Sun PM
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# Lay statistics and advice taking: Do people understand the wisdom of small crowds?

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## Questions (& Answers)

1. Do people have a conceptual understanding that the averaging of estimates leads to increase accuracy? Do they understand law of large numbers? **MANY DON'T**

2. Are people sensitive to an advisor's group size (1 vs. 3) when revising their estimates? **JUST A LITTLE**

3. Do increased levels of conceptual understanding translate into more sensitivity to advisor group size? **NOT AT ALL!**

## Advice Taking: Method

Mturkers (n = 172) *(another 70 Ss failed attention checks)*

**Initial block** (10 trials)

"how old is this person?"

**your estimate:**

**Revision block** (10 trials)

"Now you will see the same faces with your initial age estimate & the average estimate from other three participants* **Use this advice to revise your initial judgment as you see fit.**

**your initial estimate:** 39
**the average estimate from 3 other participants:** 34
**your revised estimate:** ?

Experimental Manipulation (between-subjects):

Size of the Advisor Group (one, three)

* In fact, every participant in the study received the same identical 'advice'.

## Lay Understanding about Averaging

A newly assembled 10-item battery including:

Law of large numbers (3 items)

e.g. 'A game of squash can be played to either 9 or 15 points. Holding all other rules of the game constant, if Michael is a better player than John, which scoring scheme would give Michael a better chance of winning?' (Tversky & Kahneman, 1974)

- Playing to 9 points
- ★ Playing to 15 points **0.32 correct**
- No difference whether they play to 9 or 15 points

Wisdom of crowds (5 items)

e.g. "Imagine we ask 10 participants to forecast tomorrow's temperature for Omaha, Nebraska. Which answer will most likely be closest to the true value?"

- the individual forecast of a single participant (randomly selected)
- the average forecast of two participants (randomly selected)
- ★ the average forecast of three participants(randomly selected) **0.86 correct**

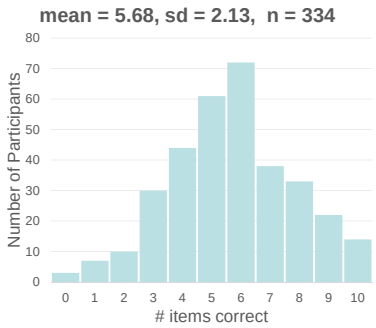
Implementing Averages (2 items)

e.g. "You and 3 friends of yours go hiking in the state park. Upon seeing the first tree, you estimate it to be 150 feet tall. Your 3 friends also make their estimates, which they average to 190 feet. Which of the following answers is most likely to be closest to the truth?"

- 150 (your answer)
- 170 (the midpoint between your answer and the average answer of your 3 friends)
- ★ 180 (a value ¾ away from your answer and ¼ away from the average answer of your 3 friends) **0.41 correct**
- 190 (the average answer of your 3 friends)

## Battery: Preliminary Findings

- Good range of difficulty across items (from .29 to .86)
- Good range in performance across participants (see histogram)
- Monetary incentive did not increase performance (not shown)

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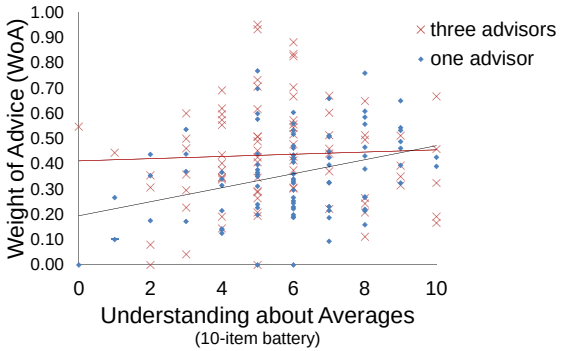
## Advice Taking: Results & Discussion

- **Advice was weighed a little more strongly when coming from three advisors (.43) than when coming from one (.35),** $t(170) = 2.7$, $p = .007$

  Weight of advice: $\frac{|\text{revised estimate} - \text{initial estimate}|}{|\text{advice} - \text{initial estimate}|}$

- **In regression analysis, increased conceptual understanding did not translate into more sensitivity to advisor group size** (interaction: $p = .07$ in opposite direction)




## Replication

We replicated the findings using a different estimation task; instead of estimating the age of faces, subjects estimated world facts (e.g., "What percent of the world's airports are in the USA?").

Advice from three advisors was weighed more strongly than advice from one (.50 vs .42, p = .05), but most importantly and as predicted, increased conceptual understanding did not modulate this effect.