Evidence-based Decision Making

Consensus: The wisdom of the crowd

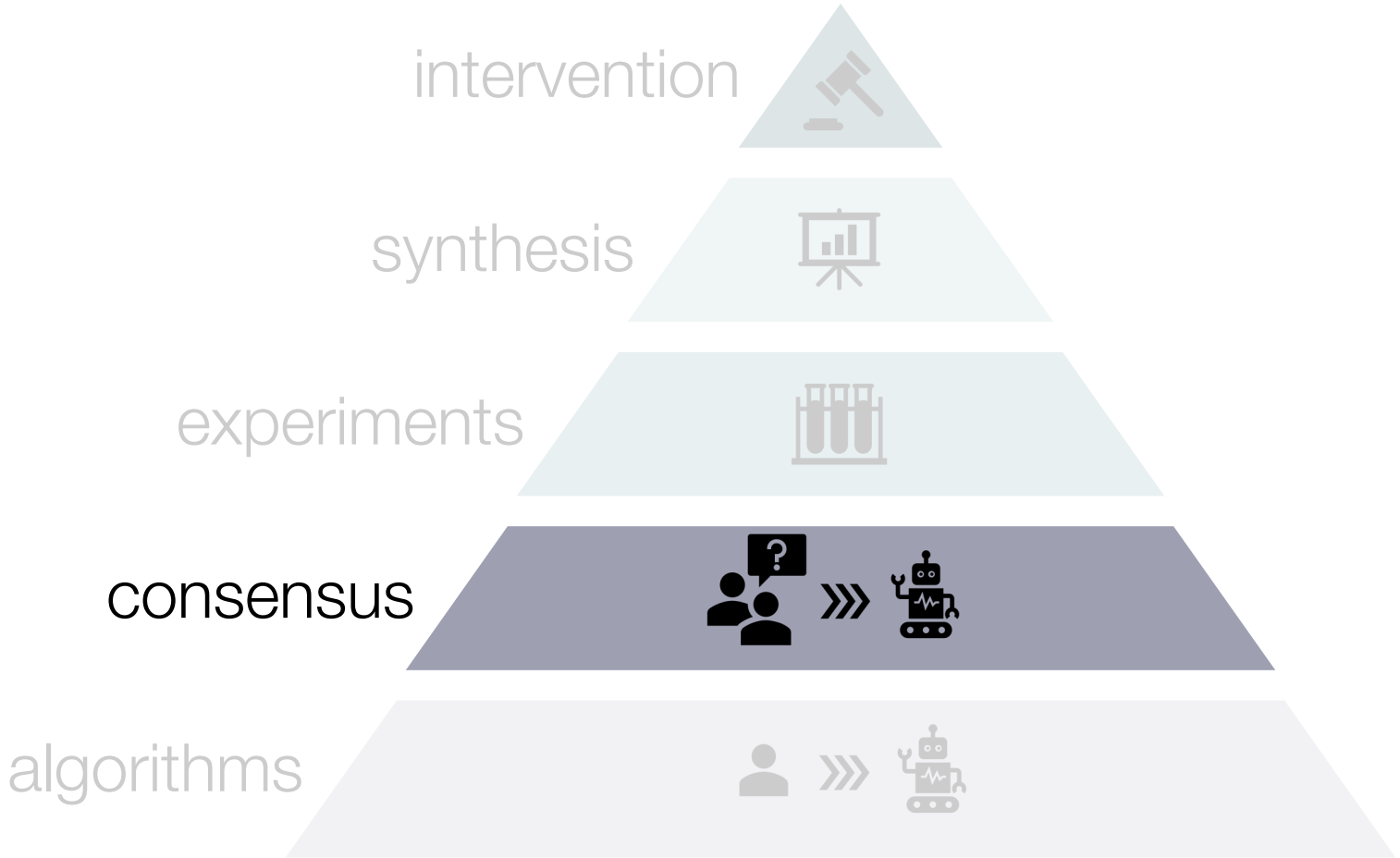
Loreen Tisdall, FS 2026

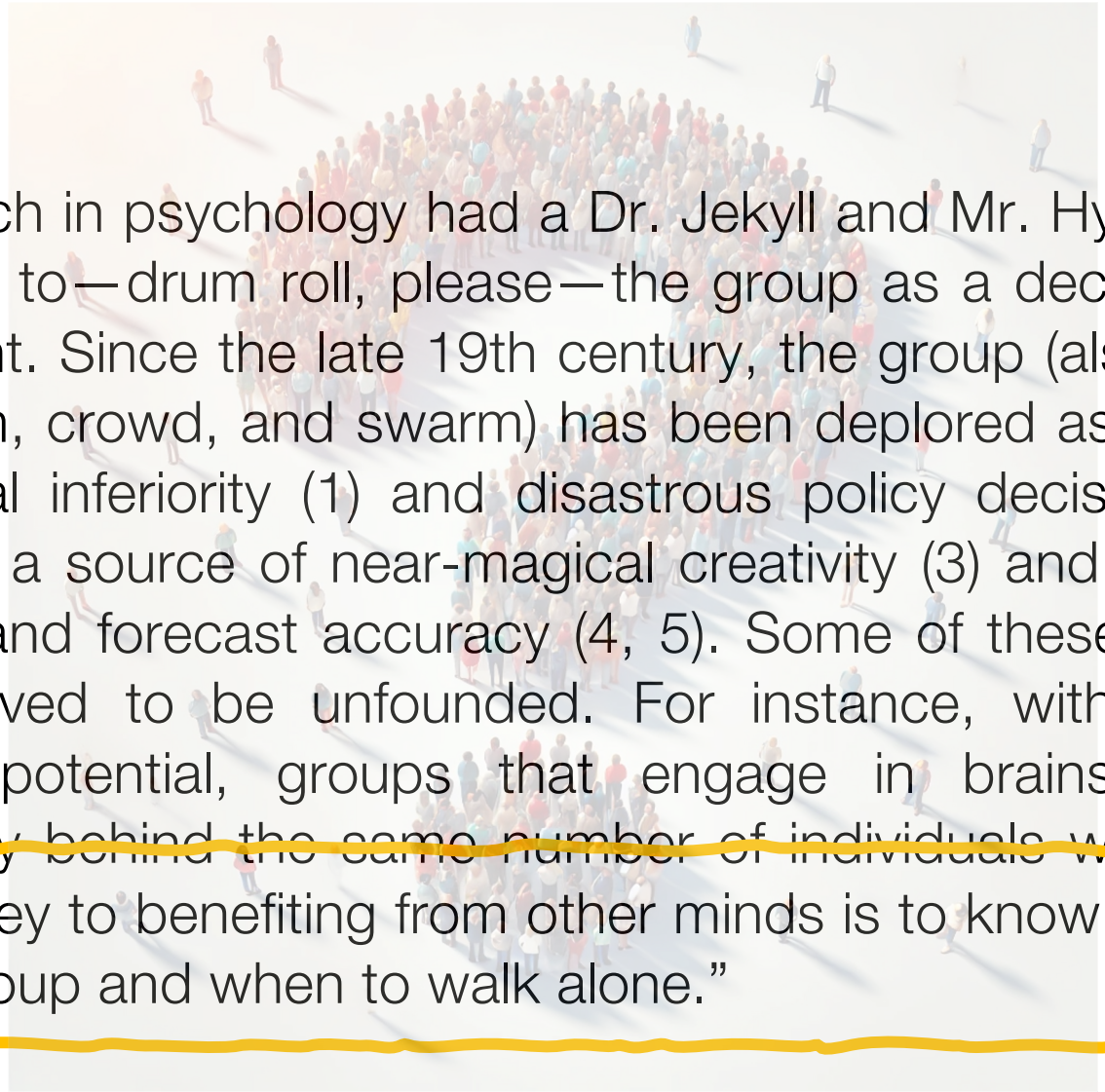
Version: March 16, 2026

Peer observation (LT)

Key reading

Climbing the pyramid of evidence





"If research in psychology had a Dr. Jekyll and Mr. Hyde Award, it would go to—drum roll, please—the group as a decision-making instrument. Since the late 19th century, the group (also known as jury, team, crowd, and swarm) has been deplored as a source of intellectual inferiority (1) and disastrous policy decisions (2) and hailed as a source of near-magical creativity (3) and unparalleled wisdom and forecast accuracy (4, 5). Some of these attributions have proved to be unfounded. For instance, with respect to creative potential, groups that engage in brainstorming lag hopelessly behind the same number of individuals working alone (6). The key to benefiting from other minds is to know when to rely on the group and when to walk alone."

Image generated with AI (ChatGPT 4o), March 2025

Hertwig, R. (2012). Tapping into the Wisdom of the Crowd—With Confidence. *Science*, *336*(6079), 303–304. https://doi.org/10.1126/science.1221403

Goals for today

- Understand that group processes can range from very complex (processes requiring intensive communication and deliberation) to simple (members never communicate)
- Understand that groups can sometimes (but not always) outperform individual decision makers
- Understand that some advantages of group decision making can be understood via simple principles (e.g., aggregation)

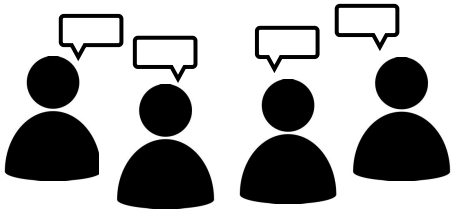
From individuals to groups

Individual level

The cognitive process of a single individual guides the decision

Autonomy

Deliberative group



A group process determines the outcome, and individual decisions are dependent on the actions of other group members

Interaction with talk

Statisticized group

A group process determines the outcome, but individual decisions are not dependent on group activity

Aggregation without talk


WE NEED MORE DISSENTING OPINIONS.
ABSOLUTELY, SIR
WE AGREE 100%
Carol Simpson ©2004

Groupthink

"[…] a quick and easy way to refer to the mode of thinking that persons engage in when *concurrence-seeking* becomes so dominant in a cohesive ingroup that it tends to override realistic appraisal of alternative courses of action."

1961 BAY OF PIGS INVASION

- A failed U.S.-backed invasion of Cuba by anti-Castro exiles.
- Approved by President John F. Kennedy and orchestrated by the CIA.
- Goal: Overthrow Fidel Castro's communist government.
- Result: A major foreign policy fiasco and public embarrassment for the U.S.

"At every meeting, he [President J.F. Kennedy] allowed the CIA representatives to dominate the discussion. He permitted them to give their immediate refutations in response to each tentative doubt that one of the others might express, instead of asking whether anyone shared the doubt or wanted to pursue the implications of the new worrisome issue that had just been raised."

Janis, I. L. (1971). Groupthink. *Psychology Today*.

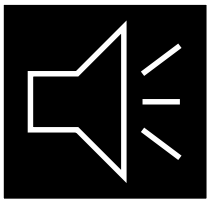
Recognizing groupthink

Irving Janis proposed **eight symptoms** that are indicative of groupthink:

1. Illusions of **invulnerability** creating excessive optimism and encouraging risk taking.
2. Ignoring/**rationalising warnings** that might challenge the group's assumptions.
3. Unquestioned belief in the **morality of the group**, causing members to ignore the consequences of their actions.
4. To **stereotype those who are opposed** to the group as weak, evil or stupid.
5. Direct **pressure to conform** placed on any member who questions the group, couched in terms of "disloyalty".
6. Suppression (**self-censorship**) of ideas that deviate from the apparent group consensus.
7. Shared **illusion of unanimity** among group members, silence is viewed as agreement.
8. (Self-appointed) **mindguards** — members who shield the group from dissenting information.

Janis, I. L. (1971). Groupthink. *Psychology Today*.

Groupthink – other examples?



Your turn!

Image created with AI (Bing), February 13, 2024

Talk to your neighbour(s) and discuss strategies to prevent groupthink.

~2 minutes

Preventing groupthink

1. Each member of the group becomes a **critical evaluator**
2. Starting point is **impartiality** instead of stated preferences and outcome expectations → counteracting confirmation bias
3. Facilitate outside perspectives by forming **multiple (external) groups** with independent leaders
4. Members consult and deliberate with **trusted sources outside of the group** and report back to group
5. Presence of **external expert(s) at every meeting**
6. At every stage of deliberation, **one member becomes devil's advocate** and/or challenges majority position
7. Consider the **other side** (e.g., when the mission / problem involves other nations, companies) **and their motives**
8. For feasibility and effectiveness decisions, **split into subgroups under different chairmen**, report deliberations back to the main group
9. Hold a **second-chance meeting after a preliminary decision** has been made to discuss the current consensus and resolve residual doubts, questions, etc.

Janis, I. L. (1971). Groupthink. *Psychology Today*.

Hidden profiles

Hidden profile refers to **a paradigm in group decision making** that shows some limitations of group decisions.

The paradigm involves a situation in which **part of some information is shared among group members, whereas other information is unshared** (e.g., information known to only one member prior to discussion).

Typically, **shared information and unshared information lead to different decisions**, and the **alternative implied by the unshared information is the correct one** given all information available to the group.

Most often, **groups cannot pick this best solution**, suggesting that group discussion does not provide a good way to make decisions!

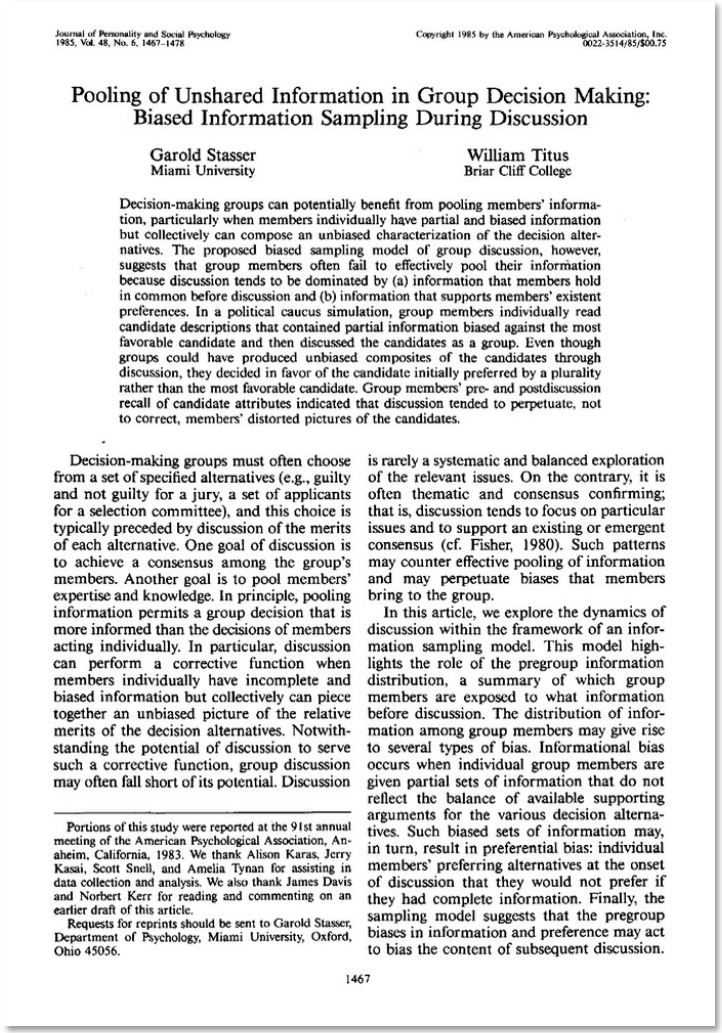
Stasser, G., & Titus, W. (1985). Pooling of unshared information in group decision making: Biased information sampling during discussion. *Journal of Personality and Social Psychology, 48*(6), 1467-1478.

Hidden profiles: Seminal paper

Example:

- You are part of a hiring committee that needs to decide between candidate A and candidate B.
- Goal of discussion and deliberation is to a) achieve consensus among group members, and b) pool members' expertise and knowledge

→ *juries, hiring committees, expert meetings, corporate boards, negotiation teams, medical ethics boards, citizen's assemblies*



Journal of Personality and Social Psychology
1985, Vol. 48, No. 6, 1467-1478

0022-3514/85/$00.75

Pooling of Unshared Information in Group Decision Making: Biased Information Sampling During Discussion

Garold Stasser
Miami University

William Titus
Briar Cliff College

Decision-making groups can potentially benefit from pooling members' information, particularly when members individually have partial and biased information but collectively can compose an unbiased characterization of the decision alternatives. The proposed biased sampling model of group discussion, however, suggests that group members often fail to effectively pool their information because discussion tends to be dominated by (a) information that members hold in common before discussion and (b) information that supports members' existent preferences. In a political caucus simulation, group members individually read candidate descriptions that contained partial information biased against the most favorable candidate and then discussed the candidates as a group. Even though groups could have produced unbiased composites of the candidates through discussion, they decided in favor of the candidate initially preferred by a plurality rather than the most favorable candidate. Group members' pre- and postdiscussion recall of candidate attributes indicated that discussion tended to perpetuate, not to correct, members' distorted pictures of the candidates.

Decision-making groups must often choose from a set of specified alternatives (e.g., guilty and not guilty for a jury, a set of applicants for a selection committee), and this choice is typically preceded by discussion of the merits of each alternative. One goal of discussion is to achieve a consensus among the group's members. Another goal is to pool members' expertise and knowledge. In principle, pooling information permits a group decision that is more informed than the decisions of members acting individually. In particular, discussion can perform a corrective function when members individually have incomplete and biased information but collectively can piece together an unbiased picture of the relative merits of the decision alternatives. Notwithstanding the potential of discussion to serve such a corrective function, group discussion may often fall short of its potential. Discussion is rarely a systematic and balanced exploration of the relevant issues. On the contrary, it is often thematic and consensus confirming; that is, discussion tends to focus on particular issues and to support an existing or emergent consensus (cf. Fisher, 1980). Such patterns may counter effective pooling of information and may perpetuate biases that members bring to the group.

In this article, we explore the dynamics of discussion within the framework of an information sampling model. This model highlights the role of the pregroup information distribution, a summary of which group members are exposed to what information before discussion. The distribution of information among group members may give rise to several types of bias. Informational bias occurs when individual group members are given partial sets of information that do not reflect the balance of available supporting arguments for the various decision alternatives. Such biased sets of information may, in turn, result in preferential bias: individual members' preferring alternatives at the onset of discussion that they would not prefer if they had complete information. Finally, the sampling model suggests that the pregroup biases in information and preference may act to bias the content of subsequent discussion.

Portions of this study were reported at the 91st annual meeting of the American Psychological Association, Anaheim, California, 1983. We thank Alison Karas, Jerry Kasai, Scott Snell, and Amelia Tynan for assisting in data collection and analysis. We also thank James Davis and Norbert Kerr for reading and commenting on an earlier draft of this article.

Requests for reprints should be sent to Garold Stasser, Department of Psychology, Miami University, Oxford, Ohio 45056.

Stasser, G., & Titus, W. (1985). Pooling of unshared information in group decision making: Biased information sampling during discussion. ***Journal of Personality and Social Psychology, 48***(6), 1467-1478.

Hidden profiles: Seminal paper

Case 4: Severely biased distribution

Pro-A			
Shared	a_1	a_1	a_1
Unshared	a_2, a_3	a_4, a_5	a_6, a_7
Pro-B[a]	b_1, b_2, b_3, b_4	b_1, b_2, b_3, b_4	b_1, b_2, b_3, b_4

	Mary (A)	Joan (B)
a1, b1: Hard working	✓	✓
a2, b2: Motivated	✓	✓
a3, b3: Conscientious	✓	✓
a4, b4: Nice	✓	✓
a5: Modest	✓	
a6: Autonomous	✓	
a7: Attentive	✓	
TOTAL	7	4

Stasser, G., & Titus, W. (1985). Pooling of unshared information in group decision making: Biased information sampling during discussion. *Journal of Personality and Social Psychology, 48*(6), 1467-1478.

Hidden profiles: Meta-analyses

Lu et al. (2012): Comprehensive meta-analysis on hidden profiles (k = 101, 65 studies, 3189 groups)

- E.g., about 2 SDs more common information is shared relative to unique information
- E.g., hidden profile groups are 8 times less likely to find the solution relative to groups that share all the information.

Mesmer-Magnus et al. (2009): Focus on information sharing (72 studies, 4795 groups)

- Information sharing was more predictive of performance on intellective hidden profile tasks (i.e., tasks for which there was a correct criterion), $r = 0.46$ (relative to $r = 0.34$ on non-hidden profile tasks)
- Information-sharing was not predictive of team performance in non-intellective (judgmental) tasks

Lu, L., Yuan, Y. C., & McLeod, P. L. (2012). Twenty-Five Years of Hidden Profiles in Group Decision Making. *Personality and Social Psychology Review, 16*(1), 54–75.

Mesmer-Magnus, J. R., & DeChurch, L. A. (2009). Information sharing and team performance: A meta-analysis. *Journal of Applied Psychology, 94*(2), 535–546.

Methods to elicit better (group) judgments

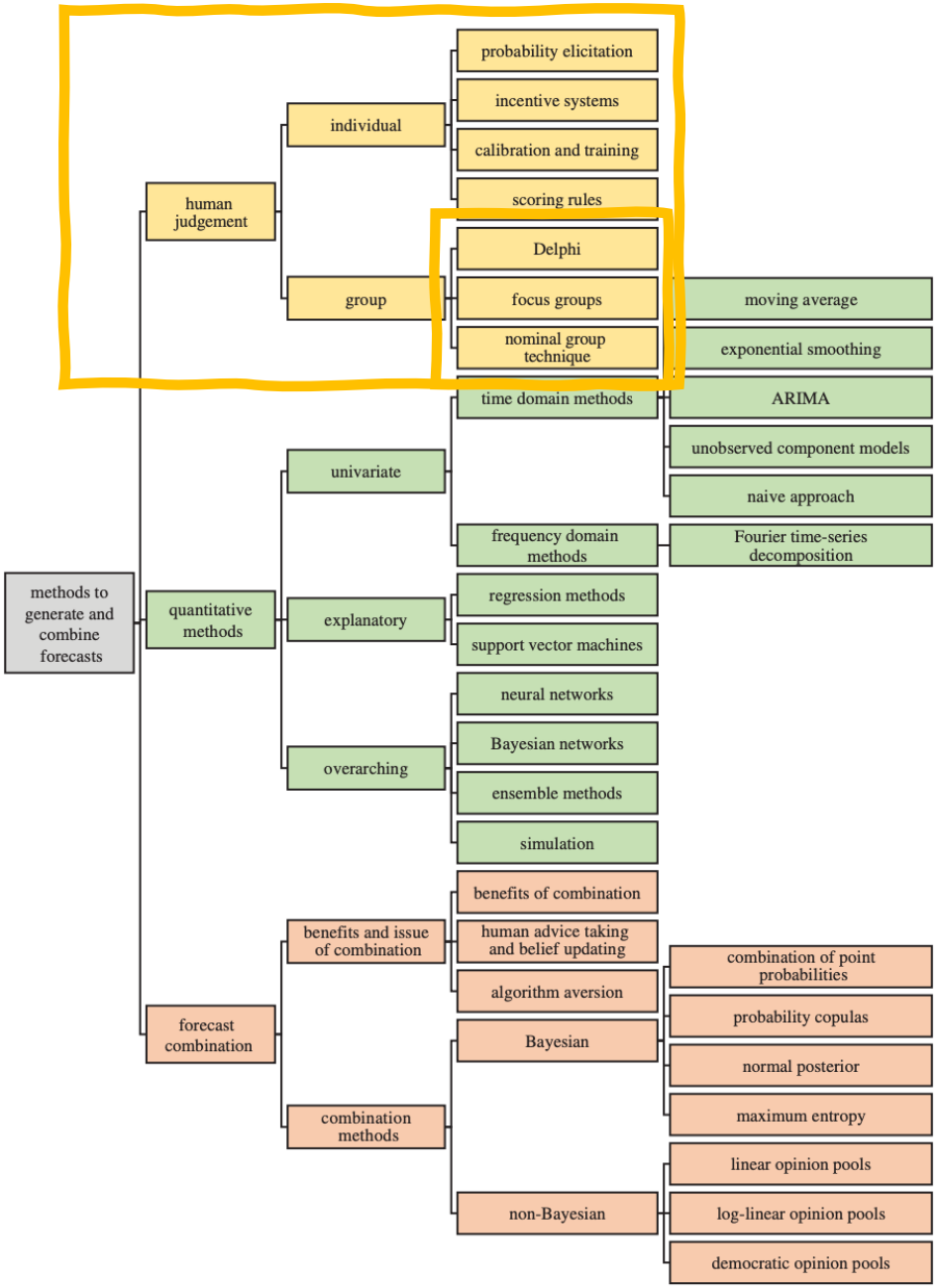


Figure 1. Structural overview of surveyed methods.

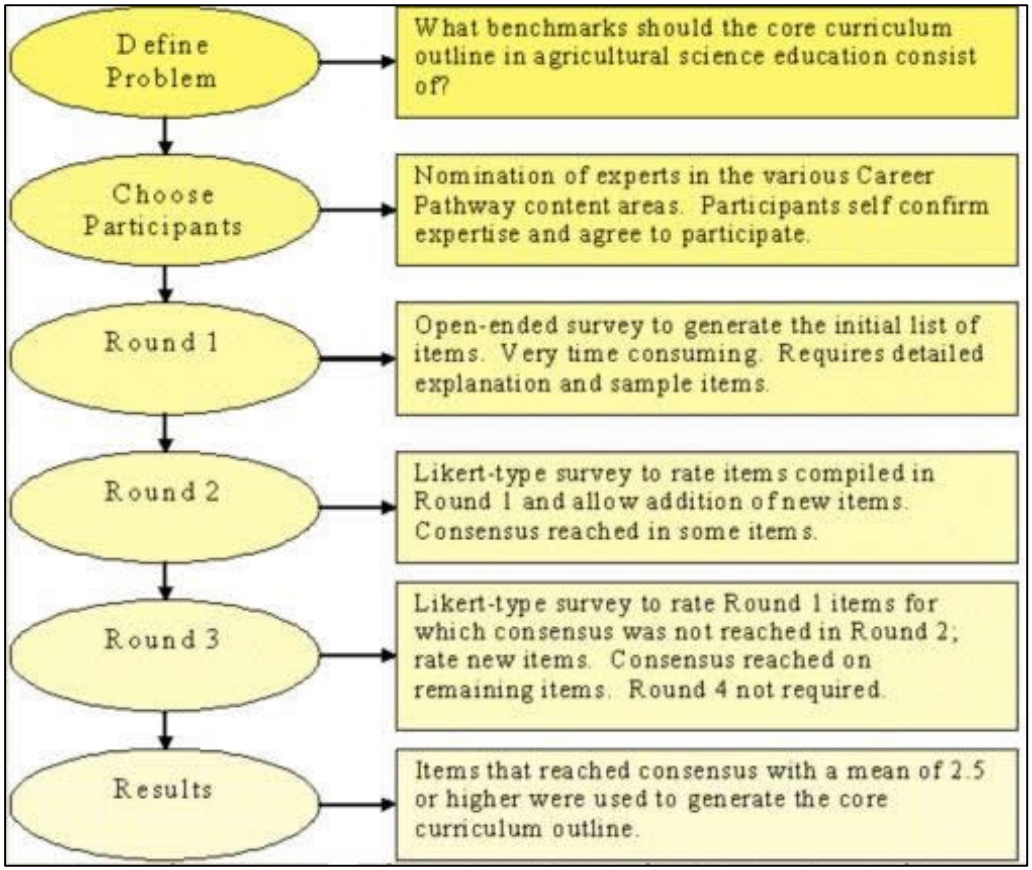
Zellner, M., Abbas, A. E., Budescu, D. V., & Galstyan, A. (2021). A survey of human judgement and quantitative forecasting methods. *Royal Society Open Science*, *8*(2), rsos.201187, 201187. https://doi.org/10.1098/rsos.201187

Different types of structured interaction methods

Focus groups	• Face-to-face discussions between decision makers on a predefined problem/question/topic under the supervision of a moderator.	✓ Simple to set up ✓ Allows for fast and easy sharing of information ✓ Tends to result in high acceptance of the group opinion by individual decision makers o Susceptible to groupthink (face-to-face discussion dynamics, desire for social acceptance, power imbalances or status differences among group members) o Lacks a defined rule for combining individual judgments: moderator and group dynamics influence how opinions are aggregated. o Violates best practices, especially the principle of independent generation of decisions
Nominal Group Technique	• Setup is divided into five steps: (1) the moderator poses the question, (2) each decision maker individually produces a decision, (3) which is then explained to other members of the group to generate debate; (4) decisions are anonymously assessed and ranked by each individual, before (5) being combined by the moderator, commonly using a linear opinion pool (i.e., you average over individual judgments/decisions and assume equal weights for each judgment)	✓ Follows a clear structure, unlike open-ended focus groups ✓ Less prone to groupthink and social pressure than focus groups ✓ More effective at stimulating creativity compared to the Delphi ✓ Less time-consuming than Delphi, as it avoids multiple iterative rounds o Less accurate and reliable than the Delphi method, according to several studies
Delphi method	• Advanced version of the Nominal Group Technique, key features are anonymity, iteration, controlled feedback and statistical combination of the group response using linear opinion pool • Anonymity is ensured by giving decision makers a questionnaire containing the decision problem, whose responses the other judges cannot discern (supposed to prevent social pressures from changing an individual decision-maker's judgement) • Anonymous responses are statistically analysed, and the mean and variance are supplied to all the decision makers to update their prior belief (if updating leads to outlier judgment, decision maker has to provide justification) → process repeated for several rounds!!! • Several variations of this technique (first round can be unstructured to not constrain the decision maker, or structured to make the procedure simpler for the monitoring team)	✓ Improves forecast accuracy compared to individual human forecasts ✓ Reduces variance among predictions, leading to more consistent outcomes ✓ Anonymity in judgment collection helps minimize direct social pressure ✓ Emphasizing reasoning (asking judges to explain their judgments) boosts accuracy ✓ Using explanations in feedback makes the process more persuasive and helps reduce individual bias o Pressure to conform may still arise in later rounds, despite anonymity o Judges can remain biased toward their own initial assessments, even after seeing group feedback

Zellner, M., Abbas, A. E., Budescu, D. V., & Galstyan, A. (2021). A survey of human judgement and quantitative forecasting methods. *Royal Society Open Science*, *8*(2), rsos.201187, 201187. https://doi.org/10.1098/rsos.201187

Delphi method (practical example)



Example: Developing a structured core curriculum

- Systematic interactive aggregation method obtained from a panel of experts:
  - *Anonymity of the participants*
  - *Structured information flow*
  - *Regular feedback*
- Seems to perform better than standard interaction groups in reducing biased outcomes
- May be more feasible/ethically defensible relative to quantified approaches (e.g., prediction markets) for some domains (e.g., deaths, terrorist attacks)

Armstrong, J. S. (2008). Methods to elicit forecasts from groups: Delphi and prediction markets compared.

From individuals to groups

Individual level

The cognitive process of a single individual guides the decision

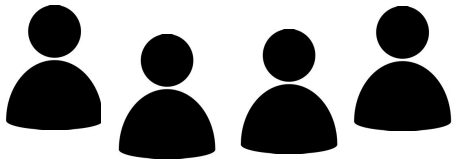
Autonomy

Deliberative group

A group process determines the outcome, and individual decisions are dependent on the actions of other group members

Interaction with talk

Statisticized group



A group process determines the outcome, but individual decisions are not dependent on group activity

Aggregation without talk

Marquis de Condorcet (1743-1794)

https://en.wikipedia.org/wiki/Marquis_de_Condorcet

- French philosopher, mathematician, political thinker and pioneer political scientist
- Introduced the **first formal treatment** of group decision making
- **Why group decision making works**
  - *Jury theorem (1785)*
- **When group decision making fails**
  - *Condorcet's paradox (1785)*

Are you noticing anything confusing or contradictory?

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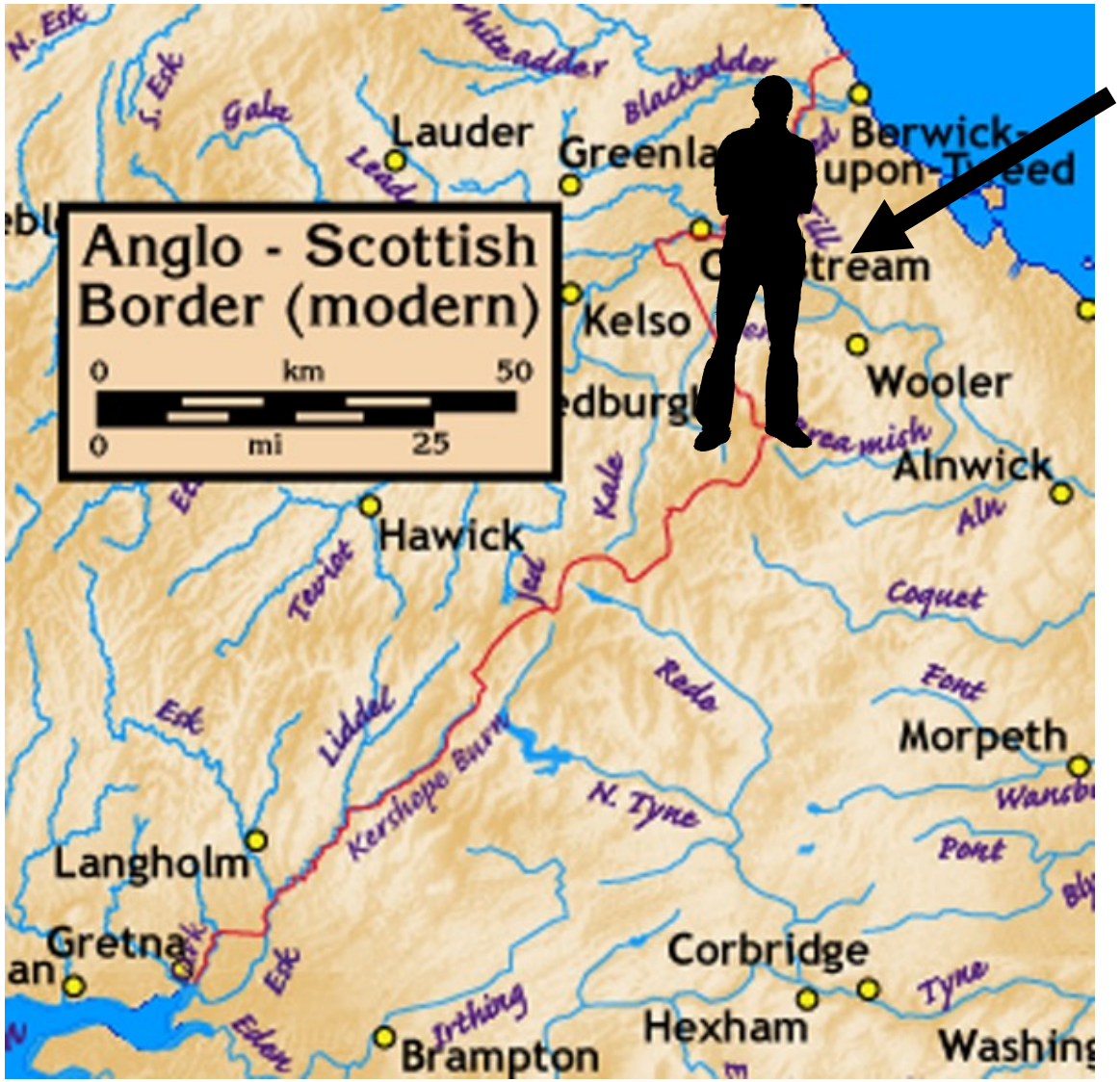
- **When group decision making fails**
  - *Condorcet's paradox (1785)*

NOTE:
Condorcet's "jury" is not a deliberative group!!! Instead, he imagined a group of individuals making independent decisions (no interaction, no discussion), and then using majority rule to decide.

Condorcet's jury theorem (1785)



Innocent man…

Idea behind the jury theorem:

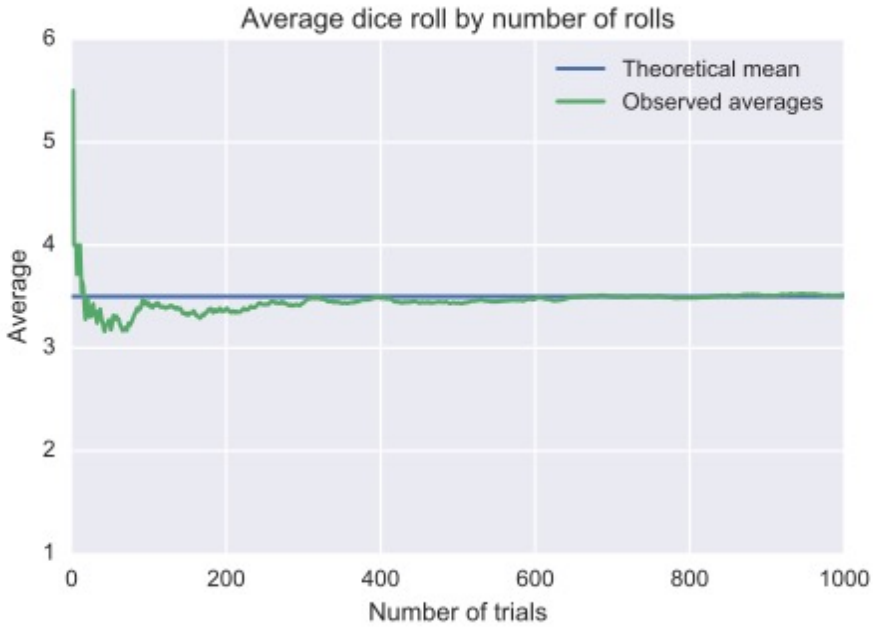
An innocent man is accused of murder on the border between England and Scotland. All other considerations aside, he would be wiser to hand himself over in Scotland than England. This is because, given exactly the same evidence, a jury of fifteen persons is more likely to reach a true verdict than a jury of twelve.

Note: Theorem (mathematical proof), not empirical observation!

Condorcet's jury theorem (1785)

Applies to binary judgments about truth - there is a ground truth, an objectively correct answer.

- Condorcet used **probability and logic**, hence the theorem (proof) is logically deduced from its assumptions
- Proof shows that **if individuals have independent and better-than-random accuracy**, then **aggregating their judgments** (e.g., via majority vote or averaging) **increases the probability of a correct group decision**
- Relies on the **law of large numbers**: as the number of trials (or observations) increases, the average of the results gets closer to the true underlying probability
- This directly **supports the statisticized group model,** where decisions are not deliberated but statistically pooled
- Like all models, **whether it applies in real life depends on how well the assumptions match reality!**



https://en.wikipedia.org/wiki/Law_of_large_numbers

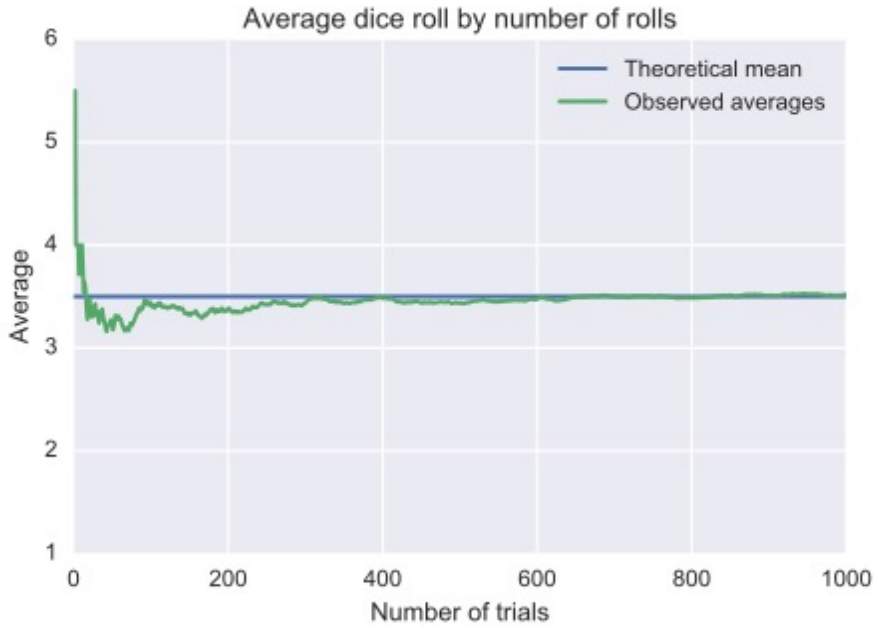
Condorcet, J.-A.-N. de Caritat, (1785). Essai sur l'application de l'analyse à la probabilité des décisions rendues à la pluralité des voix. Paris: Imprimerie Royale.

Condorcet's jury theorem (1785)

Key implications

- Aggregation can be more reliable than any single expert
- Larger groups (with independent judgments) can outperform smaller ones
- Emphasizes the value of independence, not discussion

➢ It provides a mathematical foundation for the "wisdom of the crowd" in settings like quizzes, prediction markets, diagnostics



https://en.wikipedia.org/wiki/Law_of_large_numbers

"Sure, groups can be wise when making simple judgments…but watch out when things get more complicated — collective choices can get weird!"

Condorcet, J.-A.-N. de Caritat, (1785). Essai sur l'application de l'analyse à la probabilité des décisions rendues à la pluralité des voix. Paris: Imprimerie Royale.

Condorcet's paradox (1785)

Applies to aggregation over multiple preferences, e.g., voters rank alternatives.

Condorcet's paradox is a phenomenon in voting theory that highlights the inherent challenges and complexities of aggregating individual preferences into a collective choice: **When you let a group vote, the group can act confused, even though each person is totally reasonable!**

Why it matters:

• The paradox shows that aggregating individual preferences can produce incoherent collective choices, even when individual preferences are consistent

Key implications:

• Simply statisticizing judgments (e.g., ranking or voting) can lead to cyclical or paradoxical outcomes
• Raises questions about fairness, rationality, and stability in group decision rules

Conclusion:

It's a cautionary insight: aggregation is not always clean, especially with ordinal preferences or complex choices!

Example

Imagine you and two friends are trying to decide what to eat: pizza, burgers, or tacos. Each of you ranks these options from favourite to last:

You: (1) Pizza, (2) Burgers, (3) Tacos
Alice: (1) Burgers, (2) Tacos, (3) Pizza
Bob: (1) Tacos, (2) Pizza, (3) Burgers

Now you try to find a winner (like a mini-tournament) by voting one food against another:

Pizza versus burgers: Pizza wins (you, Bob)
Burgers versus tacos: Burgers wins (you, Alice)
Tacos versus pizza: Taco wins (Alice, Bob)

Wait, what? Pizza beats burgers, burgers beats tacos, but tacos beats pizza? That's a circle, no real winner ☹

→ Classic illustration of intransitivity in group preferences!

Voting methods

Hypothetical Preference Profile of 13 Voters for Three Choice Options, B, P, and S

Individual preference ranking (from best to worst)	Number of voters who have that preference
$B > S > P$	3
$P > B > S$	5
$P > S > B$	1
$S > B > P$	3
$S > P > B$	1

Method	Description	Winner
Condorcet	Chose the option that beats all competitors in pairwise competition	None
Plurality	Each voter gives one vote to one option, namely the option he or she ranks first. Chose the option with most votes.	P
Single transferable vote	If seeking a single consensus option, choose the plurality winner if that option was ranked first by more than half of the voters. Otherwise, eliminate the option with the smallest number of plurality votes (e.g., B), re-rank the remaining options, and compute a new plurality score among the remaining options	S
Borda	The first ranked option of each voter scores two points, and the second ranked scores one point. Chose the option with the most points	B

Popov, S. V., Popova, A., & Regenwetter, M. (2014). Consensus in organizations: Hunting for the social choice conundrum in APA elections. ***Decision, 1***(2), 123-146.

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Key implications

- Aggregating preferences can lead to social choice conundrums - it is important to formalize and agree on decision processes beforehand!!!
- Different voting methods require (or consider) different amounts of information. For example, plurality vote only considers first choice, but single transferable vote or Borda consider more information (e.g., it could be important to exclude candidates that are very unpopular).
- Fortunately, social choice conundrums may not arise often in the real world (cf. Popov et al., 2014)

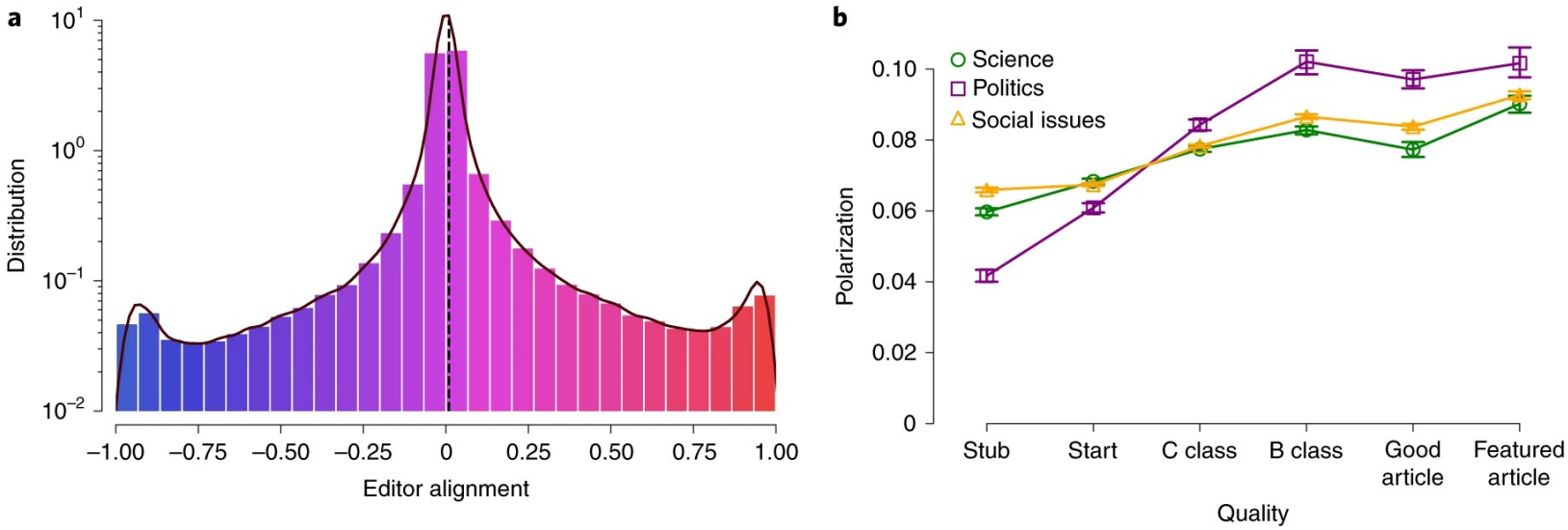
Popov, S. V., Popova, A., & Regenwetter, M. (2014). Consensus in organizations: Hunting for the social choice conundrum in APA elections. ***Decision, 1***(2), 123-146.

Summary

- **Deliberative groups:** Deliberative groups can fall prey to biases. Formalization of decision process and structured interaction (e.g., nominal group technique, delphi methods) provide an alternative to purely deliberative groups.
- **Voting methods**: Consensus obtained through voting is possible but this research refers to preferences (not inference). Crucially, this literature shows that different voting methods can lead to different conclusions!

Have a good week and see you next Monday!

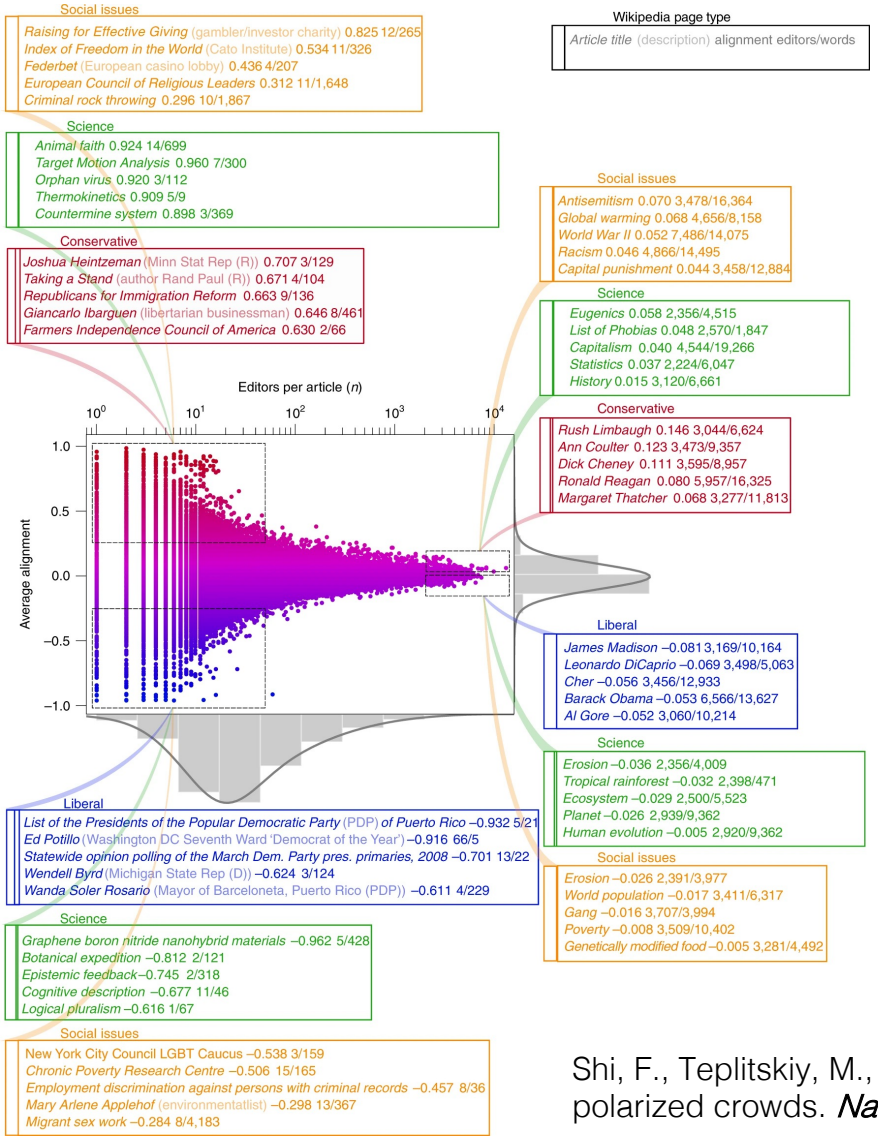
APPENDIX (just for fun!)
(Increased?) Wisdom of polarized crowds



"Our analysis reveals that **polarized teams consisting of a balanced set of ideologically diverse editors produce articles of a higher quality than homogeneous teams**. The effect is most clearly seen in Wikipedia's political articles, but also in social issues and even science articles."

Shi, F., Teplitskiy, M., Duede, E., & Evans, J. A. (2019). The wisdom of polarized crowds. *Nature Human Behaviour, 3*(4), 329-336.

APPENDIX (just for fun!)
(Increased?) Wisdom of polarized crowds



Average political alignment shrinks as the number of editors increases, demonstrating the Linus effect.

"Analysis of article 'talk pages' reveals that ideologically polarized teams engage in longer, more constructive, competitive and substantively focused but linguistically diverse debates than teams of ideological moderates. More intense use of Wikipedia policies by ideologically diverse teams suggests institutional design principles to help unleash the power of polarization."

Shi, F., Teplitskiy, M., Duede, E., & Evans, J. A. (2019). The wisdom of polarized crowds. *Nature Human Behaviour, 3*(4), 329-336.