The Primaries Project: Social Choice and Democracy

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.

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)

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.

Data and Results
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)

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 2nd choice. Different from the real election in which Biden won MA.

Impact
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Project Supervised by Prof. Rory Smead
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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

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