Information sampling in decision-making under uncertainty: an experimental investigation

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- Decision-making and deliberate reasoning

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    - In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 dates for the patch to cover the entire lake, how long would it take for the patch to cover half the lake?

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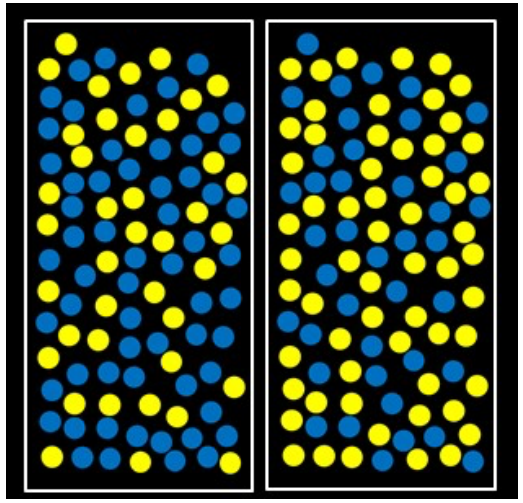
Information sampling

- Reduce uncertainty - Improve your decision
- Risk and ambiguity

Beads-task

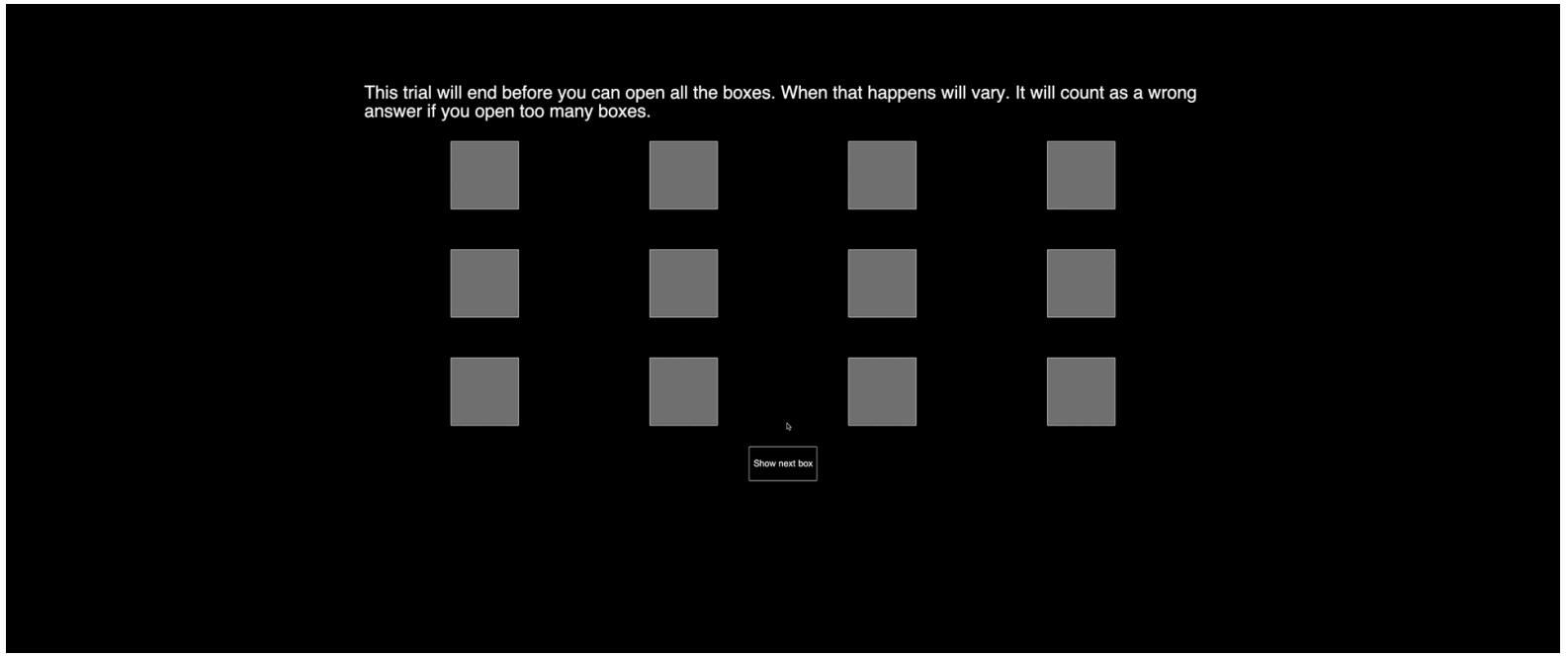
“What urn are you drawing from?”



Press 1 for
60/40 blue
Press 2 for
60/40 yellow
Press ‘space’
to draw more
beads

Huq, S. F., Garety, P. A., & Hemsley, D. R. (1988). Probabilistic judgements in deluded and non-deluded subjects. *Quarterly Journal of Experimental Psychology A, 40*(4), 801-812.
Modified version of: Phillips, L. D., & Edwards, W. (1966). Conservatism in a simple probability inference task. *Journal of Experimental Psychology, 72*(3), 346-354.

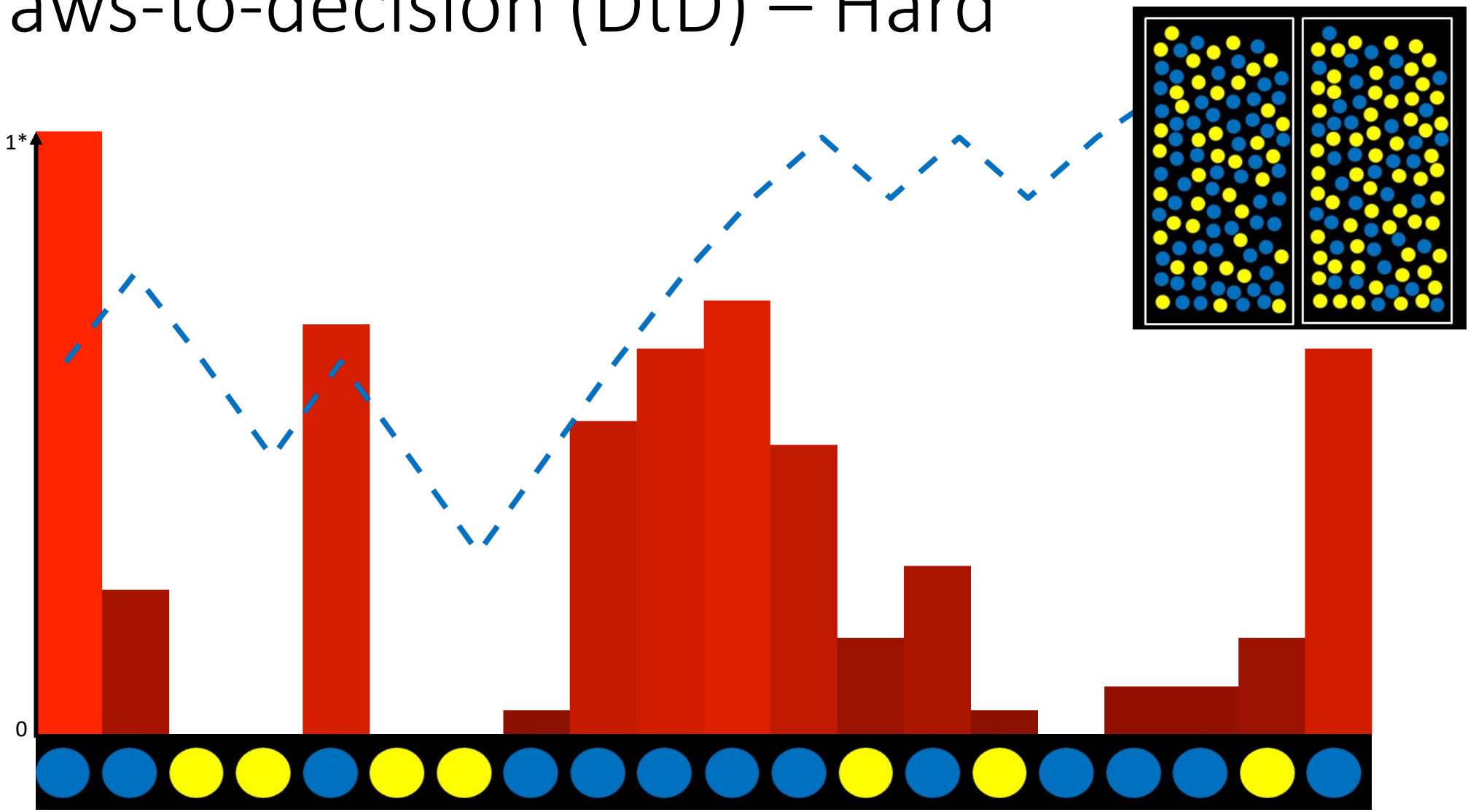
Box-task



Example “time-limit” trial↑ Make a decision or keep sampling?

Balzan, R. P., Ephraums, R., Delfabbro, P., & Andreou, C. (2017). Beads task vs. box task: The specificity of the jumping to conclusions bias. *Journal of Behavior Therapy and Experimental Psychiatry, 56*, 42-50.
Moritz, S., Goritz, A. S., Balzan, R. P., Gaweda, L., Kulagin, S. C., & Andreou, C. (2017). A new paradigm to measure probabilistic reasoning and a possible answer to the question why psychosis-prone individuals jump to conclusions. *Journal of Abnormal Psychology, 126*(4), 406-415.

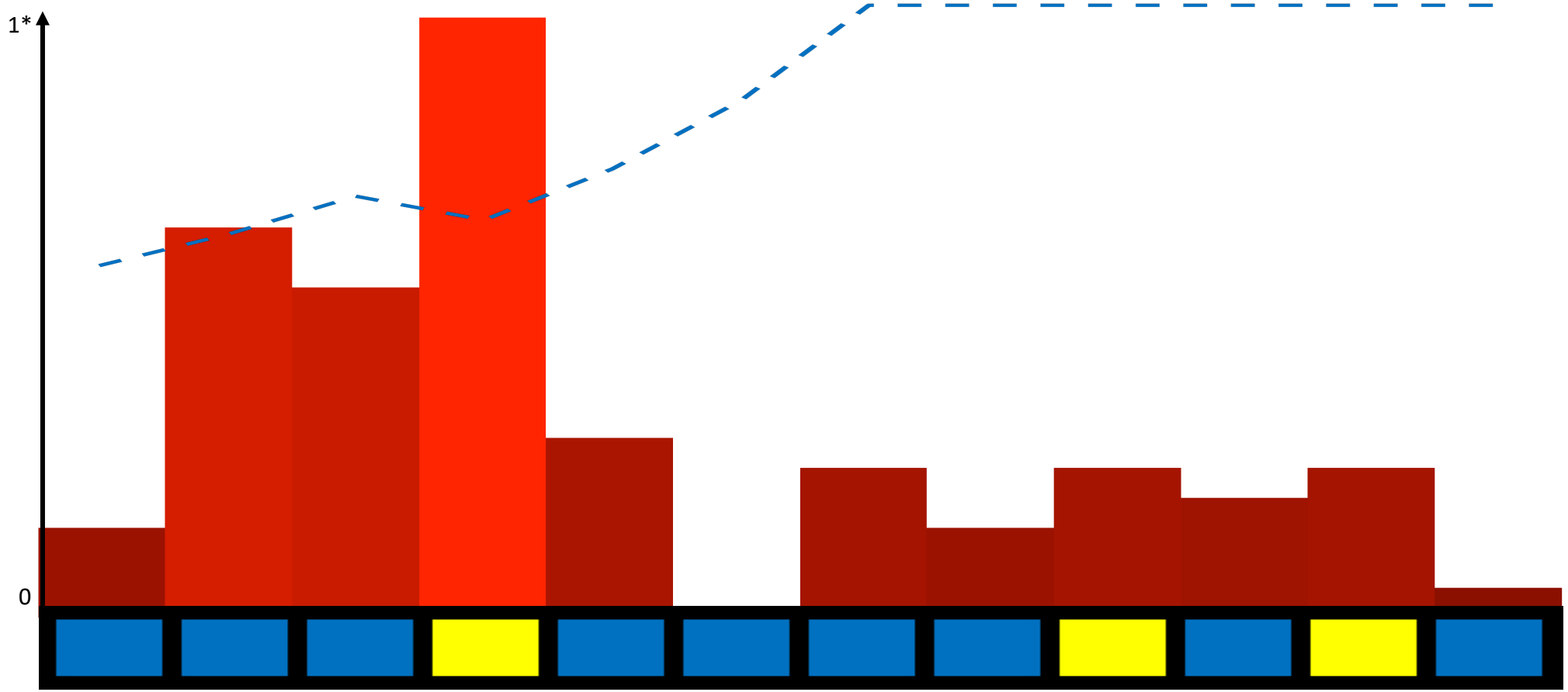
Draws-to-decision (DtD) – Hard



BeadsTask – Trial 3 – 60/40 - 👥144

*Dotted line: Point-estimates Naïve Bayesian Observer in favor of .60 Blue jar v. .60 Yellow jar

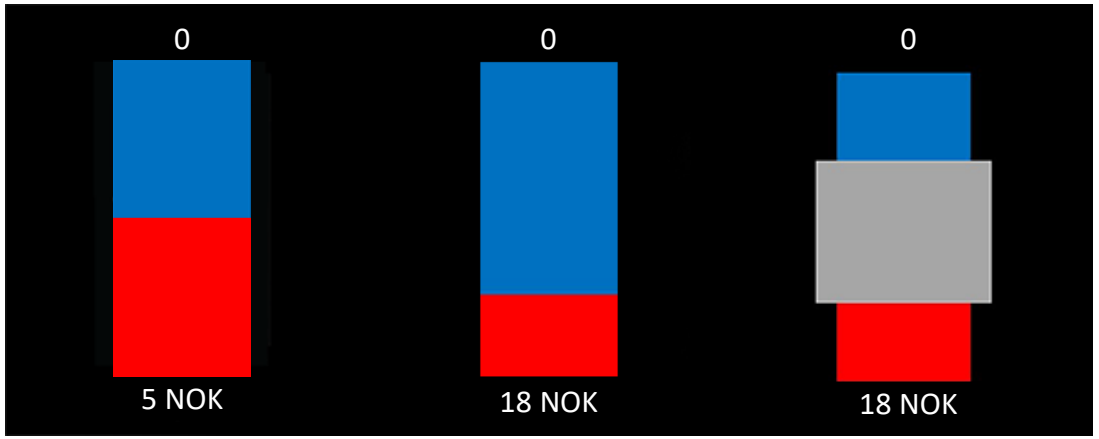
Draws-to-decision (DtD) – No-limit



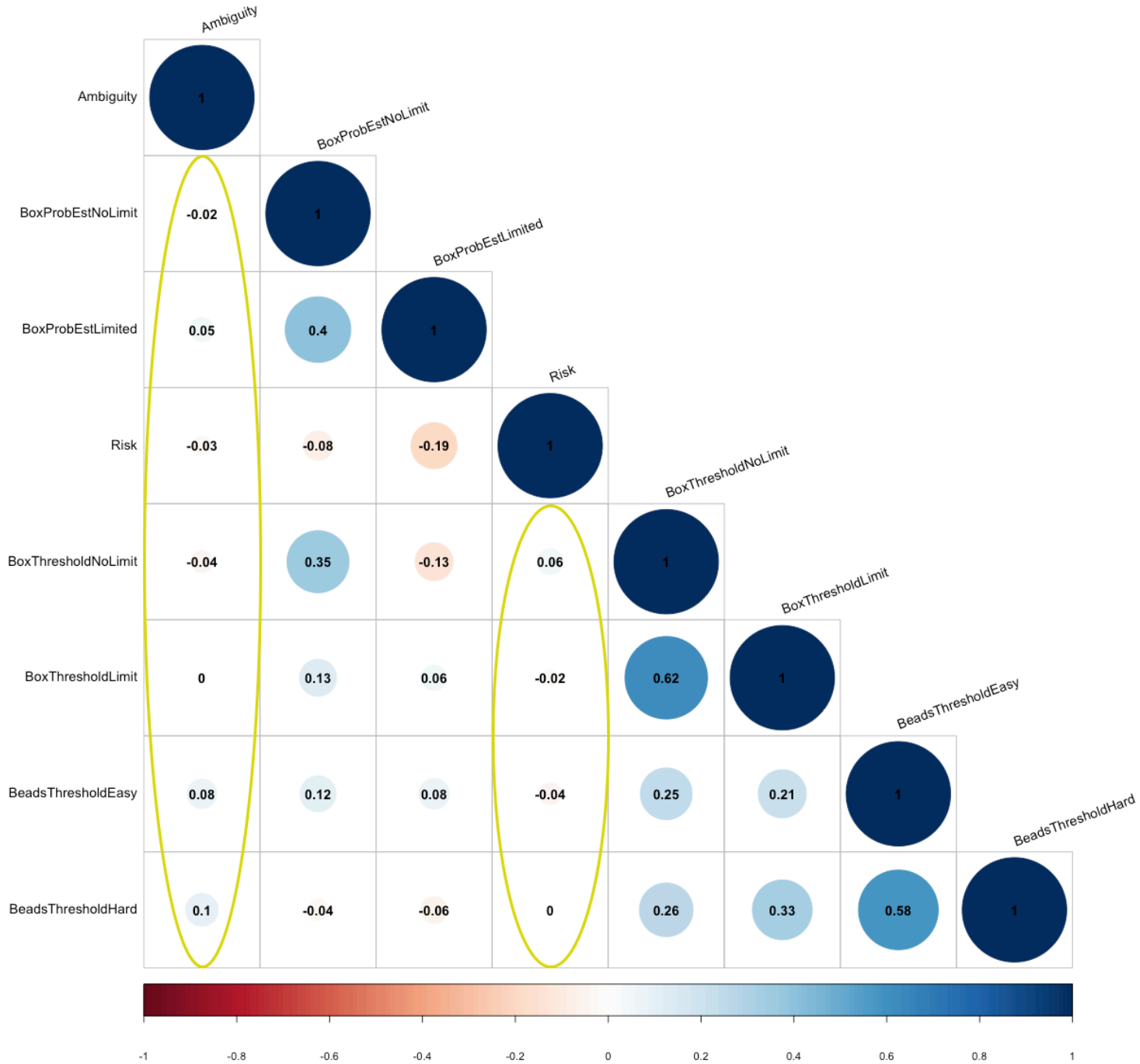
BoxTask – Trial 1 - 👥76

*Dotted line: Point-estimates Ideal Observer in favor of majority blue boxes v. majority yellow boxes

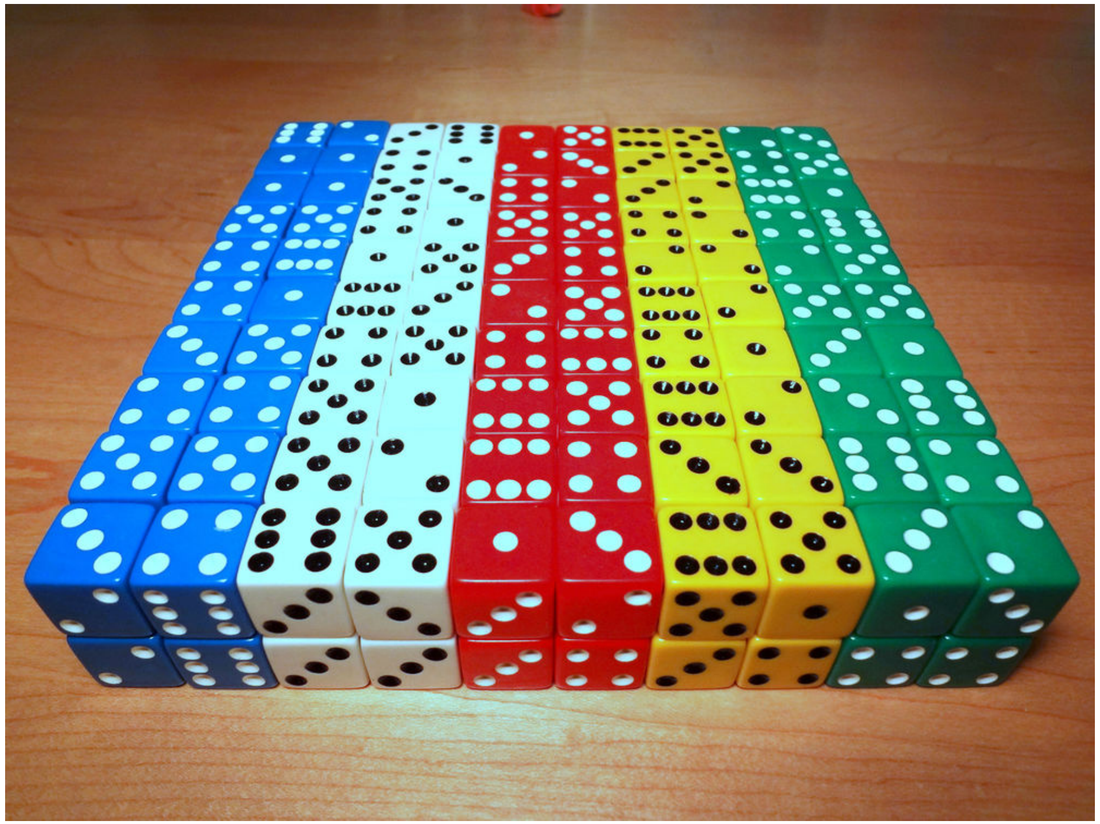
Ambiguity and Risk Task (ART)



Levy, I., Snell, J., Nelson, A. J., Rustichini, A., & Glimcher, P. W. (2010). Neural representation of subjective value under risk and ambiguity. *Journal of Neurophysiology, 103*(2), 1036-1047.


Ambiguity
BoxProbEstNoLimit
BoxProbEstLimited
Risk
BoxThresholdNoLimit
BoxThresholdLimit
BeadsThresholdEasy
BeadsThresholdHard
1
-0.02
1
0.05
0.4
1
-0.03
-0.08
-0.19
1
-0.04
0.35
-0.13
0.06
1
0
0.13
0.06
-0.02
0.62
1
0.08
0.12
0.08
-0.04
0.25
0.21
1
0.1
-0.04
-0.06
0
0.26
0.33
0.58
1
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1

MathPsych2020: Information sampling, risk-, and ambiguity-aversion - Kristoffer Klevjer



- Who samples information, and when, to reduce uncertainty and improve their decision making?
    - What is a good information sampling task?
    - What influences our degree of information sampling?
    - What cognitive traits relates to information sampling?
- How does this relate to certain mental disorders?
    - Clinical sample
    - Correlational with healthy population varying in their tendencies