Why Approval Voting is Unworkable in Contested Elections

And How the Borda Count, Score Voting, Range Voting and Bucklin Voting are Similarly Flawed Due to Vulnerability to Strategic Voting

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Summary

Approval voting is a method of voting to elect single winners that has adherents among some voting theorists, but is unworkable in contested elections in which voters have a stake in the outcome. Once aware of how approval voting works, strategic voters will always earn a significant advantage over less informed voters. This problem with strategic voting far outweighs any other factor when evaluating the potential use of approval voting in governmental elections.

Among other methods that should not be used in meaningfully contested elections are range voting, score voting, the Borda Count and Bucklin voting. They all share approval voting's practical flaw of not allowing voters to support a second choice without potentially causing the defeat of their first choice. Such voting methods have their potential value, but only in elections where voters have no particular stake in the outcome.

The only voting methods that should be weighed seriously for governmental elections are methods that do not violate this "later-no-harm" criterion (plurality voting and forms of runoff elections and instant runoff voting [http://www.instantrunoff.com]) or only do so indirectly (such as Condorcet voting methods).

We support our claims about approval voting and similar voting methods both with theoretical analysis and with a broad range of evidence, including the failure of these voting methods in every single significant use in meaningfully contested elections.

Highlights of Analysis

- Approval voting is not a viable method of voting because it is highly vulnerable to strategic voting in contested elections. It violates the "later-no-harm" criterion, meaning that indication of support for a lesser choice can help defeat a voter's most preferred candidate. It is a system that only will work when voters don't understand the system or have no stake in the outcome.

- All voting methods have certain theoretical flaws, but having a practical flaw that inevitably leads to tactical voting is qualitatively different. Creating incentives for strategic voting is not just another undesirable property. It makes a system unworkable in elections with active campaigns and meaningful choices. Quite simply, it is unacceptable that voters who vote tactically by casting a single vote for their favorite candidate will gain an advantage over those voters who indicate support for more than one candidate in the manner suggested by the ballot instructions.

- Some voting system theorists do not provide proper weight to vulnerability to strategic voting due to a failure to understand the nature of competitive campaigns. In competitive elections, voters will not be "honest men," in the words of French mathematician Jean-Charles de Borda. Borda realized his similar proposal (the Borda Count) would not work unless voters and campaigners avoided tactical voting. But tactical voting is not dishonest if allowed by the rules; seeking to win is a natural part of elections in which voters care who wins, and any system that fails to accommodate that reality is insupportable.

- Other voting method analysts also conclude that approval voting is highly vulnerable to strategic voting. James Green-Armytage's *Strategic Voting and Nomination* finds voting methods that violate later-no-harm, including approval voting, to be the most vulnerable to strategic voting. In *Collective Decisions and Voting,* Nicolaus Tideman ranked approval voting last among 25 systems in its lack of resistance to strategic voting.

- Approval voting and variations of it have rarely been used in meaningfully contested elections due to this problem. The few trials of the method confirm our critique, however. Examples include problematic early elections of president and vice-president in the United States and the rise and fall of "Bucklin voting" in a number of U.S. jurisdictions. Hypothetical uses of approval voting also underscore its unworkability in meaningfully contested elections.

- Approval voting faces other hurdles that add to its lack of viability. It will face significant political opposition due to violation of our common sense understanding of majority rule. With approval voting, for example, a candidate with the first choice support of more than 50% of voters can lose to a candidate without a single first choice supporter.

- It is no coincidence that plurality voting and forms of runoff voting and instant runoff voting are the only voting systems used to elect single-winner offices at any level of government anywhere in the world. They are the only voting methods that uphold the later-no-harm criterion. Although plurality voting and traditional runoffs are more vulnerable to strategic voting than instant runoff voting, those vulnerabilities are not nearly as problematic as violation of the later-no-harm criterion.

- The Borda count, Bucklin voting and range voting are among other voting methods that are also unworkable in meaningfully contested elections due to violation of the later-no-harm criterion.

- Voting methods that transparently violate later-no-harm are illusions for reformers of governmental elections. They represent a promise that will never be realized and are distractions from the core policy choice for jurisdictions debating how best to elect single winner offices: whether to adopt plurality voting, traditional runoffs or instant runoff voting.

- Approval voting and other methods that violate later-no-harm can have value when in surveys or certain private elections where honest, non-strategic behavior is to be expected. But such uses are

quite different from using these methods in elections where candidates campaign aggressively and voters care about who wins and who loses.

Outline of Analysis

- The Significance of the Practical Flaw of Violating "Later-No-Harm"
- Lessons from Problems with the Borda Count
- How Strategic Actors Would Game Approval Voting
- Real-World Failures for Approval Voting and Variants
- Lessons from Bucklin Voting in 20th Century Elections in the United States
- Examples of Actual Single Winner Elections Where Approval Voting Would Have Failed
- A Place for Approval Voting: Where "Honest Behavior" Can Be Expected
- Conclusion: Focus on Viable Voting Methods for Governmental Elections

The Significance of the Practical Flaw of Violating "Later-No-Harm"

Approval voting is a single-winner voting method based on a simple concept: "just count all the votes." It is a form of "range voting" (sometimes called "score voting") in which voters are able to cast equally weighted votes for as many candidates as they want (meaning awarding to each of them a score of "1" or "0"). The candidate with the most votes is the winner and theoretically is the candidate with the highest rate of acceptability among voters.

But while simple to describe and tally, approval voting is highly unlikely to be won and sustained in governmental elections or in any private elections in which campaigners seek to influence voters in a competitive election. Its Achilles heel is a practical flaw that, by making it highly vulnerable to strategic voting, prevents it from working as advocates expect in meaningfully contested elections. It creates unrepresentative outcomes and justified controversy surrounding the legitimacy of "winners."

Before explaining this flaw, it is important to distinguish between a ***practical flaw*** and a ***theoretical flaw***. As true of all voting methods, approval voting has theoretical flaws. A theoretical flaw is one that runs counter to what logic suggests a fair method should do. For example, in an approval voting election a candidate who is the first choice of more than 50% of voters could lose to a candidate who is not the first choice of even a single voter, but who wins after securing a large number of lesser votes of approval from backers of other candidates. Approval voting has other similar theoretical flaws that make it vulnerable to criticism on grounds that are not addressed in this analysis.

While approval voting's violation of the common sense definition of majority rule is sure to make it hard to win and sustain politically, however, it is not in itself a reason to oppose its use in elections. *Every* voting system has at least one theoretical flaw that, viewed in isolation, can make the system seem unsupportable. As true of theoretical flaws associated with other voting methods, approval voting's theoretical flaws are not in themselves likely to interfere with the conduct of campaigns nor affect voter and candidate strategy – in other words, they will not cause a break down in the system's basic functioning, even if potentially leading to

controversy after an election. Given that representative democracy demands holding elections and that every system has at least one major theoretical flaw, we must accept imperfection and balance competing priorities in our choice of a voting method.

A practical flaw is different than a theoretical flow because it makes the system unworkable in real-life elections where voters care about the results and have a range of opinions about their choices. Along with several other proposed voting systems like range voting, Bucklin voting and the Borda count, approval voting violates the **later-no-harm criterion**. When a system violates the later-no-harm criterion, voters cannot indicate support for a second candidate without that indication of support counting *directly* against the chances of their first choice to win.

Among the most commonly proposed voting methods for single-winner offices, the only systems that uphold the later-no-harm criterion are plurality voting, traditional runoff election systems and forms of instant runoff voting. It is no coincidence that these voting methods are the only voting methods used to elect single-winner office holders for *any* governmental election at *any* level *anywhere* in the world – and are also the voting methods used for almost all private associations' single-winner elections, particularly if those elections are meaningfully contests with active campaigns.

Violation of the later-no-harm criterion makes a single-winner voting method unworkable in a competitive election that has a full range of strategic players – "strategic players" meaning people who have a stake in who wins and who loses. These strategic players include candidates, campaign consultants, partisan pundits and informed voters. They will analyze any system to see if there is a way to secure an advantage for helping their most preferred candidate and/or hurting their least preferred candidate.

Many voters will not work hard to figure out these incentives directly, but will be influenced by what they hear. Once a system as a clear strategic vulnerability, you can be sure that strategic players will exploit it. As an analogy, suppose a baseball player is very good at hitting fastballs, but has problems hitting a curveball. Once this player's weakness is discovered, any informed opposing pitcher will throw far more curveballs to this player than fastballs. Or suppose a catcher is not particular good at throwing out people attempting to steal second base – you can be sure the opposing team will try to steal second base far more often. Doing so isn't "dishonest" – rather it is a tactic that is an obvious one to pursue if you want to win.

Voters simply will not act in approval voting elections as predicted by those who advocate the system based only on theory; in the real world of contested elections, mathematical proofs will melt way, and transparent tactical incentives for strategic players will lead to rampant attempts to game the vote. Suppose a strategic player initially fails to realize the implications of a system violating later-no-harm and, as a result, instead naively acts as if the best way to vote is as suggested by the ballot instructions. They inevitably will end up acting against their interests when facing tactical voters – as they undoubtedly will - -and will learn how to game the vote themselves by the next election.

For example, consider an approval voting election with ten voters deciding among three candidates: Jill, Jack and Harry. Suppose further that a strong 70% majority of seven voters prefer Jill as their first choice, three voters prefer Jack as their first choice and no voters prefer Harry as a first choice. Five of Jill's backers are not well-informed about voting methods, however. Because they can tolerate Jack, but do not like Harry, they

decide to cast approval votes for both candidates Jill and Jack. The three backers of Jack all could tolerate Jill as a winner, but are well-informed about voting methods. They have concluded that Harry won't be able to win and that Jill is in fact the most important opponent. They decide to cast a single "bullet vote" for Jack.

As a result, Jack wins the election with 8 votes rather than Jill, who has 70% first choice support and in fact would have had 100% backing if every voter had cast a sincere vote. In such ways less informed voters and candidates either will vote in a way that hurts their own interests or, far more likely, quickly join more informed voters in engaging in tactical behavior that undermines the legitimacy of the election and the goal of avoiding "split votes" and "spoilers."

Violation of the later-no-harm criterion explains the low ratings approval voting receives for resistance to strategic voting. For example, Nicolaus Tideman in his book *Collective Decisions and Voting* (Ashgate 2006) [http://books.google.com/books/about/Collective_decisions_and_voting.html?id=RN5q_LuByUoC] ranked approval voting last among 25 systems in its resistance to strategic voting. In 2010, James Green-Armytage's *Strategic Voting and Nomination* [http://www.econ.ucsb.edu/~armytage/svn2010.pdf] analyzed eight voting methods, finding instant runoff voting (which he calls "Hare") to be the least vulnerable to strategy and finds approval voting and other systems that violate the later-no-harm criterion to be most vulnerable.

Accurate Democracy [http://www.accuratedemocracy.com/l_data.htm] explains how these findings confirm and extend the conclusions of researchers such as John Chamberlin and Samuel Merrill. Accurate Democracy quotes this section of a paper co-authored by Chamberlin:

> *"The most striking result is the difference between the manipulability of the Hare system [instant runoff voting] and the other systems. Because the Hare system considers only 'current' first preferences, it appears to be extremely difficult to manipulate. To be successful, a coalition must usually throw enough support to losing candidates to eliminate the sincere winner (the winner when no preferences are misrepresented) at an early stage, but still leave an agreed upon candidate with sufficient first-place strength to win. This turns out to be quite difficult to do……One other factor also distinguishes the Hare system from the other[s]. The strategy by which Hare can be manipulated, on the occasions when this is possible, is quite complicated in comparison with the strategies for the other methods."*

Lessons from Problems with the Borda Count

Understanding that violation of the later-no-harm criterion is a problem is nothing new. More than two centuries ago, French mathematician Jean-Charles de Borda developed a similar voting method that still bears his name: "the Borda count." Like instant runoff voting (IRV), the Borda count is a ranked choice voting system, but one where each ranking is assigned a point value in a way that violates the later-no-harm criterion. As one example, your first choice might earn three points, your second choice two points and your third choice one point, with the winner being the candidate with the most points.

The Borda count can work without much controversy for some award contests like college football's Heisman Trophy because most voters in these elections (sportswriters in a Heisman Trophy vote, for example) may care about who wins, but are not so deeply invested in the outcome that they will vote insincerely and urge

other voters to vote insincerely. Likelihood of sincere voting is particularly true of any situation where voters' preferences are public, as with judges in a figuring skating or gymnastics event, because insincere voting is noticed and widely criticized – think of past controversies over figure skating and gymnastics judges whose ratings are public.

It also is true that if all voters cast sincere ballots without concern about second choices counting against first choices, the Borda count will produce more representative outcomes than plurality voting. Borda was proud of his system, but understood it was only for "honest men" because ranking a candidate second can cause one's first choice to lose – and lose in a transparent way that would affect any meaningfully contested election in which voters have a preferred candidate. With meaningfully contested elections that have secret ballots and aggressive campaigners seeking to persuade voters how to vote, it doesn't take a "dishonest" person to decide to cast an insincere ranking in order to help elect a preferred candidate. It is simply inevitable.

As a real-life example, consider an excerpt from a blog post in 2011 by Steve Pond, a former *Los Angeles Times* entertainment reporter and one of Hollywood's leading experts on the Academy Awards. As detailed at *OscarVotes123.com*, the Academy of Motion Pictures has used the proportional voting version of ranked choice voting (called "choice voting") for nominations for decades. Starting in 2010, it also used instant runoff voting (which it calls "preferential voting," the name of the system in Robert's Rules of Order) for picking best picture.

This Best Picture system is new enough that some voters have misconceptions about it. The main error has been for some voters to assume that rankings will be turned into points as in the Borda count. In February 2011, Pond wrote a commentary [http://www.thewrap.com/awards/column-post/dont-believe-schmucks-24542] entitled *Oscars Best Picture Ballot: Don't Believe the Schmucks* in which he focused on why it matters that the Oscar voting method for Best Picture is instant runoff voting and not the Borda count. Here is an excerpt:

> *A year and a half after the Academy went to a different system for counting Best Picture ballots, nominees and voters and campaigners still don't understand how it works. And it's driving me crazy. The latest example: I went to a party over the weekend, and heard a producer who'd gotten a Best Picture nomination telling people, 'It's a weighted ballot. You need to vote for [my movie] number one, and [our biggest competitor] number 10.'*
>
> *He's wrong. It's not a weighted ballot. And his strategy would not do a damn thing to help his movie. This is the same kind of dumb campaigning that lost "Hurt Locker" producer Nicolas Chartier his tickets to last year's Oscar show. Now, Chartier pushed his strategy (which was to ask people to rank his movie first, and "Avatar" last) in emails, which is worse than doing so verbally because it's a far more blatant campaign violation.*
>
> *But no matter whether it's done via email or whispers at parties, the bottom line remains the same: it won't work…. [Instant runoff voting] is NOT a weighted ballot. It does NOT allocate 10 points to your number one choice, nine points to number two, etc. You CANNOT hurt your top choice by ranking its*

biggest competitor second. And anybody who tells you otherwise doesn't know what he or she is talking about.

The main thing to keep in mind when you fill out a Best Picture ballot is that you are simply casting one vote, for one movie. That vote goes to the movie ranked first on your ballot, and it stays there until that movie has either won, or been eliminated from contention. If your favorite is eliminated, then and only then will the vote shift to your second choice. If this happens, you can rest assured that you had absolutely nothing to do with your top choice being knocked out, and there's not a thing you could have done to prevent it (short of persuading more people to vote for your movie).

Pond can so forcefully reject the anonymous producer's strategic advice about casting insincere rankings only because instant runoff voting (IRV) does not violate later-no-harm. If the Borda count indeed were used in these elections instead of IRV, the producer would be absolutely right. The word would spread in Hollywood that Academy voters should not vote the way the directions suggest they do – that instead they should rank their favorite first and either not rank the perceived strongest competitors or insincerely put them last. Once people realized the system could be gamed and in fact was being gamed, it would be quickly replaced.

How Strategic Actors Would Game Approval Voting

Approval voting magnifies the failure of Borda count due to tactical voting because indicating support for a second choice not only counts directly against a first choice, but counts *equally* with that first choice. Confident in mathematical theory, approval voting advocates will explain how voters "should' vote, suggesting that the optimum strategy is to vote for the candidate who is minimally acceptable and all other candidates favored more than that candidate. They then produce arguments, charts and simulations (a particularly misleading one [http://zesty.ca/lj/yee-oca-transferable-vote-3.pdf] by mathematician Ka-Ping Yee) that show approval voting working wonderfully well, based on the false supposition that voters will act like Borda's "honest men" – e.g., they will vote like rational computers who all have read and understood recommendations by approval voting advocates on how to vote.

But these theorists are better in math than human psychology and electoral politics 101. Real-world voting in fact is much more about psychology than math. The Best Picture Oscar debate highlighted by Steve Pond provides one example, but imagine the climate in elections for president, governor and any other office in which there is a real contest with campaign consultants, 24-hour-news-cycle punditry and voters who care deeply about who wins and who loses. Violation of later-no-harm becomes utterly devastating – not just as a theoretical problem, but as a practical problem that makes the system unworkable.

Suppose you have an approval voting election with two candidates who each have the first choice loyalty of about 45% of voters, but are strongly opposed by the other candidate's voters – a situation that is common for nominees of the two major parties in the United States. In addition to these two candidates, there is a third candidate who has 10% first choice support and is a tepid "second choice" of from many backers of the other two candidates. Suppose further that polls indicate that while this third candidate would lose badly with a plurality vote, he or she might have a chance to win with approval voting if all voters were Borda's "honest men."

Consider what strategic actors would do in this election. The campaign consultants and all the partisan bloggers and pundits would certainly get the word out to cast a bullet vote only for their preferred candidate. Backers of the two leading candidates would want their preferred to candidate to win, and would quickly realize that casting a second approval vote for the centrist candidate might cause their preferred candidate to lose.

As for the voters, the 90% of voters backing the two plurality voting frontrunners would be in an obvious bind. They would have to decide whether they cared more about electing their favorite candidate or defeating their least favorite – and would be internally divided over what to do. Meanwhile, backers of the centrist candidate would realize that their best chance to win would be to cast a bullet vote for only one candidate, even if having a sincere preference for one of the "wing" candidates over the other wing candidate. The media would go into full "horse race" mode, with much discussion of whether the centrist candidate would maintain support. Voters' strategic dilemma would be crystal clear.

An election in which the centrist candidate nearly won or even just a poll showing them ahead would lead backers of the "wing" candidates to start following the advice of all of their candidates' most active backers. These strategic actors would realize that "bullet voting" for only one candidate would be the best tactic. There might be certain elections where one major wing would know that the only way to defeat the other wing would be to approve of the centrist candidate, but any time they thought their candidate had a real chance to win, they would overwhelmingly cast a bullet vote. The result would quite likely be a plurality winner who potentially is unrepresentative and lots of finger-pointing about "spoilers" and tactical voting.

Most elections, of course, are more complicated than this scenario, and either do not have any polling information or have polls that make it unclear about the best way to vote. Without that information, it's all the more likely that voters would be uncertain what to do – and be that much more likely to listen to strategic actors who would be feverishly spreading the word that you should cast "bullet vote" for your favorite candidate and hope for the best.

Real-World Failures of Approval Voting and Variants

Some approval voting advocates focus on mathematics rather than the world of psychology that is so central to real-life politics. They may try to dismiss analyses of the certain breakdown of approval voting in practice, taking advantage of a Catch 22: approval voting's flaws have led to very few uses of it that can show how poorly it works in operation. They sometimes point to irrelevant uses of approval voting where honest behavior was to be expected. They also may tout the results of approval voting-type exit polls that don't indicate much strategic voting – failing to realize that in an actual approval voting elections, voters would cast ballots after a heated campaign in which strategic actors had pursued strategies to try to beat the system and voters had grappled with their individual tactical dilemmas.

Even though approval voting has an abysmal record as a viable reform proposal, we can examine a handful of trial uses of it that strengthen the case against its use in meaningfully contested elections. Among the handful of private associations with approval voting, only a few have generated much heat and energy, but in

every single instance where such an election has gotten competitive, approval voting has suffered a major breakdown due to violation of the later-no-harm criterion.

Early U.S. presidential elections: One example showcasing approval voting's flaws was the first form of the Electoral College in U.S. Presidential elections, as detailed in Jack Nagel's fascinating article *The Burr Dilemma in Approval Voting* [http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1065909]. Under the Constitution's original Electoral College rules, each state's electors cast two votes rather than one. The candidate with the most electoral votes would become president and the candidate with the second most electoral votes would become vice-president. Although technically this system was a two-winner election rather than an approval voting election, the system can fairly be analyzed as a single-winner election, as the choice of president was far more important to electors.

Because the framers of the Constitution failed to anticipate that politicians would establish groupings that evolved quickly into political parties, they did not structure a voting rule based on "tickets" forming – "tickets" tied to early party-like groupings that wanted leaders of its party to win both the presidency and vice-presidency. By the first presidential election without George Washington in 1796, however, party politics was already in full force [Source: http://www.senate.gov/artandhistory/history/common/generic/VP_Thomas_Jefferson.htm]. The Federalists backed John Adams and his de facto running mate Thomas Pinckney, while the Democratic-Republicans backed Thomas Jefferson and his running mate Aaron Burr.

Supporters of John Adams believed that their candidate had enough votes in the Electoral College to win, but also grasped the problem of later-no-harm: if every backer of Adams also voted for Pinckney and Pinckney picked up any other votes, then Pinckney might win –or at the very least Adams and Pinckney would tie, in which case the U.S. House of Representatives would have to pick the president, with each state's House delegating casting one vote. Adams' backers therefore spread the word that a certain number of Federalist electors should not vote for Pinckney.

In the midst of a competitive election overall, however, the Federalists could not coordinate exactly how many electors should not vote for Pinckney. As a result, too many electors in fact failed to do so. The result was a final electoral vote total of 71 for Adams, 59 for Pinckney and 68 for John Adams' main opponent Thomas Jefferson. Although elected Vice-President, Jefferson stayed well away from the nation's capital during most of Adams' presidency.

In 1800, Adams and Jefferson again sought the presidency, with the same de facto running mates. This time, the underlying vote was narrowly in Jefferson's favor. To avoid Adams becoming vice-president, however, Jefferson's electors rigorously voted for both Jefferson and his running mate Aaron Burr. The result was an electoral vote tie, just as Federalist strategists had feared might happen in 1796. The election was thrown to the U.S. House of Representatives, where Burr unexpectedly decided to compete for the presidency. After seven days of turmoil, with thirty-six votes of the U.S. House delegations, Jefferson finally cut enough deals to become president.

The nation's political leaders had had enough of a flawed voting method. The result was the 12th amendment of the Constitution, ratified in 1804. It established that electors had only one vote for president, eliminating the problem of later-no-harm from the Constitution.

***Dartmouth College**:* A recent example of approval voting's flaws comes from alumni seats on the powerful Board of Trustees of Dartmouth College, for which approval voting was used for several elections until 2009. In these elections with approval voting the Dartmouth Association of Alumni would nominate several candidates.

Some dissenting Dartmouth alumni began to nominate "petition" candidates – single candidates backed primarily by opponents of the direction of Dartmouth's leadership. These candidates had positive qualities, of course, and alumni voters would read their biographies and give them a share of their lesser-choice approval votes even if they themselves were not opposed to the board's general direction and even if they likely would have backed an Association nominee in a one-on-one race against a petition candidate. Many backers of the petition candidates were more strategic, however. They were more likely to bullet vote, reflecting the passion that led to getting that petition candidate on the ballot in the first place.

In the muddied waters of approval voting, the result was a series of upset wins for petition candidates, at least some of whom likely would have lost in one-on-one races against Association nominees. As a result, in 2009, the Association took action. It put a referendum on the alumni ballot to have an opportunity to eliminate approval voting and adopt a more traditional election rule. The student newspaper *the Dartmouth* editorialized:

> *"When the alumni electorate fails to take advantage of the approval voting process, the three required Alumni Council candidates tend to split the majority vote, giving petition candidates an advantage. By reducing the number of Alumni Council candidates, and instituting a more traditional one-person, one-vote system, trustee elections will become more democratic – and will more accurately reflect the desires of our alumni base."*

In the referendum, alumni voted by an overwhelming 81% to 19% to eliminate approval voting. Dartmouth alumni today have a traditional runoff system to uphold majority rule without violating the later-no-harm criterion.

Instructively, in the first election in 2010 with the new system, a petition candidate ran a very similar campaign to previous petition campaigns against the Council-backed candidate – but with traditional vote-for-one rules, the petition candidate lost by 70% to 30%, which certainly was a more accurate reflection of how alumni voters perceived the direction of the College and its Board than had been clear when approval voting was used.

In 2011, Dartmouth College again demonstrated the failure of approval voting, this time in student elections. An unelected student committee with exclusive power to change election rules installed approval voting without any campus debate. In the subsequent student vote for president, only one candidate made the ballot. As a result, there were two serious write-in candidacies, with many other write-in votes cast.

In the approval voting election, the ballot-qualified candidate won, even though he earned approval votes from only 41.5% of student voters. The strongest write-in candidate trailed just behind with 38.6%. With 1,665 students, the total number of extra votes was only 96, meaning almost 95% of voters cast a single bullet vote in their very first election with a flawed system that violates later-no-harm.

Institute of Electrical and Electronics Engineers: Many private associations use other alternative single winner voting systems, particularly instant runoff voting. A few associations have adopted approval voting, although mostly in elections that are not meaningfully contested.

The largest and most important such use of approval voting was in elections for the Institute of Electrical and Electronics Engineers (IEEE), the world's largest professional association with more than 400,000 members. After adopting approval voting in 1987 the IEEE board voted to eliminate it in 2002. The Institute's newsletter reported that about 80% of members were voting plurality-style for only one candidate. Rather than have some voters get a tactical advantage over others, it decided to accept plurality outcomes rather than a system prone to tactical voting. In the IEEE's 2009 presidential elections, the winner earned less than 40% of the vote. Perhaps the IEEE will again look to reform – but presumably not to approval voting.

Lessons from Bucklin Voting in 20th Century Elections in the United States

The list of elections where approval voting did not work well might suggest that we are cherry-picking results and ignoring other successful implementations. But that's not the case. Approval voting simply has a very limited record in elections that are meaningfully contested and has apparently failed in every single such implementation, especially if used multiple times.

For that reason we turn to Bucklin voting, a form of ranked choice voting used for important elections in a number of states and cities in the early decades of the 20th century. Bucklin voting was backed by advocates with arguments similar to those used for the ranked choice voting method of instant runoff voting today.

As with IRV, Bucklin voting allowed voters to indicate a first choice and a second choice (and sometimes more). Ballots were counted differently than with IRV, however. With Bucklin voting, no candidates were ever eliminated. Instead the system operated like a "time delay" form of approval voting, with all second choices simultaneously added to all first choices in the event there were no initial majority winner, and then all third choices added and so on. These rules meant, of course, that second choices counted directly against first choices, which is why Bucklin voting violates later-no-harm.

Bucklin voting in practice led to a massive dropoff between the number of voters indicating a first choice and second choice. In Alabama, for example, sixteen statewide primary election races were used with Bucklin voting between 1916 and 1930. On average, 87% of voters cast only a single bullet vote for one choice, in sharp contrast to competitive instant runoff voting elections. Not a single Bucklin voting race in Alabama led to a winner earning a majority of votes who didn't win a majority of first choice votes.

As a result, some Alabama civic leaders suggested requiring voters to express a second choice – in other words, they sought to force them to be "honest men" – but this was rejected out of respect for voters who genuinely had no second choice. Even if this rule had been passed, however, it would have failed to

accomplish its objective. Voters would have had an incentive to disingenuously pick a second choice they believed had no chance to win in order to avoid helping to defeat their first choice candidate.

Bucklin voting elections in the United States deserve more research, but Alabama's pattern of bullet voting seems to have been the norm. For example:

- The City of San Francisco in 1916 adopted Bucklin voting, but stopped using it soon after. One issue was changing to voting machines that had trouble tabulating the system, but another apparently was a massive rejection of casting additional choices, with only 3% of voters doing so. [Source: City government in the United States By Charles Mayard Kneier (3rd ed., 1957)]

- Grand Junction (CO) used Bucklin voting for some mayoral elections. In 1909, the order of finish in first choices had the two frontrunners at 34% and 26%, with two other candidates at 20% and 13% and two final candidates in single digits. But after second and third choice rankings were added, the candidate with 20% won, and the candidate initially with 13% of first choices finished second. The candidate initially with 6% ended up with nearly as many votes as the two frontrunners. These results provide a clear example of apparent tactical voting by the frontrunners' backers not wanting to rank the other frontrunner candidate second.

- Portland (OR) used Bucklin voting from 1913 to 1932, when it was repealed by 81% to 19% [http://www.portlandonline.com/auditor/index.cfm?&a=5168&c=27141]

- Instructively, when trying to reform its laws after a controversial governor nominated by the dominant Democratic Party was impeached, the Oklahoma legislature tried to correct the apparent failures of Bucklin voting in practice. It required voters to rank multiple candidates and gave steadily decreasing values to second and third choices. But mandating rankings was tossed out by state courts – and would have likely been seen as controversial in practice.

- Overall, Bucklin was adopted in more than dozen cities, including Spokane (WA), Denver (CO), Cleveland (OH), Trenton (NJ), Jersey City (NJ), and Houston (TX), but it was not used anywhere in the country by 1940.

Reviewing this history of Bucklin voting, Ernest Bernard Shulz in his *American city government: its machinery and processes* (1949, pages 216, 217, and 370) said Bucklin's most serious defect was the least surprising to someone familiar with the later-no-harm criterion – that a voter's second choice could count against a first choice. The *National Municipal Review* fingered this same problem far earlier. (Source: *National Municipal Review*, Volume 5 http://books.google.com/books?id=j1IJAAAAIAAJ&pg=PA377&dq=Bucklin+system&ei=\HMVpS73PHaCUNebfiYkL&cd=4#v=onepage&q=Bucklin%20system&f=false). It critiqued Bucklin as having the "essential defect" that "the expression of a second-choice may harm the first-choice" and that ""as soon as the largest group of electors discovers that it does not pay to record second preferences, the system will tend to break down." The 1915 mayoral elections in Cleveland were given as an example, with the first round leader Peter Witt being defeated partly by second choices of his own supporters.

In contrast to the massive dropoff in second choices by Bucklin voters, such as the 87% of Alabama voters casting a bullet vote, far higher percentages of voters indicate second choices with instant runoff voting, a system that does not violate later-no-harm. There is typically some degree of dropoff in rounds of counting in IRV elections where voters have the option not to rank people second, but relatively little. In Oakland's hotly contested IRV race for mayor in 2010, for example, more than 85% of voters ranked more than one candidate. (And about three in four of the remaining 15% had backed one of the two frontrunners as a first choice, meaning that their ballot counted for that first choice in every round and a second choice would never have come into play.)

Examples of Actual Single Winner Elections Where Approval Voting Would Have Failed

To underscore how approval voting, Bucklin voting, the Borda count and range voting would not work as promised, we review recent elections in the United States in which voters had more than two choices and consider how those campaigns might have developed with approval voting. Each example shows just how problematic approval voting and similar systems would be in practice.

One obvious example is a special election that took place in Hawaii for a vacant U.S. House seat in 2010. Although a large number of candidates participated, the race quickly boiled down to three frontrunners: Republican Charles Djou and two Democrats, Colleen Hanabusa and Ed Case. An Asian American state senator, Hanabusa was backed by more of the party's traditional backers than Case, who a few years earlier had given up his U.S. House seat to challenge Sen. Daniel Akaka in a Democratic primary. There was a good deal of ill will between backers of Case and Hanubusa, connected to issues involving race, party loyalty and issue positions. As a result, while backers of the Democratic candidate would support either candidate over the Republican, many fiercely wanted their favorite to be the winner.

In an election decided by plurality voting, Republican Djou won with 39.4%. Hanubusa finished second with 30.8% and Case was third with 27.6%. The combined majority vote split by the top two Democrats was 58.4%, which was nearly 20% more than the Republican. With instant runoff voting or traditional runoffs, the outcome almost certainly would have been different. The majority of Case and Hanubusa backers would have backed the other Democrat ahead of Djou, and in this case Hanubusa very likely would have won – and indeed, in the regularly scheduled election later in the year that took place without another Democrat on the ballot, Hanabusa defeated Djou with 53.2% of the vote.

If approval voting had been used in the special election, it's quite likely that Djou would still have won because too many Democrats would have cast bullet votes in the hope that their preferred candidate could win. Just as with plurality voting, then, the winner would have been the candidate who would have lost to each of his top competitors in a one-on-one race. Finger pointing among Democrats after the election would have been rampant – indeed, even if a Democrat had won, backers of the other Democrat who had voted for both Democrats might well have wished they could have had their ballot back in order to cast a bullet to vote to help their favorite.

As another example, consider hotly contested races both major parties held in 2008 to determine their presidential nomination. On the Democratic side, the first caucuses in Iowa were dominated by Barack

Obama, John Edwards and Hillary Clinton, who finished in that order, with other candidates such as Joe Biden, Bill Richardson and Dennis Kucinich trailing. Going into the first primary in New Hampshire, Obama was well-positioned to become a clear frontrunner and the near-certain nominee with another win. Edwards and Clinton had to defeat him, and the remaining Democratic candidates knew they had to finish surprisingly well to have any chance to stay in the race.

If approval voting has been used in the New Hampshire primary, each campaign and their backers would have been thrown into a frenzy of calculation about how best to vote rather than just vote sincerely, as would have the case if instant runoff voting were used. For Obama's consultants, the decision would have been straightforward – to try to get their supporters to vote only for him, while also trying to pick up some approval votes from the "disorganized" backers of Edwards ,who in that state generally preferred Obama to Clinton.

Consultants to Clinton would have been in a tricky place: they would have wanted to slow Obama's momentum in any way possible, but also not fall behind Edwards. They would have watched the polls very closely – encouraging a bullet vote for Clinton if she was positioned to win, but suggesting an additional vote for Edwards if that were the only way to defeat Obama. Edwards' consultants would have made very similar calculations.

For the trailing candidates, the situation would also have been complicated. To have any chance, they would have had to pull an upset to move into the top three, but at the same time, they might well have wanted to weigh in on the choice among those top three candidates. Such dilemmas would have continued as the campaign progressed, with voters and their consultants again and again beset by strategic decisions on how best to vote, with sincere voting rarely the answer.

These tactical problems can be understood all the more clearly if the Democratic nomination had been decided by a single national primary with approval voting. For any voter with a first choice of Obama, Edwards or Clinton, they would have been torn between the obvious logic of the bullet vote and the option of casting a second vote to count against their least favored major candidate. They might have tossed an approval vote to one of the lesser candidates, but only if they truly believed those candidates could not win – something they would have to trust the polls to be able to know.

Any backer of a lesser candidate would have known that giving a vote to any of the top three candidates would make their candidate's potential upset all the less likely. Even though those voters might indeed have a real preference among those top three, most of them probably would not express it unless they truly had given up on their candidate having a chance to win. That would have turned those lesser candidates into classic "spoilers." The outcome almost certainly would have a relatively low plurality, with much talk of spoilers and tactical voting.

The same dynamics would have been present in a prospective national primary for the Republican nomination that year, in which the top candidates at different times included eventual nominee John McCain and challengers Mitt Romney, Mike Huckabee and Rudy Giuliani, with other candidates like Ron Paul and Fred Thompson also securing support.

Strategic dilemmas again would have run rampant. After all the pundits had made their arguments and campaigns had made their case to their backers, most voters likely would have cast bullet votes, just as if it were a plurality voting race. Perhaps some voters might have done a "reverse bullet vote" against their last choice by approving everyone except that candidate – but only if they really didn't care which candidate won and only wanted to make sure their least preferred candidate was defeated.

Few voters would have done what the approval voting theorists say they "should" do (e.g., vote for any candidate they found acceptable and everyone they liked more than that candidate) because it would have been clear that doing so might have led to the defeat of their favorite candidate. Instead, all the "organized" voters influenced by campaigns would have cast bullet votes and then hoped that the "unorganized" backers of other candidates would naïvely give out extra approval votes due to not having much of a preference or not understanding the underlying incentives of the system. Bloggers and pundits would have a field day with conjectures and tactical suggestions, and partisans would regularly have pointed fingers at other campaigns and cried foul for alleged insincerity – insincere tactics that all of them in fact would have been surreptitiously urging their strongest backers to pursue.

Both of these hypothetical national primaries would have been chaotic and controversial. And worse, just as in the Hawaii example, it's quite possible that the winner would not have been the candidate who truly had the widest backing among voters, but instead would be the candidate whose campaign did the best job at manipulating the vote.

A Place for Approval Voting: Where "Honest Behavior" Can Be Expected

Even if approval voting and other methods that violate later-no-harm rarely should be used in meaningfully contested elections, they have a useful place in our society: for surveys or private elections where honest, non-strategic behavior is to be expected. A group deciding on where to have dinner might sensibly use approval voting or perhaps might want to turn to range voting with a wider range of numerical options that allow voters to give extra weight to passionate support for a meal option. A hiring committee might decide to narrow the field to their top three candidates with approval voting. Some sports awards voting might want to consider such systems as long as voters were expected to vote sincerely, as is the case with uses of the Borda Count in such contests.

Approval voting might even work in certain contested candidate elections that have provisions for repeated voting, with repeated voting until candidates earn a certain minimum level of support. With such rules, a voter might choose to bullet vote for their true favorite without risk of helping to elect their least favored candidates. Voters in later rounds of voting would be forced to consider compromise choices and, as with the political conventions of old, eventually a winner would emerge with enough acceptability to be considered legitimate. Provisions for repeated voting would be impractical for governmental elections and many private elections, but can used for in-person gatherings where participants are willing to spend a lot of time voting and for elections where it is possible to do repeated elections online.

Even in such uses, however, a first requirement would be that all voters would need to be fully informed about how approval voting works in order to avoid "organized" voters having an advantage over less

informed voters. This requirement probably would make it more sensible to use runoff elections, instant runoff voting or Condorcet voting.

Conclusion: Why Serious Reformers Focus on Viable Voting Methods for Governmental Elections

This analysis is designed to explain to policymakers and would-be backers of approval voting why it is a fool's errand to propose approval voting and similar systems for use in meaningfully contested elections due to its practical flaw that makes it highly vulnerable to strategic voting. We would urge anyone still unconvinced to consider approval voting's prospective use in other potential consequential single-winner elections where more than two candidates might win and then to think hard about how strategic actors and analysts would act in this election. It will not take long to realize just how unworkable approval voting would be in such an election.

While our assessment of approval voting may seem harsh, it is designed to explain why prominent backers of instant runoff voting do not support it. Instant runoff voting backers do not mean to be "sectarian" in the way that some backers of other methods can be – indeed the history of IRV advocates like FairVote has been to only express negative views of approval voting and its variations as part of a defense of instant runoff voting. With this analysis, we have provided a detailed examination of approval voting to which we now can direct potential backers of these systems with a goal of cutting short long debates about irrelevant alternatives.

The bottom line is that if policymakers or reformers are unhappy with the use of plurality voting in single-winner elections that are meaningfully contested, they have only three serious options:

1) ***Proportional voting***: Seek to turn those single-winner elections into multi-winner elections and then use any number of proportional voting systems that provide more voter freedom and representative outcomes.

2) ***Runoff elections***: Adopt a traditional multi-round runoff election system and accept some of the difficulties that come with approaches, such as disparities in turnout between rounds and increased costs of administering elections and running for office.

3) ***Instant runoff voting***: Adopt a form of instant runoff voting (a.k.a.," ranked choice voting" or "preferential voting") that upholds the later-no-harm criterion.

FairVote would back any of these three reform options, working within the context of what office is being elected, what local reformers want to do and what election administration conditions exist. What is unacceptable to us is maintaining plurality voting – and spending energy on proposals with practical flaws that make them unworkable and irrelevant.