Modelling Meta-Agreement through Deliberation: An Adaptation of the DeGroot Model

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Working Example

Alice: a $\succ$ b $\succ$ c, thinks a is most tasty, no monetary restrictions
Bob: c $\succ$ a $\succ$ b, does not care as much for taste, thinks c is cheapest
Charlie: b $\succ$ c $\succ$ a, thinks b is most tasty, also thinks b is the cheapest

Instead of directly trying to pick a winner, we ask them to talk a bit before.

After deliberation

They realize that Bob and Charlie hold mutually exclusive beliefs, namely c and b cannot both be the cheapest options. It turns out that b is actually cheaper!

Alice: $a \succ b \succ c$
Bob: $b \succ a \succ c$
Charlie: $b \succ c \succ a$

These preferences are now single-peaked. This now allows us to pick b as the winner, using the strategyproof rule of picking the median alternative.

Motivation

Following work by list etc. we propose deliberation as a mechanism of enforcing "shared realities".
We set out to find a formal description of deliberation, as well as a mechanistic computational model.
Using this we hope to be able to understand deliberation and inform interventions on cultivating shared realities.

Outline

- Short history of deliberation theory
- Models of deliberation
- Negative results
- Our model

Deliberation, a political science perspective

Tenets of deliberation (Cohen, 2002):

- Free
- Equal
- Reasoned
- Consensus

List (2002): Meta-agreement, unanimous consensus too strong on substantive agreement.

Meta-agreement requires three hypotheses to be satisfied

Deliberation in mini republics increases voter knowledge and judgement

America in one Room (2020)

- Large scale deliberative experiment
- Measured pre- and post-deliberation opinions of participants
- Deliberation caused participants to be more likely to vote, have more favorable opinions of alternatives, and be more likely to support Joe Biden

We use the data from this experiment to validate our own model.

Deliberation, a modelling perspective

Rad and Roy (2021)

- Participants discuss preference rankings
- Make use of different metric spaces to calculate new opinion
- Participants are biased
- Only consensus in the form of unanimous preferences

Missing:

- No “meta-agreement”
- Updating procedure requires knowledge of large graphs
- Reasoned
- Consensus

Notation

Rad and Roy (2021)

- Participants discuss preference rankings
- Make use of different metric spaces to calculate new opinion
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Missing:

- No “meta-agreement”
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Strategyproofness

This leads to the next tenet of deliberation: Honesty

Our model: The Adapted DeGroot model

Experimental Setup

Results

Limitations

Conclusion