

Making Use of the Wisdom of Crowds: Stuck in the Majority Rule

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Introduction

In a world in which facts are often difficult to verify and individual views are pervasive, how do people actually make use of the ‘wisdom of crowds’? We present decision-makers with a series of statements that are factually true or false, and evaluate how they utilize information about other individuals’ views, confidence levels, and higher-order beliefs to make their own judgments. We find that people have difficulty in making effective use of more detailed information about others’ assessments, instead relying heavily on majority opinion as the main heuristic when forming their own judgments.

Methods

We implement an experiment with 50 factual trivia questions of varying expected difficulty levels that test participants’ real-world knowledge in a controlled setting. Without having access to external resources in Stage 1, participants are incentivized to report:

- whether each of the 50 statements is correct or not;
- their confidence in their own answer (ranging from 50%-100%);
- their second-order beliefs regarding the proportion of participants giving the same answer as they do (ranging from 1%-100%);
- the average confidence of all participants in own answers (ranging from 50%-100%).

TREATMENT OVERVIEW

Treatment	Information provided in Stage 2: Answer revisions
NI	(Not applicable)
LI	Distribution of <i>a</i>); Average of <i>b</i>) separated by those who agree and disagree with the statement
MI	Distribution of <i>a</i>); Average of <i>b</i>) and <i>c</i>), separated by those who agree and disagree with the statement
FI	Distribution of <i>a</i>); Average of <i>b</i>), <i>c</i>), and <i>d</i>), separated by those who agree and disagree with the statement

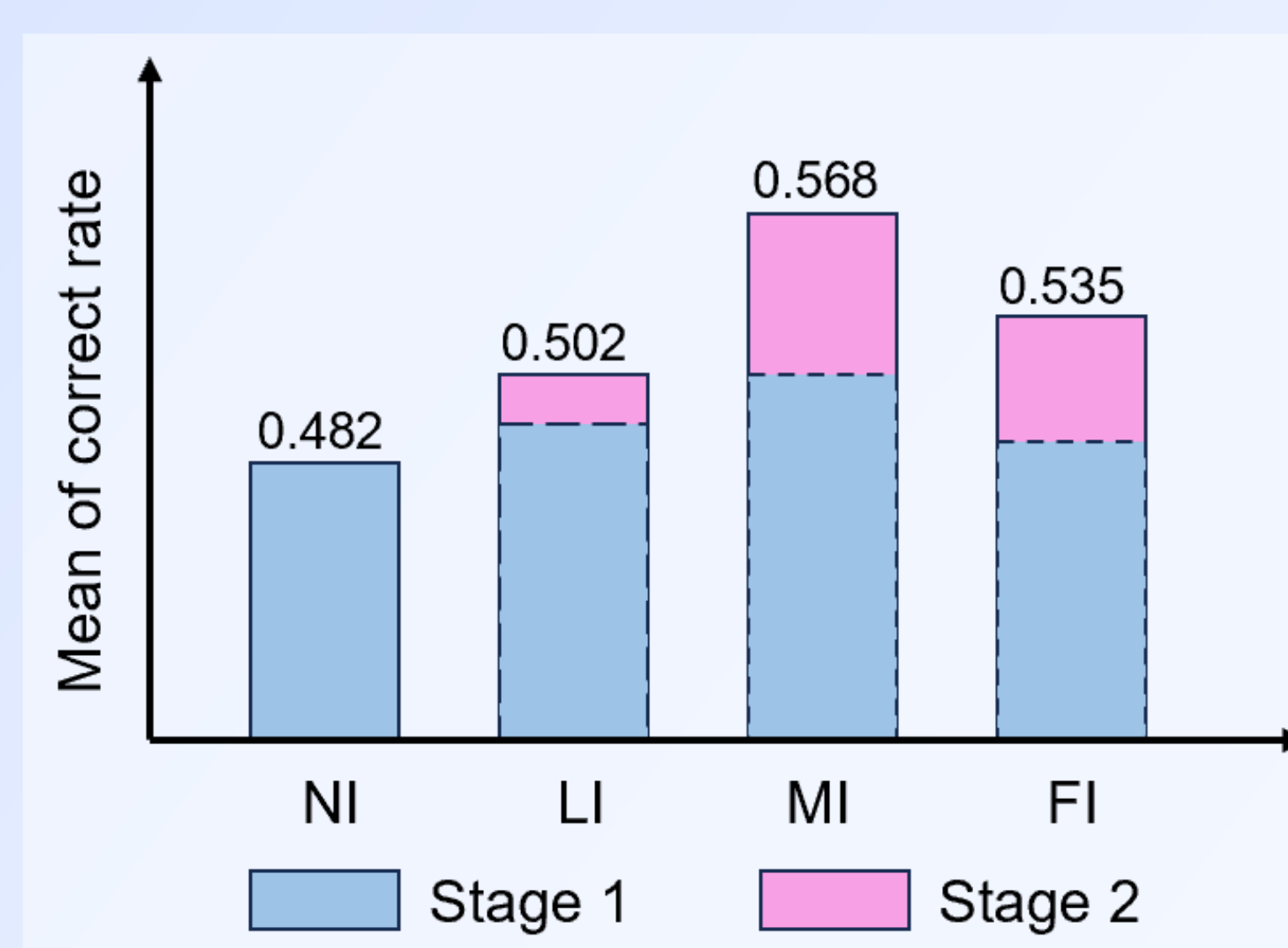
Procedures

Four experimental sessions of 128 subjects in total (32 subjects per treatment), were conducted on December 22, 2019, at the experimental laboratory of Beijing Foreign Studies University, with university undergraduate students as the subject pool. We implemented a power test to verify that this sample size is sufficient to detect a treatment effect at the conventional 5% significance level and power over 90%.

The experiment was programmed and conducted using the software z-Tree (Fischbacher, 2007). Each session lasted approximately 60 minutes, and the average payment received was 43.43 RMB per subject (including a 10 RMB show-up fee), which is within the standard range of payment for experiment participation in mainland China.

Results

Result 1. Information tends to improve performance from the first stage to the second stage. The moderate information condition yields the best outcome out of the three information conditions. This is partially attributed to the higher confidence levels reported by the subjects giving correct answers compared to their counterparts.



Result 2: Information at all levels (LI, MI, FI) improves performance on easy questions but does not necessarily improve performance on difficult questions. Individual performance improvements are negatively correlated with initial performance and initial confidence, indicating that performance gains are primarily concentrated among subjects with low initial knowledge and confidence levels.

Results (Continued)

Result 3: The overall revision rate is relatively low in the information treatments, and does not necessarily increase with the amount of the information provided. Nevertheless, subjects are significantly influenced by the answers and confidences of others in their answer revision choices.

Result 4: Decision-makers’ answers are most frequently consistent with the Majority rule, in situations where discrepancies between the three rules (Majority rule, Maximum Confidence rule, Surprising Popularity rule) exist, even though following the Maximum Confidence rule can yield better performance.

DECISION HEURISTICS

Treatment	Comparison between the heuristics	Favoring the former rule
MI	Majority rule vs. Maximum Confidence	50.00%
FI	Majority rule vs. Maximum Confidence	75.00%
	Maximum Confidence vs. Surprising Popularity	68.75%
	Majority rule vs. Surprising Popularity	81.25%

NOTE: Majority rule refers to selecting the answer with more than half the votes; Maximum Confidence rule refers to selecting the answer with a higher aggregate reported confidence; Surprising Popularity rule (Prelec, Seung, and McCoy, 2017) refers to selecting the answer that is chosen more frequently than estimated.

Conclusion

Firstly, our study shows that even when a multitude of information on answers and incentivized confidence levels of others is available, decision-makers tend to rely heavily on the Majority rule as a favored heuristic, perhaps due to its simplicity.

Secondly, our findings point to the potential for information about other individuals’ confidence levels to improve collective knowledge. While information on confidence levels was not utilized to its fullest extent among participants in our experiment, it could have helped performance further.

Thirdly, our study points out that there is a limit to the amount of information about others’ views that decision-makers can effectively process. In particular, decision-makers may not know how to utilize the higher-order information provided in the Full-Information treatment, and could even be confused by it.

Main References

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