-0.061	0.020	-0.083	0.022
Perception of fraud: common/occasional				
People voting more than once	-0.072	0.044	-0.102	0.036
Ballot stealing or tampering	-0.072	0.043	-0.059	0.033
Voter impersonation: at the polls	0.046	0.040	-0.004	0.035
Non-citizen voting	-0.045	0.039	-0.012	0.029
Voter impersonation: absentee ballots	-0.031	0.035	-0.030	0.028
Official manipulating vote count	-0.256	0.038	-0.164	0.031
Perception of hacking: major/minor issue				
local computer hacking	0.029	0.032	-0.027	0.023
nationwide computer hacking	-0.065	0.033	-0.108	0.027
Own home	-0.003	0.027	-0.016	0.021
Married/living with partner	-0.056	0.026	0.028	0.020
Income: Below $75,000				
Income: $75,000 to $124,999	0.026	0.036	0.035	0.025
Income: $125,000 to $174,999	0.050	0.036	0.037	0.028
Income: $175,000 or more	0.000	0.036	0.047	0.030
Perception of fraud: not sure	Included		Included	
Perception of hacking: not sure	Included		Included	
Congressional district fixed effect	Included		Included	

E Comparison of Missing Data Handling Methods

Here we handle the missing values in survey data Y using Listwise Deletion (LD), Hot Deck imputation (HD), and Multiple Imputation (MI), and yield complete data sets Y^{LD}, Y^{HD}, and Y^{MI}, respectively. The LD method excludes the observations with missing values. In our survey, there are 2,058 observations that have at least one missing values in the variables included in our main models. After listwise deletion, the resulted data set Y^{LD} contains the rest 4,431 complete records. We use Hot Deck (Cranmer and Gill, 2013) method to find the closest alternatives to impute the missing values in target observations, and yield Y^{HD} with all 6,489 rows. We also implemented Bootstrapping based Expectation and Maximization (EMB) (Honaker and King, 2010) algorithm to obtain $M = 5$ multiple imputed data sets, Y_m^{MI} ($m \in \{1, 2, 3, 4, 5\}$).

The comparison of average voter confidences computed from Y^{LD}, Y^{HD}, and Y^{MI} are shown in Figure 7. The listwise deleted data set tend to have higher average voter confidences in own vote, votes in OC and CA, but the differences are not significant ($\alpha = 0.05$).

The average marginal effects obtained from estimating the models on each of Y^{LD}, Y^{HD}, and Y^{MI} data sets are shown in Table 8-11. Notice that estimates of listwise deleted data sets differ a lot from those of Hot Deck imputed and multiple imputed data sets. It is because omitting 31.7% (2,058 out of 6,489) observations causes a severe information loss, and both estimates of coefficients and standard errors are heavily biased. In addition, although estimates of multiple imputed data sets are close to those of Hot Deck imputed data sets, the former tend to be less significant. It is due to that Hot Deck imputation couldn't fully capture the uncertainty of missing values and underestimated the standard errors.

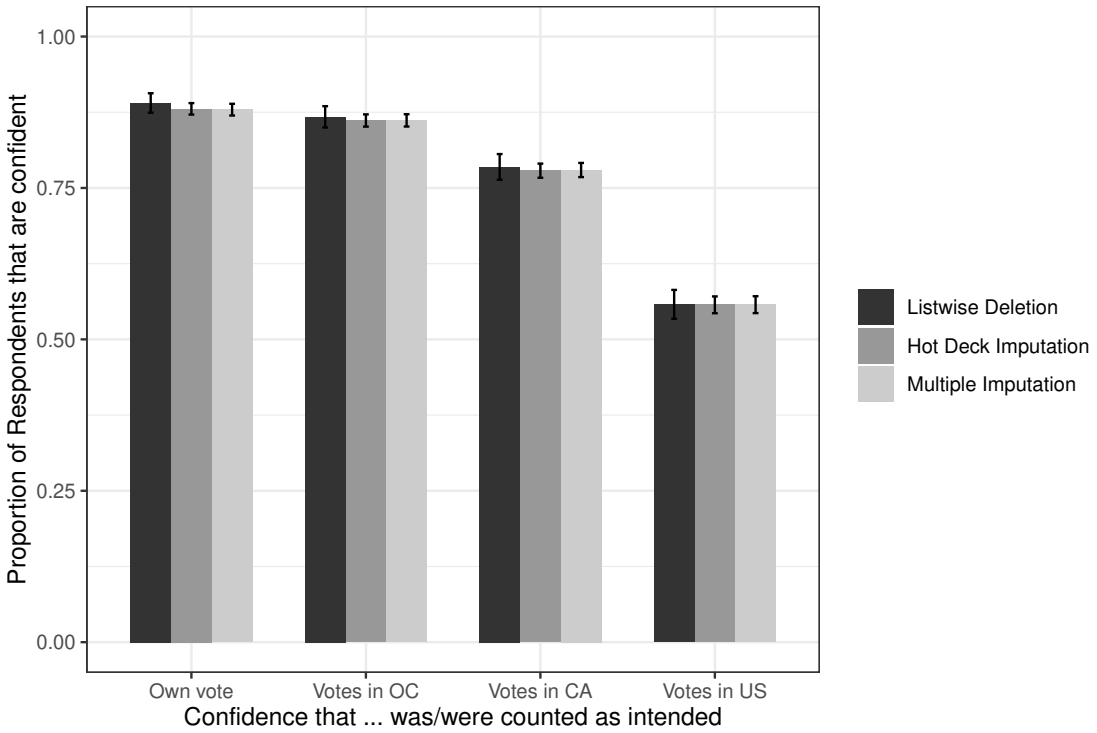

Figure 7: Comparison of Average Voter Confidences over Missing Data Handling Methods

Table 8: Comparison of the Average Marginal Effects on Voter Confidence in Own Vote

	In Person			By Mail		
	LD	HD	MI	LD	HD	MI
Democratic	0.0342**	0.0444***	0.0409	0.0339**	0.0448***	0.0413
	(0.0131)	(0.0105)	(0.0107)	(0.0131)	(0.0106)	(0.0108)
Republican	−0.0141	−0.0143	−0.0135	−0.0145	−0.0129	−0.0122
	(0.0144)	(0.0116)	(0.0116)	(0.0143)	(0.0117)	(0.0117)
Permanent absentee	−0.0154	−0.0242*	−0.025*	−0.0154	−0.0212*	−0.0224*
	(0.014)	(0.0107)	(0.011)	(0.014)	(0.0103)	(0.0105)
First time voter	0.0403	0.0268	0.0321	0.0404	0.0258	0.0302
	(0.0261)	(0.0226)	(0.023)	(0.0261)	(0.0223)	(0.0225)
Follow news most of the time	−0.0024	−0.0231	−0.0147	−0.0017	−0.0225	−0.0147
	(0.0204)	(0.015)	(0.0163)	(0.0204)	(0.0156)	(0.0167)
Follow news some of the time	0.0393	0.0162	0.025	0.04	0.0164	0.025
	(0.0207)	(0.0154)	(0.0167)	(0.0207)	(0.016)	(0.0173)
Twitter User	0.0048	0.0065	0.0041	0.0047	0.0096	0.0075
	(0.0121)	(0.0101)	(0.0103)	(0.012)	(0.0099)	(0.0101)
Discuss concerns on Twitter	0.0112	−0.0185*	−0.019	0.0107	−0.0183*	−0.0191
	(0.0159)	(0.0089)	(0.0097)	(0.016)	(0.009)	(0.0099)
Bad in-person voting experience	−0.0113	−0.0511***	−0.0545***			
	(0.0168)	(0.0089)	(0.009)			
Bad by-mail voting experience				0.0063	−0.075***	−0.0731***
				(0.0174)	(0.0093)	(0.0098)
Vote more than once	0.0014	−0.0337*	−0.0247	0.0017	−0.0313*	−0.0225
	(0.0183)	(0.015)	(0.015)	(0.0183)	(0.0152)	(0.0152)
Stealing or tampering	−0.0537	−0.0433	−0.0504	−0.0542	−0.044	−0.0514
	(0.0156)	(0.0129)	(0.013)	(0.0156)	(0.0131)	(0.0133)
Pretending to be someone else	−0.0075	0.0011	$8e-04$	−0.0082	−0.0076	−0.0084
	(0.0205)	(0.0165)	(0.0168)	(0.0205)	(0.0169)	(0.0173)
Not a U.S. citizen	−0.0505**	−0.0468**	−0.0534	−0.0503**	−0.0471**	−0.0534
	(0.0188)	(0.0156)	(0.0152)	(0.0188)	(0.0155)	(0.0152)
Voting other person's ballot	0.0109	0.0113	0.0126	0.0112	0.0129	0.0148
	(0.018)	(0.0148)	(0.0153)	(0.0181)	(0.0153)	(0.0158)
Changing the reported vote count	−0.0977***	−0.1122***	−0.1101***	−0.0974***	−0.113***	−0.1115***
	(0.014)	(0.0115)	(0.0114)	(0.014)	(0.0114)	(0.0114)
Local computer hacking	−0.0746***	−0.0827***	−0.0791***	−0.0747***	−0.0761***	−0.0727***
	(0.0181)	(0.0144)	(0.0149)	(0.0181)	(0.0144)	(0.0151)
Nationwide computer hacking	0.0375	0.0459**	0.0436**	0.0379	0.0394*	0.0378*
	(0.0205)	(0.0163)	(0.0165)	(0.0206)	(0.0163)	(0.0168)

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table 9: Comparison of the Average Marginal Effects on Voter Confidence in Votes in OC

	In Person			By Mail		
	LD	HD	MI	LD	HD	MI
Democratic	0.0216	0.0345**	0.0318**	0.0214	0.0347**	0.0321**
	(0.0147)	(0.0116)	(0.0118)	(0.0147)	(0.0116)	(0.0118)
Republican	−0.0079	−0.0174	−0.0171	−0.0083	−0.0155	−0.0154
	(0.0146)	(0.0124)	(0.0124)	(0.0145)	(0.0124)	(0.0125)
Permanent absentee	0	$-2e-04$	−0.0033	$1e-04$	$5e-04$	−0.0031
	(0.0147)	(0.011)	(0.0112)	(0.0147)	(0.0106)	(0.0108)
First time voter	0.0563*	0.0346	0.0273	0.0567*	0.0332	0.026
	(0.028)	(0.0227)	(0.0229)	(0.0281)	(0.0214)	(0.022)
Follow news most of the time	−0.0128	−0.0416**	−0.0419*	−0.0132	−0.0418*	−0.0424*
	(0.0197)	(0.0158)	(0.0164)	(0.0196)	(0.0162)	(0.0167)
Follow news some of the time	0.0137	−0.0117	−0.011	0.0133	−0.012	−0.0115
	(0.0208)	(0.0167)	(0.017)	(0.0207)	(0.0171)	(0.0173)
Twitter User	0.0056	0.0023	−0.0015	0.0055	0.0049	0.0016
	(0.0126)	(0.0107)	(0.0108)	(0.0126)	(0.0106)	(0.0107)
Discuss concerns on Twitter	0.0025	−0.0192	−0.02	0.003	−0.0192	−0.0203
	(0.0159)	(0.0099)	(0.012)	(0.016)	(0.0102)	(0.0122)
Bad in-person voting experience	−0.009	−0.0449***	−0.0482***			
	(0.0174)	(0.0095)	(0.0096)			
Bad by-mail voting experience				−0.0099	−0.0706***	−0.0705***
				(0.0194)	(0.0099)	(0.0107)
Vote more than once	−0.0101	−0.0363*	−0.0323	−0.01	−0.0337*	−0.0301
	(0.0192)	(0.016)	(0.0165)	(0.0192)	(0.016)	(0.0164)
Stealing or tampering	−0.0633	−0.0775***	−0.0774***	−0.0637	−0.0781***	−0.0783***
	(0.0181)	(0.0147)	(0.0146)	(0.018)	(0.015)	(0.0148)
Pretending to be someone else	−0.0347	−0.0106	−0.0075	−0.0349	−0.0184	−0.0159
	(0.0206)	(0.017)	(0.0171)	(0.0206)	(0.0174)	(0.0174)
Not a U.S. citizen	−0.0532**	−0.0539**	−0.0515**	−0.0527**	−0.0545	−0.0516**
	(0.0202)	(0.0164)	(0.0163)	(0.0201)	(0.0164)	(0.0164)
Voting other person's ballot	0.0058	0.0202	0.0133	0.0056	0.0226	0.0162
	(0.0203)	(0.016)	(0.016)	(0.0204)	(0.0165)	(0.0165)
Changing the reported vote count	−0.0989***	−0.115***	−0.1155***	−0.0986***	−0.1166***	−0.1172***
	(0.0161)	(0.0125)	(0.0127)	(0.0162)	(0.0128)	(0.013)
Local computer hacking	−0.0688	−0.0736***	−0.0705***	−0.069	−0.068***	−0.0647***
	(0.0174)	(0.0145)	(0.0149)	(0.0173)	(0.0144)	(0.0147)
Nationwide computer hacking	0.017	0.0219	0.0256	0.0173	0.0165	0.0209
	(0.0199)	(0.0164)	(0.0165)	(0.0199)	(0.0164)	(0.0165)

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table 10: Comparison of the Average Marginal Effects on Voter Confidence in Votes in CA

	In Person			By Mail		
	LD	HD	MI	LD	HD	MI
Democratic	0.0601	0.0694***	0.0681***	0.0596	0.0698***	0.0683***
	(0.0152)	(0.0123)	(0.0127)	(0.0152)	(0.0124)	(0.0127)
Republican	−0.0735	−0.0791***	−0.0782***	−0.0744***	−0.0777***	−0.0769***
	(0.0181)	(0.0147)	(0.0154)	(0.0181)	(0.0147)	(0.0155)
Permanent absentee	0.0228	0.0109	0.0081	0.0236	0.0068	0.0036
	(0.016)	(0.0119)	(0.012)	(0.0159)	(0.0118)	(0.0119)
First time voter	0.0365	0.021	0.0212	0.0369	0.0233	0.0236
	(0.0302)	(0.0237)	(0.0251)	(0.0304)	(0.0233)	(0.025)
Follow news most of the time	−0.0347	−0.0488**	−0.0449*	−0.0344	−0.0484**	−0.045*
	(0.0226)	(0.0185)	(0.0192)	(0.0224)	(0.0185)	(0.0191)
Follow news some of the time	$-2e-04$	−0.0076	0.0018	$-4e-04$	−0.0079	0.0018
	(0.0246)	(0.0198)	(0.0205)	(0.0245)	(0.0199)	(0.0206)
Twitter User	$2e-04$	−0.0033	−0.0051	$-2e-04$	−0.001	−0.0026
	(0.0151)	(0.0121)	(0.0123)	(0.0151)	(0.0123)	(0.0124)
Discuss concerns on Twitter	0.0038	−0.0508***	−0.0533***	0.004	−0.052***	−0.0546***
	(0.0159)	(0.012)	(0.0123)	(0.0161)	(0.0123)	(0.0126)
Bad in-person voting experience	−0.032	−0.0508***	−0.0533***			
	(0.0205)	(0.011)	(0.0115)			
Bad by-mail voting experience				−0.0107	−0.0577***	−0.0569***
				(0.0182)	(0.0127)	(0.0128)
Vote more than once	−0.0236	−0.0434*	−0.0387*	−0.0231	−0.0425*	−0.0383*
	(0.022)	(0.0178)	(0.0178)	(0.0222)	(0.0178)	(0.0178)
Stealing or tampering	−0.0301	−0.0498**	−0.0517**	−0.0313	−0.0507**	−0.0526**
	(0.0201)	(0.0164)	(0.0163)	(0.0201)	(0.0165)	(0.0164)
Pretending to be someone else	−0.067**	−0.0411*	−0.0377*	−0.068**	−0.048**	−0.0447*
	(0.0232)	(0.0182)	(0.0183)	(0.0232)	(0.0185)	(0.0186)
Not a U.S. citizen	−0.1121***	−0.114***	−0.1182***	−0.111***	−0.1134***	−0.1173***
	(0.0223)	(0.0176)	(0.0176)	(0.0222)	(0.0177)	(0.0177)
Voting other person's ballot	0.0052	0.0081	0.0058	0.0049	0.0102	0.0084
	(0.0218)	(0.0173)	(0.0173)	(0.0219)	(0.0176)	(0.0176)
Changing the reported vote count	−0.1138***	−0.1222***	−0.124***	−0.113***	−0.1236***	−0.1257***
	(0.0176)	(0.0143)	(0.0143)	(0.0176)	(0.0145)	(0.0146)
Local computer hacking	−0.0697	−0.0604	−0.0622	−0.0695	−0.0583	−0.0601
	(0.0193)	(0.0158)	(0.0161)	(0.0193)	(0.0159)	(0.0161)
Nationwide computer hacking	0.0321	0.0392*	0.0383*	0.0329	0.0377*	0.0372*
	(0.0215)	(0.0176)	(0.0178)	(0.0216)	(0.0176)	(0.0178)

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table 11: Comparison of the Average Marginal Effects on Voter Confidence in Votes in US

	In Person			By Mail		
	LD	HD	MI	LD	HD	MI
Democratic	−0.073	−0.0514**	−0.0548**	−0.0731	−0.0515**	−0.0551
	(0.0198)	(0.0156)	(0.0167)	(0.0198)	(0.0156)	(0.0166)
Republican	−0.0369	−0.0271	−0.0247	−0.0372	−0.0257	−0.0232
	(0.0246)	(0.0187)	(0.0189)	(0.0246)	(0.0186)	(0.0189)
Permanent absentee	0.0189	0.0145	0.0119	0.0198	0.0103	0.0074
	(0.0214)	(0.0154)	(0.0163)	(0.0214)	(0.0152)	(0.0162)
First time voter	0.0758	0.0585	0.057	0.0764	0.0616	0.06
	(0.0466)	(0.0335)	(0.035)	(0.0468)	(0.0332)	(0.0348)
Follow news most of the time	−0.1411***	−0.1208***	−0.1116	−0.1407***	−0.1189***	−0.1097
	(0.0317)	(0.0248)	(0.0291)	(0.0317)	(0.025)	(0.0293)
Follow news some of the time	−0.0312	−0.0227	−0.0112	−0.0311	−0.0217	−0.0097
	(0.0344)	(0.0264)	(0.0298)	(0.0344)	(0.0267)	(0.03)
Twitter User	−0.0219	−0.0588	−0.0594	−0.0224	−0.0574	−0.0576
	(0.0189)	(0.0149)	(0.0151)	(0.0189)	(0.0149)	(0.0151)
Discuss concerns on Twitter	−0.0257	−0.0971***	−0.0995***	−0.0267	−0.0983***	−0.1003***
	(0.0236)	(0.0162)	(0.0163)	(0.0238)	(0.0161)	(0.0162)
Bad in-person voting experience	−0.0352	−0.0506**	−0.0493**			
	(0.0299)	(0.0169)	(0.0171)			
Bad by-mail voting experience				−0.0049	−0.0676	−0.0742***
				(0.0261)	(0.0167)	(0.0169)
Vote more than once	−0.0811*	−0.0853**	−0.0821**	−0.0806*	−0.0838**	−0.0806**
	(0.0344)	(0.0263)	(0.0271)	(0.0344)	(0.0262)	(0.027)
Stealing or tampering	−0.0472	−0.0587*	−0.0609*	−0.0483	−0.0602*	−0.0621*
	(0.0322)	(0.0243)	(0.0251)	(0.0322)	(0.0244)	(0.0252)
Pretending to be someone else	−0.0012	0.0147	0.0132	−0.0017	0.0092	0.0073
	(0.0347)	(0.0265)	(0.0289)	(0.0347)	(0.0266)	(0.0291)
Not a U.S. citizen	−0.0479	−0.0267	−0.0218	−0.0476	−0.0258	−0.0208
	(0.0302)	(0.0233)	(0.0242)	(0.0302)	(0.0234)	(0.0244)
Voting other person's ballot	−0.0311	−0.0307	−0.0344	−0.0313	−0.0293	−0.0324
	(0.0269)	(0.0212)	(0.022)	(0.0269)	(0.0212)	(0.0219)
Changing the reported vote count	−0.1681***	−0.1896***	−0.1939***	−0.1675***	−0.1909***	−0.195***
	(0.0283)	(0.0214)	(0.0219)	(0.0283)	(0.0214)	(0.0219)
Local computer hacking	−0.0282	−0.0094	−0.0095	−0.028	−0.0086	−0.0082
	(0.0232)	(0.0186)	(0.0189)	(0.0232)	(0.0186)	(0.0188)
Nationwide computer hacking	−0.1004	−0.0899***	−0.0887***	−0.0999	−0.09***	−0.0887***
	(0.0265)	(0.0211)	(0.0212)	(0.0265)	(0.021)	(0.0212)

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

F Ordinal Levels of Voter Confidence

In this section, we report results from alternative models (proportional-odds cumulative logit models) that use ordinal levels of voter confidence as dependent variable. The coefficient estimates and standard errors are shown in Table 12.

Table 12: Estimates Using Ordinal Categorical Voter Confidence

	Own Vote		**Votes in OC**		**Votes in CA**		**Votes in US**	
	In Person	By Mail	In Person	By Mail	In Person	By Mail	In Person	By Mail
Democratic	0.1976**	0.2035**	0.0802	0.0815	0.2412	0.2424	−0.2008**	−0.2021**
	(0.073)	(0.0734)	(0.0706)	(0.0709)	(0.0668)	(0.0669)	(0.0652)	(0.0651)
Republican	−0.0837	−0.0636	−0.1832*	−0.1664	−0.5214***	−0.5088***	−0.0529	−0.0446
	(0.0872)	(0.0874)	(0.0866)	(0.0872)	(0.0855)	(0.0855)	(0.0796)	(0.0797)
Permanent absentee	−0.4512***	−0.4922***	−0.1038	−0.1395	−0.0436	−0.0754	0.0272	0.007
	(0.0808)	(0.079)	(0.0753)	(0.0748)	(0.0721)	(0.0721)	(0.0648)	(0.0648)
First time voter	0.2626	0.3131*	0.3037*	0.3476*	0.3352*	0.3543*	0.2587	0.2732*
	(0.1392)	(0.1376)	(0.1403)	(0.1396)	(0.143)	(0.1427)	(0.1387)	(0.139)
Follow news most of the time	−0.0085	$1e-04$	−0.2258	−0.2205	−0.2024	−0.2042	−0.4957***	−0.4915***
	(0.1146)	(0.1164)	(0.1163)	(0.1176)	(0.1082)	(0.1089)	(0.1075)	(0.1089)
Follow news some of the time	0.0018	0.0065	−0.2013	−0.1972	−0.0281	−0.0291	−0.0656	−0.0598
	(0.1192)	(0.121)	(0.1219)	(0.1234)	(0.1167)	(0.1171)	(0.1106)	(0.1119)
Twitter User	−0.0219	−0.002	−0.1022	−0.0828	−0.1296	−0.1163	−0.3049***	−0.2953***
	(0.0716)	(0.0714)	(0.0704)	(0.0702)	(0.067)	(0.0671)	(0.0625)	(0.0623)
Discuss concerns on Twitter	−0.1635*	−0.1796*	−0.1672*	−0.1823*	−0.2839***	−0.2956***	−0.5535***	−0.5569***
	(0.0726)	(0.0729)	(0.0739)	(0.0745)	(0.0675)	(0.0686)	(0.0694)	(0.0694)
Bad in-person voting experience	−0.5284***		−0.4785***		−0.3852***		−0.2215**	
	(0.0888)		(0.0768)		(0.0753)		(0.0722)	
Bad by-mail voting experience		−0.5558***		−0.544***		−0.379***		−0.3277***
		(0.0875)		(0.083)		(0.0817)		(0.0744)
Vote more than once	−0.2965*	−0.2847*	−0.1543	−0.1481	−0.3817	−0.3763	−0.3332**	−0.3318**
	(0.1157)	(0.1168)	(0.115)	(0.115)	(0.1133)	(0.1137)	(0.1087)	(0.1085)
Stealing or tampering	−0.4523***	−0.4624***	−0.6376***	−0.6502***	−0.4562***	−0.4657***	−0.3057**	−0.3071**
	(0.1026)	(0.1037)	(0.108)	(0.1083)	(0.1099)	(0.11)	(0.0977)	(0.0983)
Pretending to be someone else	−0.0842	−0.1364	−0.2643*	−0.308*	−0.2861*	−0.3159**	0.0186	−0.0073
	(0.1197)	(0.1219)	(0.1241)	(0.1261)	(0.1134)	(0.1148)	(0.1075)	(0.1081)
Not a U.S. citizen	−0.3794	−0.3706	−0.2777**	−0.2718*	−0.7592***	−0.7544***	−0.1797	−0.1731
	(0.1063)	(0.1074)	(0.105)	(0.1063)	(0.1068)	(0.1077)	(0.0949)	(0.0956)
Voting other person's ballot	−0.0525	−0.0422	−0.1232	−0.1076	−0.1586	−0.1458	−0.1359	−0.1252
	(0.0989)	(0.0995)	(0.0932)	(0.0941)	(0.0923)	(0.0925)	(0.087)	(0.087)
Changing the reported vote count	−1.0325***	−1.0404***	−1.1312***	−1.1451***	−1.0271***	−1.0451***	−0.9296***	−0.9397***
	(0.0927)	(0.0927)	(0.0973)	(0.0985)	(0.0961)	(0.0971)	(0.0905)	(0.091)
Local computer hacking	−0.574***	−0.5727***	−0.6029***	−0.596***	−0.5144***	−0.5099***	−0.0785	−0.0739
	(0.0878)	(0.088)	(0.084)	(0.0841)	(0.0852)	(0.0851)	(0.0766)	(0.0762)
Nationwide computer hacking	−0.0427	−0.048	−0.1043	−0.1152	0.0548	0.0476	−0.3886***	−0.3924***
	(0.1059)	(0.1052)	(0.1)	(0.0995)	(0.0994)	(0.0993)	(0.0854)	(0.0854)
Not at all confident|Not too confident	−4.3879***	−4.6297***	−4.8174***	−5.0499***	−4.2699***	−4.463***	−3.0146***	−3.156***
	(0.228)	(0.2353)	(0.2432)	(0.2517)	(0.2237)	(0.233)	(0.2093)	(0.218)
Not too confident|Somewhat confident	−3.2478***	−3.4901***	−3.4418***	−3.6728***	−2.9316***	−3.1307***	−1.5136***	−1.6524***
	(0.2199)	(0.2249)	(0.2353)	(0.2429)	(0.2197)	(0.2304)	(0.2049)	(0.2128)
Somewhat confident|Very confident	−1.0305***	−1.2751***	−0.9568***	−1.1916***	−0.529*	−0.7295**	0.4184*	0.2817
	(0.2127)	(0.218)	(0.2295)	(0.2361)	(0.213)	(0.2207)	(0.2047)	(0.2118)

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

G Pooling In-Person and By-Mail Voters

In this section, we report results from alternative models that pools all voters regardless of their modes of voting. Specifically, we exclude the voting experience variable, while including an indicator variable of in-person voters and its interactions with all other independent variables in our models in the main text. The average marginal effects of our main variables of interest are presented in Figure 8-9.

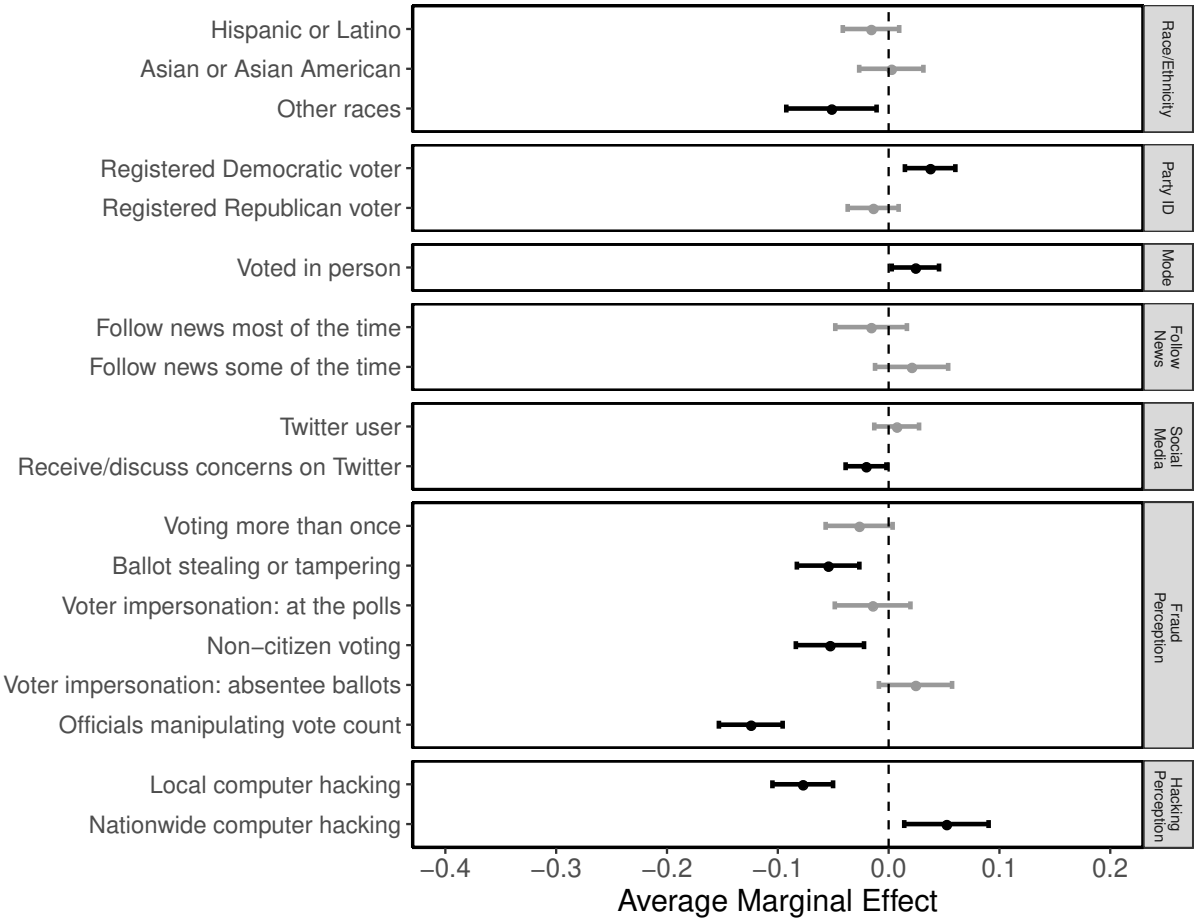

Figure 8: Confidence in Own Vote (In-Person and By-Mail, N = 6,489)

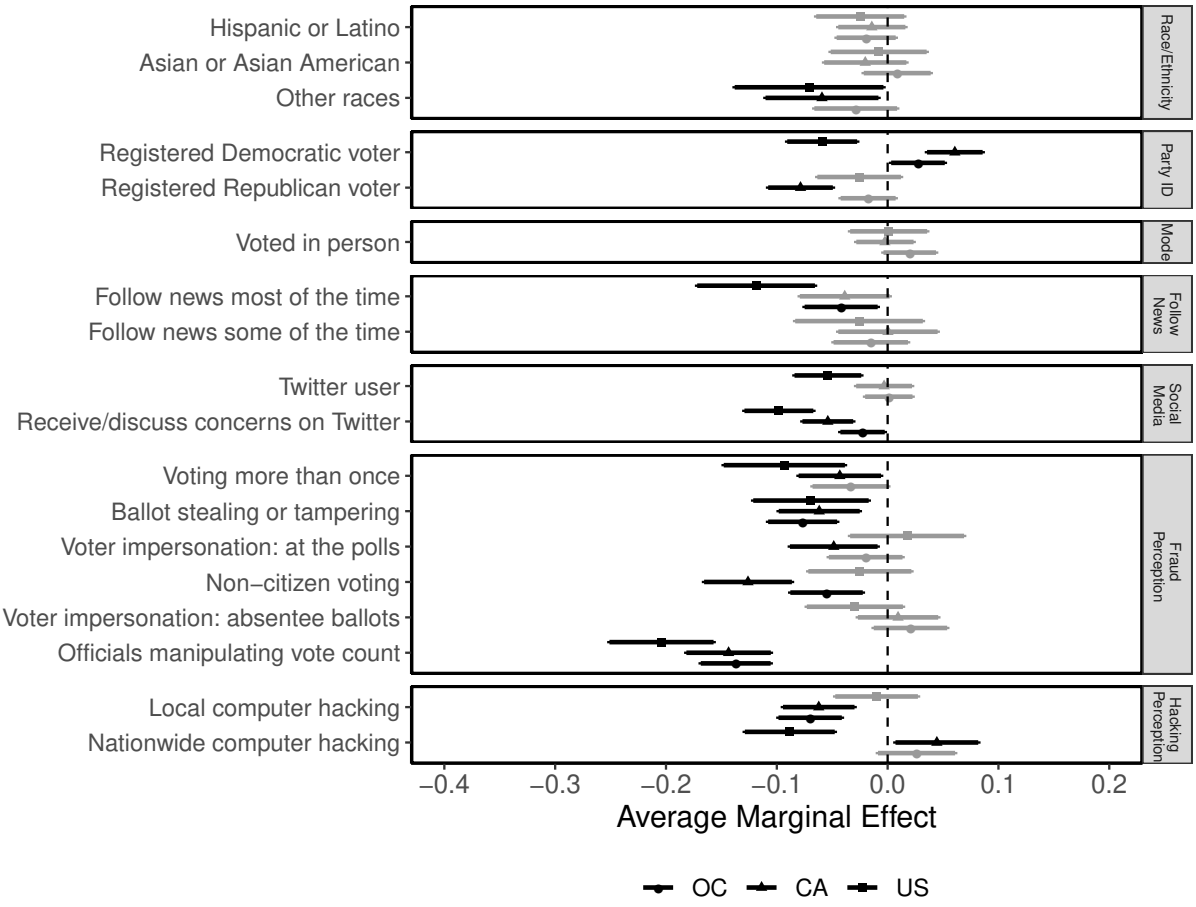

Figure 9: Confidence in Votes in OC, CA, and U.S. (In-Person and By-Mail, N= 6,489)