How graphical representation improves probability weighting in risky choice

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I Introduction

- Risky choices can be improved by representing options graphically in the Open Sampling (OSa) format (Hilbig & Glöckner, 2011), a matrix of 10 x 10 outcomes, with regard to weighting of small probabilities and accordance to expected value maximization.
- By identifying the crucial feature(s) of the OSa format, this study provides insights into the processes which decisions rely on and how decisions can be improved.

The OSa format differs from the classical descriptive format on four features:

1. **Presentation of frequencies**
2. **Enables quick and automatic scanning**
3. **Presentation of a large sample**
4. **Presentation of a representative sample**

- Previous research has shown no effect of frequencies or formats enabling quick and automatic scanning on risky choices (e.g., Camilleri & Newell, 2011a).
- In line with the sampling approach (Fiedler, 2000), providing a large and representative sample leads to more appropriate decisions (Camilleri & Newell, 2011b).
- Going beyond traditional investigation of choice behavior, this study estimates the *probability sensitivity parameter* γ of CPT (Tversky & Kahneman, 1992) as an indicator for probability weighting.

M Method

- *N* = 530 participants made 60 choices between gambles presented in one of the following formats

Between-subject manipulation of presentation format

+ frequencies
H1: no effect

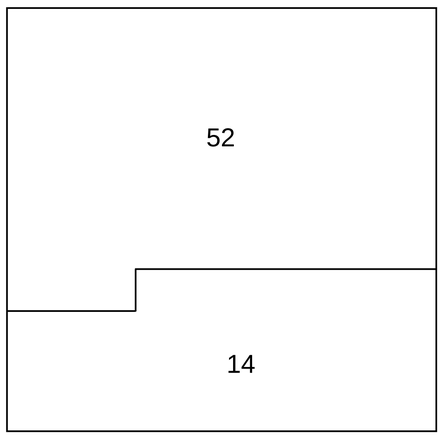
+ quick and automatic scanning
H2: no effect

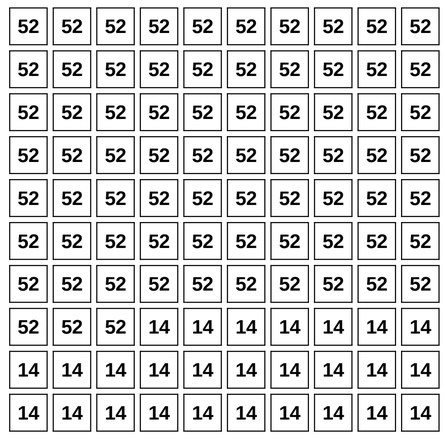
+ large sample
H3: improvement of probability weighting

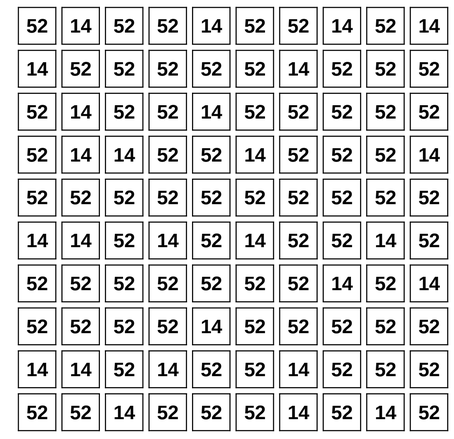
+ randomization of sample
H4: improvement of probability weighting

Probability	Outcome
73 %	52
27 %	14

73 ticket(s) with 52 point(s)
27 ticket(s) with 14 point(s)





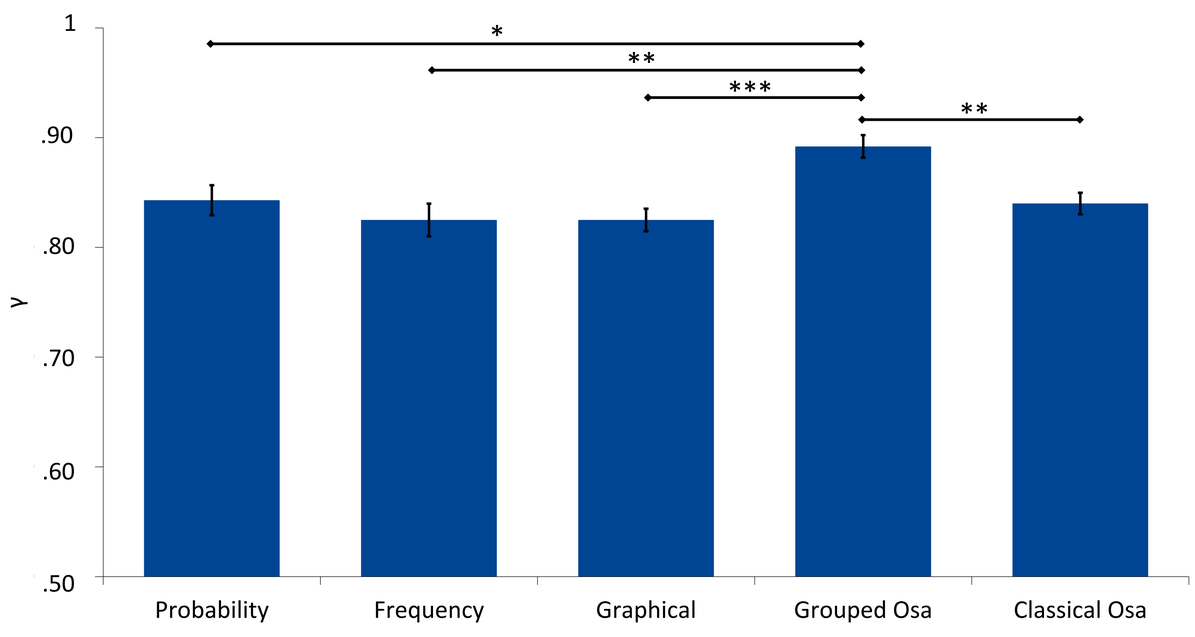


Probability format | *Frequency format* | *Graphical format* | *Grouped OSa format* | *Classical OSa format*

R Results

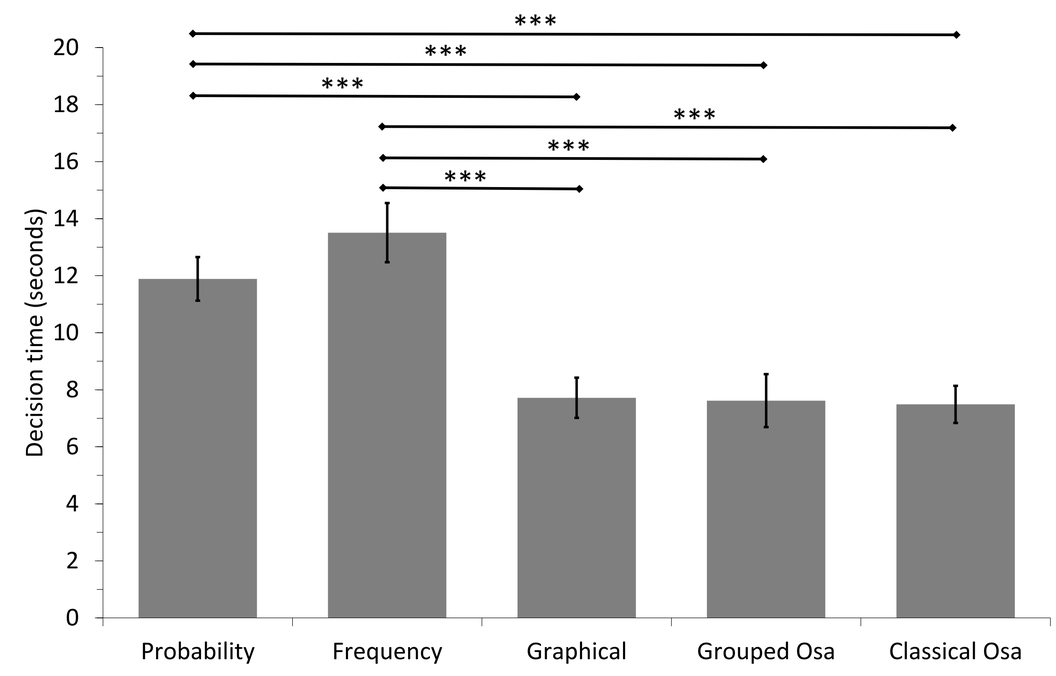
Probability weighting (γ)

- Larger values indicate higher sensitivity for probabilitites



error bars indicate one standard-error of the mean
*p < .05, **p <.01, ***p < .001

Decision time



C Conclusion

- Probability weighting improves when risky choices are presented as a sample, but randomization does not improve it further.
- Although the graphical format does not affect probability weighting (vs. the descriptive formats), it reduces decision time.

References

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