

Successive Rank Voting

Single-Winner Election (with 4 candidates)

The goal of an election is to choose a candidate with broad public support. “Broad public support” can be summarized by a single metric:

The winning candidate should receive some level of support from at least a majority of voters.

The simplest way to reliably achieve this goal is by using a runoff system between candidates based on some initial voting scheme (plurality, range/score, approval, ranking, etc.). Election systems without runoffs often fail because voters can opt to choose a single candidate (or if forced to choose additional candidates they can choose dishonestly to minimize risk to their favorite). For example, range voting and approval voting will reduce to plurality voting if voters refuse to support any candidate but their favorite.

As far as I can tell, ALL runoff schemes have the flaw of being “non-monotonic”. This means that a candidate A who would win a runoff against B but not C might fare better if some of their votes had been changed to candidate B. Another possibility is that A would win a runoff against either B or C, but A does not make it to the runoff. Such elections still succeed in meeting the stated metric for successful elections, but the possibility of such peculiar outcomes can erode faith in the election system, especially a new one.

Is it possible to reward voters for voting honest second and third choices without the peculiarities of runoffs (i.e. without eliminating candidates prematurely)? Here is a proposed solution that I call “Successive Rank Voting”.

Voters rank candidates in order. The basic idea is that votes are counted one rank at a time until a winning candidate has votes from a majority of voters. Votes are tallied as follows:

First Round: If a candidate receives a majority of 1st rank votes, then that candidate is the winner. Otherwise:

Second Round: Include only ballots with 2nd rank votes. The candidate with the highest total of 1st and 2nd rank votes wins IF that total is greater than 50% of all ballots cast. If all voters choose a 1st and 2nd choice in a 4-way race (with no write-ins) the winning candidate is guaranteed to have at least 50% at this point. Otherwise:

Third Round: Include only ballots with 2nd and 3rd rank votes. The candidate with the highest total of 1st, 2nd, and 3rd rank votes wins IF that total is greater than 50% of all ballots cast. In a 4-way race this is the “least opposed” candidate. Otherwise:

Fourth Round: Include only ballots with 2nd, 3rd, and 4th rank votes. The candidate with the highest total of votes wins.

Note that voters are incentivized to include 2nd, 3rd, and 4th choices in order to have their votes count in later rounds. This makes it highly likely that the winner will have received majority support. Because all ranks count equally if counted at all, there is no incentive to rank a “safe”

candidate ahead of a preferred candidate. It is possible to set the winning threshold higher than 50%, but that would likely diminish support among the public at present. If write-in votes are allowed, voters can game the system by choosing irrelevant write-ins so that their preferred candidate accumulates votes while other candidates do not. This “gaming” can be limited and legitimized by controlling the number of write-in votes.

Sample Ballot:

Rank <u>four</u> candidates in order of preference with <u>exactly one</u> candidate per rank and <u>one</u> rank per candidate. Do not leave any rank completely blank.				
	1 st	2 nd	3 rd	4 th
Ape	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bee	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dog	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(Write-in or None)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Tabulation for Sample Election

Assume that Eel has been identified as a popular write-in candidate. Suppose that three voters rank the candidates as follows:

Voter 1: (Ape, Bee, Cat, Dog)

Voter 2: (Bee, Eel, Blank, Ape)

Voter 3: (Dog, Ape, Bee, Cat)

Votes would be tabulated as follows:

Candidate →		Ape	Bee	Cat	Dog	Eel	Other	None
Ballots with all ranks voted	1st	1			1			
	2nd	1	1					
	3rd		1	1				
	4th				1			
Ballots with no 4 th rank	1st							
	2nd							
	3rd							
Ballots with no 3 rd rank	1st		1					
	2nd					1		
Ballots with no 2 nd rank	1st							

Vote tallies:

With three voters, two votes are required in order to exceed 50%.

First Round: Sum 1st rank votes on all ballots:

Ape: 1, Bee: 1, Cat: 0, Dog: 1, Eel: 0, Fox: 0, Other: 0

No candidate exceeded 50%.

Second Round: Sum 1st and 2nd rank votes on all ballots including a 2nd rank vote:

Ape: 2, Bee: 2, Cat: 0, Dog: 1, Eel: 1, Fox: 0, Other: 0. Ape and Bee are tied. Use the next round as a tiebreaker:

Third Round: Sum 1st, 2nd, and 3rd rank votes on ballots including 1st-3rd ranks:

Ape: 2, Bee: 2. Still tied. Although Bee picked up a third vote, Bee also lost a vote because the voter who ranked Bee 1st tried to game the system by omitting a third rank vote that would have helped another candidate. Add another round as a tiebreaker:

Fourth Round: Ape: 2, Bee: 2. The vote is still tied. Although voter 2 chose Ape as the 4th rank, that ballot was nullified after the second round of voting.

Primary Election (with 4 winners)

When selecting four winners, the “best” candidate by most definitions would likely be selected by almost any method. The question is what sort of representation is desirable among the four winners. Should they represent four candidates favored by a single majority-sized group of voters (e.g. approval voting or “vote for 4”)? Or should they represent four distinct constituencies (e.g. plurality voting)? Or something in between (e.g. range/score or ranked voting)?

Consistency with the method described above would follow a similar pattern but with a 25% threshold:

Voters rank four candidates in order. Votes are tallied as follows:

First Round: If a candidate receives 25% of 1st rank votes, then that candidate is selected. In theory this could yield four winners with 25% each. Otherwise proceed to the next round:

Second Round: Remaining candidates (up to four) with the highest total of 1st and 2nd rank votes are selected IF their totals exceed 25%. At this point eight candidates splitting the votes evenly would have 25%, or two candidates could each have 100%.

Third Round: Remaining candidates (up to four) with the highest total of 1st, 2nd, and 3rd rank votes are selected IF their totals exceed 25%. At this point twelve candidates splitting the votes evenly would have 25%, or three candidates could each have 100%.

Fourth Round: Remaining candidates (up to four) with the highest total of votes (all ranks) are selected. At this point sixteen candidates splitting the votes evenly would have 25%, or four candidates could each have 100%.

Please send suggestions or comments to robert.close@classicalmatter.org.