CLASSICAL MEETS MODERN IN THE IDEA PROTOCOL: WHAT COULD GO WRONG?

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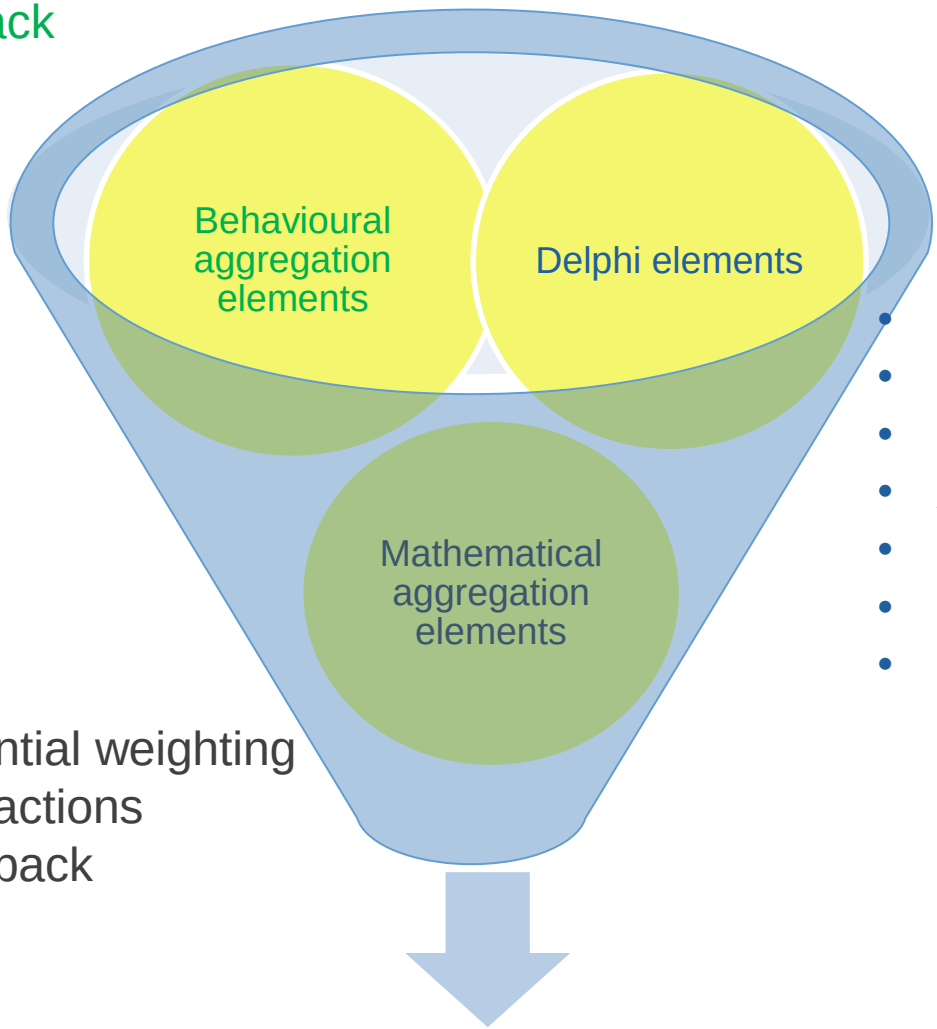
- Seeks consensus
- Extensive facilitated interactions
- Extensive feedback



- Mixed aggregation
- Subsequent rounds
- Seeks consensus
- Anonymity
- Restricted interaction
- Restricted feedback
- Equal weighting

- Equal or differential weighting
- Restricted interactions
- Restricted feedback

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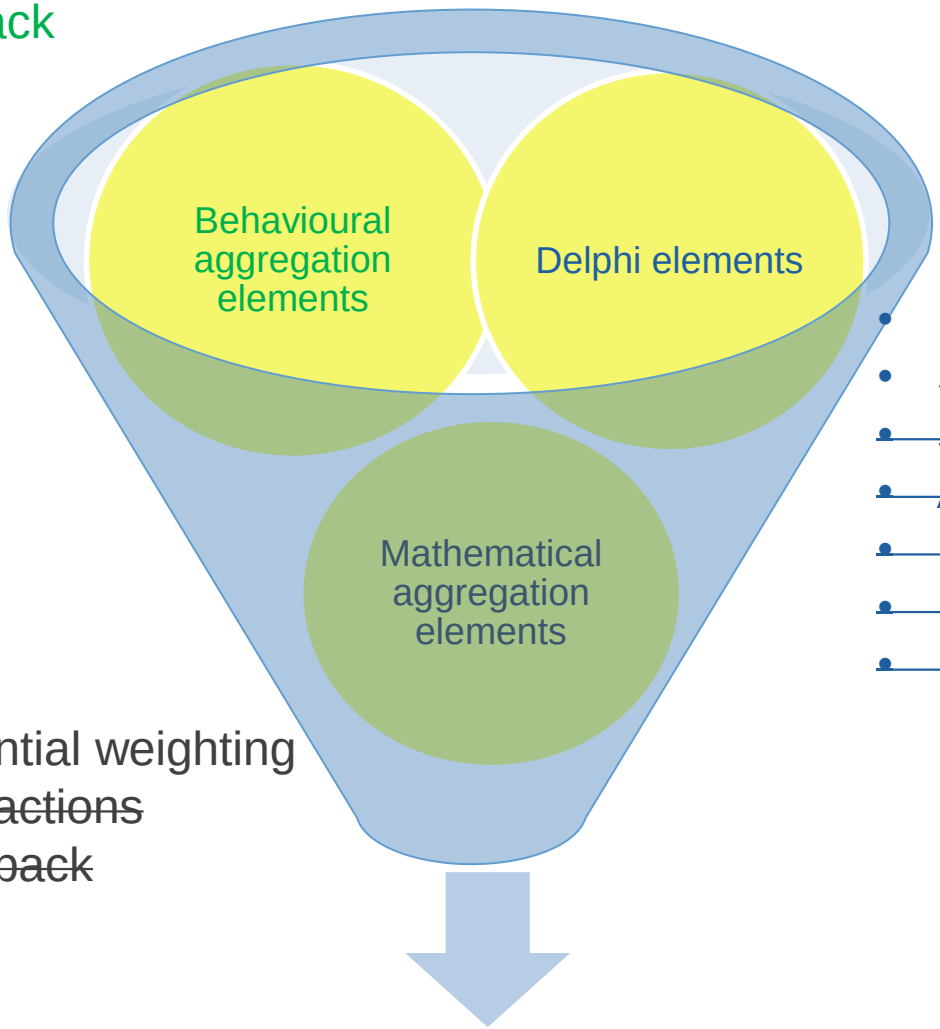
- Extensive feedback



- Mixed aggregation
- Subsequent rounds
- ~~Seeks consensus~~
- ~~Anonymity~~
- ~~Restricted interaction~~
- ~~Restricted feedback~~
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- Equal or differential weighting
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- ~~Restricted feedback~~

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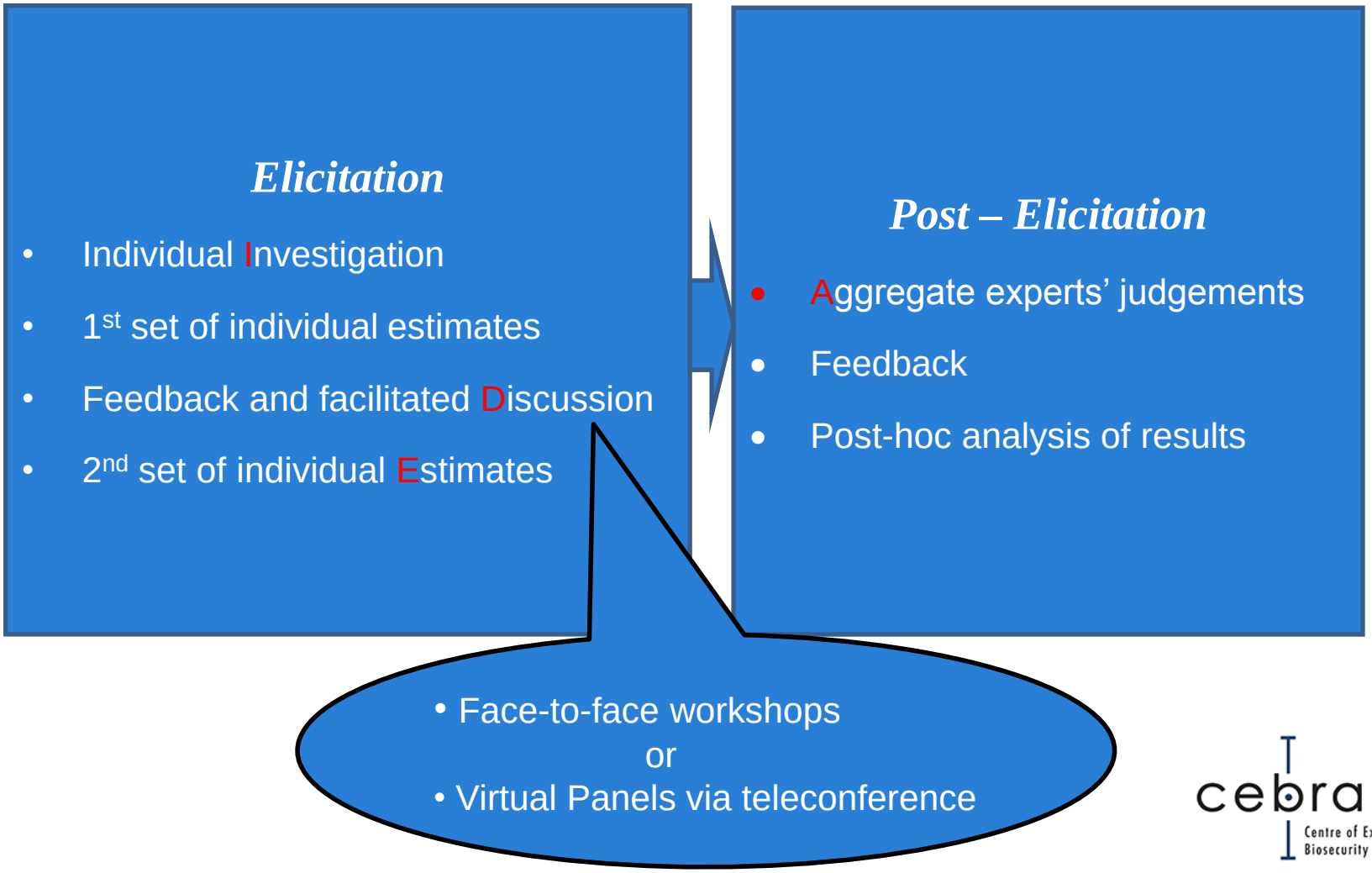
IDEA (Investigate, Discuss, Estimate, Aggregate)



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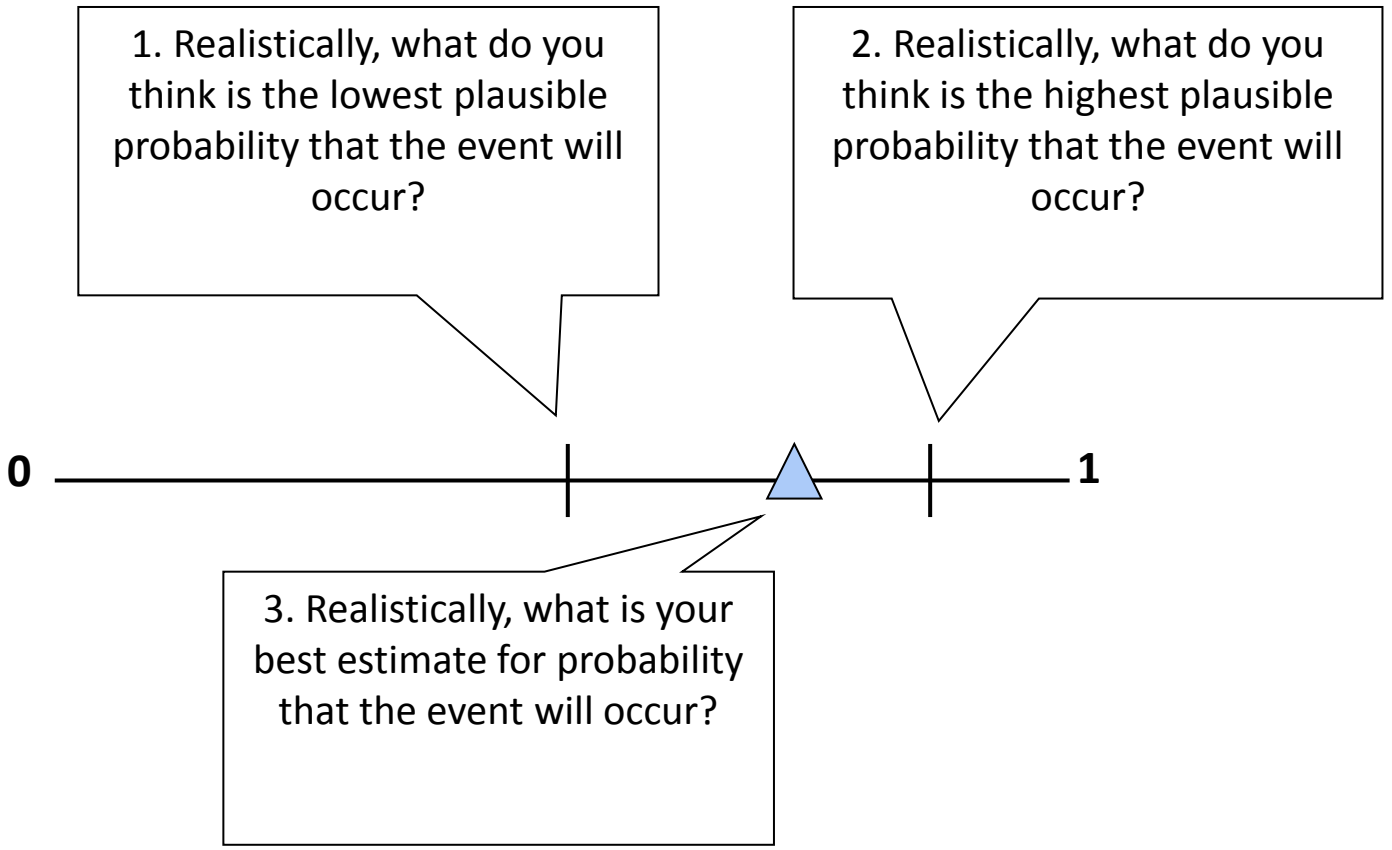
Eliciting probabilities



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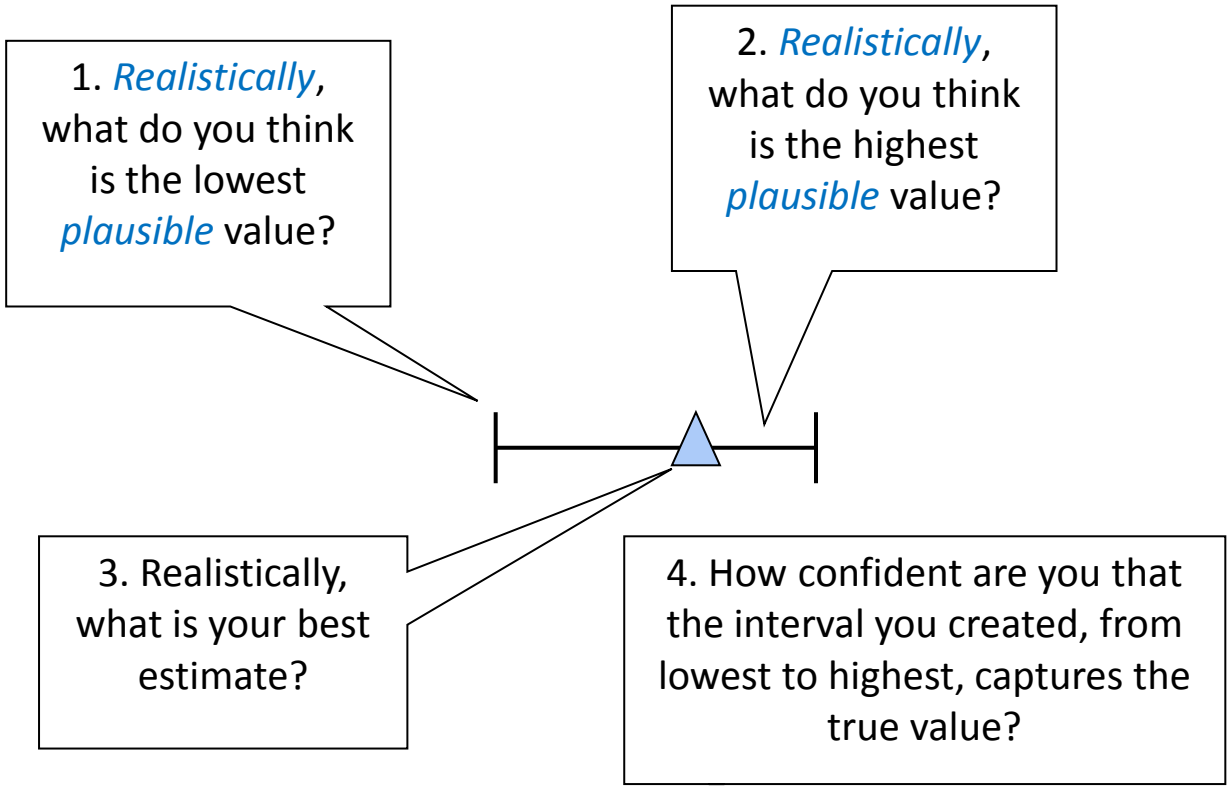
Eliciting quantities and frequencies



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It's all there for a reason

- ✓ *The 1st individual assessment avoids anchoring on other people estimates*
- ✓ *The discussion between rounds reduces the effect of the availability bias*
- ✓ *The way we ask the questions reduces the anchoring & overconfidence*

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Guard against…

Anchoring bias.

People are **over-reliant** on the first piece of information they hear. In a salary negotiation, whoever makes the first offer establishes a range of reasonable possibilities in each person's mind.

Availability heuristic.

People **overestimate the importance** of information that is available to them. A person might argue that smoking is not unhealthy because they know someone who lived to 100 and smoked three packs a day.

Overconfidence.

Some of us are **too confident about our abilities**, and this causes us to take greater risks in our daily lives. Experts are more prone to this bias than laypeople, since they are more convinced that they are right.

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It's all there for a reason

- ✓ *The 1st individual assessment avoids anchoring on other people estimates*
- ✓ *The discussion between rounds reduces the effect of the availability bias*
- ✓ *The way we ask the questions reduces the anchoring & overconfidence*
- ✓ *The 2nd individual anonymous assessment reduces dominating effects and group think*

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Guard against…

"That's an excellent suggestion, Miss Triggs. Perhaps one of the men here would like to make it."

https://wattsupwiththat.com/2014/10/12/the-trouble-with-physics-another-branch-of-science-captured-by-groupthink/
http://womeninastronomy.blogspot.com.au/2014/07/stop-interrupting-me-gender.html

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However…

- ✓ Designed for eliciting ***point estimates***
- ✓ All the “bounds” questions are asked to get the best *best estimate*
- ✓ Uncertainty is asked for, so why not use it?
- ✓ Why not extend it to other purposes?

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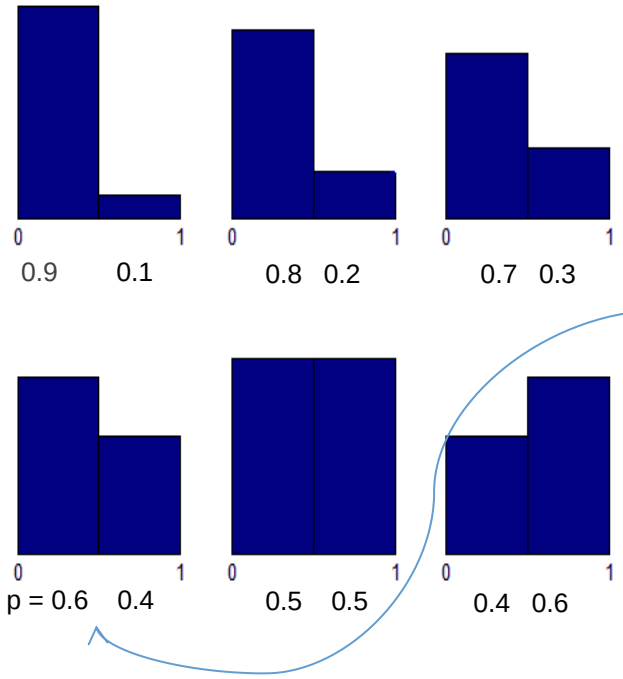
IDEA for eliciting uncertainty

Eliciting probabilities

- ✓ If probabilities are relative frequencies, we're fine, otherwise we're in trouble
- ✓ But not in more trouble than the CM
  - Calibrate on similar questions – not much guidance, experience
  - How do we reconcile what we fix and what the expert actually thinks

Difficulties

IDEA
asks for p = P(X=1)
and
plausible bounds around it



- ✓ Only p is used for the calibration
- ✓ To calibrate one needs hundreds of ***similar*** questions
- ✓ The difference between the plausible bounds is almost never 0.1

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Proposal

An expert will place M_i variables in B_i and only some of them will realise

$\Rightarrow$ I can calculate S_i for B_i

Using the exact binomial test for each bin B_i

$$M_i \mid S_i \sim \text{Bin}(M_i, p_i)$$

under the null

Proposal

Then the distribution of S

$$S = \sum_i Bin(n_i, p_i)$$

$$Cal(e) = P\left(S \geq \sum_{i=1}^{10} n_i s_i\right)$$

$$info(e) = \frac{1}{N} \sum_{i=1}^{10} n_i I(p_i; 0.5)$$

$$0.005 \leq info \leq 0.5$$

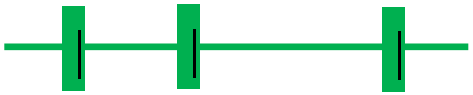
I want large info & large Cal

$$w(e) = Cal(e) \cdot info(e)$$

IDEA for continuous quantities

Eliciting quantities

IDEA asks for 3 number , which can be interpreted as quantiles ,and a confidence level



5th quantile median 95th quantile

- ✓ If experts specify 90% confidence level we work with the 5th and the 95th quantiles
- ✓ If experts specify 50% confidence level we work with the 25th and the 75th quantiles
- ✓ Allowing experts to specify their own confidence level reduces overconfidence

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Difficulties

- ✓ Very low confidence levels
- ✓ When presenting feedback, the intervals are normalised to the 90% confidence interval using a linear extrapolation
- ✓ Physical bounds are often equal to the lower/upper bounds given by experts
- ✓ Adjusting for all these, making appropriate assumptions and preparing results in the form Excalibur likes is a nightmare

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Difficulties

- ✓ The calibration helps us identify poor calibrated experts, then why optimise?
- ✓ [1/10, 5/10, 3/10, 1/10] achieves a calibration of 0.71
- ✓ [2/10, 4/10, 3/10, 1/10] achieves a calibration of 0.31
- ✓ Informativeness doesn't always allow us to choose between equally calibrated experts

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Online elicitations

- ✓ Seed variables online blessing or curse?
- ✓ More difficult to find
- ✓ More representative of the questions of interest

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IDEA as a general protocol

The main IDEA

Estimate (before seeing) – discuss – estimate (again, privately)

- ✓ Features of a BN structure – (with Tina Nane and Sophia Wright)
- ✓ Good reasoning – IARPA – CREATE
- ✓ Correlations – informal pilot study (with Annemarie Christophersen)

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Thank You!

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