The Will of the People: How we vote and why it matters

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This talk IS about:

- Elections where exactly one candidate must be selected
- How election procedures affect outcomes, sometimes in surprising ways

Why have elections?

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"The will of the people shall be the basis of the authority of government; this will shall be expressed in periodic and genuine elections which shall be by universal and equal suffrage and shall be held by secret vote or by equivalent free voting procedures."

– United Nations Universal Declaration of Human Rights, Article 21, December 1948

How do we vote?

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In this case, the procedure is straightforward: Every voter votes for their preferred candidate, and the candidate with the most votes wins.

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- **Plurality voting:** Whichever candidate gets the most votes wins, even if their vote total is less than 50%.
- **Runoff elections:** If no candidate wins more than 50% of the vote, a second election is held between the two candidates with the two largest vote totals in the original election.

How well does it work?

Even with just these two possibilities, different procedures may produce different results.

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Simple example: Suppose that 60% of the population likes both candidates A and B about equally, and dislikes candidate C. Meanwhile, the other 40% of the population prefers C and dislikes both A and B.

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The initial election produces the following results:

$$A : 32\%, \qquad B : 28\%, \qquad C : 40\%.$$

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$$A : 32\%, \qquad B : 28\%, \qquad C : 40\%.$$

With a plurality vote, C wins. But in a runoff election between A and C, most of B's voters prefer A, and A wins.

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- 36% of the population strongly favors A, thinks B would be a reasonable second choice, and HATES C.
- 34% of the population strongly favors C, thinks B would be a reasonable second choice, and HATES A.
- 30% of the population strongly favors B and strongly dislikes both A and C, but about 2/3 of them prefer C vs. A as a second choice.

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- 36% of the population strongly favors A, thinks B would be a reasonable second choice, and HATES C.
- 34% of the population strongly favors C, thinks B would be a reasonable second choice, and HATES A.
- 30% of the population strongly favors B and strongly dislikes both A and C, but about 2/3 of them prefer C vs. A as a second choice.

With a plurality vote, A wins with 36% of the vote.
In a runoff election between A and C, C wins with 54% of the vote.

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With a plurality vote, A wins with 36% of the vote.
In a runoff election between A and C, C wins with 54% of the vote.

But a strong case could be made that candidate B comes closest to representing "the will of the people."

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- General elections are almost always decided by plurality vote, and minor party candidates can easily play the role of spoiler.
  - 1992 Presidential election: Clinton 43%, Bush 38%, Perot 19%
  - 2000 Presidential election in Florida: Bush 48.85%, Gore 48.84%, Nader 1.6%

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Another weakness of this system is that, as in the example above, primary elections are often won by more extreme candidates who inspire strong opinions in both directions, while candidates who might be the second or third choice of most voters are eliminated from consideration.

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For this reason, many attempts have been made to tweak the rules in order to improve the chances of electing more moderate candidates in primary elections, who it is hoped will fare better in the subsequent general elections.

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This system was used in Washington, California, and Alaska until the year 2000, when the Supreme Court ruled it unconstitutional in *California Democratic Party v. Jones* because it forced political parties to endorse candidates against their will.

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This system is currently in use for all statewide primaries except presidential primaries in Washington and California. A similar, but slightly different, system is also used in Louisiana.

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However, this can also occur when a party with minority support runs fewer candidates than the majority party and so has less vote-splitting between candidates.

For example, in Washington's 2016 election for state treasurer, the primary results were as follows:

Candidate	Party	Vote percentage
Davidson	R	25.09%
Waite	R	23.33%
Liias	D	20.36%
Comerford	D	17.97%
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Democrats received 51.57% of the primary vote but were shut out of the general election.

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The obvious shortcoming of these standard voting systems is that voters are only allowed to provide partial information about their preferences: Each voter can vote for only one candidate and cannot say anything about their preferences among the rest.

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Many alternate systems have been proposed over the years in order to allow voters to express more nuanced opinions.

The Borda Count

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- For each ballot, N points are given to the 1st place candidate, $N-1$ points to the 2nd place candidate, etc., down to 1 point for the last-place candidate. (Alternatively, points may range from $N-1$ down to 0.)

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- After all points are tallied, the candidate with the most points wins.

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In our example from before, the ballots might be cast as follows. (For simplicity, assume there are exactly 100 voters.)

Ordered preferences	Votes
(A, B, C)	36
(C, B, A)	34
(B, C, A)	20
(B, A, C)	10

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So with this system, B wins — despite coming in last place in the plurality vote!

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Today it is used in many academic and private institutions, and (with variations) even in a few political jurisdictions.

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- How to count ballots where not all candidates are ranked?
- Highly susceptible to a form of tactical manipulation called *teaming* or *cloning*

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Now say that the Silvers decide to run a second, much less popular candidate C, who will receive about 10% of the Silver vote. Then the ballots might be cast as follows. (Again, assume there are 100 voters.)

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Ordered preferences	Votes
(A, B, C)	54
(A, C, B)	6
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Candidate	Total points
A	$(54 \times 3) + (6 \times 3) + (36 \times 1) + (4 \times 1) = 220$
B	
C	

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Even though C takes votes *away* from B, the mere presence of C in the election allows B to defeat A.

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- The procedure is repeated until some candidate has at least 50% of the vote, and then that candidate wins the election.

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With 4 or more candidates, this system can produce different results from a standard runoff election.

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- RCV has been used for nationwide elections in Australia since 1918.
- In the U.K., the Labour Party and the Liberal Democrats use RCV to elect party leaders.
- Several U.S. cities (e.g., San Francisco, Minneapolis, and Portland, Maine) use RCV in mayoral elections.

Ranked Choice Voting (RCV)

- In 2016, voters in Maine approved a referendum to implement ranked-choice voting for statewide elections. The state Supreme Court first ruled that this system violated the state constitution, but then reversed itself in April 2018. It was used for the first time **this week** in Maine's primary election.

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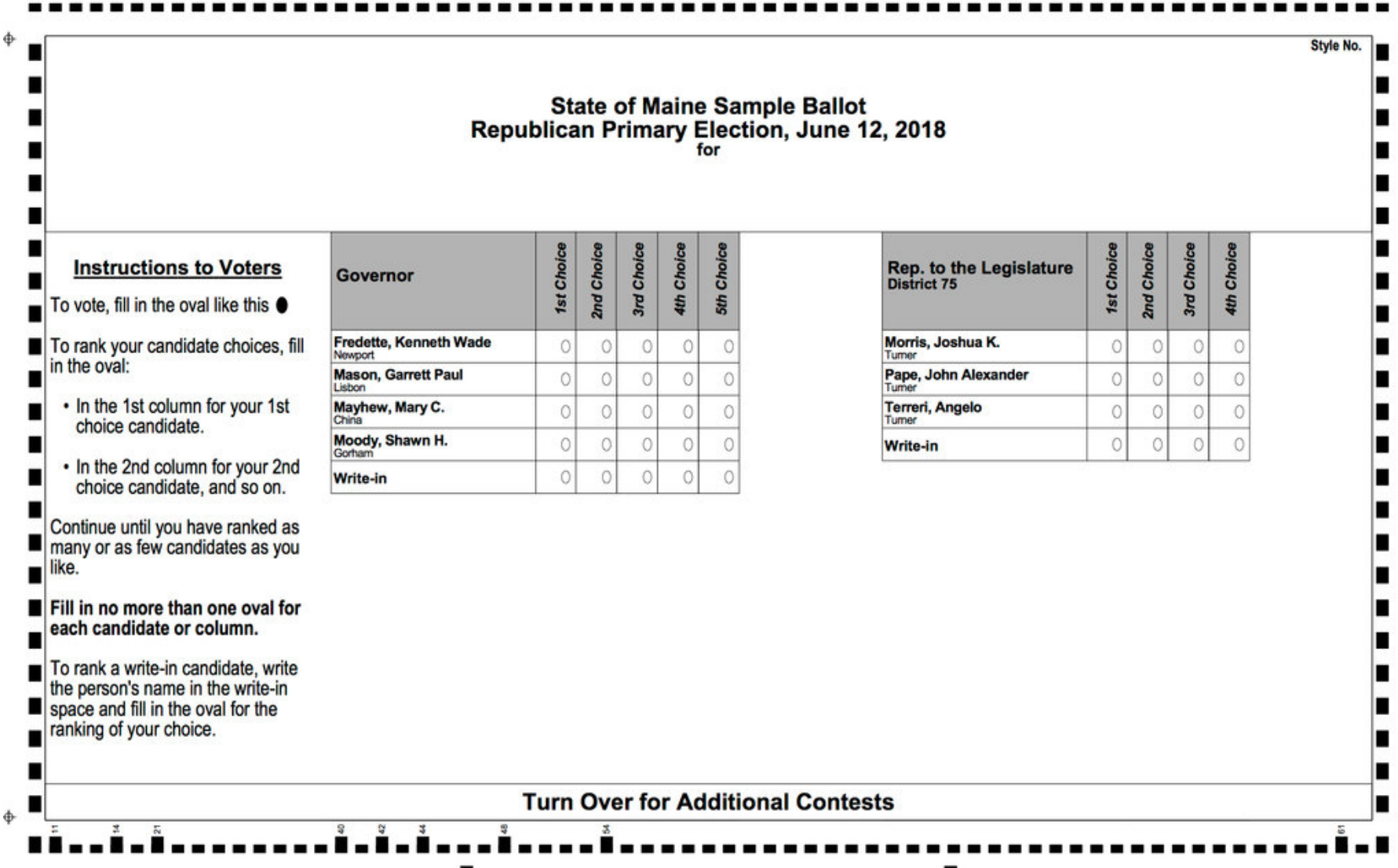
- Maine voters also affirmed this week (55% to 45%) that the state will continue using RCV, effective immediately.

Ranked Choice Voting (RCV)



Style No.

State of Maine Sample Ballot
Republican Primary Election, June 12, 2018
for

Instructions to Voters

To vote, fill in the oval like this ●

To rank your candidate choices, fill in the oval:

- In the 1st column for your 1st choice candidate.
- In the 2nd column for your 2nd choice candidate, and so on.

Continue until you have ranked as many or as few candidates as you like.

Fill in no more than one oval for each candidate or column.

To rank a write-in candidate, write the person's name in the write-in space and fill in the oval for the ranking of your choice.

Governor	1st Choice	2nd Choice	3rd Choice	4th Choice	5th Choice
Fredette, Kenneth Wade Newport	0	0	0	0	0
Mason, Garrett Paul Lisbon	0	0	0	0	0
Mayhew, Mary C. China	0	0	0	0	0
Moody, Shawn H. Gorham	0	0	0	0	0
Write-in	0	0	0	0	0

Rep. to the Legislature District 75	1st Choice	2nd Choice	3rd Choice	4th Choice
Morris, Joshua K. Turner	0	0	0	0
Pape, John Alexander Turner	0	0	0	0
Terreri, Angelo Turner	0	0	0	0
Write-in	0	0	0	0

Turn Over for Additional Contests

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- Easy to explain to voters, legislators, judges
- Relatively resistant to tactical manipulation by strategic ranking
- May inspire more positive campaigning, as candidates aim to become voters' second and third choices instead of attacking their opponents

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- It is possible that a candidate who would win all head-to-head contests among the candidates may not win the election

A cautionary tale: The 2009 Burlington, VT mayoral election

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The 2009 mayoral election of Burlington, VT was conducted by RCV and featured 3 main candidates:

1. Kurt Wright (Republican)
2. Andy Montroll (Democrat)
3. Bob Kiss (Progressive, and the incumbent)

Ranked Choice Voting (RCV)

Excluding minor candidates who did not affect the vote, the ballot count was as follows:

Ranking	Votes	Ranking	Votes	Ranking	Votes
(M, K, W)	1332	(K, M, W)	2043	(W, M, K)	1513
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Second round tally: Kiss 4314, Wright 4064.
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Montroll 18,425.5, Kiss 17,496, Wright 17,076.5.

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Aftermath: in 2010, Burlington repealed RCV by a vote of 52% to 48%.

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- Highly vulnerable to tactical manipulation by, e.g., only voting for one candidate (where it essentially reduces to plurality voting if enough voters do this)
- It is possible that the winning candidate still has less than 50% approval, and so lacks a perceived mandate

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- **Condorcet's jury theorem:** If each member of a voting group is more likely than not to make a correct decision, then the probability that the highest vote of the group is the correct decision increases as the number of group members increases.
- **Condorcet's paradox:** With 3 or more candidates, majority preferences can become intransitive: The electorate may prefer A to B, B to C, and C to A. (This is called a *Condorcet cycle*.)

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The treatise also outlines the **Condorcet method**, which is designed to simulate all pairwise elections between all candidates.

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For example, the voting procedure in Robert's Rules of Order is a Condorcet method.

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Condorcet disagreed strongly with Borda's method, because it can fail to elect the Condorcet winner (if there is one).

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The only procedure that satisfies these conditions is dictatorship.

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Don't let the perfect be the enemy of the good!

For further reading:

- Donald Saari, *Chaotic Elections! A Mathematician Looks at Voting*
- Jordan Ellenberg, *How Not to Be Wrong: The Power of Mathematical Thinking*, Chapter 17: "There is no such thing as public opinion"