American Trust in Voting Technology[1]

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Introduction

Since the 2016 American election, issues of cyber-security have been at the forefront of public debate on electoral integrity. Issues of disinformation, fake news, voter privacy, and database hacking have been of top interest to policymakers, scholars and the public alike. One key theme that underlines this debate is how the use of new technologies impact the perceptions of voters and their trust in the electoral process. Even if elections are made secure from hacking and manipulation, just the *perception* of this threat as prevalent will impact voters' confidence in elections and democracy more generally.

This paper responds to the question: How does the use of electoral technology at the voting booth impact voters' trust in the electoral process? This project focuses in on the use of voting machines at polling places, one of the most basic and well-known forms of technology used in elections. While election administrators use technology throughout the electoral cycle, for everything from voter registration to announcing the results, the voter most intimately experience the use of technology in elections through their experience at the ballot box, with the use of direct recording electronic voting mechanisms, optical scanning machines or other forms of e-voting technology.

This paper seeks to provide additional evidence on the impact of these technologies on voter trust, by considering the use of technology in in-person voting in the United States. The American experience is particularly useful to study since the technology used at the polls varies widely between American counties, due to a de-centralized system of election administration. Taking advantage of the differences in electoral technology used between and within state, this paper considers the impact of voting technology on citizen trust in American elections in the 2014 and 2016 American elections. It considers the predictors of public survey responses on trust in elections. It tests whether there is a relationship between the technology used and voter confidence in their vote and concerns about hacking. The results speak to current debates about the use of technology in elections and their influence on public trust.

E-Voting in the United States and Abroad

E-voting research became more prominent after the 2000 federal US election, when legislation proposed after the election recount lead many US counties to install touch screen Direct-Electronic Recording (DRE) machines (Card and Moretti). Florida specifically exposed defects of the current voting system to the public, which created a demand for improved voting systems and put pressure on the government to update or replace current hand voting and punch card voting systems (Glidden). Additionally, the 2000 federal US election saw an uptake in the number of residual votes affecting the electoral outcome (Henmer et al). The US then took

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legislative steps to reduce the number of voters who unintentionally failed to vote, or whose votes were not counted due to a misstep in the process (Hamner et al).

In 2002, Congress passed the Help America Vote Act (HAVA), to improve the voting processes with $200 million devoted to implementing new voting technology (Hill) and replace the punch card system (Hanmer et al). After the implementation of HAVA, between 2000-2004, a new understanding of e-voting has been assessed (Hanmer et al) with the primary focus of e-voting machines being usability and reliability (Dunn and Merkle). The replacement of punch card systems and introduction of e-voting machines saw extensive media coverage emphasizing the accuracy of these machines (Beaulieu).

This paper focuses on e-voting technology used after the US federal election in 2000. In this section, e-voting will first be defined, then the e-voting technology currently employed in the US will be described. Next, advantages and disadvantages of e-voting will be explored, particularly regarding how this impacts voter trust in the electoral process.

The Types of E-Voting Technology

Electoral technology can vary in application and use. Electronic voting (e-voting) has been defined by a variety of authors, in broad and specific terms. Hill and Alport, writing about the Australian voting process, define e-voting as “computer assisted voting, vote counting, data transfer, and reporting of results,” while Goodman et al., writing about the Canadian municipal voting process, define e-voting as “a blanket term used to describe an array of voting methods that operate using electronic technology.” Shat and Pimenidis, analyzing Palestinian election voting, define e-voting as “electronic voting procedures and techniques that take place through the use of punch cards, optical scan voting systems and specialized electronic voting systems that would replace use of ballot boxes and accompanying tools” synergizing information communication technology (ICT) and practicing democracy.

The methods and devices used to conduct e-voting at polling stations vary widely according to jurisdiction and technologies used. According to the MIT Election Data and Science Lab, there have been five shifts in voting technology in the US over the past 60 years, with Optical Scanned Ballots and DRE Machines being the most dominant form of e-voting in 2016 (MIT Election Data and Science Lab).

Other forms of voting that are now obsolete include mechanical lever machine and punch card voting. Mechanical Lever Machines involved a lever that the voter pulls before and after voting, ensuring that ballots are counted once and preventing over-voting. These machines are, by law, disallowed from being used in future federal elections. Punch card voting was used in the 1960s, whereby voters punch out the pre-scored bit of paper that corresponded with a candidate choice, then depositing the ballot in the ballot box. The ballots were then counted using a card reader, however punch card voting is also disallowed from being used in future federal elections. Meanwhile, paper ballots are marked by voters and counted by hand, involving no technology and are not commonly used in the US today (MIT).

As mentioned earlier, American elections most commonly employ DRE machines and optical scans. DRE machines came into popular use in the 1970s, and allows voters to choose a candidate on a touch screen (MIT). The DREs themselves are portable computers that display ballot choices and record votes electronically and include a paper audit trail (VVPAT) to audit and recount votes. DRE machines are used in many countries, including Australia, in which the DRE machines entail directing a cursor to the desired candidate or pushing a button against a candidate’s name, which is then stored on a memory drive and collected by polling officials (Hill and Alport). While Hill and Alport contend that DRE machines using partial internet voting decrease voter resistance to e-voting, as it is not internet connected, Dunn and Merkle find a number of security issues with US DRE machines due to "lack of access controls, inadequate input validation, and an alarming number of backdoors." The study pays particular attention to the heavy reliance on hardware and software and a lack of non-volatile records (Dunn and Merkle). These second-generation DRE machines are generally executed using desktop and laptop computers which use a touchscreen interface, with multiple independent studies finding a variety of security risks that could compromise the voting results (Dunn and Merkle). Security breaches include a virus that can target the machine which could alter votes, flaws in the interface resulting in lost and duplicate votes, and the lack of adequate use of cryptography by not securing encryption keys (Dunn and Merkle).

Hanmer et al look to the voter experience of DRE machines maintaining that optical scanner machines and DRE machines reduce residual votes. DREs are programmed so voters cannot vote for more than one candidate, eliminating the risk of over-voting. Additionally, DRE machines allow voters to review their choices and correct mistakes while also drawing voters' attention to uncast votes on the review screen (Hamner et al). One setback of the voter interface involved voters double tapping through a selection and not checking the review screen for missed votes, which aided the conclusion that more voter knowledge in tandem with a switch in voting technology was needed.

Optical Scan Voting (or scanned paper ballots) were first used in the 1960s and is akin to the technology that scores standardized tests (MIT). Voters completely fill in a bubble beside the candidate's name and then places the ballot into the ballot box. A scanner sits atop the ballot box, counted at the end of election day, and tallied for that precinct (MIT). Paper or electronic results are then transferred to the central elections office (MIT). In some cases, ballots are not scanned at the precinct, but rather at the central elections office directly (MIT). Optical voting, like DRE machines, inform and allow voters to correct any errors on the ballot, or complete a new ballot. However, scanned ballots that are counted at the central elections office do not provide voters with this option (NCSL, 2018). Similar to DRE machines, optical scan votes reduce residual votes (Hamner et al.) In fact, Hanmer et al contend that if US jurisdictions had used optical scan cards instead of punch cards in the 2000 US federal election, half a million more votes would have been counted. Optical scan voting mechanisms are also likely to reduce overvotes, however voters often fail to review their ballot at the precinct level where mistakes can be corrected. Otherwise, no serious security concerns arise compared with DREs.

The Promises and Pitfalls of E-Voting

This section considers the advantages and disadvantages of the various tangible and intangible factors affecting voters' trust in the e-voting system. This includes physical capabilities such as the security of the machines, effect on different voter demographics, voter knowledge, cost, and voter turnout, and abstract impacts on transparency and accountability.

Advantages of E-Voting

E-voting can provide some valuable security benefits for the confidence and secrecy of the vote. Writing about the 2013 Kenyan elections, Barkan proposes that the Kenyan government implemented e-voting to reconcile the lack of an accurate and secure voter registry, and failures of transmitting votes accurately from the polling stations to the counting centres (Barkan). E-voting implementation in Kenya also sought to validate the aggregation of results and ensure the outcome of the election were accurate (Barkan).

Similarly, Hill and Alport write on the impact of e-voting in Australia showing a high satisfaction rate among voters, with over 28,000 votes cast online and less than 10 complaints. The process was based on standard personal computers "housed in polling booths" linked to a computer server at the same booth operating within a LAN (Hill and Alport). Security was enhanced by the independence of the polling station with no permanent long-term internet connection that could be subject to a security breach (Hill and Alport). Additionally, VVPAT paper trails add additional security and confidence that the correct vote is cast (Dunn and Merkle; Hill). Burton et al contend that accessible verification measures, such as printing paper copies of the e-vote ballot, aided in voters trust in the electoral process. The study by Burton et al based in Victoria, Australia demonstrated that verification processes at home were also used, as voters were able to electronically search for their voting receipt online to ensure their vote was cast, which increased transparency and accountability of the polling stations and ultimately the electoral process. Burton et al conclude that the only drawback to the e-voting was limited bandwidth, which can be reconciled by not housing the servers in one location.

As mentioned previously, DRE machines and optical scan machines reduce the potential for residual votes (Allers and Kooreman). The DRE and Optical Scan review screens are able to help voters identify mistakes made during the voting process and restricts voters from over-voting (Hanmer et al). Hanmer et al argue that training for both poll workers and citizens is essential to reducing residual votes and ensuring a smooth electoral process. Although voter knowledge and education are a necessary component of enabling an operational e-voting system, introducing e-voting could reduce costs overall. Additionally, contradictory to the theory that high implementation costs reduce polling stations, electronic voting, once implemented should increase accessibility, however this aspect was analyzed primarily by internet voting studies and less costs in the long-term (Goodman et al). Ultimately e-voting can assist governments in reducing the opportunity for human error (Alomari). Ultimately introducing ICT into the voting process has the potential to increase efficiency, transparency, accessibility and responsiveness to citizens, should the organizational change be successful (Marcuzzo).

E-voting can also improve accessibility and use for marginalized demographics. In Australia where language barriers exist between aboriginal communities and the Australian population, e-voting was introduced with optimal success, as computer literacy was not required to understand the voting process, and merely a push of a button beside the candidate was required to vote (Hill and Alport). In this sense, Clark and Abbinga (2004) note that e-voting revolutionized access and participation for those that are culturally and linguistically disconnected from the political process.

Disadvantages of E-Voting

However, there are also a number of potential concerns associated with e-voting. Among these issues is the cost of implementation. Hill demonstrates that in the years post HAVA, "counties spent approximately 25% more on election administration". Allers and Kooreman demonstrate that higher cost of e-voting machines may result in fewer polling stations, harming accessibility. Furthermore, implementation can vary depending on cultural and geographical context, and Marcuzzo et al argue that the move to e-government initiatives needs to match users' needs and organizational structure. Part of understanding users' needs is obtaining citizens trust in the internet, government, and perceived usefulness of e-voting (Alomari).

Legal difficulties also impact the application and adoption of e-voting, as experienced in California. Post-HAVA, complications arose in some Californian counties that had purchased DRE systems in 2004 without VVPAT, which was then legally required through a state decision in 2006 (Hill). The counties were then required to retrofit the existing equipment, or purchase new equipment altogether, wasting a portion of the electoral process budget.

Looking at the potential impact on voter turnout, Card and Moretti show that touch screen voting in the 2000 and 2004 US federal election had a negative effect on voter turnout, which is not a permanent effect when accompanied by voter knowledge and education, but one that impacts elections on a small scale upon implementation. This could be due to voter fatigue, Lott argues, which is a symptom of introducing and implementing different e-voting systems. Voter education and knowledge does remain a limitation as it requires extensive resources (mostly time and money) to ensure the public is aware of the updated voting process (Goodman et al).

We finally turn to the impact of e-voting on trust in the electoral process, the main focus of this paper. Trust in electoral processes can have profound impacts on democracy, as Pippa Norris notes, digital technology has the potential to strengthen democratic institutions and civic society, especially in newer democracies. Contrarily, however, several studies have suggested that a negative relationship may exist between the use of e-voting and public trust in elections, in a variety of contexts, from Argentina to Greece (Alvarez, et al. 2011, Alvarez, et al. 2013, Delis, et al. 2014, Pomares, et al. 2014).

A notable study in the American context Alvarez et al (2008) undertook a survey following the 2004 American election asking respondents whether they believed their vote was counted as intended. They demonstrate that voters who had used electronic voting technology had lower levels of trust. They suggest three possible reasons: firstly, that voters may be using new and unfamiliar technology; secondly, that voters do not trust the "black box" of electronic voting machines, where they are unable to physically place a ballot in a box; and/or thirdly, that publicized security issues may have a negative impact on their levels of trust. While the first rationale, that voters have not gotten used to the technology should have largely subsided, the final two rationales remain for the cases of 2014 and 2016 elections that are studied in this paper. Thus, following these arguments, *this paper predicts that voters who use electronic voting systems at the polls will be less likely to have high trust in the electoral process*.

Methodology

This paper tests the relationship between the use of e-voting technology at the polls and voter trust in the electoral process. To do so, this paper employs two main sources of data: information on the type of technology a voter used at the polls, and survey data on their trust in the election.

Data on the election technology used for voting in US counties was collected by Election Data Services[3] for their Election Official and Voter Equipment Reporting database. These data provide the start and end date of technology used by county across the United States.[4] In this study, only in-person polling technology are considered. Each county's use of technology is recorded, and this varies within and between counties and states. In some states, the same technology is used throughout. For example, in 2016, all New Mexico counties were reported to

[3] http://ea.electiondataservices.com/reports

[4] See Appendix A for more details about some incomplete data.

be using optical scan technology. In Texas, however, approximately half of counties (48%) used electronic voting, while the other half used optical scan (47%) (another small percentage used other variations).

Voter trust is measured by three survey questions from the Survey of the Performance of American Elections (SPAE)[5], a national survey of voters about their voting experience and opinions. Data were available from surveys conducted following the 2014 midterm elections and the 2016 presidential election in all US States. Only the responses of those who voted in person were used, thus respondents from all mail-ballot states, for example, were not included. The survey questions employed to measure a voter's trust were:

- How confident are you that your vote in the General Election was counted as you intended?
- How often do you think the following occurs: Officials changing the reported vote count in a way that is not a true reflection of the ballots that were actually counted?
- How much of a problem do you believe computer hacking was locally in the administration of elections in 2016?

See Appendix B for details on how survey data variables were constructed.

Because we know that voter demographics play a large role in determining trust, several control variables were also included in the models. As Beaulieu concludes, older individuals are less likely to trust e-voting than younger individuals. Younger individuals using e-voting in Latin America were significantly less concerned about fraud than older individuals, specifically those aged 60 and over (Beaulieu). Not only is age a factor, but Johnson proposes that inequalities are part of a much broader digital divide related to internet skills and trust in technology. Although not directly related to the use of e-voting machines in polling places, Johnson argues that white, young, wealthy, and educated individuals are more likely to gather political information on the internet than black, elderly, uneducated poor individuals which harms the voter education checks in place when introducing new technology (Johnson). Thus age, education, race, and gender are included as control variables in all models. Additionally, a binary variable for the year of the study is included to take into account differences between the 2014 and 2016 elections.

To test the relationship between election technology and trust, the type of technology used in each respondent's county was merged into the survey dataset. In the initial models, ordered logistic regression are used, since the dependent variables are all ordered categories. The main independent variable is a binary variable with electronic voting as 1 and all other forms (optical scan, paper ballots etc.) as 0. Alternative modelling strategies and variables as robustness checks are found in Appendix C. These include a model that tests the relationship with a variety of different types of election technology (not simply a binary variable with electronic voting), as well as regression models with the dependent variable as a scale and a logistic regression model with the dependent variable as a binary variable.

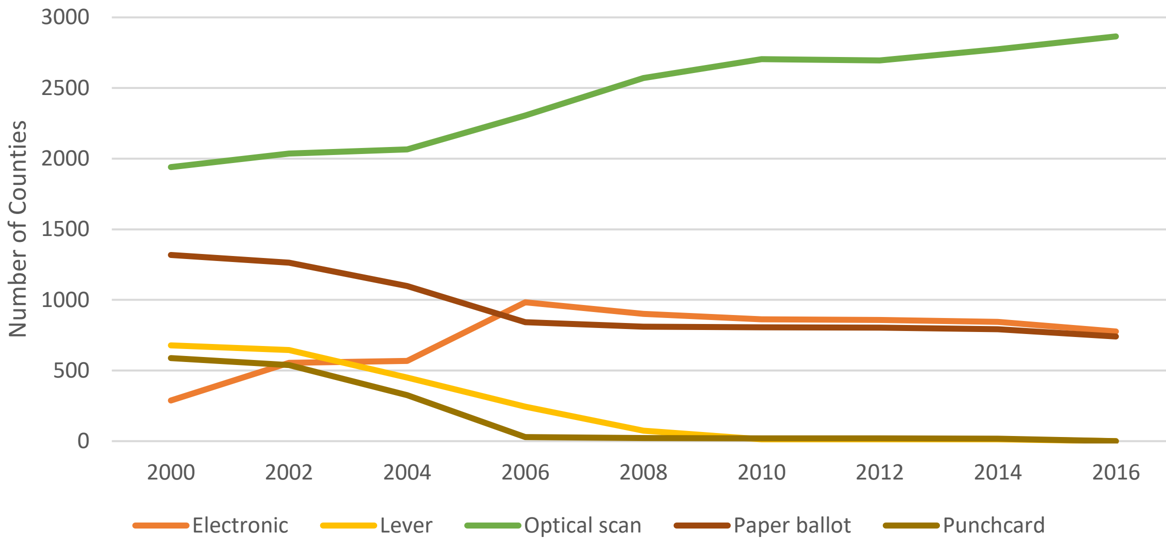
Results

Figure 1 presents the changes over time in the number of counties using the five major types of voting technology described in the Election Official and Voter Equipment Reporting database (See Appendix B for a chart with all types of election technology recorded in this dataset). It is important to consider two noticeable trends. Firstly, the use of punch-card and lever voting has decreased since 2000, and by the 2016 election had fallen completely out of use in the

[5] https://dataverse.harvard.edu/dataverse/SPAE

United States. In the same time period, there were decreases in the use of paper ballots. There is a noticeable increase in the use of electronic voting between 2000 and 2006, and then a slight decline. The greatest increases in usage are found with optical scan technology, which remains the most commonly used voting technology in US counties.

Figure 1: Number of Counties with Selected Voting Technologies



Note: Only selected technologies depicted. See Appendix X for a chart of all recorded technologies used in each year.

Table 1 presents the results of the ordered logistic regression, with a specific focus on the potential impact of the use of electronic voting on voter confidence. As mentioned earlier, see Appendix C for further modelling strategies. Model 1 considers the impact of electronic voting on the respondent's confidence in their individual vote. Those who used electronic voting means were less likely to trust that they were very confident. The predicted probability of being very confident for those using electronic voting means was 69%, compared with 73% predicted probability of being very confident among those using all other means of voting. This supports the hypothesis that the use of technology at the polls decreases voter trust.

Table 1: The Use of Electronic Voting Technology and Trust in Elections

	(1) Confidence individual vote	(2) Confidence nation-wide	(3) Election officials changing the vote	(4) Hacking local election administration	(5) Hacking national election administration
Used Electronic Voting	-0.24***	0.02	0.20***	0.21***	0.13*
	(0.06)	(0.05)	(0.05)	(0.05)	(0.07)
Age	0.02***	-0.01***	-0.01***	-0.00*	0.00

	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Gender	-0.04	-0.01	0.12***	-0.04	0.16***
	(0.05)	(0.04)	(0.04)	(0.04)	(0.06)
Black	-0.63***	-0.28***	0.76***	0.39***	0.61***
	(0.08)	(0.08)	(0.08)	(0.09)	(0.11)
College	0.14***	-0.08*	-0.45***	0.37***	0.05
	(0.05)	(0.04)	(0.05)	(0.05)	(0.07)
2016 Election	-0.14***	0.22***	0.40***	-3.67***	-4.43***
	(0.05)	(0.04)	(0.04)	(0.07)	(0.08)
cut1	-3.12***	-2.95***	-0.57***	-2.79***	-4.63***
	(0.13)	(0.10)	(0.10)	(0.11)	(0.14)
cut2	-2.03***	-1.49***	0.10	0.23**	-2.76***
	(0.11)	(0.09)	(0.10)	(0.10)	(0.14)
cut3	-1.65***	-1.39***	0.92***		
	(0.11)	(0.09)	(0.10)		
cut4	0.20*	0.60***	2.28***		
	(0.10)	(0.09)	(0.10)		
N	9554	9367	8497	8424	8301

*Standard errors in parentheses, * p<0.10 ** p<0.05 *** p<0.01*
Ordered logistic regression. See Appendix X for more details on independent and dependent variable.

However, it is, of course, always possible that existing levels of trust in elections lead to decisions about the types of technology that are adopted by electoral officials. One way to shed some light on whether voters are actually referencing their use of technology when reflecting how much they trust in their vote is to contrast these results with a similar survey question that considers the respondent's trust in the vote nation-wide. In this case, the respondent should likely be considering a wider variety of factors that influence their trust. Model 2 demonstrates that there hardly any distinguishable difference in trust in the vote nation-wide between those using electronic voting means and those who are not. This lends support to the idea that the use of technology is influencing individual trust, as opposed to existing levels of trust influencing the types of technology used.

The second way of testing voter trust is looking more specifically at whether the respondent believes that officials changed the reported vote count. The results in Model 3 suggest that respondents that had used electronic voting machines were more likely to agree that officials perhaps changed the reported vote count in a way that was not a true reflection of the results. Those who used electronic technology to vote had a 50% predicted probability of responding that this "almost never occurs," compared with 55% for all others. This suggests that those who use technology to vote are more suspicious of electoral officials tampering with election results than those who used paper ballots.

Finally, we consider whether those who used technology are more likely to think that computer hacking is a serious threat to elections. Looking at opinions at the local level, there is about a 3 percentage point difference in the predicted probability of those who used electronic voting technology and those who did not in terms of whether they believe hacking is a major problem (more prevalent for those who used electronic voting) and whether they believe hacking is not a problem at all (more prevalent for those who did not use electronic voting technology).

Again, it is possible to contrast these findings with the respondents' perceptions of the likelihood of hacking at the national level. While those who used electronic voting technology were again more suspicious of hacking, the difference with those who used other voting methods is less than one percentage point. This suggests that, once again, broader considerations are at play (not their experience of technology at the ballot box) when voters assess the trustworthiness of national-level election technology.

Conclusion

In sum, e-voting is a contentious topic, due to physical security issues and implementation challenges, but also due to its potential impact on public trust in elections. This paper demonstrated that, in the 2014 and 2016 American elections, voters who used electronic voting machines tended to have lower trust in the confidence of their vote, lower trust that electoral officials would not change the results, and lower trust that electoral systems would not be hacked. However, at the same time, these voters had hardly any distinguishable differences in trust in the vote or hacking of election administration nation-wide, suggesting that the use of electronic voting machines at the polls may, in fact, play a role in their lower trust in the electoral process.

The implications of this finding are important for those seeking to improve public confidence in elections, including policymakers and election administrators. The experience of voting on a machine appears to be linked to voters having less trust in their vote, electoral officials and the security of electoral infrastructure. Thus, the push for a move from technology to 'paper ballots' in order to improve voter trust may find support in the results of this paper.

There are a number of next steps in this line of research. The first task will be to collect further fine-grained data on the use of technology at the polls in different counties. There was conflicting information for some counties in the dataset used, and the first step will be to resolve these issues and cross-check with alternative sources of data. The next step is to expand the analysis to further elections. In the post-2016 climate, it is possible that a lack of trust in electoral technology may even be magnified. Finally, consideration of the influence of other means of voting (such as mail-in voting and online voting), which may have similar impacts on trust in elections, since voters do not have the traditional paper ballot experience, should be further studied.

Other analysis should consider the process involved in the adoption of electoral technology at the state level, including how specific models and vendors are chosen. In addition to being an important contribution in its own right, this analysis will assist in the current analysis, to help control for potential endogenous adoption and implementation factors that may concurrently influence voter trust.

In sum, this paper provides support to the argument that technology used in elections can decrease voter trust, and thus provides election administrators some additional evidence for consideration when making decisions about the use of technology in the voting process.

Appendix A: Variables (SPAE)

Variable	Original Variable Name	Survey Question	Response Options (Recoded for Analysis)
Confidence individual vote	Q33	How confident are you that your vote in the General Election was counted as you intended?	1. Not at all confident 2. Not too confident 3. I don't know 4. Somewhat confident 5. Very confident
Confidence nation-wide	Q36	Finally, think about vote counting throughout the country. How confident are you that votes nationwide were counted as voters intended?	1. Not at all confident 2. Not too confident 3. I don't know 4. Somewhat confident 5. Very confident
Election officials changing the vote	Q37F	Officials changing the reported vote count in a way that is not a true reflection of the ballots that were actually counted?	1. It almost never occurs 2. It occurs infrequently 3. I'm not sure 4. It occurs occasionally 5. It is very common
Hacking local election administration	Q39	(2016 only) How much of a problem do you believe computer hacking was locally in the administration of elections in 2016?	1. Not a problem at all 2. Minor problem 3. Major problem
Hacking national election administration	Q38	(2016 only) How much of a problem do you believe computer hacking was nationwide in the administration of elections in 2016?	1. Not a problem at all 2. Minor problem 3. Major problem
Age	Birthyr	Year of study - birthyear	Numeric
Gender	Gender	Are you male or female?	0 – Male 1 - Female
Black	Race	What racial or ethnic group best describes you?	0 – Other 1 - Black
College	Educ	What is the highest level of education you have completed?	0 – Less than some college 1 – Some college or more

Appendix B: Number of Counties using each type of Election Technology

	2000	2002	2004	2006	2008	2010	2012	2014	2016
Ballot Marking	1	1	1	1	1	1	1	1	0
DataVote	81	66	25	2	1	1	1	1	0
Electronic	288	555	567	983	900	863	857	845	777
Electronic w/Op	0	0	0	1	1	1	1	1	4
Electronic w/Pa	32	51	76	278	263	265	264	250	222
Lever	678	646	451	244	75	14	14	14	0
Mixed systems	153	184	163	88	82	83	83	83	82
Optical scan	1,940	2,036	2,066	2,306	2,570	2,704	2,695	2,775	2,865
Paper ballot	1,318	1,263	1,099	842	811	806	803	793	741
Punchcard	588	539	326	30	23	20	20	18	0

Data from: Election Data Services[6] for their Election Official and Voter Equipment Reporting database.

Note: Accurate data was not available for all counties. Work is currently ongoing to resolve conflicting data on a number of counties.

[6] http://ea.electiondataservices.com/reports

Appendix C: Additional Models (Robustness Checks)

Table C1: Independent Variable with 5 Categories of Technology

	(1) Confidence individual vote	(2) Confidence nation-wide	(3) Election officials changing the vote	(4) Hacking local election administration	(5) Hacking national election administration
Electronic w/Pa	0.21**	0.24***	-0.01	-0.26***	-0.16
	(0.10)	(0.09)	(0.09)	(0.10)	(0.13)
Mixed System	0.51***	-0.11	-0.51***	-0.09	-0.29**
	(0.11)	(0.08)	(0.09)	(0.09)	(0.13)
Optical Scan	0.20***	-0.03	-0.17***	-0.22***	-0.11
	(0.06)	(0.05)	(0.05)	(0.06)	(0.07)
Paper Ballot	0.59***	-0.00	-0.75***	-0.38**	0.00
	(0.22)	(0.16)	(0.20)	(0.19)	(0.25)
Age	0.02***	-0.01***	-0.01***	-0.00*	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Gender	-0.04	-0.01	0.13***	-0.04	0.16***
	(0.05)	(0.04)	(0.04)	(0.04)	(0.06)
Black	-0.61***	-0.28***	0.73***	0.39***	0.60***
	(0.08)	(0.08)	(0.08)	(0.09)	(0.11)
College	0.14***	-0.07	-0.45***	0.37***	0.05
	(0.05)	(0.04)	(0.05)	(0.05)	(0.07)
2016 Election	-0.13***	0.22***	0.40***	-3.67***	-4.44***
	(0.05)	(0.04)	(0.04)	(0.07)	(0.08)
cut1	-2.89***	-2.96***	-0.76***	-3.01***	-4.76***
	(0.14)	(0.10)	(0.10)	(0.12)	(0.15)
cut2	-1.80***	-1.50***	-0.09	0.02	-2.90***
	(0.12)	(0.10)	(0.10)	(0.11)	(0.15)
cut3	-1.42***	-1.39***	0.73***		
	(0.12)	(0.10)	(0.10)		

cut4	0.43***	0.60***	2.10***		
	(0.11)	(0.10)	(0.11)		
N	9554	9367	8497	8424	8301

*Standard errors in parentheses, * p<0.10 ** p<0.05 *** p<0.01*

Ordered logistic regression. Electronic Voting as the reference category. See Appendix A for more details on independent and dependent variable.

Table C2: Logistic Regression (Binary Dependent Variable)

	(1) Confidence individual vote (Somewhat and very)	(2) Confidence nation-wide (Somewhat and very)	(3) Confidence individual vote (Very)	(4) Confidence nation-wide (very)	(5) Election officials changing the vote (Somewhat and very)
Used Electronic Voting	-0.24**	0.03	-0.23***	-0.00	0.18**
	(0.12)	(0.06)	(0.06)	(0.06)	(0.07)
Age	0.03***	-0.01***	0.02***	-0.01***	-0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Gender	-0.26**	0.02	-0.02	-0.02	0.09
	(0.11)	(0.05)	(0.05)	(0.05)	(0.06)
Black	-0.94***	-0.49***	-0.56***	0.03	0.84***
	(0.14)	(0.09)	(0.08)	(0.09)	(0.11)
College	0.19*	-0.03	0.13**	-0.14**	-0.48***
	(0.11)	(0.06)	(0.05)	(0.05)	(0.07)
2016 Election	-0.25**	0.26***	-0.13***	0.27***	-0.07
	(0.11)	(0.05)	(0.05)	(0.05)	(0.06)
_cons	1.77***	1.33***	-0.15	-0.43***	-0.36***
	(0.22)	(0.11)	(0.10)	(0.11)	(0.13)
N	9385	9169	9554	9367	7298

*Standard errors in parentheses, * p<0.10 ** p<0.05 *** p<0.01*
Logistic Regression. See Appendix A for more details on independent and dependent variable.

Table C2: OLS Regression (Dependent Variable as a 1-5 scale)

	(1) Confidence individual vote	(2) Confidence nation-wide	(3) Election officials changing the vote
Used Electronic Voting	-0.07***	0.02	0.12***
	(0.02)	(0.03)	(0.03)
Age	0.01***	-0.01***	-0.01***
	(0.00)	(0.00)	(0.00)
Gender	-0.03*	-0.01	0.08***
	(0.02)	(0.03)	(0.03)
Black	-0.29***	-0.24***	0.55***
	(0.03)	(0.05)	(0.05)
College	0.06***	-0.04	-0.32***
	(0.02)	(0.03)	(0.03)
2016 Election	-0.05***	0.15***	0.20***
	(0.02)	(0.03)	(0.03)
_cons	4.21***	3.88***	2.51***
	(0.04)	(0.06)	(0.06)
N	9554	9367	8497

*Standard errors in parentheses, * p<0.10 ** p<0.05 *** p<0.01*

OLS Regression. See Appendix A for more details on independent and dependent variable.

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