The Failure of Instant Runoff Voting to accomplish the very purpose for which it was adopted: An object lesson in Burlington Vermont

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Abstract

Instant-Runoff Voting (IRV), recently relabeled "Ranked-Choice Voting" (RCV), has been marketed to "guarantee the majority candidate is elected", to "eliminate the spoiler effect", and to empower voters, particularly those supporting third-party or independent candidates, to "vote your hopes, not your fears" which is meant to level the playing field between such candidates and those from the major party duopoly. It is shown that in Burlington Vermont, IRV objectively failed to deliver on these promises but this failure is not blamed on the use of the ranked ballot or RCV in general, but on the Hare method of tallying the ballots and identifying the winner. A correction to the method is offered including a template for possible legislative language.

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1   What are participatory democracies trying to accomplish with elections?

Ranked-Choice Voting (RCV) is not new in the 21st century and has earlier taken a few different forms. One form that saw use around the turn of the previous century is *Bucklin Voting* in which second-ranked votes are added to first-ranked votes if the latter are not enough for a 50% majority. This election system was challenged in various state judiciaries. A ruling on cumulative voting [1] from the North Dakota Supreme Court in 1911 made a fundamental observation about the purpose of elections and in the nature of majority rule:

> "The theory of cumulative voting... rests upon a false or fictitious premise. It assumes that the computation of the number of marks placed upon a ballot in favor of a candidate should determine whether he is elected, when in fact the marks are, and can only be, representative of persons possessing certain qualifications [citizens having franchise]. The end sought is to determine how many persons who have registered their preference by voting in favor of the election of a particular candidate, and the number of such persons cannot be increased or diminished by any false or fictitious system of marking the ballots.

> "The placing of marks upon the ballot is only a method of enumerating persons, and if the number of persons desiring the election of a named candidate can be multiplied by two by the fiat of the legislature, it can, by the same means, be multiplied indefinitely.
>
> "Our system of government is based upon the doctrine that the majority rules. This does not mean a majority of marks but a majority of persons possessing the necessary qualifications and the number of such persons is ascertained by means of an election… regardless of all theories of those who would, by means more or less indirect, make it possible for a minority to secure representation where not entitled to it under our system."

An interesting curiosity is that Fargo North Dakota is the very first municipality to recently adopt an election reform competing with RCV known as *Approval Voting* which is another form of "cumulative voting".

The salient ethic to draw from this opinion and ruling is that, while minority groups (along any lines, not only along race, creed, ethnicity, class or gender) can expect protections of various rights, the entitlement of a minority of the electorate to rule, to set policy, to elect leaders is not one of them. That right belongs to the majority of the electorate as individuals with franchise and who bother to go to the poll and vote. That is the only way for our votes to count equally as citizens possessing equal rights and equal franchise. If, because of a "false or fictitious system of marking the ballots," the candidate favored by the majority of voters is not elected, that means the voters for the minority-favored winning candidate had cast votes that each counted more than each of the greater number of votes cast for the majority-favored candidate.

Elections are about majorities, not a majority of marks for their own sake, but of a majority of enfranchised citizen voters, as persons having equal rights and who have the right to have their votes count equally and "not be increased or diminished by any false or fictitious system of marking the ballots". This principle of equality of the value of our votes is commonly expressed as:

1. *"One person, one vote"*. **Every enfranchised voter has an equal influence on government in elections** because of our inherent equality as citizens and this is independent of any utilitarian notion of personal investment in the outcome. If I enthusiastically prefer Candidate A and you prefer Candidate B only tepidly, your vote for Candidate B counts no less (nor more) than my vote for A. The effectiveness of one's vote – how much their vote counts – is not proportional to their degree of preference but is determined only by their franchise. A citizen with franchise has a vote that counts equally as much as any other citizen with franchise. For any ranked ballot, this means that if Candidate A is ranked higher than Candidate B then that is a vote for A, if only candidates A and B are contending (such as in the RCV final round). It doesn't matter how many levels A is ranked higher than B, it counts as exactly one vote for A.

Elections are about "enumerating persons" and identifying the choice of the majority of voters as persons having equal rights and equal franchise. However the numerical and operational meaning of *"majority"* needs to be considered. An *"absolute majority"* are more votes than half of all cast, more

than the totality of **all** other alternatives, and a *"simple majority"* is more than half of votes cast, excluding abstentions. If 100 ballots are cast in a two candidate single-winner race, 45 for Candidate A, 40 for Candidate B, and 15 expressing no preference between A and B, we say that Candidate A received a simple majority (53% of voters expressing a preference) but not an absolute majority (45%) of the cast ballots.

Nonetheless everyone agrees that Candidate A, having a simple majority, is the preference of the electorate and no one disputes the legitimacy of the election of Candidate A to office. And between two candidates, there is always a simple majority unless they tie. This simple fact is sometimes misconstrued that Hare RCV (formerly called "Instant-Runoff Voting" or IRV) elections "guarantee a majority winner" because they boil the field of candidates in an election down to two candidates in which there is always a simple majority.

When there are two alternatives to choose from in an election, either two candidates for office or a binary yes/no question, everyone agrees who or which alternative has won. The candidate that has more votes than the other, a simple majority, wins even if that candidate did not get an absolute majority of support from the electorate. ***If more voters mark their ballots preferring Candidate A over Candidate B than the number of voters marking their ballots to the contrary, then Candidate A is elected and Candidate B is not elected.*** This is the principle of majority rule in an election with a binary choice. We elect the candidate that displeases the fewest voters expressing a preference on their ballots.

However, when there are more alternatives than two, when there is Candidate C in the race, then we don't know that Candidate A is still the majority choice of the electorate. Perhaps Candidate C is preferred over both A and B or perhaps C is less preferred than either A or B. But this does not change the preference the electorate has for Candidate A over B. If the presence of Candidate C somehow causes the election of Candidate B even though a simple majority of voters prefer A to B, we call that a *"spoiled election"* or the *"spoiler effect"* and Candidate C is the *"spoiler"*. A spoiler is a candidate who loses in an election yet, simply by being a candidate in that election, changes who the winner is.

When an election is apparently spoiled, many of the voters who voted for the ostensible spoiler suffer voter regret for their choice when they learn of the outcome of the election and they realize that they aided the candidate they preferred least to win by *"throwing away their vote"* or *"wasting their vote"* on their favorite candidate rather than voting for the candidate best situated to beat their least-preferred candidate.

This leads to tactical voting in future elections, where the voting tactic is called *"compromising"*. This tactical voting is not a nefarious strategy to throw or game an election but is an undesired burden that minor party and independent voters carry, which pressures them to vote for the major party candidate that they dislike the least. They are voting their fears and not their hopes and this has the effect of advantaging the two major parties. This reflects *"Duverger's Law"* which states that plurality rule (First-Past-The-Post or FPTP) elections, with the traditional mark-only-one ballots, promote a two-party political system, and third party or independent candidates will not have a level playing field in such elections. Voters who want to vote for these third party or independent candidates are discouraged from doing so, out of fear of helping elect the major party candidate they dislike the most.

With Candidate C in the race, we don't know immediately that Candidate A is still the majority preference, but we continue to know that Candidate B is not. Then with more than two candidates, this principle of majority rule is generalized as:

2.   *Majority rule:* **If more voters mark their ballots preferring Candidate A over Candidate B than the number of voters marking their ballots to the contrary, then Candidate B is not elected.** If Candidate B *were* to be elected, that would mean that the fewer voters preferring Candidate B had cast votes that had greater value and counted more than those votes from voters of the simple majority preferring Candidate A.

Along with well-warned elections, equal and unhindered access of the enfranchised to the vote, the secret ballot, and process transparency, these two principles; *Majority rule* and *"One person, one vote"*, are among the fundamental principles on which fair single-winner elections are based.

There are at least two other properties that we desire for elections:

3.   Avoiding the *"spoiler effect"*: The relative merit of candidates A and B is not affected by the presence of a third candidate C. If a simple majority of voters agree that Candidate A is better than B, whether Candidate C enters the race or not, it does not reverse the preference of Candidate A over Candidate B. If that relative preference of candidates are not affected among voters (with Candidate C in the race), then the relative outcome of the election should not be affected (which would be Candidate B winning over Candidate A). Conversely, this means that removing **any** loser from the race and from all ballots, that this should not alter who the winner is.

4.   Voters should not be called upon to do *"tactical voting"*. Voters should feel free to simply vote their conscience and vote for the candidates they like best, without worrying about whom that they think is most electable. Voters should be able to vote for the candidate of their choosing (e.g. Perot in 1992 or Nader in 2000) without risk of contributing to the election of the candidate they **least** prefer (perhaps Clinton in 1992 or Bush in 2000). They should not have to sacrifice their vote for their favorite choice because they are concerned about "wasting" their vote and helping elect the candidate they loathe. Voters should be able to *"Vote their hopes rather than vote their fears"*.

2   An anomalous election in a small and progressive city

Consider the RCV election for mayor of Burlington Vermont in 2009. At the time the method was known as *"Instant-Runoff Voting"* (IRV) and will also be referred to here as *"Hare RCV"* to differentiate the method from other ranked-choice voting systems. Referring to Table 1 below one can see an anomaly in the column on the right [2]. Note that among these IRV elections that were audited by the authors of the source document, all elections are checked, except for one; the Burlington 2009 mayoral election.

Election	Candidates	Ranks	Ballots	Condorcet winner
2002 Dáil Éireann, Dublin North[*]	12	12	43,942	✓
2002 Dáil Éireann, Dublin West[*]	9	9	29,988	✓
2002 Dáil Éireann, Meath[*]	14	14	64,081	✓
2006 Burlington mayor	6[‡]	5	9,865	✓
2007 San Francisco mayor	18	3	149,465	✓
2007 Takoma Park city council special, ward 5	4[‡]	4	204	✓
2008 Pierce County assessor	7[‡]	3	312,771	✓
2008 Pierce County council, dist. 2	4[‡]	3	43,661	✓
2008 Pierce County executive	5[‡]	3	312,771	✓
2009 Aspen city council[†]	11[§]	9	2,544	✓
2009 Aspen mayor[†]	5[‡]	4	2,544	✓
2009 Burlington mayor	6[‡]	5	8,984	
2009 Pierce County auditor	4[‡]	3	159,987	✓
2010 Berkeley auditor	2[‡]	3	45,986	✓
2010 Berkeley city council, dist. 1	5[‡]	3	6,426	✓
2010 Berkeley city council, dist. 4	5[‡]	3	5,708	✓
2010 Berkeley city council, dist. 7	4[‡]	3	4,862	✓
2010 Berkeley city council, dist. 8	4[‡]	3	5,333	✓
2010 Oakland auditor	3[‡]	3	122,268	✓
2010 Oakland city council, dist. 2	3[‡]	3	15,243	✓
2010 Oakland city council, dist. 4	8[‡]	3	23,884	✓
2010 Oakland city council, dist. 6	4[‡]	3	14,040	✓
2010 Oakland mayor	11[‡]	3	122,268	✓
2010 Oakland school board director, dist. 2	2[‡]	3	15,243	✓
2010 Oakland school board director, dist. 4	3[‡]	3	23,884	✓
2010 Oakland school board director, dist. 6	2[‡]	3	14,040	✓
2010 San Francisco board of supervisors, dist. 2	7[‡]	3	28,911	✓
2010 San Francisco board of supervisors, dist. 6	15[‡]	3	25,057	✓
2010 San Francisco board of supervisors, dist. 8	5[‡]	3	38,551	✓
2010 San Francisco board of supervisors, dist. 10	22[‡]	3	20,550	✓
2010 San Leandro city council, dist. 1	4[‡]	3	23,494	✓
2010 San Leandro city council, dist. 3	2[‡]	3	23,494	✓
2010 San Leandro city council, dist. 5	3[‡]	3	23,494	✓
2010 San Leandro mayor	7[‡]	3	23,494	✓
2011 San Francisco district attorney	6[‡]	3	197,242	✓
2011 San Francisco mayor	25[‡]	3	197,242	✓
2011 San Francisco sheriff	5[‡]	3	197,242	✓

[*] Multiseat STV elections that have been treated as IRV.
[†] IRV-like rules that have been treated as IRV.
[‡] Includes a single combined write-in candidate.
[§] Includes two combined write-in candidates.
The Ranks column denotes how many candidates a voter was allowed to rank on the ballot.
There is a ✓ in the Condorcet winner column if the IRV procedure elects the Condorcet winner.

Table 1 A compilation of data from various IRV elections. Note the anomaly in the right-hand column.
(from Sarwate, et al. 2013 *"Risk-limiting Audits for Nonplurality Elections"*)

The *Condorcet Winner* (after Nicolas de Condorcet, an 18th century French mathematician and philosopher who was martyred by French revolutionaries that he once was allied with) is the candidate who, from the ranking data expressed on ranked-order ballots, defeats every other candidate in a one-on-one runoff paired with each of the other candidates. This head-to-head runoff is exactly what happens in the IRV final round. The term *"Pairwise Champion"* has sometimes been used in scholarship for the Condorcet Winner simply for the purpose of description. A better term that will be used here is *"Consistent Majority Candidate"*.

It should not be surprising that the Condorcet Winner wins in these IRV elections in Table 1 because the Consistent Majority Candidate must have *some* base support in order to prevail in every one of those head-to-head runoffs. And all the Condorcet Winner need accomplish is to get into the IRV final round and the Condorcet Winner will always win that final round.

The table shows that the apparent desired outcome of all of these IRV elections that were analyzed is that the Condorcet winner (or Consistent Majority Candidate) is identified from the ballot data and elected. Except for one exception that is apparently Burlington 2009. If any candidate other than the Consistent Majority Candidate is elected, it is necessary that Principles 1 and 2 above (One-person-one-vote, Majority rule) are violated and it is shown that Properties 3 and 4 above must also be violated in that election.

The 2009 Burlington IRV election illustrates this perfectly. The data in Tables 2 and 3 was compiled by the author directly from public files obtained from the Burlington City Clerk and is repeated by Warren Smith [3] and Brian Olson [4]. These analyses show that candidate Andy Montroll was preferred over Kurt Wright by a margin of 933 voters and that Andy Montroll was preferred over Bob Kiss by a margin of 588 more voters, yet the IRV final round was between Wright and Kiss, with Kiss being preferred (over only Wright, not Montroll) by a margin of just 252 voters (out of 8374). Why was the final round contested between candidates Wright and Kiss when the ballot data indicates that candidate Montroll would have defeated either of them in the final round?

Candidate A (Andy) was preferred, as expressed explicitly on their ballots, by a simple majority of Burlington voters over Candidate B (Bob), yet Candidate B was elected to office. The 3476 voters that preferred Bob had votes that counted more than those of the 4064 voters that preferred Andy. These are **not** equally valued votes nor is this majority rule and as such is a **failure of democracy**.

Although he ran to win and was a serious contender, Kurt Wright was effectively the spoiler; a candidate who loses an election and yet whose presence in the race actually *changes* who the winner is. Had Kurt Wright not run and the same Burlington electorate come to the polls and expressed their same preferences with the remaining four candidates, the election outcome would have been different, with Andy Montroll prevailing in the final round over Bob Kiss by a margin of 588 votes.

Of the voters preferring Wright in the semifinal round, the largest group were 1510 voters who marked Montroll as their second choice and preferred Kiss not at all. As shown in Table 2, if 371 (less than one in four) or more of these voters had anticipated that their guy was not going to win and voted tactically, this voting tactic being "compromising", they would have prevented the election of Bob Kiss, the candidate they disliked the most. (Or if 587 of those voters, along with 154 preferring only Wright, had

just stayed home and not come to the polls at all, they would have prevented the election of the candidate they disliked the most.)

Except that Ranked-Choice Voting was used, this is hardly different than what happens with Progressive or Green Party voters who compromise and vote for the Democrat out of fear of helping elect the GOP candidate they loathe. IRV promised these voters that they could "Vote their hopes rather than vote their fears".

But these conservative voters in Burlington found out otherwise: *"In this liberal town I gotta choose between* 'Liberal' *or* 'More-Liberal'*, because if I vote for the guy I really like then* 'More-Liberal' *gets elected!"* That has got to make some people angry. Simply by marking their sincere favorite choice as #1, they literally *caused* the election of their most disliked candidate.

Recently former Vermont governor, presidential candidate, and longtime Burlington resident Howard Dean, in promoting re-adoption of Hare RCV, mistakenly claimed *"you can still get your second-choice vote."*[5] That promise was clearly not delivered to these 1510 Wright voters that disliked Kiss and that caused the election of Kiss simply by marking Wright as #1. Their first choice was defeated and their second-choice vote was not counted. If those second-choice votes had been counted, a different candidate for mayor would have been elected. The following year, Ranked-Choice Voting (then called "IRV") was repealed in Burlington Vermont.

An additional desirable property of a voting system is:

> 5. *Precinct summability:* Transporting ballot information from polling places to the central tabulation location (City Hall) in an opaque manner is viewed as less transparent than having each precinct reporting vote subtotals for each race to the media and to the campaigns for them to also tally and audit the election results. While First-Past-The-Post (FPTP) is precinct summable and precincts report their vote subtotals, Instant-Runoff Voting (a.k.a. Hare RCV) is not. However, a Condorcet-consistent RCV method can, for each precinct, report vote subtotals for each pairing of candidates that are summable by outside parties. Condorcet RCV preserves this salient property of process transparency that Hare RCV does not.

IRV in Burlington in 2009 did not elect the candidate that was preferred by simple majorities over all of the other candidates. IRV did not protect against the spoiler effect and, after promising not to, IRV punished a large group of voters (one sixth of the electorate) for simply marking their favorite choice as #1, thus discouraging sincere non-tactical voting. These facts are indisputable and are supported by the public record.

Furthermore IRV is not precinct summable, requiring the opaque transporting of ballot data from the polling places to a central tabulation facility and the tallying of votes and the identification of the winner to be done **only** at that central tabulation location.

It is this failure that happened in 2009 that we should not repeat. Particularly in the City of Burlington that had the only government election employing IRV in which IRV literally elected the wrong candidate, someone other than the Consistent Majority Candidate (a.k.a. Condorcet winner).
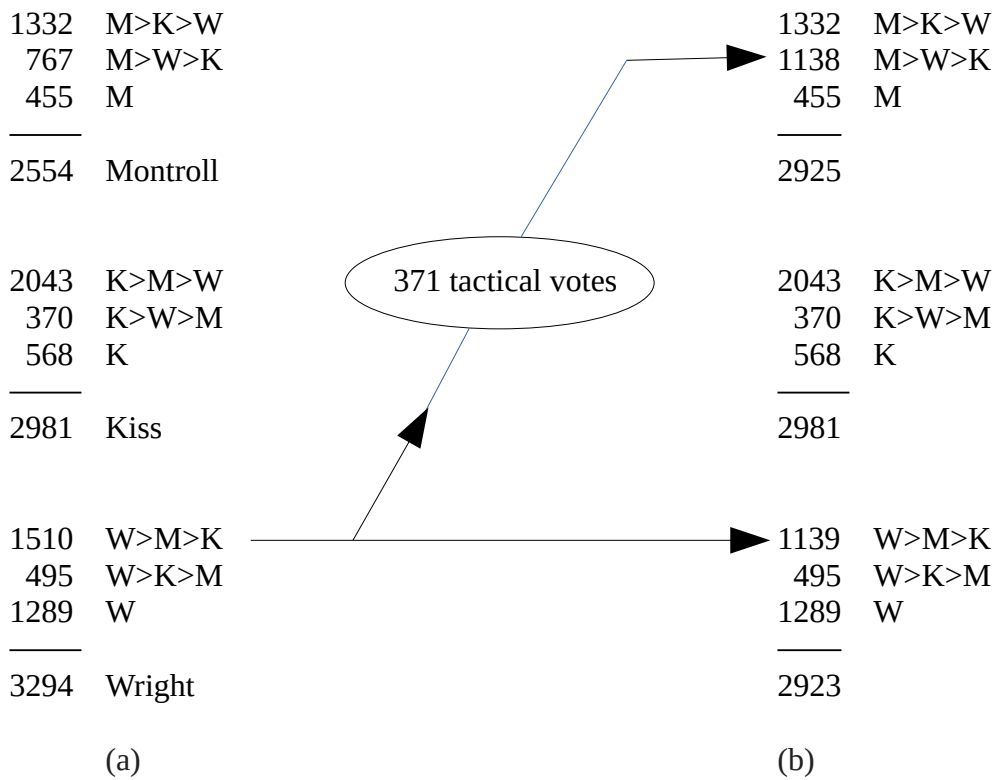
1332	M>K>W
767	M>W>K
455	M

| 2554 | Montroll |

2043	K>M>W
370	K>W>M
568	K

371 tactical votes

| 2981 | Kiss |

1510	W>M>K
495	W>K>M
1289	W

| 3294 | Wright |

(a)

1332	M>K>W
1138	M>W>K
455	M

| 2925 | |

2043	K>M>W
370	K>W>M
568	K

| 2981 | |

1139	W>M>K
495	W>K>M
1289	W

| 2923 | |

(b)

Table 2   (a) Ballot rankings for the top three candidates in the semifinal round.
(b) For the 1510 Wright voters that disliked Kiss the most, had 371 or more of these voters
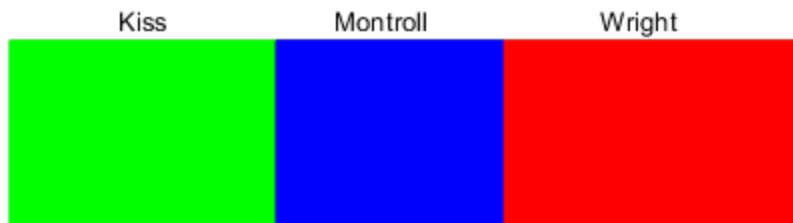voted tactically, they would have prevented Kiss from winning the IRV election in 2009.

Fig. 1   Effective first-choice votes in the semifinal round. The second-choice preferences are not
visible to the Hare RCV method in the semifinal round.

Montroll	4064	M>K			
Kiss	3476	K>M	Montroll	4570	M>S
	———		Smith	2997	S>M
	588			———	
				1573	

Montroll	4597	M>W			
Wright	3664	W>M	Wright	3971	W>S
	———		Smith	3793	S>W
	933			———	
				178	

Kiss	4313	K>W			
Wright	4061	W>K	Kiss	3944	K>S
	———		Smith	3576	S>K
	252			———	
				368	

Table 3 Pairwise tallies for the four significant candidates, six pairings. The tallies for the Kiss-Wright pairing are consistent with the results of the IRV final round. Also note that only candidate Montroll defeats every other candidate he faces. These figures can be obtained from totaling the corresponding pair subtotals for every precinct poll, which is why Condorcet-consistent RCV is *Precinct Summable.*
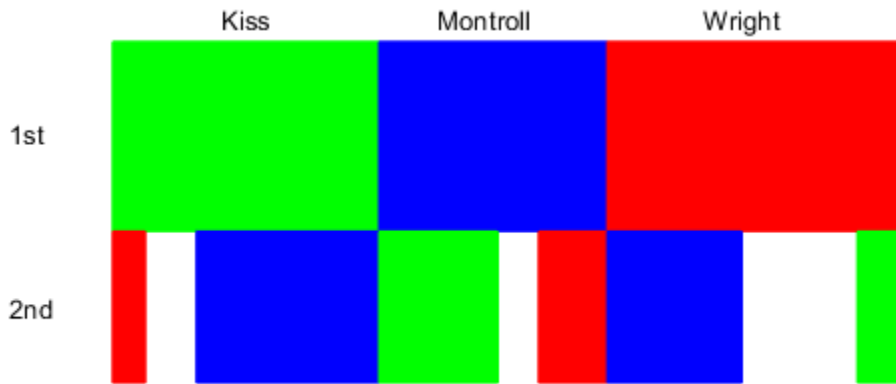

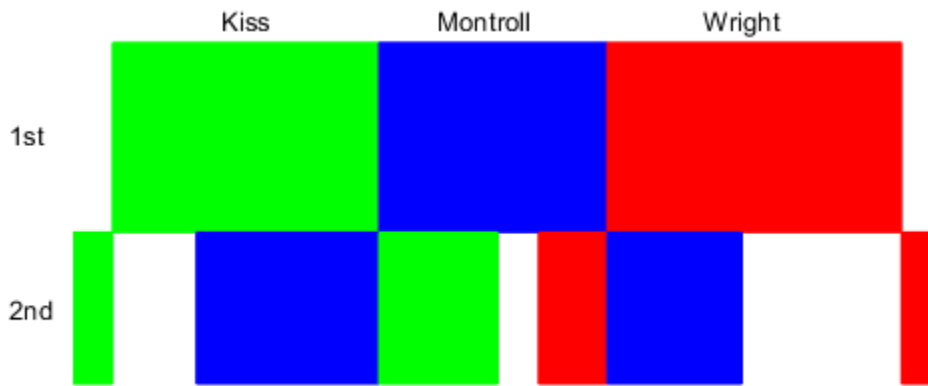**Fig. 2** First-choice votes (above) and second-choice preferences (below) in the semifinal round.

Fig. 3   Second-choice preferences for non-center candidates "wrapped around".

3   The seminal flaw

Elections are zero-sum games. There are winners and losers. The only party that had benefited from IRV in the only two applications of IRV in Burlington or in Vermont is the Progressive Party. In 2009 Hare RCV demonstrated a statistical bias that harms the centrist candidate in favor of those candidates on the left or right wings. This bias is called the *"Center Squeeze effect"* [6] and originates from the fact that Hare RCV is opaque to second-choice votes that are not yet transferred to be effective first-choice votes and counted as shown in Fig. 1. The centrist candidate in the semifinal round normally will receive more second-choice rankings from voters on the left or right than the candidates on the left or right can expect to receive from voters in the opposite wing. This is shown in Fig. 2 and Fig. 3.

By comparison, in the final round the entire ballot is considered. Every ballot with A ranked higher than B counts as a vote for A no matter how low both rankings are. Some second-choice votes count and indicate voter support. With Montroll eliminated in Hare RCV and with Montroll voters' second-choice votes split among Wright and Kiss, Fig. 4 shows Kiss having slightly more support than Wright with a margin of 3.01%. Kiss got more votes from Montroll voters than did Wright.

Fig. 4   Votes effectively counted with Montroll eliminated.

However if Montroll is compared directly to Wright (with Kiss voters split), in Fig. 5, Montroll prevails by a margin of 11.3%. Montroll gets far more votes from Kiss voters than does Wright. And if Montroll is compared directly to Kiss (with Wright voters split), in Fig. 6, Montroll prevails with a margin of 7.8%. Again, Montroll gets far more votes from Wright voters than does Kiss.

Compared directly, Montroll (alone) simply was preferred over either Wright (alone) or Kiss (alone) by Burlington voters in 2009.
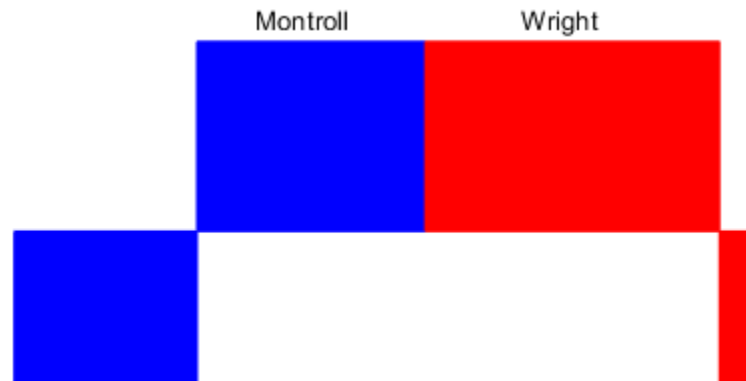

Fig. 5   Votes effectively counted with Kiss eliminated.
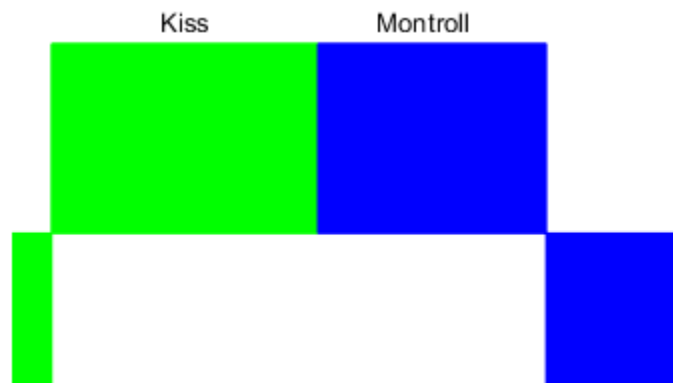

Fig. 6   Votes effectively counted with Wright eliminated.

Obscuring this second-choice voter support in the semifinal round disproportionately harms the centrist candidate more than those on the left or right wings. This may make the voter support for the centrist candidate appear, in the semifinal round, to be less than what it truly is when second-choice votes are visible and that disproportionate effect is the Center Squeeze.

This bias does not inherently lean left or right, it just leans away from the center. However, since 2019

there are no Republicans in Burlington elected to public office at all. Only the Progressive Party remains to benefit from this Center Squeeze effect and 13 years ago, this known statistical bias of Hare RCV, harming the candidate and voters in the center of the spectrum, was demonstrated in example in Burlington Vermont.

And conservative voters were promised (as were all voters promised) that they could vote for their favorite candidate without fear of helping elect their least favorite candidate. That promise was not kept in Burlington in 2009. Now these GOP voters are, in reality, the *third party* in Burlington and whom should most look forward to benefiting from the blessings of Ranked-Choice Voting. They should be able to run a candidate for mayor without fear of vote splitting with the Democrats.

But it is only the Progressive Party that conveniently benefited from this unnecessary flaw in Hare RCV that, in different ways, harmed both Democrats and the GOP in Burlington Vermont.

4   A simple correction compatible with the Single Transferable Vote model

The language of the common Hare RCV method can be modified to correct the mistake made by Ranked-Choice Voting in Burlington in 2009 by failing to elect the Consistent Majority Candidate. It can be modified so that the Consistent Majority Candidate is never eliminated in any round preceding the final round. And we know that the Consistent Majority Candidate (or "Pairwise Champion") will always defeat any candidate in the final round.

This modification to Hare RCV is called *"BTR-STV"* for *"Bottom Two Runoff – Single Transferable Vote"* and was conceived by Rob LeGrand in 2006 [7]. It is very similar to the Single Transferable Vote (STV) model in Hare RCV; having sequential rounds, eliminating one candidate each round, and transferring votes from defeated candidates to the contingency choices of voters. In STV, each voter has this vote token that, with the voter's permission, is transferred to another candidate when the voter's preferred candidate is defeated. But instead of identifying the candidate with the fewest number of vote tokens to be whom is defeated in a round, BTR-STV requires the two candidates with the least number of votes to contend, in a one-on-one runoff just as in the STV final round, to see which candidate has *greater voter support* and that candidate advances to the next STV round. Of the two bottom candidates, the candidate with *"lesser voter support"* is defeated.

This *greater* or *lesser voter support* is defined exactly as it would be if the bottom two candidates were the final two candidates. If the number of ballots having A ranked higher than B exceeds the number of ballots having B ranked higher than A, then B has *lesser voter support,* B is defeated, and A advances to the following STV round. Likewise, if the number of ballots having B ranked higher than A exceeds the number of ballots having A ranked higher than B, then A has *lesser voter support,* A is defeated, and B advances to the following STV round. This is exactly how the two candidates contend in the STV final round and the very same metric of voter support is used in this critical action decision that eliminates a candidate.

The Consistent Majority Candidate (or Pairwise Champion) can never be the candidate with *"lesser voter support"* in any pair and therefore the Consistent Majority Candidate will never be defeated in any BTR-STV round. And we know that the Consistent Majority Candidate will beat any other

candidate in the final round, insuring that the Consistent Majority Candidate wins. Having the fewest number of vote tokens and having *"lesser voter support"* do not necessarily mean the same thing **except** in the RCV final round. That is when the candidate with the most votes is also certainly the candidate with the greater voter support and that candidate is elected.

A plausible template for legislative language could be:

> All elections of [office] shall be by ballot, using a system of ranked-choice voting without a separate runoff election. The presiding election officer shall implement a ranked-choice voting protocol according to these guidelines:
>   (1) The ballot shall give voters the option of ranking candidates in order of preference. Lower ordinal preference shall be considered higher rank and the candidate marked as first preference is considered ranked highest. Equal ranking of candidates shall not be allowed. Any candidate not marked with a preference shall be considered as ranked lower than every candidate marked with a preference.
>   (2) If a candidate receives a majority (over 50 percent of all marked ballots) of first preferences, that candidate is elected.
>   (3) If no candidate receives a majority of first preferences, an instant runoff retabulation shall be performed by the presiding election officer. The instant runoff retabulation shall be conducted in sequential rounds. A "continuing candidate" is defined as a candidate that has not been defeated in any previous round. Initially, no candidate is defeated and all candidates begin as continuing candidates.
>   (4) In each round, every ballot shall count as a single vote for whichever continuing candidate the voter has ranked highest. The [two candidates with the fewest votes in a round, herein denoted as "A" and "B", shall contend in a runoff in which the candidate, A or B, with lesser voter support shall be defeated in the current round. If the number of ballots ranking A higher than B exceeds the number of ballots ranking B higher than A, then B has lesser voter support, B is defeated, and A continues to the following round. Likewise, if the number of ballots ranking B higher than A exceeds the number of ballots ranking A higher than B, then A has lesser voter support, A is defeated, and B continues to the following round. In the case that the aforementioned measures of voter support of A and B are tied, then the] candidate with fewest votes is defeated in the current round.
>   (5) The aforementioned instant runoff retabulation, eliminating one candidate each round, shall be repeated until only two candidates remain. The remaining candidate then receiving the greatest number of votes is elected.
>   (6) The [governing jurisdiction] may adopt additional regulations consistent with this subsection to implement these standards.

5   Conclusion

Five simple and uncontroversial principles and desirable properties of governmental elections are enumerated:

1. One person, one vote
2. Majority rule
3. Avoid spoiler effect
4. Disincentivize tactical voting
5. Precinct summability and audit transparency

It's hard to imagine any advocate of participatory democracy disputing the salience and value of any of these principles or properties. Yet in Burlington Vermont in 2009, the Hare RCV election failed to comport with any of these five principles or desirable properties. Proponents of Hare RCV never promised precinct summability but they do regularly promise that RCV:

1) is "guaranteed to elect the candidate with majority support" even when there are more than two candidates,
2) "eliminates the Spoiler Effect",
3) and lifts the burden of tactical voting from voters allowing them to "Vote their hopes rather than vote their fears" which levels the playing field for third-party and independent candidates to fairly compete with those candidates of the two major parties.

However, 13 years ago in Burlington Vermont, Hare RCV objectively failed to deliver on any of those promises. Following the 2009 election there was great and acrimonious controversy. The elected mayor was perceived to have diminished legitimacy.

Bob Kiss in 2009, unfortunately shares a distinction with George W. Bush in 2000 and with Donald Trump in 2016. All three candidates were elected to executive office when the public record indicates that more voters marked their ballots preferring a different *specific* candidate for that office.

The following year, 2010, Instant-Runoff Voting was repealed and the city had reverted to plurality rule (or "First-Past-The-Post").

In 2021, Burlington voted to readopt Hare RCV and, ironically in the same election, the incumbent Mayor Miro Weinberger was reelected under FPTP with a 43% plurality, only 0.9% more than Max Tracy, when independent Ali Dieng received nearly 13% of the vote, clearly enough to possibly alter the outcome of the election. If Dieng had not run and his voters had broken 7 to 6 in favor of Tracy, then Max Tracy would have been elected mayor. But we'll never know because we did not collect enough information from the voters in Burlington with the traditional *"mark-only-one"* ballot. A ranked ballot is needed to collect this contingency information from voters. This precipitated clamor for expeditiously completing enactment of the re-adoption of the ranked ballot. As of 2021, the Hare RCV charter change has not been acted upon by the Vermont legislature.

The State of Vermont is in a unique position to correct this technical flaw in Hare RCV now that Ranked-Choice Voting is on the cusp of returning to the state. In doing so, Vermont can again make history, *good* history, history befitting a discerning and progressive *"brave little state"* by recognizing and understanding the problem and, rather than ignoring or denying it, acting to correct the problem with model legislation.

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