

Voters' Abilities to Cast their Votes as Intended

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National Science Foundation grant 0306698
Carnegie Corporation grant D05008



Selected Voting Tasks

- Vote for candidates for 18 offices and 4 ballot questions
- Vote for 2 candidates in a multi-candidate election
- Change a vote
- Cast a write-in vote

Accuracy Measures

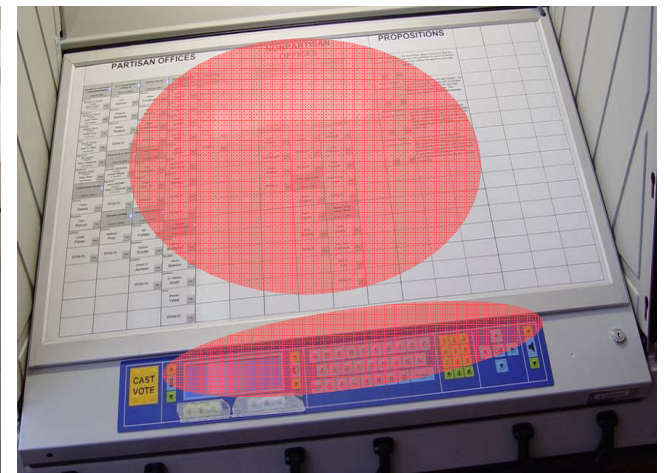
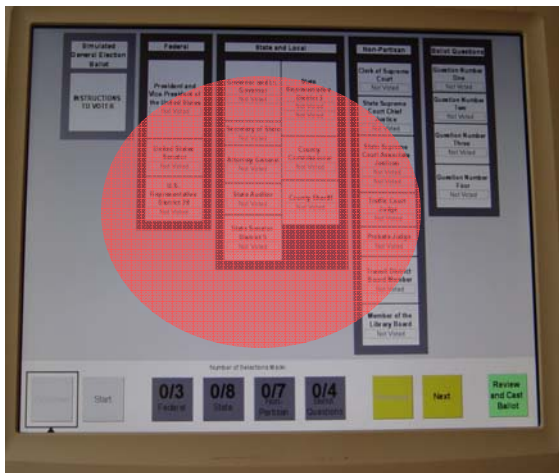
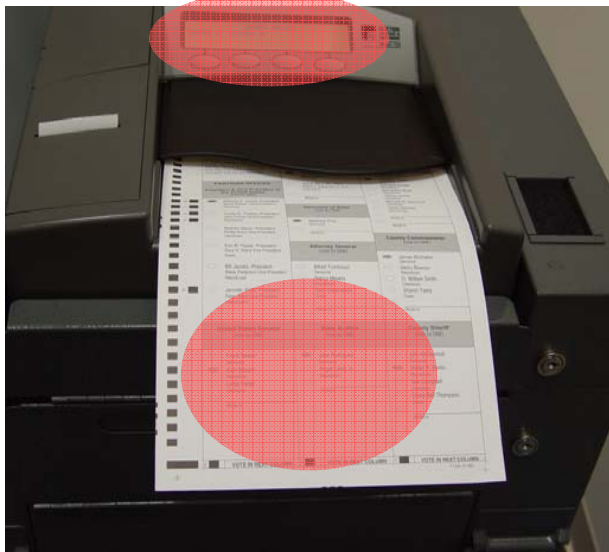
- Correct Vote
 - Selection matches candidate circled in voting booklet (cue sheet)
- Types of voting errors
 - Vote incorrectly cast for the candidate listed before or after candidate circled (“proximity error”)
 - Vote cast for some other candidate
 - No vote cast
 - Write-in incorrectly cast

Voting Accuracy and Errors

Vote for President

Percent of votes	ES&S Model 100	Diebold AccuVote-TS	Avante Vote-Trakker	Zoomable Prototype	Hart InterCivic eSlate	Nedap LibertyVote
Voted as intended	95.8	96.7	96.7	97.5	96.3	96.3
Proximity error	3.0	2.4	2.2	1.4	2.4	2.4
Voted for another candidate	1.0	0.4	1.0	0.5	0.4	0.5
No vote cast	0.2	0.5	0.1	0.6	0.9	0.8

Features Criticized



Impact of Voting Tasks on Errors

(Office-bloc, without Straight-Party Feature)

<u>Task</u>	ES&S Model 100	Diebold AccuVote TS	Avante Vote Trakker	Zoomable Prototype	Hart InterCivic eSlate	Nedap Liberty Vote
<i>No Special Tasks</i>	97.4	97.7	97.5	97.6	97.1	97.5
<i>Vote for Two</i>	96.5	95.7	93.5	96.6	86.6	94.6
<i>Change Vote (Probate Judge)</i>	89.6	93.9	85.6	92.8	92.0	90.7

Impact of Voting Tasks on Errors

(Straight-Party Feature)

<u>Task</u>	ES&S Model 100	Diebold AccuVote TS	Avante Vote Trakker	Zoomable Prototype	Hart InterCivic eSlate	Nedap Liberty Vote*
<i>No Special Tasks</i>	94.9	95.5	94.4	95.7	95.4	92.0
<i>Vote for Two</i>	92.5	94.4	84.3	94.6	84.4	90.4
<i>Change Vote (Probate Judge)</i>	84.0	87.5	79.5	90.5	87.5	85.7

*Nedap used party column ballot.

Number of Errors Voters Make

	ES&S Model 100	Diebold AccuVote- TS	Avante Vote- Trakker	Zoomable prototype	Hart Inter- Civic eSlate	Nedap Liberty Vote
Office bloc ballot						
0	80.2	78.5	78.2	79.9	75.0	80.4
1	11.9	14.7	13.6	12.8	15.9	11.0
≥ 2	7.9	6.8	8.2	7.3	9.1	8.6
Straight-party feature ballot						
0	71.4	74.7	60.7	72.4	73.4	61.7*
1	16.8	14.6	14.9	17.0	15.7	16.9
≥ 2	11.8	10.7	24.4	10.6	10.9	21.4

*Nedap used party column ballot.

INSTRUCTIONS TO VOTER 1. To vote, completely blacken the CIRCLE (?) to the LEFT of the candidate. Do not vote for more than the authorized number of candidates. 2. Use only the #2 pencil provided. 3. To vote for a person whose name is not on the ballot, write in the candidate's name on the Write-In line AND completely blacken the CIRCLE (?) to the LEFT of your choice. 4. If you make a mistake while voting, return the ballot to the election official for a new one. A vote that has been erased or changed will not be counted.	United States Senator (Vote for ONE.) <input type="radio"/> Frank Searer Democrat <input type="radio"/> Alan Slocum Republican <input type="radio"/> Linda Fisher Libertarian <input type="radio"/> Write-In	State Auditor (Vote for ONE.) <input type="radio"/> Jose Rodriguez Democrat <input type="radio"/> Roger Laird, Jr. Republican <input type="radio"/> Write-In	
	U. S. Representative District 28 (Vote for ONE.) <input type="radio"/> Larry Herman Democrat <input type="radio"/> Rebecca Rehberg Republican <input type="radio"/> William Petelos Natural Law <input type="radio"/> Write-In	State Senator District 5 (Vote for ONE.) <input type="radio"/> Bill Forbes Democrat <input type="radio"/> Victoria Snyder Republican <input type="radio"/> Joseph A. Jackson Libertarian <input type="radio"/> Write-In	State Representative District 3 (Vote for no more than TWO.) <input type="radio"/> Cheryl Adams Democrat <input type="radio"/> Jonathan Davic Democrat <input type="radio"/> Leonard Arnold Republican <input type="radio"/> Samantha Bolin Republican <input type="radio"/> Jeffrey Jones Libertarian <input type="radio"/> Michael R. McCloud Libertarian <input type="radio"/> Helen Barclay Natural Law <input type="radio"/> Write-In
	Governor & Lt. Governor (Vote for ONE.) <input type="radio"/> Conrad Schweitzer--Gov. Democrat <input type="radio"/> James Milligan--Lt. Gov. Democrat <input type="radio"/> Joyce McGrath--Gov. Republican <input type="radio"/> Ethan J. Edwards--Lt. Gov. Republican <input type="radio"/> Write-In	State Representative District 3 (Vote for no more than TWO.) <input type="radio"/> Cheryl Adams Democrat <input type="radio"/> Jonathan Davic Democrat <input type="radio"/> Leonard Arnold Republican <input type="radio"/> Samantha Bolin Republican <input type="radio"/> Jeffrey Jones Libertarian <input type="radio"/> Michael R. McCloud Libertarian <input type="radio"/> Helen Barclay Natural Law <input type="radio"/> Write-In	Secretary of State (Vote for ONE.) <input type="radio"/> Matthew Prior Democrat <input type="radio"/> Write-In
	PARTISAN OFFICES President & Vice-President of the United States (Vote for ONE.) <input type="radio"/> Edward Z. Jones--President Democrat <input type="radio"/> Steve Kaiser--Vice-President Democrat <input type="radio"/> Curtis G. Tucker--President Republican <input type="radio"/> John Fisher--Vice-President Republican <input type="radio"/> Nathan Davis--President Libertarian <input type="radio"/> Phillip Knox--Vice-President Libertarian	Attorney General <input type="radio"/> Write-In	<input type="radio"/> Write-In

4. If you make a mistake while voting, return the ballot to the election official for a new one. A vote that has been erased or changed will not be counted. 5. To vote for every candidate of one party, blacken the CIRCLE (●) to the LEFT of the name of the party for which you wish to vote. To vote for non-partisan offices, blacken the CIRCLE (●) to the LEFT of the candidate for whom you wish to vote.	U. S. Representative District 28 (Vote for ONE.) <input type="radio"/> Larry Herman Democrat <input type="radio"/> Rebecca Rehberg Republican <input type="radio"/> William Petelos Natural Law <input type="radio"/> Write-In	<input type="radio"/> Bill Forbes Democrat <input type="radio"/> Victoria Snyder Republican <input type="radio"/> Joseph A. Jackson Libertarian <input type="radio"/> Write-In
STRAIGHT PARTY VOTING <input type="radio"/> Democratic Party <input type="radio"/> Republican Party <input type="radio"/> Libertarian Party <input type="radio"/> Green Party <input type="radio"/> Natural Law Party	Governor & Lt. Governor (Vote for ONE.) <input type="radio"/> Conrad Schweitzer--Gov. Democrat <input type="radio"/> James Milligan--Lt. Gov. Democrat <input type="radio"/> Joyce McGrath--Gov. Republican <input type="radio"/> Ethan J. Edwards--Lt. Gov. Republican <input type="radio"/> Write-In	State Representative District 3 (Vote for no more than TWO.) <input type="radio"/> Cheryl Adams Democrat <input type="radio"/> Jonathan Davic Democrat <input type="radio"/> Leonard Arnold Republican <input type="radio"/> Samantha Bolin Republican <input type="radio"/> Jeffrey Jones Libertarian <input type="radio"/> Michael R. McCloud Libertarian <input type="radio"/> Helen Barclay Natural Law <input type="radio"/> Write-In
PARTISAN OFFICES President & Vice-President of the United States (Vote for ONE.) <input type="radio"/> Edward Z. Jones--President Democrat <input type="radio"/> Steve Kaiser--Vice-President Democrat <input type="radio"/> Curtis G. Tucker--President Republican <input type="radio"/> John Fisher--Vice-President Republican <input type="radio"/> Nathan Davis--President Libertarian <input type="radio"/> Phillip Knox--Vice-President Libertarian	Secretary of State (Vote for ONE.) <input type="radio"/> Matthew Prior Democrat <input type="radio"/> Write-In	<input type="radio"/> Write-In
Attorney General <input type="radio"/> Write-In	<input type="radio"/> Write-In	<input type="radio"/> Write-In

Sources of confusion

Least problematic

PARTISAN OFFICES President & Vice-President of The United States (Vote for ONE.) <input type="radio"/> Edward Z. Jones -- President Democrat <input type="radio"/> Steve Kaiser -- Vice-President Democrat <input type="radio"/> Curtis G. Tucker -- President Republican <input type="radio"/> John Fisher -- Vice-President Republican <input type="radio"/> Nathan Davis -- President Libertarian <input type="radio"/> Phillip Knox -- Vice-President Libertarian		
United States Senator (Vote for ONE.) <input type="radio"/> Frank Searer Democrat <input type="radio"/> Alan Slocum Republican <input type="radio"/> Linda Fisher Libertarian		
United States Representative District 28 (Vote for ONE.) <input type="radio"/> Larry Herman Democrat <input type="radio"/> Rebecca Rehberg Republican		

A Comparison of Errors

- Residual votes (overvotes, uncast votes, and uncountable ballots)
 - About 2% of voters had a residual vote for president in 2000 (Caltech/MIT).
- Voting for the wrong candidate
 - More than 2.5% of voters in our field experiments voted for the wrong candidate for president
 - More serious error – the preferred candidate loses a vote and the opponent gains a vote

Errors Associated with Write-Ins

Percent of ballots	ES&S Model 100	Diebold AccuVote-TS	Avante Vote-Trakker	Zoomable Prototype	Hart InterCivic eSlate	Nedap LibertyVote
Perfect	70.2	90.7	92.2	89.3	86.2	88.2
Error in writing in name	1.7	6.3	4.3	8.1	10.6	8.1
UNLIKELY TO BE COUNTED	28.1	3.0	3.5	2.6	3.2	3.7
No vote cast	1.0	0.9	0.8	0.9	1.3	2.6
Other Cand.	2.0	1.7	2.4	1.4	1.7	0.4
Bubble not filled	25.0	na	na	na	na	na

Voter Characteristics and Accuracy

- Significant evidence of the digital divide
 - Computer usage
 - Education
 - Age
 - English as primary language
 - Race/ethnicity
- Strength of partisanship
- Prior voting experience had no impact
- Straight-party device → increased errors

Conclusions

- Voting technology and ballot styles influence voters' abilities to cast their votes as intended
- Voting for the wrong candidate is the most frequent and most serious error
- Optical scan systems pose problems with write-ins
- Voter characteristics influence voting accuracy

For More Information

- www.capc.umd.edu

Thank you!