

Straight-Party Voting: What Do Voters Think?

Bryan A. Campbell and Michael D. Byrne

Abstract—One of the options available to a sizable minority of U.S. voters is the ability to, with a single action, cast votes in multiple races; this is termed straight-party voting (SPV). SPV is implemented inconsistently across the U.S. and this may result in voter confusion, threatening the integrity of elections. We presented survey respondents with multiple SPV scenarios, testing both their understanding of SPV-marked ballots and their likelihood of using SPV to make multiple selections on a ballot. Participants were also asked their opinions on how SPV ought to work. Voters had significant difficulty in interpreting SPV ballots and were reluctant to generate them, though this was improved when ballots had more clear and detailed instructions. Participants also tended to believe that SPV should not work the way they believed it had worked on ballots they had previously seen. Overall, our results suggest that SPV is a likely cause of voter confusion, suggesting further research on the usability of straight-party voting systems.

Index Terms—Effectiveness, efficiency, human factors, mental model, straight party, straight ticket, usability, voting.

I. INTRODUCTION

A. Voting Usability

EVEN if a voting system were perfectly secure, perfectly reliable, and perfectly anonymous, the voting system would be seriously compromised if it did not accurately capture voter intent. How could a system meeting these criteria still fail to do so? By failing in terms of usability. Although increasing in frequency, voting system usability research is woefully lacking. The research presented here attempts to expand our fundamental knowledge of voting system usability to a particularly understudied area of voting known as straight-party voting. Only when we have a sufficiently large foundation of knowledge about voting system usability, in coordination with security and reliability efforts, will we be able to properly inform future generations of these technologies.

To date, voting system security has captured much of the U.S. national spotlight; and for good reasons, voting system security and reliability are vital to election integrity. However, voting system usability is an essential part of this equation. A perfectly secure, but unusable voting system, one failing to account for those who must use them, can seriously compromise the soundness of an election. We have already seen several examples of how this can occur.

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The authors are with the Psychology Department, Rice University, Houston, TX 77005 USA (e-mail: bryan.campbell@rice.edu; e-mail: byrne@rice.edu).

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The now-infamous “butterfly ballot” calamity in the 2000 U.S. Presidential election caused a certain amount of public outcry about usability in elections and was a factor in the introduction of new legislation—the 2002 Help America Vote Act, or HAVA—designed to improve the voting experience [1]. Motivated by HAVA, many U.S. counties discarded older punch card and lever-based systems in favor of optically scanned paper and direct recording electronic (DRE) voting systems [2]. However, the rush for newer voting systems was not backed with knowledge of behavioral science and usability of voting systems remains an under-studied problem. Yet, we know that factors like poor ballot design can lead to serious questions about election integrity. The Brennan Center for Justice published a report in 2008 that details at some length the effect bad ballot design has had on numerous recent election results. In almost every case they report, the residual vote rate¹ was *higher* than the margin of victory. In many cases, the unusually high residual vote rate could be attributed to poor ballot design [3]. Poor interaction design may have its own consequences. Allowing direct navigation in DREs has been shown to dramatically increase undervoting [4] and requiring voters to deselect before changing a selection has been shown to cause confusion amongst voters [5].

B. Straight-Party Voting

Although on the decline in the United States, as of the 2008 Presidential Election (November 4th, 2008), 16 states² still offered straight-party voting (SPV) as a provision on their ballots [6]. Those states that offered SPV were Alabama, Indiana, Iowa, Kentucky, Michigan, New Jersey, New Mexico, North Carolina, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Texas, Utah, West Virginia, and Wisconsin. Straight-party voting, also known as straight-ticket voting, for our purposes is characterized as the ability to or the option of making a *single* choice on a ballot that has the same effect as individually marking or individually selecting all the partisan candidates of a given political party on a given ballot.

On its surface, SPV appears to be one way to satisfy the National Institute of Standards and Technology’s (NIST’s) recommended [7] use of the International Organization for Standardization’s (ISO’s) usability metric of efficiency [8], defined in the voting context by NIST as time on task. By allowing the voter the opportunity to make a single selection, which replaces making potentially many selections, SPV carries the ability to effectively shorten a given ballot. This is a problem peculiar to many U.S. elections where in some jurisdictions ballots regularly contain 30, 40, or more races. One can easily see how this might help alleviate long lines and wait times at polling places.

¹Residual votes are the difference between voter turnout and the number of valid ballots tallied at the end of the election. Residual vote rates can be calculated as a function of the entire ballot or individual races [3].

²According to the National Conference of State Legislatures, five states—Georgia, Illinois, Missouri, New Hampshire, and South Dakota—have eliminated the straight-party provision since 1994 [6].

Unfortunately, there is no hard evidence showing that SPV actually has such effects; face validity alone is not enough. Furthermore, there may be serious costs associated with this practice. As early as 1989, it had been noted that the concept of SPV is a potentially confusing one for voters. Darcy and Schneider [9] observed unusually high roll-off rates for a state-level partisan race that was not included in a straight-party vote. They asserted that several ballot characteristics, particularly the straight-party provision, were potentially confusing and perhaps contributing factors. Similarly, Nichols [10] noted that the straight-party provision can be confusing as voters may presume no further action is required once a straight-party vote has been made. This is a potentially serious problem. Voters who do not realize that non-partisan races, local races (e.g., city council), or propositions may not be included in a straight-party vote may end up being disenfranchised.

It may be that the source of voter confusion concerning SPV stems from the lack of clear and thorough instructions. Neimi and Herrnson [11] make reference to several ballot examples that exhibit ambiguous, conflicting, and blatantly contradictory instruction sets. They recommend both uniformity and clarity in SPV instruction sets.

Redish [12] describes at length the inconsistency between the instructions found within both DRE and paper ballot voting technologies and the “best practices in giving instructions.” The Redish report is in essence an expert usability review of instructional language use in ballot design. Redish details several occasions where (on both DRE and paper ballots) the straight-party provision is poorly explained or, worse, not explained at all. The problem with this practice as Redish describes is:

When you leave out the explanation [of straight-party voting], you must be assuming that everyone who comes to vote understands the concept without any explanation. Is that a valid assumption? [13]

Redish followed up on the instructional language review and presented a set of 20 specific guidelines for clear instructional writing in ballot design [13]. The guidelines Redish created were based heavily on the previous ballot language review. However, of particular interest in this document, Redish makes an explicit call for more research to identify if voters understand the meaning of the term “Straight Ticket.” Further, Redish *et al.* [5] reported to NIST the findings of a user study on plain language ballot instructions. The primary focus of this study was on the effect of plain language in ballot design; however, their ballot did include an SPV provision. The SPV provision, particularly changing a post straight-party vote selection, was identified as a source of voter confusion. In their report to NIST, Redish *et al.* [5] recommend removing the SPV provision from ballots. Though the authors admit the SPV instructions they used could have been even more clear, they conclude that plain language was able to help voters understand the straight-party provision, however, it was not able to eliminate a majority of the confusion they observed. SPV itself appears to be inherently confusing. We believe the present work is a step toward understanding the source of this voter confusion. By understanding the mental model voters have of the SPV provision, we can better inform its design and implementation.

C. Mental Models

The question such usability issues raise is: what mental model do voters have for SPV? There are several definitions of the term *mental model* found within the cognitive science and human-computer interaction literature; however, there appears to be little convergence on what the exact definition may be [14]–[18]. As such, and for the purposes of this research, we will adopt a definition of the term *mental model* that most closely resembles that of Halasz and Moran [14]. By *mental model* we mean the specific cognitive representation a voter generates regarding how SPV operates on and within a given ballot design. In particular, we are interested in how voters understand ballots cast using SPV, and how voters would generate their own ballots using SPV. Knowing the mental model voters adopt when confronted with the option to cast a straight-party vote allows for the future ascertainment of baseline, SPV performance (e.g., accuracy and efficiency). By systematically deviating from this mental model, a determination of how specific ballot design choices may affect voting performance can be generated which would then allow specific recommendations to be made.

In this research, we investigated the mental model voters have of the SPV provision based solely on paper-style ballot implementations of the provision. As such, this does not provide any assurance that the mental model we propose is generalizable across all voting technologies (e.g., DRE systems). However, systematic comparisons between voting technologies require a starting point. We cannot begin to understand how SPV implementations in DREs may affect voting performance without first understanding how voters understand SPV in the now more-common optical scan paper voting methods [2].

II. METHOD

To understand the mental model voters have of the SPV provision, we recruited eligible voters to participate in an online, web-based survey of SPV. Our participants were shown actual sample ballots from four of the 16 U.S. states that allowed SPV as of the 2008 U.S. Presidential election. We asked our participants a series of questions about the presented ballots and, described in more detail below, the answers to those questions were used to gauge how participants believed the straight-party provision worked. In addition to the ballot questionnaires, self-reported demographic and prior voting experience data were collected on our participants and used in the analysis that follows.

A. Participants

Participants were recruited via online and printed advertisements as well as by an extensive word-of-mouth campaign. The only requirement of participation was being 18 years of age or older. Overall, 120 participants responded to our web-based survey. Completed surveys were eligible for entry into a raffle for 1 of 5 \$20 gift cards to a national retail chain. The mean age of our respondents was 30.09 (SD = 13.61, $N = 96$) years. Sixty-three (63) were female, 33 were male, and 24 were of an unknown gender and unknown age. A mean age of 30 years is low when considering the only age requirement to vote in the United States is being 18 years of age or older. This may be

TABLE I
NUMBER OF SURVEY PARTICIPANTS IN EACH SURVEY SECTION. ONLY 95 OF THE 120 SURVEYS COLLECTED WERE COMPLETED THROUGH ALL 5 SECTIONS. ONE PERSON COMPLETED ALL THE SECTIONS EXCEPT FOR SECTION 1 (THE FIRST SECTION SEEN) WHILE ANOTHER COMPLETED ALL THE SECTIONS EXCEPT FOR SECTION 2 (WE PRESUME THIS WAS AN ERROR IN THE ELECTRONIC DATA COLLECTION)

Section	Description	Number of Participants
1	Alabama ballot	$N = 119$
2	Kentucky ballot	$N = 108$
3	West Virginia ballot	$N = 100$
4	Rhode Island ballot	$N = 97$
5	Demographics	$N = 96$

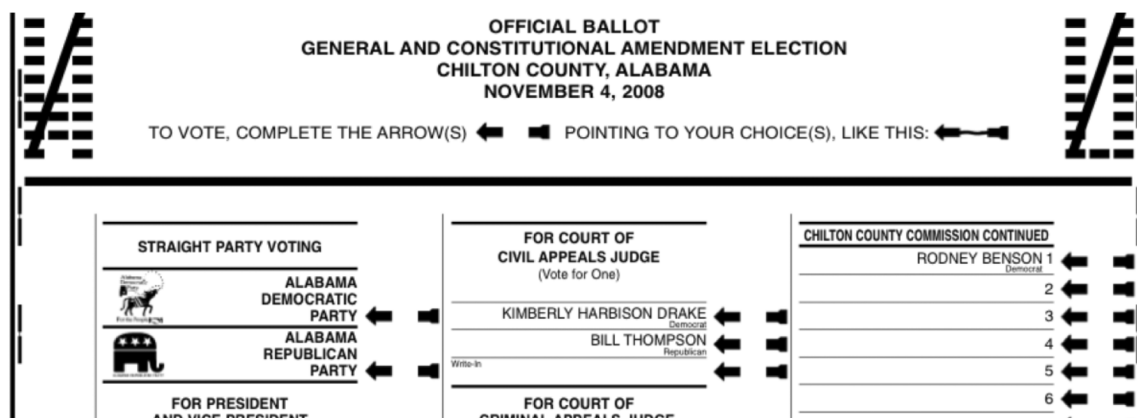


Fig. 1. Alabama ballot.

due to younger voters being more inclined to self-select into a web-based survey; however, presumably due to the delivery method and the length of the survey, not every participant completed the entire survey. Not completely unexpected, there was a roll-off effect. Nearly all of our participants completed Section 1 (seen first) while many fewer participants completed our survey all the way through Sections 4 and 5 (seen last), which, may have contributed to the somewhat low mean age we observed. Table I shows the number of participants who completed each section. The results described below are based on the entire data set, including partial completions, except where otherwise indicated.

Despite the roll-off effect, we observed a fairly diverse set of participants in terms of voting experience. Eleven of our participants reported having voted in more than 10 national elections with the overall mean number of previous national elections being 4.10 ($SD = 5.19$, $N = 96$). In addition to previous national elections, 16 of our participants reported having voted in more than 10 “other” elections (e.g., state or local elections) with the overall mean number of previous non-national elections being 4.19 ($SD = 7.44$, $N = 96$). Thirty-seven of the 96 participants who responded to demographic questions reported currently residing in a U.S. state that, as of the 2008 Presidential election, allowed a straight-party provision. Twenty-four of those 37 resided in Texas. However, previous experience with SPV appeared to be minimal. Only 16 of our 96 demographics respondents reported regularly casting a straight-party vote and on a 10-point Likert scale, with 1 being novice and 10 being expert, the average self-reported rating of experience with SPV was 3.72 ($N = 96$).

B. Materials

Four ballots were chosen from the 16 states that, as of the 2008 Presidential Election, allowed SPV. We examined ballot exemplars of those U.S. states from which we could find

publicly available sample ballots. Ultimately, we chose ballots from counties (or precincts) located in Alabama, Kentucky, West Virginia, and Rhode Island. The ballots chosen from these states were presented “as-is” without any modification or alterations made before presentation to our participants. These straight-party ballots were chosen based on two criteria: 1) their availability for public inspection, usually the Secretary of States’ website [19]–[22] and 2) their degree of instructional comprehensiveness. Instructional comprehensiveness varied a great deal between states. For example, in Alabama, Chilton County’s ballot (Fig. 1) presented the straight-party option without any sort of instruction. In fact, on this ballot there are few instructions of any kind and there is no indication of what actually happens when the straight-party vote selection is made.

In Kentucky, Fayette County’s ballot (Fig. 2) provides some additional ballot instruction for voters but the SPV instructions are vague and somewhat ambiguous. What is particularly interesting about the Kentucky ballot, however, is the instructions for SPV actually imply a question that neither the ballot nor the instructions address. That is, to which contests does SPV apply? Specifically, are there races on this ballot to which an SPV does not apply? This is not without precedent. In the 2008 Presidential Election, the North Carolina ballot included a straight-party provision that did *not* in fact include the Presidential race but rather, only all non-Presidential partisan races. North Carolina’s ballot has operated this way for some time [11] and may likely be a contributor to North Carolina’s rather high Presidential undervote rate [23]. However, the Kentucky ballot’s instructions remain silent on this issue despite its critical implication.

In West Virginia, Lewis County’s ballot (Fig. 3) provides a greater degree of SPV instruction as compared to the two previous ballots. Not only does this ballot explain how to cast a straight-party vote, it also provides the answer to two “what if”


OFFICIAL BALLOT FOR FAYETTE COUNTY GENERAL ELECTION HELD ON November 04, 2008			Precinct AB-001
Instruction Text: Please use a black or blue pen to mark your ballot. To vote for your choice in each contest, completely fill in the box provided to the left of your choice. STRAIGHT PARTY Voting for a party automatically marks all candidates of that party in contests where straight-party voting is allowed.  <input type="checkbox"/> Republican Party <input type="checkbox"/> Democratic Party <input type="checkbox"/> Constitution Party <input type="checkbox"/> Libertarian Party	STATE REPRESENTATIVE 39th Representative District (Vote for One) <input type="checkbox"/> Chris W. MOORE REP <input type="checkbox"/> Robert R. DAMRON DEM <input type="checkbox"/> Write-in _____	NONPARTISAN "SCHOOL CANDIDATES" FAYETTE COUNTY BOARD of EDUCATION Educational Division 5 (Vote for One) <input type="checkbox"/> Rebecca "Becky" SAGAN NP <input type="checkbox"/> Write-in _____	
	NONPARTISAN JUDICIAL BALLOT (Vote for One in Each Division)		
	JUSTICE of the SUPREME COURT 5th Supreme Court District (Vote for One) <input type="checkbox"/> Mary C. NOBLE NP <input type="checkbox"/> Write-in _____		
	CIRCUIT JUDGE 22nd Judicial Circuit		
SOIL and WATER CONSERVATION DISTRICT SUPERVISOR (Vote for Four) <input type="checkbox"/> Larry D. SWETNAM NP <input type="checkbox"/> Kenneth CROPPER JR. NP <input type="checkbox"/> Lillie MILLER-JOHNSON NP <input type="checkbox"/> Teresa J. HANCOCK NP			

Fig. 2. Kentucky ballot.

A	LEWIS COUNTY, WV	B	GENERAL ELECTION	C	NOVEMBER 4, 2008
OFFICIAL BALLOT INSTRUCTIONS TO VOTER 1. To vote you must darken the oval (●) completely next to the candidate or issue of your choice. STRAIGHT TICKET VOTERS: "IF YOU MARKED A STRAIGHT TICKET: When you mark any individual candidate in a different party, that vote will override your straight party vote for that office. When you mark any individual candidate in a different party for an office where more than one will be elected, YOU MUST MARK EACH OF YOUR CHOICES FOR THAT OFFICE because your straight ticket vote will not be counted for that office."		NATIONAL TICKET FOR U.S. SENATOR (Vote For ONE) <input type="radio"/> JAY WOLFE REP Salem Harrison Co. <input type="radio"/> JAY ROCKEFELLER DEM Charleston Kanawha Co. <input type="radio"/> NO CANDIDATE(S) FILED MTN <input type="radio"/> Write-in _____ FOR U.S. HOUSE OF REPRESENTATIVES 2nd Congressional District (Vote For ONE) <input type="radio"/> SHELLEY MOORE CAPITO REP Charleston Kanawha Co.			
		STATE TICKET FOR TREASURER (Vote For ONE) <input type="radio"/> NO CANDIDATE(S) NOMINATED REP <input type="radio"/> JOHN D. PERDUE DEM Cross Lanes Kanawha Co. <input type="radio"/> NO CANDIDATE(S) NOMINATED MTN <input type="radio"/> Write-in _____ FOR COMMISSIONER OF AGRICULTURE (Vote For ONE) <input type="radio"/> J. MICHAEL TEETS REP Lost River Hardy Co. <input type="radio"/> GUS R. DOUGLASS DEM Leon Mason Co.			

Fig. 3. West Virginia ballot.




questions. The first of these questions is, what happens when a voter makes a straight-party mark and later marks a candidate for an opposing party (a cross-vote)? The second question is, what happens when a voter makes a straight-party mark in a race that allows k of n votes (i.e., allows multiple votes in one race)? Despite the more thorough instruction set, the formatting and peculiar use of all uppercase type, make the instructions confusing, awkward to read, and in all likelihood, difficult to comprehend [5].




In Rhode Island, the Town of Bristol's ballot (Fig. 4) provides a fairly comprehensive set of voting instructions. Rhode Island's ballot includes clear instruction for not only how to vote generally but also how to use the straight-party provision. Included in the SPV instructions are the answers to both questions raised when examining the West Virginia ballot (i.e., cross-votes and k of n voting). In addition to the instruction provided on the ballot, the Rhode Island Secretary of State's office published a voter guide,³ an excerpt of which is provided in Appendix I [21].

³This is not to imply that any other jurisdiction did not provide their voters with voting guides. However, the Rhode Island voter guide was readily available and we felt it warranted including the relevant section of this voter guide in our study as an extension of the on-ballot instructions.

In Rhode Island's voter guide, instructions for casting a straight-party vote are clearly and comprehensively spelled out. The voter guide addresses the issues raised with the Alabama, Kentucky, and West Virginia ballots while addressing an additional concern that might arise. Namely, the voter guide clearly states that SPV only applies to the partisan races on this ballot, and that if the voter forgets to cast a specific vote in these races, their potential vote may be recorded as a "no-vote," known officially as an undervote.

After briefly reviewing these ballot designs, several questions about SPV begin to emerge: How do voters know for whom a vote is received when the ballot contains no instructions? Does SPV apply to every race on the ballot, just the partisan races, or some hybrid combination? What happens when voters make a cross-party mark after making a straight-party mark? For whom do voters believe receive a vote when a straight-party mark is made and more than one candidate in a given race can receive a vote? What happens when a straight-party vote is cast but further down the ballot a write-in choice was made for a partisan race? Answering all such questions is beyond the scope of the present study. In this research we ask two related questions concerning SPV: 1) How do voters think SPV *actually* works? 2) How do

1. To vote:
Complete the arrow(s)   pointing to your choice(s) with a single bold line, like this .

2. To vote for a write-in candidate:
Print the name of the person on the blank line labeled "Write-In" for the office and complete the arrow   pointing to your write-in choice like this .

3. To cast a straight party vote:
Complete the arrow pointing to the party of your choice in the straight party section of the ballot. If you cast a straight party vote and also vote for an individual candidate or candidates for a certain office on the ballot, the straight party vote will not be counted for that office and only the individual candidate or candidates voted for will be counted for that office.

STRAIGHT PARTY

To vote a "Straight Ticket" complete the arrow pointing to the party of your choice.

**SENATOR IN
GENERAL ASSEMBLY
DISTRICT 11
TWO Year Term**

**TOWN COUNCIL
TWO Year Term**

Vote for any 5

Fig. 4. Rhode Island ballot.

1. Please place a mark next to the candidate names below you believe would be tallied if you completed the Democratic Party 'Straight Party Voting' arrow on this ballot **AND** made **NO** other marks on the ballot.

<p>___ Barack Obama & Joe Biden (D) (President & Vice President)</p> <p>___ John McCain & Sarah Palin (R) (President & Vice President)</p> <p>___ Kimberly Drake (D) (Court of Civil Appeals Judge)</p> <p>___ Bill Thompson (R) (Court of Civil Appeals Judge)</p>	<p>___ Aimee Smith (D) (Court of Criminal Appeals Judge, PL 2)</p> <p>___ Mary Windom (R) (Court of Criminal Appeals Judge, PL 2)</p> <p>___ Judy Bell (D) (Member, State Board of Education)</p> <p>___ Stephanie Bell (R) (Member, State Board of Education)</p>
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2. Please place a check mark next to the candidate names below you believe would be tallied if you completed the Republican Party 'Straight Party Voting' arrow on this ballot **AND** completed the arrow for Kimberly Drake, a Democrat, in the race for Court of Civil Appeals Judge.

<p>___ Barack Obama & Joe Biden (D) (President & Vice President)</p> <p>___ John McCain & Sarah Palin (R) (President & Vice President)</p> <p>___ Kimberly Drake (D) (Court of Civil Appeals Judge)</p> <p>___ Bill Thompson (R) (Court of Civil Appeals Judge)</p>	<p>___ Aimee Smith (D) (Court of Criminal Appeals Judge, PL 2)</p> <p>___ Mary Windom (R) (Court of Criminal Appeals Judge, PL 2)</p> <p>___ Judy Bell (D) (Member, State Board of Education)</p> <p>___ Stephanie Bell (R) (Member, State Board of Education)</p>
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Fig. 5. Example scenario put forth to participants. Shown are the Alabama scenarios.

voters think SPV *should* work? Or, in other words, what is the voters' mental model of SPV?

C. Design and Procedure

The survey was published entirely online in an effort to be accessible to as diverse a selection of eligible voters as possible. The survey consisted of four primary sections (divided by state) that were further divided into two subsections. Each ballot described above was presented, in its entirety, to participants in the same order they were presented earlier (i.e., Alabama, Kentucky, West Virginia, and Rhode Island); however, the order of the ballots was not counterbalanced.

We decided the most practical approach to understanding our participants' mental model of SPV should be three-part. In part one, we wanted to determine who, from a given set of candidates, participants believed would have a vote tallied for them if they chose the straight-party option. In part two, we

wanted to determine how our participants would complete the ballot on their own in order to satisfy a list of outcomes we provided in which all the candidates within were to receive a vote. In part three, we asked participants how they thought SPV should work.

In part one of the survey, we presented our participants with two separate SPV scenarios with a list of ballot-specific candidates attached to them. From this list, we measured the number of participants who thought a given candidate would receive a tally. Comparisons were made between the two scenarios (Fig. 5). In scenario one, a straight-party mark has been made and no other mark on the ballot has been made. In scenario two, a straight-party mark has been made and in addition, a cross-vote has been made. A cross-vote can be defined as a vote for a candidate of a political party other than the straight-party mark's political party.

In part two of the survey, two lists of ballot-specific candidates were presented to participants who were then asked how

3. List A:

1. **Barack Obama and Joe Biden (D)**
(President & Vice President)
2. **Jeff Sessions (D)**
(United States Senator)
3. **Deborah Paeur (D)**
(Associate Justice of the Supreme Court)
4. **Judy Bell (D)**
(Member, State Board of Education)
5. **Greg Moore (R)**
(Chilton County Commission)
6. **Tim Mims (I)**
(Chilton County Commission)

In order to vote the candidates in List A using the ballot above, I would...

... complete the arrow next to _____	... complete the arrow next to _____
... complete the arrow next to _____	... complete the arrow next to _____
... complete the arrow next to _____	... complete the arrow next to _____
... complete the arrow next to _____	... complete the arrow next to _____
... complete the arrow next to _____	... complete the arrow next to _____
... complete the arrow next to _____	... complete the arrow next to _____

Fig. 6. An example list of candidates participants were asked to vote for in part two of the survey. Shown are candidates from the Alabama ballot (see Appendix II). The primarily Democratic list is shown here. The primarily Republican list is not shown due to space limitations.

they would complete the ballot in order to satisfy each candidate on the list receiving a tally. Comparisons of straight-party provision use were made between states. We developed two sets of candidate lists based on the content found within each ballot (see Appendix II for an example ballot). A primarily Republican list and a primarily Democratic list were compiled and both lists were presented to our participants (Fig. 6). We asked our participants how they would complete the ballot in order to satisfy casting a vote for *all* candidates on the given list. Twelve response options were provided for participants to type in the candidate names and participants were told they did not need to necessarily complete all twelve-response options. An instructional example (not shown) was provided immediately prior to the two lists.

III. RESULTS

The nature of the content within each question (from each of the ballots) is certainly political in nature and a possible cause for concern. Therefore, as a result, the political party (Republican or Democrat) that dominated the content of a specific question was alternated between questions and between state ballots; however, this order was counterbalanced.

A. Survey Data: Part I

As described above, in the first part of our survey (for each state section) we wanted to know from a given set of candidates who our participants thought would receive a tally if the straight-party mark had been made on the ballot (Fig. 5). In the first scenario provided, we indicated that a straight-party mark had been made and no other mark had been made on the ballot. Participants responded fairly consistently in scenario one. By and large our participants thought the candidates who belonged to the same political party as the straight-party mark would receive a tally. Table II shows the results from scenario one in the Alabama state section of our survey. It is important to note that in Table II only the Democratic candidates represent correct responses. Selecting the Republican candidate, both candidates, or

neither candidate in this scenario represent incorrect responses. Thus the error rate shown in Table II is quite high. Slightly more than 13% in the three non-Presidential races and nearly 9% in the Presidential race generated incorrect responses. Given the closeness of victories in many elections, this is a somewhat distressing error rate as it would exceed the margin of victory in many races. The scenario one results from the other three state sections (Kentucky, West Virginia, and Rhode Island) were nearly identical and are thus not shown to avoid redundancy.

In the second scenario presented to participants, we asked who would receive a tally if a straight-party mark had been made and later on down the ballot, a cross-vote mark had been made. Participants largely seemed confused by this scenario and rightly so; this is one of the issues we raised previously. In the Alabama, Kentucky, and West Virginia sections of our survey many voters thought the candidate with the same political party as the straight-party mark would receive the tally. However, many participants also thought the candidate with the opposite political party as the straight-party mark would receive the tally. This indicates some confusion amongst our participants. On the Rhode Island ballot, the trend was reversed. More of our participants thought the opposite party would receive the tally than thought the same party would receive the tally (Fig. 7). One possible explanation for these data is the degree of instruction provided along with the ballot. Although its not particularly clear in the Alabama ballot⁴, in the Kentucky, West Virginia, and Rhode Island ballots the straight-party option could in fact be overridden by a cross-vote, or any other mark (e.g., a write-in) in any partisan race. The instructional issues surrounding the Alabama, Kentucky, and West Virginia ballot used in our survey were discussed earlier. It seems, that in the face of uncertainty (through lack of clear instruction), our participants believed a straight-party mark would *cancel out* a cross-vote, or other similar marks. That is, they seemed to believe that the straight-party

⁴Even we did not know exactly how the straight-party option officially worked within the Chilton County, Alabama ballot. It is certainly not clear from the examination of the ballot alone.

TABLE II

ALABAMA STATE SECTION—SCENARIO 1 CANDIDATES. VALUES ARE THE PERCENTAGES OF VOTERS WHO BELIEVED THE CORRESPONDING CANDIDATE WOULD RECEIVE A TALLY IF THE DEMOCRATIC STRAIGHT-PARTY OPTION WAS MARKED AND NO OTHER MARKS WERE MADE ON THE BALLOT

Alabama State Section - Scenario 1 Candidates	Candidate	Both	Neither
Barack Obama & Joe Biden (D) (President & Vice President)	91.6%	0.8%	7.6%
John McCain & Sarah Palin (R) (President & Vice President)	0%		
Kimberly Drake (D) (Court of Civil Appeals Judge)	85.7%	0.8%	12.6%
Bill Thompson (R) (Court of Civil Appeals Judge)	0.8%		
Aimee Smith (D) (Court of Criminal Appeals Judge, PL 2)	86.6%	0%	12.6%
Mary Windom (R) (Court of Criminal Appeals Judge, PL 2)	0.8%		
Judy Bell (D) (Member, State Board of Education)	84%	1.7%	12.6%
Stephanie Bell (R) (Member, State Board of Education)	1.7%		

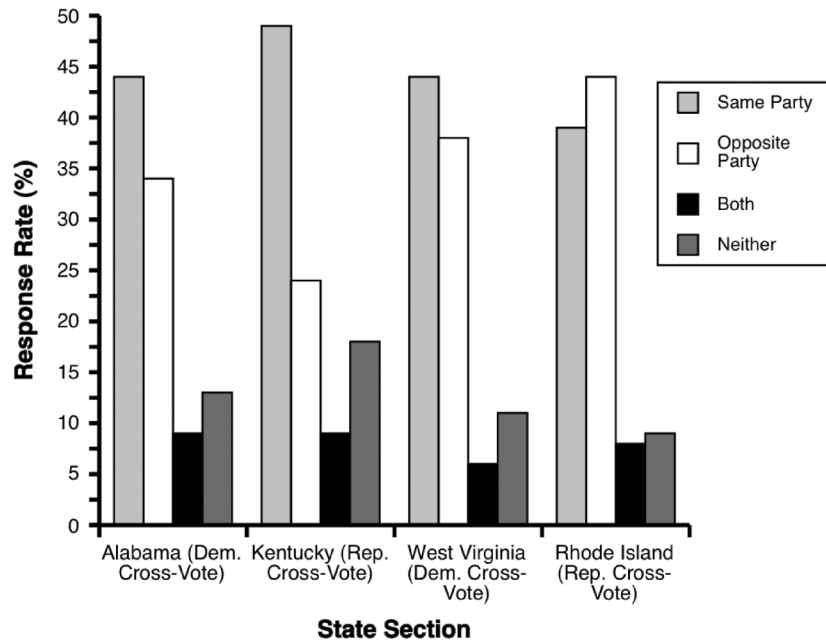


Fig. 7. Rate of responding that the candidate of the same party or the candidate of the opposite party (from the straight-party vote) would receive the tally in the cross-vote scenario. Responding opposite party was the correct response. Several participants responded that both candidates or neither candidate would receive the tally.

mark overrode all other partisan marks on the ballot. However, in face of more clear and thorough instruction (the Rhode Island ballot), it seems our participants believed, rightly so, that the cross-vote candidate would receive the tally. Across both scenarios and all four state sections, voters were incorrect more often in the cross-vote scenario, $F(3,276) = 110.41$, $p < 0.001$. Voters were also more often incorrect in states with less clear instructions, $F(6.36, 584.77) = 2.48$, $p = 0.02$, and this difference was larger in the cross-vote case, $F(9,828) = 3.04$, $p = 0.001$.

B. Survey Data: Part 2

In the second part of our survey, we wanted to know how our participants would complete the ballot on their own in order to tally a vote for every candidate found within a list we provided

(Fig. 6). We collapsed across both these lists described above for the following analyses. Shown in Fig. 8, we discovered that our participants were, overall, reluctant to use the straight-party option. In the Alabama and Kentucky ballots, 38% and 36% of our participants, respectively, utilized the straight-party option. In the West Virginia ballot, 57% of our participants utilized the straight-party option and in Rhode Island the number climbed to 68% of our participants utilizing the straight-party option. The overall difference was statistically reliable, $F(3,282) = 20.34$, $p < 0.001$ with Alabama and Kentucky generating less SPV use than West Virginia and Rhode Island, $F(1,94) = 32.86$, $p < 0.001$.

What is particularly striking about these numbers is that one explanation appears to be that as instructional clarity increased so too did our participants willingness to utilize the straight-

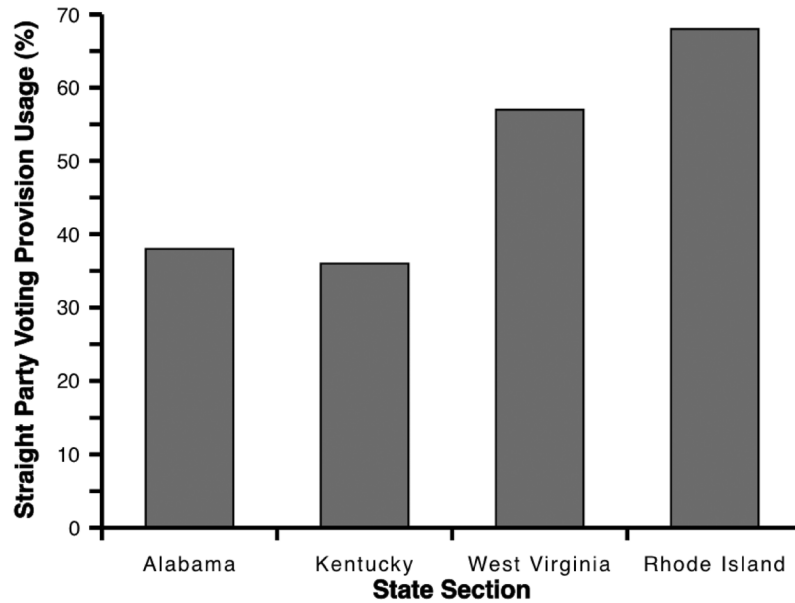


Fig. 8. Percentage of participants who chose to utilize the SPV provision in each state section.

TABLE III
PERCENTAGE OF OPEN-ENDED RESPONSES CATEGORIZED INTO EACH CLASSIFICATION. PERCENTAGES SUM TO 102%, ONE RESPONSE COULD VERY CLEARLY BE CLASSIFIED IN BOTH THE SECOND AND THIRD CATEGORIES. VALUES ARE BASED ON $N = 73$ PARTICIPANT RESPONSES

Classification	Percentage of Responses
1. SPVs mark all partisan candidates by default, which can then be overridden by cross-votes or other marks later on.	44%
2. SPVs mark all partisan candidates regardless of changes or other marks later on.	14%
3. SPVs should be illegal.	15%
4. Confused / Other.	29%

party option. It might be argued that by the time our participants reached the Rhode Island ballot they had been exposed to the word and the concept of SPV many times, and as a result, were more likely to utilize the straight-party option. This might be true especially considering the order of the ballots was not counterbalanced between participants. However, if that were truly the case, one would not expect the utilization of the straight-party provision to remain constant between the Alabama and Kentucky ballots; in fact, there were no observed differences between the straight-party use in Alabama and the straight-party use in Kentucky ($t(105) = 0.50$, $p = 0.62$). Rather one would expect in the Kentucky ballot, straight-party provision utilization would fall in between the utilization found in the Alabama and West Virginia ballots. We suspect that the use of “what if” scenarios in the instructions led to the increased use of the straight-party option.

C. Survey Data: Part 3

In the final part of our survey, rather than relying only on inferences about what our participants thought about SPV, we simply asked them how SPV should work. We grouped the responses according to four general themes we noticed having emerged. Those themes along with the percentage of responses accounted for by each can be seen in Table III.

Nearly half of our participants believed that straight-party votes, should by default, mark all corresponding choices, but that those choices could be overridden by a cross-vote or other mark (such as a write-in) later on. These data are in contrast to the data we obtained in part one of this research. The difference is a subtle but important one. Recall that in part one of our study, we observed that participants using the Alabama, Kentucky, and West Virginia ballots overwhelmingly believed that the candidate that shared the political party of the straight-party mark would be tallied despite being told the candidate of the opposite party had been marked (Fig. 7). Those data showed how our participants believed SPV *actually* worked. Here, the response data shows that our participants believed SPV *should* work quite the opposite, that is, by allowing straight-party votes to be overridden and thus tallying cross-votes and the like.⁵

IV. DISCUSSION

Our data indicates that there is a discontinuity between what is thought about how SPV *should* work and how SPV *actually* works. Participants by majority indicated that they believed straight-party votes *should* work as “default” switches that can

⁵It is worth noting again that this is how straight-party voting actually did work in the Kentucky, West Virginia, and Rhode Island State example ballots.

be overridden later on down the ballot at the behest of the voter. As one respondent noted:

Algorithmically speaking, a straight-party vote should cause all the candidates with the same party to be chosen as an initial state. Then the ballot should be [scanned] for any additional choices in partisan elections. Where such overrides occur, the defaults should be cleared for that [race] and then the overrides should be recorded.

This is in contrast to how participants acted when *actually* confronted with a straight-party mark and cross-vote scenario. In this scenario, we learned that many participants thought SPV would override cross-votes or any other marks on the ballot. Additionally, we also discovered that our participants were overall reluctant to utilize the straight-party option. However, clarity of straight-party instruction appeared to somewhat mitigate this reluctance. This suggests that the mental model voters have of SPV may be somewhat complicated. It may depend on how the question is phrased. This has significant implications for ballot design. SPV provisions should be designed according to how voters believe SPV *should* work, as described above, but one cannot ignore that without proper instruction, a ballot of this design will most likely result in confusion and may inflate error rates.

There are other potential complications surrounding SPV. We have suggested that the discontinuity between how voters believe SPV *actually* works and how voters believe SPV *should* work may be caused by the lack of clarity in on-ballot (or readily accessible) instruction. This is probably not the whole story. Throughout all the ballot samples we reviewed, no two states had the same level of on-ballot instructions and most (with possibly the exception of the Rhode Island sample) would probably not meet Redish's "best practice in giving instructions" criterion [5], [12], [13].

One of the factors that may contribute to voters' difficulty with SPV is the nonuniform way it is implemented. It is likely that state-to-state inconsistency exasperates the confusion among voters, especially given the relative ease of mobility voters enjoy in the United States. Voters experience with one version of SPV may not generalize to others, and those who have moved from a state without SPV to a state using it may find it particularly confusing.

Additionally, we have said little about how the mental model discontinuity we observed may play out in DREs. DREs add another layer of complexity. On a paper ballot, the final state of the marks tells the whole story, but on a DRE the order in which voters take action may impact the outcome. For instance, on some DREs casting a vote in a partisan race and then later selecting a different party in the straight-party option produces a different result than performing those operations in a different order. (In the former case, the original cross-vote is overwritten by the straight-party choice, but not in the latter.) This situation can be even more confusing with more complex action sequences. Suppose a voter selects one party, then selects a cross-vote in some race, then retreats and selects a different party in the straight-party option. Is the original cross-vote re-

tained? Should it be? Answers to questions like these are unclear at best.

There are obvious limitations with survey-based methodology for answering questions like these. The response roll-off was unfortunate, though not unexpected given the length of and delivery method of the survey. In addition, the methodological design was not as balanced as one would have expected in a more traditional user-based survey and like Redish, *et al.* [5], our choice of language use might have been more clear. However, we believe this provides a meaningful starting point for future investigations into usability issues with SPV. Our goal in this research was to describe the mental model voters generate when confronted with the ability to cast a straight-party vote. It seems clear, however, that SPV provisions confuse voters. The question that remains to be answered is, can an SPV provision, designed with voter usability in mind, meet or exceed acceptable performance standards? To better understand this question, and begin formulating its answer, future research should consider generating SPV scenarios which are consistent with and which violate the expectations generated by the mental model we described, and test these scenarios in a mock election scenario.

APPENDIX I

EXCERPT FROM RHODE ISLAND'S VOTER GUIDE CONCERNING STRAIGHT-PARTY VOTING

How do I vote for all the candidates of a single party (a "straight-party" vote)?

You may cast a vote for all the candidates from a single political party for every office all at one time. This is called a "straight-party" vote and is counted the same as if you had separately completed the arrows next to every candidate from that party on the entire ballot. To cast a straight-party vote in the general election, complete the arrow pointing to the party of your choice in the "straight-party" section of the ballot. If you cast a straight-party vote and also vote separately for an individual candidate or candidates for a certain office on the ballot, only the individual party candidate or candidates that you voted for separately will be counted for that office. The straight-party vote will not be counted for that office, but it will still apply in all the offices you do not separately complete.

Reminder about "multiple vote" races and casting straight-party votes.

Races for some local offices allow you to vote for two or more candidates. If you cast a separate vote for an individual candidate in a "multiple-vote" race, your "straight-party vote" will not apply to any candidate in that race. If you intend to vote for more than one candidate in this case, be sure you complete the arrows next to every candidate you wish to vote for in multiple vote races.

Don't forget "nonpartisan" races and questions.

Some elected offices and most questions are "nonpartisan." That means that political parties do not run candidates or take positions on those races. Your straight-party vote does not apply to nonpartisan races or questions. You must vote for the nonpartisan races or questions individually or your ballot will be recorded as a "no vote" on those items.

APPENDIX II
CHILTON COUNTY, ALABAMA'S BALLOT

OFFICIAL BALLOT GENERAL AND CONSTITUTIONAL AMENDMENT ELECTION CHILTON COUNTY, ALABAMA NOVEMBER 4, 2008		
TO VOTE, COMPLETE THE ARROW(S) ← → POINTING TO YOUR CHOICE(S), LIKE THIS: ← →		
<p>STRAIGHT PARTY VOTING</p> <p> ALABAMA DEMOCRATIC PARTY ← →</p> <p> ALABAMA REPUBLICAN PARTY ← →</p> <p>FOR PRESIDENT AND VICE-PRESIDENT OF THE UNITED STATES (Vote for One)</p> <p>BARACK OBAMA ← → JOE BIDEN ← →</p> <p>JOHN McCain ← → SARAH PALIN ← →</p> <p>CHUCK BALDWIN ← → DARRELL L. CASTLE ← →</p> <p>BOB BARR ← → WAYNE ROOT ← →</p> <p>RALPH NADER ← → MATT GONZALEZ ← →</p> <p>Write-In ← →</p> <p>FOR UNITED STATES SENATOR (Vote for One)</p> <p>VIVIAN DAVIS FIGURES ← → JEFF SESSIONS ← →</p> <p>Write-In ← →</p> <p>FOR UNITED STATES REPRESENTATIVE, 6TH CONGRESSIONAL DISTRICT (Vote for One)</p> <p>SPENCER BACHUS ← →</p> <p>Write-In ← →</p> <p>FOR ASSOCIATE JUSTICE OF THE SUPREME COURT (Vote for One)</p> <p>DEBORAH BELL PASEUR ← → GREG SHAW ← →</p> <p>Write-In ← →</p>	<p>FOR COURT OF CIVIL APPEALS JUDGE (Vote for One)</p> <p>KIMBERLY HARBISON DRAKE ← → BILL THOMPSON ← →</p> <p>Write-In ← →</p> <p>FOR COURT OF CRIMINAL APPEALS JUDGE, PLACE NO. 1 (Vote for One)</p> <p>CLYDE JONES ← → BETH KELLUM ← →</p> <p>Write-In ← →</p> <p>FOR COURT OF CRIMINAL APPEALS JUDGE, PLACE NO. 2 (Vote for One)</p> <p>AIMEE COBB SMITH ← → MARY WINDOM ← →</p> <p>Write-In ← →</p> <p>FOR PRESIDENT, PUBLIC SERVICE COMMISSION (Vote for One)</p> <p>LUCY BAXLEY ← → TWINKLE ANDRESS CAVANAUGH ← →</p> <p>Write-In ← →</p> <p>FOR MEMBER, STATE BOARD OF EDUCATION, DISTRICT NO. 3 (Vote for One)</p> <p>JUDY WEST BELL ← → STEPHANIE BELL ← →</p> <p>Write-In ← →</p> <p>FOR CHILTON COUNTY COMMISSION (You May Cast No More Than 7 Votes)</p> <p>BOBBY L. AGEE 1 ← → 2 ← → 3 ← → 4 ← → 5 ← → 6 ← → 7 ← →</p> <p>KENNETH R. ALLISON 1 ← → 2 ← → 3 ← → 4 ← → 5 ← → 6 ← → 7 ← →</p>	<p>CHILTON COUNTY COMMISSION CONTINUED</p> <p>RODNEY BENSON 1 ← → 2 ← → 3 ← → 4 ← → 5 ← → 6 ← → 7 ← →</p> <p>GEARLD "Buck" COST 1 ← → 2 ← → 3 ← → 4 ← → 5 ← → 6 ← → 7 ← →</p> <p>CHARLES L. ELLISON 1 ← → 2 ← → 3 ← → 4 ← → 5 ← → 6 ← → 7 ← →</p> <p>HEEDY HAYES 1 ← → 2 ← → 3 ← → 4 ← → 5 ← → 6 ← → 7 ← →</p> <p>M. L. "Red" TURNIPSEED 1 ← → 2 ← → 3 ← → 4 ← → 5 ← → 6 ← → 7 ← →</p> <p>COUNTY COMMISSION CONTINUED ON BACK OF BALLOT</p>
CONTINUE VOTING ON BACK		

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Bryan A. Campbell received the B.A. degree in psychology in 2007 from North Carolina State University. He is currently working toward the Master's degree in the Department of Psychology, Rice University, Houston, TX.

His main research interest is human factors of voting systems.

Michael D. Byrne received the M.S. degree in computer science in 1995 and the Ph.D. degree in experimental psychology in 1996 from the Georgia Institute of Technology.

He is currently an Associate Professor of Psychology and Computer Science at Rice University, Houston, TX. His main research interests include human factors of voting systems.