Evidence-based Decision Making: Session 5

Rui Mata, FS 2021

This week: Goals

Understand that group processes can range from very simple (members never communicate) to complex (processes requiring intensive communication/deliberation)

Understand that groups can often outperform individual decision makers

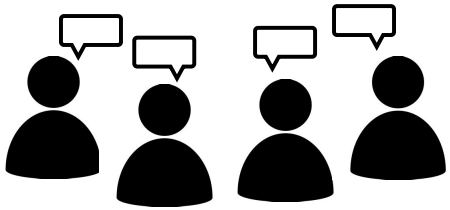
Understand the advantage of group decision making can be understood via (simple) principles (reduction of bias, aggregation)

From Individuals to Groups

Individual level

A cognitive processes alone yield the decision

Deliberative group



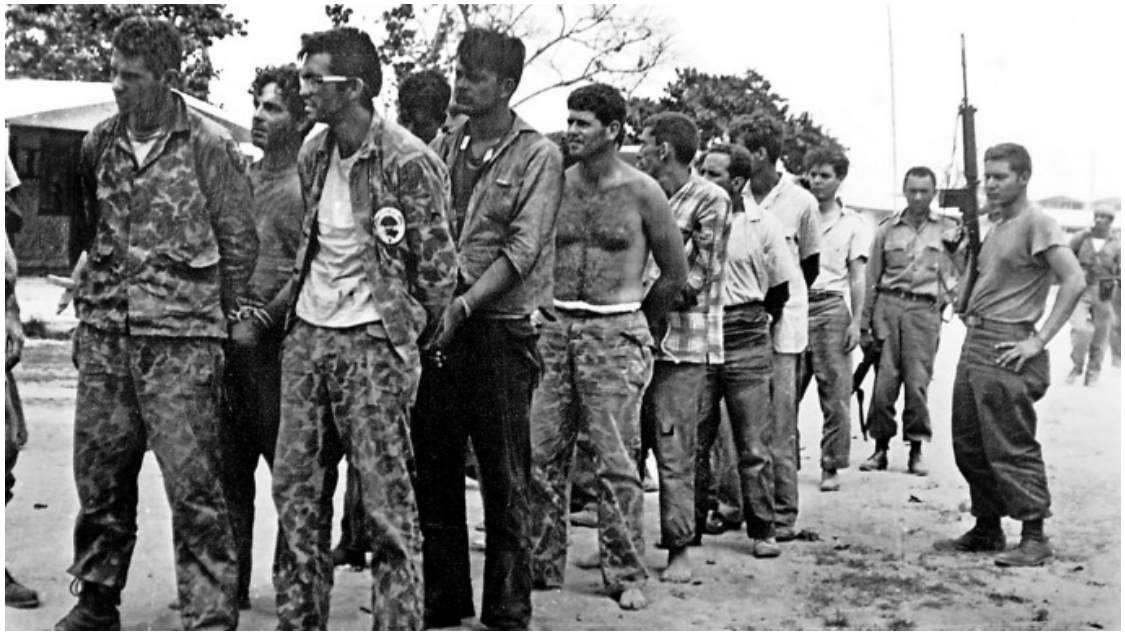
A group process determines the outcome, and individual decision are dependent on the actions of other group members

Staticized group

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


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

Groupthink



The Bay of Pigs Invasion was a failed attempt to invade Cuba by a brigade of former Cuban military officers backed by the Central Intelligence Agency (CIA)

"[At] each meeting, instead of opening up the agenda to permit a full airing of the opposing considerations, he allowed the CIA representatives to dominate the entire discussion. The president permitted them to refute immediately each tentative doubt that one of the others might express, instead of asking whether anyone else had the same doubt or wanted to pursue the implications of the new worrisome issue that had been raised"

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

Groupthink

In order to make groupthink testable, Irving Janis devised eight symptoms that are indicative of groupthink.

1. Illusions of invulnerability creating excessive optimism and encouraging risk taking.
2. 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. Stereotyping 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. Self censorship of ideas that deviate from the apparent group consensus.
7. Illusions of unanimity among group members, silence is viewed as agreement.
8. Mindguards — self-appointed members who shield the group from dissenting information.

Janis, I L. & Mann, L. (1977). *Decision making: A psychological analysis of conflict, choice, and commitment*. New York: Free Press.

Hidden Profile

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 Profile: The Seminal Paper

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.

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 Profile: The 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

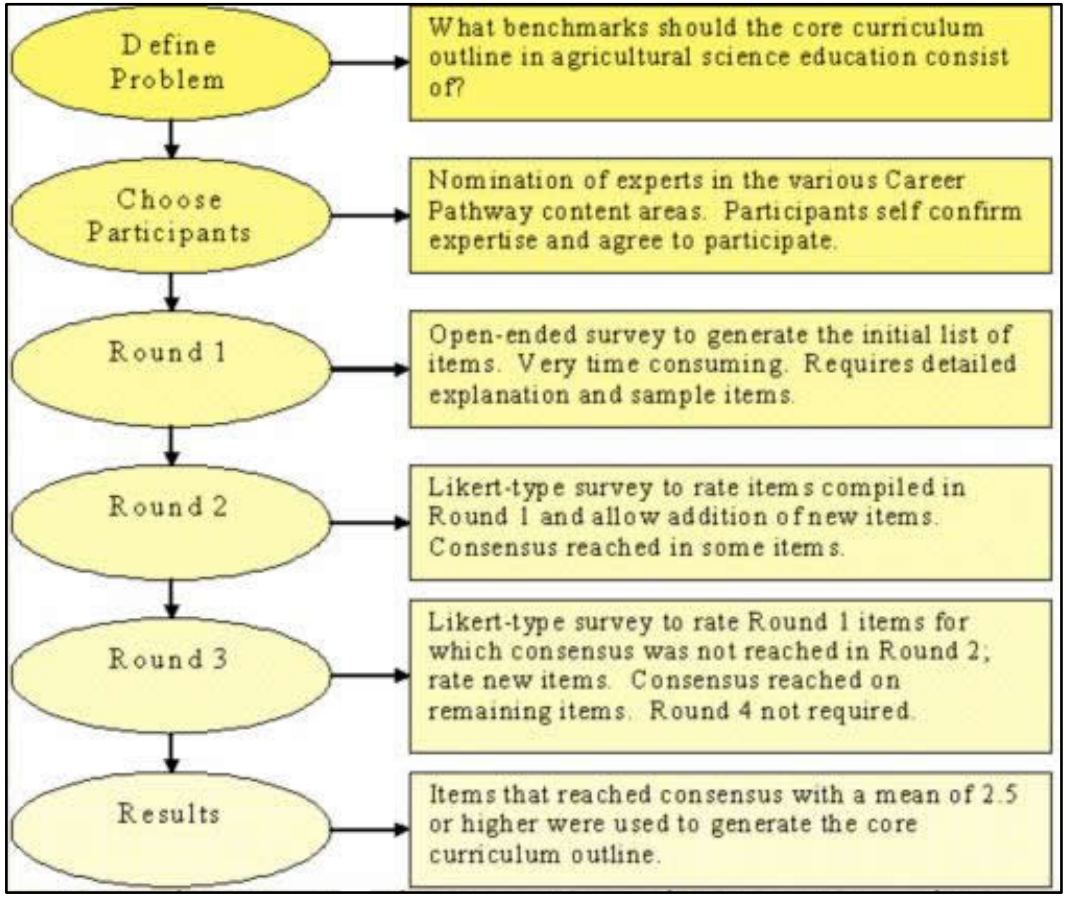
	Mary	**Joan**
a1, b1: Hard working		
a2, b2: Motivated		
a3, b3: Conscientious		
a4, b4: Nice		
a5: Modest		
a6: Autonomous		
a7: Attentive		
TOTAL	7	4

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 Profile: Meta-analyses

Summary	Reference
Most complete meta-analysis on hidden profile to date (k = 101). A few results: About 2 SDs more of common information is shared relative to unique information; b) hidden profile groups are 8 times less likely to find the solution relative to groups that share all the information.	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.
Focus on information sharing (k = 23). Intellective tasks (i.e., with a demonstrably correct criterion) with hidden-profiles show higher correlation between information sharing and team performance, r = .46, relative to non hidden-profile tasks, r = .34 (this is not the case in non-intellective tasks, .32 vs. 30).	Mesmer-Magnus, J. R., & DeChurch, L. A. (2009). Information sharing and team performance: A meta-analysis. ***Journal of Applied Psychology***, ***94***(2), 535–546.

Alternative: Delphi methods



Example: Developing a structured core curriculum

Systematic interactive aggregation method obtained from a panel of experts:

- Structured of information flow
- Regular feedback
- Anonymity of the participants

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

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Deliberative group

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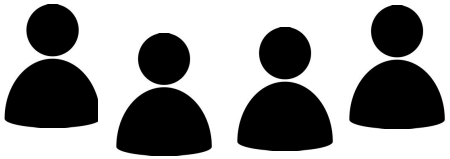
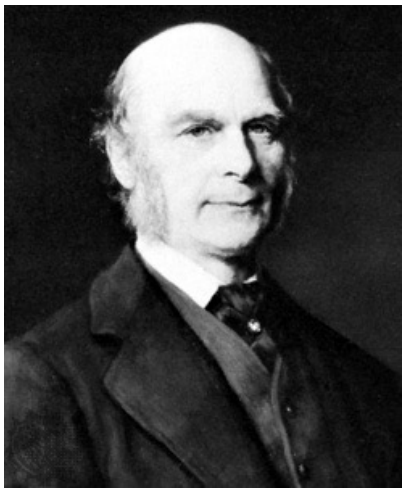
Staticized group

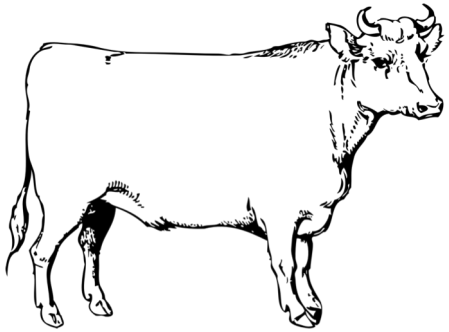


A group process determines the outcome, but individual decisions are not dependent on group activity.

When groups work: Wisdom of the crowd!



Francis Galton, 1822-1911



True = 1198 pounds

Distribution of the estimates of the dressed weight of a particular living ox, made by 787 different persons.

Degrees of the length of Array 0°—100°	Estimates in lbs.	Centiles: Observed deviates from 1207 lbs.	Centiles: Normal p.e =37	Excess of Observed over Normal
5	1074	−133	−90	+43
10	1109	− 98	−70	+28
15	1126	− 81	−57	+24
20	1148	− 59	−46	+13
q_1 25	1162	− 45	−37	+ 8
30	1174	− 33	−29	+ 4
35	1181	− 26	−21	+ 5
40	1188	− 19	−14	+ 5
45	1197	− 10	− 7	+ 3
m 50	1207	0	0	0
55	1214	+ 7	+ 7	0
60	1219	+ 12	+14	− 2
65	1225	+ 18	+21	− 3
70	1230	+ 23	+29	− 6
q_3 75	1236	+ 29	+37	− 8
80	1243	+ 36	+46	−10
85	1254	+ 47	+57	−10
90	1267	+ 52	+70	−18
95	1293	+ 86	+90	− 4

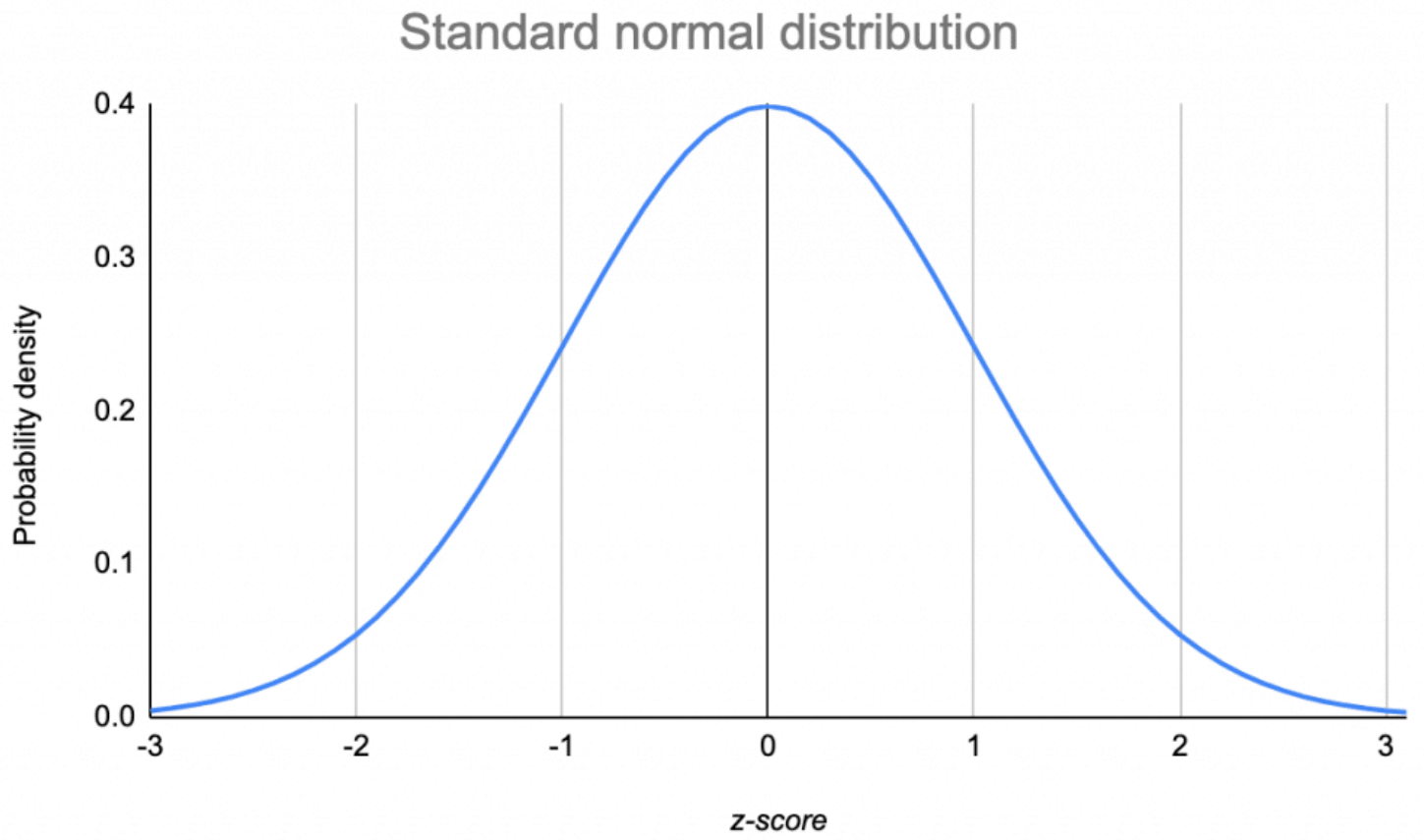
q_1, q_3, the first and third quartiles, stand at 25° and 75° respectively.
m, the median or middlemost value, stands at 50°.
The dressed weight proved to be 1198 lbs.

"This result is, I think, more credible to the trustworthiness of a democratic judgment than might have been expected."

Staticized groups can be powerful!

Galton, F. (1907). Vox Populi. ***Nature,*** 75, 450-451.

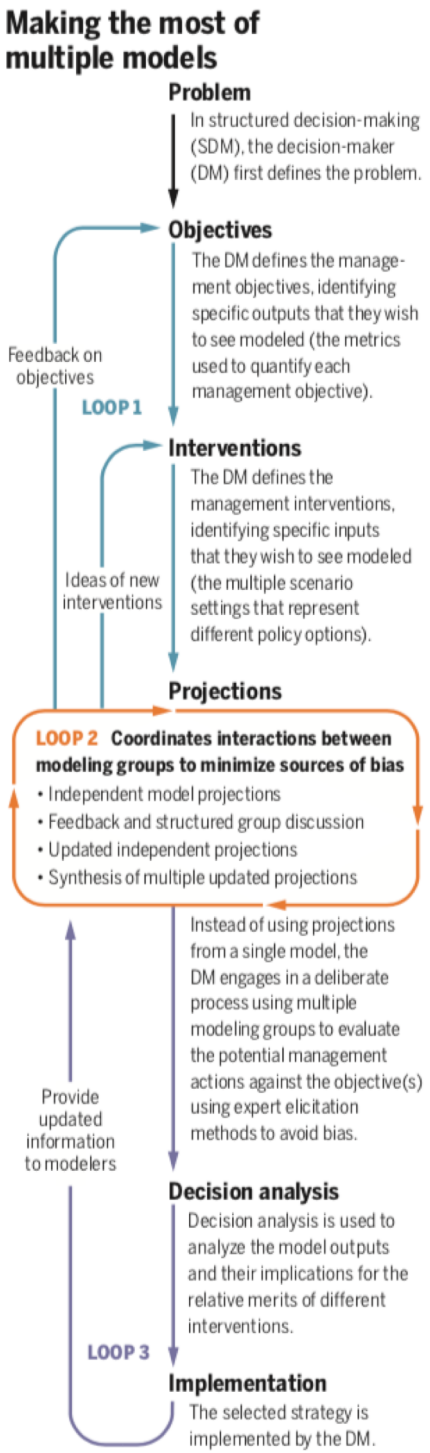
Wisdom of the crowd: The role of aggregation



Combining Deliberative and Staticized Groups

"Disparate predictions during any outbreak can hinder intervention planning and response by policy-makers, who may instead choose to rely on single trusted sources of advice, or on consensus where it appears. (…)

To harness both the creativity of individuals and the insights of groups, variations on the Delphi method (developed by the RAND Corporation in the 1950s and included within the IDEA protocol) and the Nominal Group Technique involve both independent and interactive stages in an iterative elicitation process. The expert judgment literature shows that a failure to manage the elicitation process well can lead to generation of biased information and overconfidence. Expert judgment approaches have been used for elicitation from individual experts in a wide range of relevant settings, such as development of clinical guidelines, and in conservation and ecology."



Shea, K., Runge, M. C., Pannell, D., Probert, W. J. M., Li, S.-L., Tildesley, M., & Ferrari, M. (2020). Harnessing multiple models for outbreak management. *Science*, *368*(6491), 577–579. http://doi.org/10.1126/science.abb9934

Summary

Deliberative groups can fall prey to biases. Formalization of decision process and delphi methods provide an alternative to purely deliberative groups.

Staticized groups can also work well. Understanding the performance of groups as a process of statistical processes (i.e., aggregation) – *more on this in the next session*.

Delphi and staticized methods are not incompatible!