

# The Primaries Project: Social Choice and Democracy

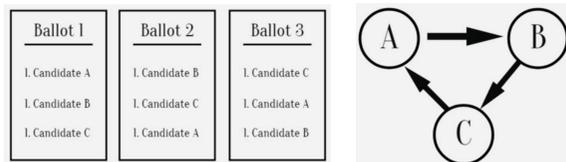
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## Opportunity

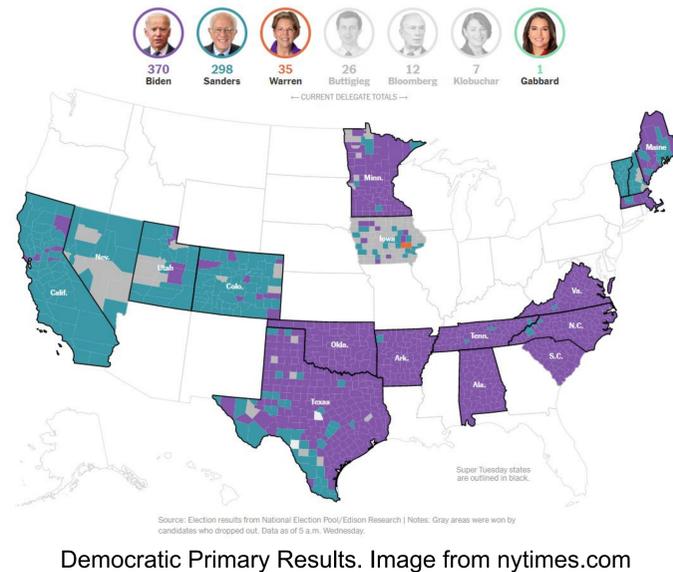
How do different voting systems like plurality, ranked choice, and least-losses, compare?

Social preferences are complicated!

- Condorcet cycles without clear winners (shown below) can cause problems
- Different election systems with the same voters can produce different results



Idea: collect complete preference data on real voters and use social choice theory to explore how different voting systems would impact the current democratic primary results.

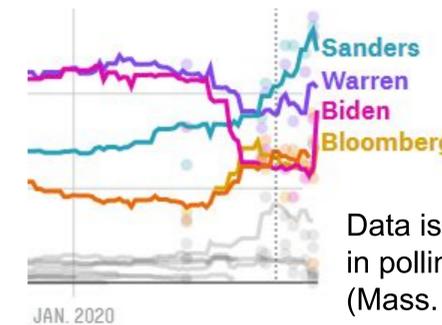


Democratic Primary Results. Image from nytimes.com

## Approach

Designed and conducted an online political opinion poll.

- Asked potential voters for their complete preferences over candidates
- Simple design, easy to use, allowed for indifference in preferences
- Collected basic demographic information
- Recruited subjects online through social media
- Collected data from Feb 29-March 3 (Super Tuesday)



Data is weighted according to Feb 29 figures in polling models from Fivethirtyeight.com (Mass. average shown here)

Welcome to Primaries Project  
Using the Democratic Primaries to Explore Democracy and Social Choice

Most Preferred

Warren Sanders

Buttigieg

Biden Klobuchar

Gabbard

Steyer

Bloomberg

Least Preferred

## Data and Results

Votes In Favor of Candidate

Vs Column Candidate

	Biden	Bloomberg	Buttigieg	Klobuchar	Sanders	Warren
Biden	0	90	57	63	27	35
Bloomberg	26	0	30	32	21	29
Buttigieg	130	103	0	101	50	52
Klobuchar	134	102	93	0	36	37
Sanders	186	113	161	183	0	123
Warren	181	111	170	191	92	0

Pairwise comparison table (raw data)

Voting methods considered:

- Plurality: Most "top preference" votes
- Borda Count (Ranked Choice): Each choice is given a score based on how many others are ranked below
- Least-Losses: Candidates ranked by the fewest head-to-head losses in comparison to others
- Ranked Pairs: Ordering candidates based on head-to-head comparisons

Data adjusted (separately) by:

- Massachusetts polls
- National polls (results not shown)

### MA Simulated Votes:

- Plurality Vote: Sanders > Warren > Buttigieg > Bloomberg > Biden > Klobuchar > Gabbard > Steyer
- Borda Count: Sanders > Warren > Buttigieg > Klobuchar > Biden > Bloomberg > Steyer > Gabbard
- Least-Losses: Sanders > Warren > Buttigieg > Bloomberg > Klobuchar > Biden > Gabbard > Steyer
- Ranked Pairs: Sanders > Warren > Buttigieg > Biden > Klobuchar > Bloomberg > Steyer > Gabbard

No two voting systems produced the same ranking, despite the fact that there were no Condorcet cycles. We did have a Condorcet Winner (a candidate that is preferred to every other in head-to-head comparisons) in Sanders, a reason all methods agree on the winner.

Each of these rankings is robust to removing Buttigieg, Klobuchar and Steyer, even if we re-allocate the votes to a 2<sup>nd</sup> choice. Different from the real election in which Biden won MA.

## Impact

Our research provides a new way to investigate the impact of particular voting systems and a method of assessing the effects of alternatives.

Important Takeaways:

- The actual election results seem more impacted by Buttigieg and Klobuchar dropping than our data suggests they should be.
- People's preferences may be heavily impacted by endorsements.
- Some voting systems (e.g. Plurality) are very sensitive to the number and similarity of candidates (who can split each others votes).
- Other systems (e.g. Ranked-Pairs) are less sensitive to these factors (and are "Clone-independent" where similar candidates do not detract from one another) but make elections harder to execute
- Tradeoff between simplicity, transparency, and robustness of voting systems.

Project Supervised by Prof. Rory Smead  
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Pete Buttigieg And Amy Klobuchar Endorse Joe Biden



	VOTES	PERCENT
Joe Biden	470,294	33.6%
Bernie Sanders	373,173	26.7%
Elizabeth Warren	299,733	21.4%
Michael Bloomberg	164,689	11.8%

MA Primary Results (from Politico)