

Making Votes Count: It's as Much About Psychology (and Ballot Design) as Security

September 28, 2020



In the highly unusual U.S. election year of 2020 in particular, maintaining secure voting systems, whether electronic or paper-based, in person or by mail, is crucial to ensuring that the democratic process works as it should (Brennan Center for Justice, 2016). Ever since the 2016 presidential election in the United States, when allegations of Russian interference dominated the news, the focus of many voters (and most election experts) has been on the security of our voting systems.

Further Research on Factors Affecting Political Participation

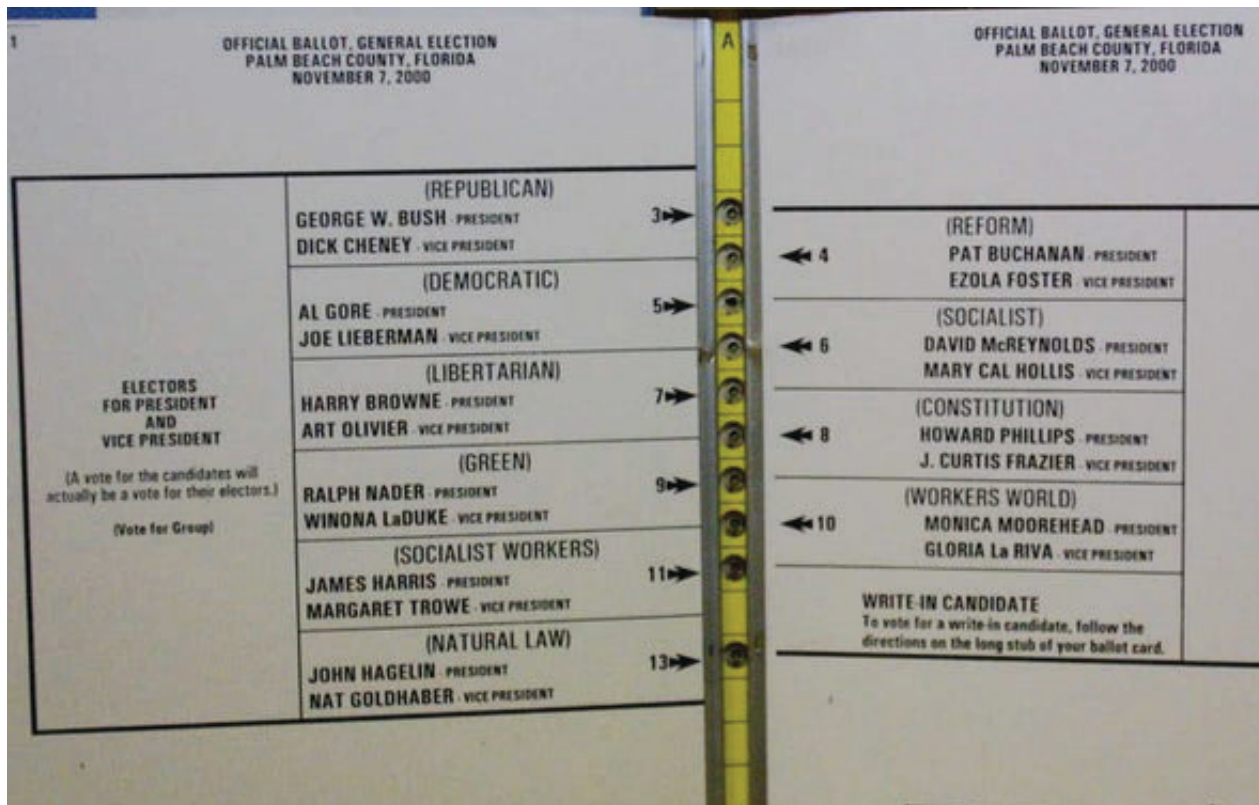
Psychological research around the world has explored how variables involving ballots, voter and candidate attributes, and much more can affect political choices and voting outcomes. [Jump to the end of this article for more on voting internationally.](#)

However, despite all the concerns that have been raised, there has not been a single documented instance of a security violation altering the outcome of an election in the United States. On the other hand, there have been numerous well-documented instances in which user-interface issues associated with ballots likely caused the outcome of an election to be changed. It does not matter how secure the voting system is if what is recorded on the ballots themselves fails to accurately represent the will of the voters.

As the following examples show, design deficiencies in ballots can prevent voters from understanding, seeing, using, and processing information correctly, which can lead directly to voting failures. These failures, in turn, can alter the outcome of elections anywhere in the world, subverting the will of the voters in the process. This is an area in which applied psychologists and human factors engineers can apply their skills to make a real difference in ensuring that ballots accurately capture voter intent.

Ballot Design and Voter Expectations

The quintessential example of a ballot whose interface altered an election is the Palm Beach County, Florida, butterfly ballot used in the 2000 presidential race (below). Al Gore's name appeared second on the left side of the ballot, and many voters simply counted down to the second hole on the punch card to cast their vote. Their logic was reasonable, but it caused them to vote for the Reform Party candidate, Pat Buchanan, rather than Gore (Sinclair et al., 2000).



The

butterfly ballot used for the 2000 presidential race in Palm Beach County, Florida, confused many voters, leading to George W. Bush winning Florida and Al Gore's loss of the presidency. Because Gore's name appeared second on the left side of the ballot, many voters simply counted down to the second hole on the punch card to cast their vote. This caused them to vote for the Reform Party candidate, Pat Buchanan, rather than Gore.

Ironically, this ballot layout was designed to *assist* voters, not to confuse them. Ordinarily, in accordance with Florida state election law, all of the candidates would have been listed on the left side of the ballot. However, the county clerk, worried that the large number of candidates would shrink the type size—a particular problem for older voters—opted to use larger type, which necessitated using both sides of the ballot.

Unfortunately for the voters, this was not what they were used to. Not only did candidates' names typically appear only on the left-hand side of the ballot, the arrows and holes on the ballot often did not quite line up on punch-card machines. That problem was made worse for some voters because of their viewing angle, which differed depending on their height. Thus, many voters learned a simple strategy over the years: Count down the number of holes. Gore was the second candidate from the top; therefore, many who wished to vote for him punched the second hole down. Voters, like everyone else, rely on procedures they already know—sometimes to their detriment.

In the end, George W. Bush won Florida with a margin of victory smaller than the number of miscast votes, leading to Al Gore's loss of the presidency (Wand et al., 2001).

Perhaps this ballot just needed better instructions to help the voters know what to expect and determine what to do (though even that probably would not have overcome the poor design). Sadly, it is often poorly written instructions that *cause* voters to make errors. An excellent demonstration of this is the 2000 presidential ballot used in Franklin County, Florida. In this ballot, below, the presidential race instructed voters to “vote for group,” while the congressional race instructed voters to “vote for one.” Confusion about those labels caused more than 100,000 voters to overvote, meaning that they cast votes for more than one set of presidential candidates (Keating, 2001). The problem was almost certainly exacerbated by the fact that the presidential race was spread out over two columns, prompting some voters to cast votes in both. Regardless of the underlying reason, this overvoting meant that their votes were not counted at all.

OFFICIAL GENERAL ELECTION BALLOT - J

A	B	C
INSTRUCTIONS TO VOTERS To vote you must blacken the oval () completely next to the candidate of your choice, using only the pencil provided. To vote for a person not on the ballot, you must blacken the oval () and write the name on the line provided. DO NOT VOTE FOR MORE THAN THE NUMBER INDICATED FOR EACH OFFICE. ELECTORS For President and Vice President (A vote for the candidates will actually be a vote for their electors.) (Vote for Group) (REPUBLICAN) GEORGE W. BUSH For President DICK CHENEY For Vice President (DEMOCRATIC) AL GORE	(CONSTITUTION) HOWARD PHILLIPS For President J. CURTIS FRAZIER For Vice President (WORKERS WORLD) MONICA MOOREHEAD For President GLORIA LA RIVA For Vice President WRITE-IN CANDIDATE For President For Vice President CONGRESSIONAL UNITED STATES SENATOR (Vote for ONE) BILL McCOLLUM (REP) BILL NELSON (DEM) JOE SIMONETTA (LAW) JOEL DECKARD (REP)	

Poorly written instructions can also cause voters to make errors. In the 2000 presidential ballot used in Franklin County, Florida, the presidential race instructed voters to “vote for group,” while the congressional race instructed voters to “vote for one.” Confusion about those labels caused more than 100,000 voters to cast votes for more than one set of presidential candidates, nullifying their votes.

The instruction-deficiency problem is widespread; an analysis by Laskowski and Redish (2006) showed that nearly all of the ballots they examined across the 50 states did not conform to the best practices that have been developed for written instructions.

Because these examples are not particularly recent, it would be tempting to believe that voting officials across the country have taken systematic steps to eliminate (or at least mitigate) the kinds of problems we have shown here. Unfortunately, such problems persist. As late as 2018, Florida's Broward County

suffered another debacle that demonstrated the need to consider human behaviors in the integrity of our voting processes.

This example comes from the race for U.S. Senate between Republican Rick Scott and Democrat Bill Nelson. The statewide margin of victory for Scott (after multiple recounts) was 10,033 votes (about 0.1% of roughly 8.2 million votes cast). Broward County is a strongly Democratic county; Nelson won it 69% to 31%. However, almost 31,000 voters failed to cast a vote in this race. Why? See the Broward County ballot below, with the often-missed races highlighted.

Ballot Style 58	Seq.058	
Official General Election Ballot November 6, 2018 Broward County, Florida	Boleta Oficial De La Elección General 6 De Noviembre Del 2018 Condado de Broward, Florida	Ofisyèl Jeneral Eleksyon Bilten 6 Novanm 2018 Konte Broward, Florida
Ballot Instructions: • To vote, fill in the oval <input type="radio"/> completely next to your choice. Use only the marking device provided or a black pen. • If you make a mistake, ask for a new ballot. Do not cross out or your vote may not count. • To vote for a write-in candidate, fill in the oval <input type="radio"/> and print the name clearly on the blank line provided for the write-in candidate. Instrucciones Para La Boleta: • Para votar, llene completamente el ovalo <input type="radio"/> junto a su selección. Use solo un lápiz de punta negra o una pluma de tinta negra para marcar la boleta. • Si se equivoca, pida una nueva boleta. Si borra algo o hace marcas, es posible que su voto no se cuente. • Para Votar por un candidato cuyo nombre no está impreso en la boleta, llene el ovalo <input type="radio"/> y escriba el nombre del candidato en la línea en blanco provista para un candidato agregado. Enfòmasyon Sou Bilten Vot: • Pou vote, byen kolore tout andan oval <input type="radio"/> ki akote respons ou chwazi a. Sèlman sèvi ak yon plim nwa oubyen ak yon kreyon pou ekri sou bilten vot la. • Si w fè yon erè, mande yo ba w yon nouvo bilten vò. Si w efase oubyen fè novwa mak, l ap posib pou vòt ou pa valab ankò. • Pou vote pou yon kandida ki pa gen non l enprime sou bilten vot la, kolore ti oval la <input type="radio"/> epi ekri non kandida a sou liy vid la rezève pou ekri non yon kandida.	Governor and Lieutenant Governor Gobernador y Teniente Gobernador Gouvènè Ak Lyetnan Gouvènè (Vote for One/Vote por Uno/Vote pou Youn) <input type="radio"/> Ron DeSantis REP Jeanette Nuñez <input type="radio"/> Andrew Gillum DEM Chris King <input type="radio"/> Darcy G. Richardson REF Nancy Argenziano <input type="radio"/> Kyle "KC" Gibson NPA Ellen Wilds <input type="radio"/> Ryan Christopher Foley NPA John Tutton Jr. <input type="radio"/> Bruce Stanley NPA Ryan Howard McJury <input type="radio"/> Write-in/Escribir/A lekri	Fourth District Court of Appeal Tribunal De Apelaciones Del Cuarto Distrito Katriyèm Distrik Lakou Dapèl Shall Judge Burton C. Conner of the Fourth District Court of Appeal be retained in office? ¿Deberá retenerse en su cargo al Juez Burton C. Conner del Tribunal del Cuarto Distrito de Apelaciones? Èske se pou jis Burton C. Conner nan katriyèm distrik lakou dapèl rete nan pòs li a? <input type="radio"/> Yes/Si/Wi <input type="radio"/> No/No/Non Shall Judge Jeffrey T. Kuntz of the Fourth District Court of Appeal be retained in office? ¿Deberá retenerse en su cargo al Juez Jeffrey T. Kuntz del Tribunal del Cuarto Distrito de Apelaciones? Èske se pou jis Jeffrey T. Kuntz nan katriyèm distrik lakou dapèl rete nan pòs li a? <input type="radio"/> Yes/Si/Wi <input type="radio"/> No/No/Non Shall Judge Carole Y. Taylor of the Fourth District Court of Appeal be retained in office? ¿Deberá retenerse en su cargo al Juez Carole Y. Taylor del Tribunal del Cuarto Distrito de Apelaciones? Èske se pou jis Carole Y. Taylor nan katriyèm distrik lakou dapèl rete nan pòs li a? <input type="radio"/> Yes/Si/Wi <input type="radio"/> No/No/Non
United States Senator Senador De Los Estados Unidos Senatè Etazini (Vote for One/Vote por Uno/Vote pou Youn) <input type="radio"/> Rick Scott REP <input type="radio"/> Bill Nelson DEM <input type="radio"/> Write-in/Escribir/A lekri	Commissioner of Agriculture Comisionado De Agricultura Komisyonè Agrikilti (Vote for One/Vote por Uno/Vote pou Youn) <input type="radio"/> Matt Caldwell REP <input type="radio"/> Nicole "Nikki" Fried DEM	Circuit Judge, 17th Judicial Circuit, Group 38 Juez De Circuito, Circuito 17Mo, Grupo 38 Jij Itineran nan 17èm Sikui Gwoup 38 (Vote for One/Vote por Uno/Vote pou Youn) <input type="radio"/> Jason Allen-Rosner <input type="radio"/> Stefanie Camille Moon Circuit Judge, 17th Judicial Circuit, Group 46 Juez De Circuito, Circuito 17Mo, Grupo 46 Jij Itineran nan 17èm Sikui Gwoup 46 (Vote for One/Vote por Uno/Vote pou Youn) <input type="radio"/> H. James Curry <input type="radio"/> Maria Markhasin-Weekes
Representative in Congress District 20 Representante En El Congreso Distrito 20 Reprezantan Nan Kongrè Distri 20 (Vote for One/Vote por Uno/Vote pou Youn) <input type="radio"/> Alcee L. Hastings DEM <input type="radio"/> Write-in/Escribir/A lekri	Justice of the Supreme Court Magistrado en el Tribunal Supremo Jistis Nan Lakou Siprèm Shall Justice Alan Lawson of the Supreme Court be retained in office? ¿Deberá retenerse en el cargo al Magistrado Alan Lawson en el Tribunal Supremo? Èske se pou jistis Alan Lawson nan lakou siprèm rete nan pòs li a? <input type="radio"/> Yes/Si/Wi <input type="radio"/> No/No/Non	

This 2018 ballot from strongly Democratic Broward County, Florida, shows how Republican Rick Scott may have narrowly won the U.S. Senate election. Almost 31,000 voters failed to cast a vote for the highlighted races, likely feeling rushed by long lines at the polls and determining the first column consisted entirely of instructions.

Many voters, some of whom probably felt pressure to vote quickly because of long lines at the polls (turnout in Broward County was over 60%), likely started at the top left of the ballot, determined the first column was instructions, and moved to the second column, thereby missing the Senate race and the House race below it. (In many parts of Broward County, there was no House race because the Democrat was unopposed.) It is unlikely that these were intentional abstentions; fewer than 6,000 voters failed to cast a vote in the governor's race, and abstention rates almost always increase as one goes further down the ballot.

So why did these errors occur? The reason is likely a combination of people's tendency to group visual items and their expectations of ballots. The left column got grouped as a single cluster, the top part of that cluster was determined to be instructions, and because people expect clusters to be uniform, many voters assumed the entire column was instructions—and skipped it. Unfortunately for Nelson, if his 69% countywide margin applied to those 31,000 lost votes, he would have won by roughly 10,000 votes, rather than losing by 10,000.

Human Behavior and Voting by Mail

With the 2020 presidential election taking place amid the ongoing COVID-19 crisis, there are real concerns that we will see many more examples of ballot errors, as voting administrators across the country rush to implement voting methods that protect voters and poll workers alike.

Voting by mail (sometimes called “mail-in voting”) is a key method that election officials have turned to in order to minimize person-to-person contact at physical polling locations. A record 75% of Americans can vote by mail this year, according to a recent article in the *New York Times* (Love, Stevens, & Gamio, 2020). The advantage of voting by mail is that it is a well-understood method. Five states use voting by mail for all of their voters, 29 additional states allow vote by mail for any reason, and all the remaining states employ at least some form of voting by mail for absentee voters or people who may have difficulties getting to the polls, such as the elderly and those with disabilities. The availability and execution of voting by mail in the 2020 election is being litigated all over the country as states move to expand or restrict it, so the vote-by-mail landscape is changing daily (Corse & Kendall, 2020). The U.S. Postal Service has warned states that it may not be able to deliver ballots on time, adding to uncertainty about the ability of voters to utilize voting by mail (Brennan Center for Justice, 2020).

Related Podcast – Days of Future Past: Concerns for the Group's Future Prompt Longing for Its Past (and Ways to Reclaim It)

In a recent article in *Current Directions in Psychological Science*, APS Fellow Michael Wohl, a researcher at Carleton University, explores how [collective angst can influence collective nostalgia](#). As the United States has its next election, this research provides intriguing insights into how political rhetoric tends to capitalize on the relation between these emotions by promising to “bring back the good

old days.”

[Listen to this and other APS podcasts here.](#)

Unfortunately, there is a large partisan split over the widespread implementation of voting by mail. Many Republicans believe it will unfairly advantage Democrats by raising Democratic voter participation, although the available evidence does not support this assertion (Bergman & Yates, 2011; Hassell, 2017; Thompson et al., 2020). Some have also alleged that fraud in voting by mail is a bigger risk, but the data from states that have employed voting by mail do not support these concerns (Kamarck & Stenglein, 2020; Weiser & Ekeh, 2020). In fact, only 491 cases of fraud involving voting by mail have been identified over 12 years, despite hundreds of millions of votes cast by mail (News21, 2012). Therefore, availability (or lack thereof) for voting by mail is a *political*, not a psychological problem.

That said, as with the other psychologically induced failures we have described, failures due to human behaviors in executing voting by mail could have a large impact in the November elections.

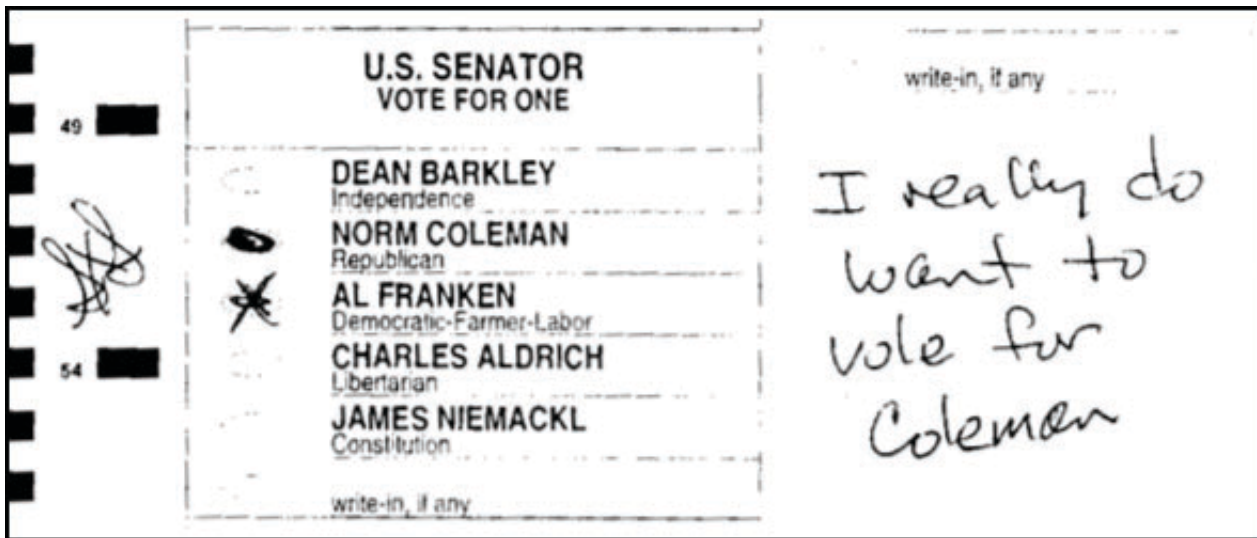
The first of these failures could stem from cognitive failures in voters’ mental models of how voting by mail works. Although rules vary by state, voters must typically make an early request for a ballot well before the election. It is likely that many voters who might want to vote by mail may miss the deadline for requesting a ballot because it does not conform to their mental model of how to vote.

The second problem we may see is a failure of memory. Voters may understand how voting by mail works, request their ballot, and even take the time to fill it out, but then forget to mail it in time for it to be counted in the election. In the recent 2020 Wisconsin election, only 77% of voters who requested mail-in ballots returned them to voting officials before the deadline (Associated Press, 2020). While a 77% return rate may sound impressive, in this case it meant that more than a quarter-million voters went to the trouble of requesting a ballot but failed to actually vote. This number is significantly higher than the margins of victory in many Wisconsin races.

Even when a voter gets a ballot, there is a chance for an error in marking it. At a regular polling station, this is complicated enough: The voter has to alert a poll worker, spoil their ballot, get a new one, and redo the entire ballot. This can be somewhat onerous if the ballot is long, but at least the appropriate procedure is clear.

Now consider voting by mail. There is no obvious correction procedure; in fact, jurisdictions differ in how corrections can be handled. Depending on the state, a voter might have to request a new ballot, if there is time. Some states allow corrections, but they have to follow a certain set of rules. The absentee ballot shown below is from the 2008 Minnesota Senate race between Norm Coleman and Al Franken. Both parties flagged this ballot for further review, with Coleman’s camp claiming the intent of the voter was clear (even though Franken was also selected) and Franken’s camp claiming the ballot was invalid

because the voter had identified themselves with their initials (which is prohibited by Minnesota voting rules). As the number of vote-by-mail ballots increases, these kinds of marking errors will become more common, and voters will need guidance on what to do if they make mistakes.



This absentee ballot from the 2008 Minnesota Senate race demonstrates potential problems with voting by mail. Absent clear guidance on how voters can correct their errors, their votes may not be counted.

The last type of error involves voters' failure to follow the instructions for submitting their completed ballot (Wright, 1981; 1998). Even diligent voters who have requested their mail-in ballot, have filled it out, and are ready to mail it back within the required time frame may make this kind of error. To make mail-in ballots more secure, many municipalities require voters to sign the back of the envelope before mailing it, so that their signature can be compared to the signature on file. Many voters fail to sign the envelope (despite repeated instructions to do so) because they have filled out their ballot and believe they are done (a form of postcompletion error, Byrne & Bovair, 1997). For example, in the 2012 California general election, 17% of the returned vote-by-mail ballots were rejected because they lacked a signature (Day, 2014).

Nationwide, data from the Election Assistance Commission suggests that nearly one million mail-in ballots were rejected in the 2016 presidential election because the ballot was late, the voter did not sign the envelope, or the signature was rejected by voting officials (Salame, 2020). Ballot rejections due to these kinds of human errors are especially troubling because the voters believe they have completed all the steps and successfully cast their ballots, when in fact they have not.

Leveraging Psychological Science

Whether voting failures stem from in-person or mail-in ballots, one of the biggest obstacles to fixing these problems through enforceable, uniform changes to ballots or voting processes is the absence of a central authority that controls ballot designs or election conduct. Contrary to what many people may think, the federal government does not administer or even regulate elections; that responsibility is constitutionally reserved to the states. Most states, in turn, delegate ballot design and creation to the thousands of county clerks who administer elections on the ground (Niemi & Herrnson, 2003).

To help mitigate the kinds of interface issues we have seen, applied psychologists would need to engage with thousands of county clerks across the United States in every election, examining tens of thousands of ballots. This suggests the need for more global strategies and easy-to-use tools to assist county clerks if we are to have widespread impact in this area.

What efforts might psychological scientists lead? We might support the development of tools that county clerks could use to examine ballots well before Election Day to ensure they conform to the best science regarding known limitations in human perception and cognition. We might perform research into ways to help voters avoid these kinds of errors when they fill out their ballots and review them. Unfortunately, we are not there yet, and poor designs that fail to account for limitations in human perception and cognition may continue to leave elections vulnerable to preventable human error.

Voting is the central element in our democratic process, and as such, it has attracted the attention of groups who seek to do it harm. While we must remain vigilant against efforts to alter our elections through vote tampering, computer hacking, or voter suppression, it is clear that we must also take action to address the errors that occur right in front of our own eyes as we vote. The outcome of the next election may depend on it.

Further Research on Factors Affecting Political Participation

Psychological research around the world has explored how variables involving ballots, voter and candidate attributes, and much more can affect political choices and voting outcomes.

[Position Effects in Choice From Simultaneous Displays: A Conundrum Solved](#)

Voters prefer candidates whose names are listed first on ballots, and restaurant patrons favor items at the beginning and end of menus. But people are more likely to choose options from the middle in multiple-choice tests and grocery store displays. What accounts for this inconsistency? In this 2015 article from *Perspectives on Psychological Science*, APS Fellow Maya Bar-Hillel (Hebrew University of Jerusalem, Israel) outlined a classification system for simultaneous choice that categorizes decisions based on three variables: whether the choice is interactive, whether sequential item processing is required, and whether the interaction—if there is interaction—is cooperative or competitive.

[If They Were to Vote, They Would Vote for Us](#)

Highly committed voters tend to overestimate support for their party among nonvoters, according to the findings of this study of Dutch voters (*Psychological Science*, 2011). Voters, candidates, and the political leaders who win may also claim greater popular affirmation for their positions than might really exist, according to Namkje Koudenburg, Tom Postmes, and Ernestine H. Gordijn (University of Groningen, Netherlands). By enlarging the imaginary “in-group,” citizens “can use low turnout to strengthen their biases,” said Koudenburg.

[If They Say “Yes,” We Say “No”: Partisan Cues Increase Polarization Over National Symbols](#)

The views expressed by political party leaders can change how individual voters feel about an issue, according to findings from this longitudinal study of voters in New Zealand (*Psychological*

Science, 2018). During the 2015–2016 New Zealand flag referendums, leaders of the National Party championed changing the flag—a move strongly contested by the Labour Party. Nicole Satherley, Danny Osborne, Chris G. Sibley (University of Auckland), and Kumar Yogeeswaran (University of Canterbury) measured attitudes toward changing the flag using data from both 2013, before the change was proposed, and 2016, at the height of the debate. Registered voters who supported the National Party were more likely to shift from opposing to wanting the flag change, whereas Labour Party supporters were more likely to shift from wanting to opposing the change.

More from the *Psychological Science* archives:

- [Competence Judgments Based on Facial Appearance Are Better Predictors of American Elections Than of Korean Elections \(2015\)](#)
- [Participating in Politics Resembles Physical Activity: General Action Patterns in International Archives, United States Archives, and Experiments \(2010\)](#)
- [Beauty at the Ballot Box: Disease Threats Predict Preferences for Physically Attractive Leaders \(2013\)](#)
- [Fatal Attraction: The Effects of Mortality Salience on Evaluations of Charismatic, Task-Oriented, and Relationship-Oriented Leaders \(2004\)](#)

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