

Complexity in Multistage Decision Making



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Introduction

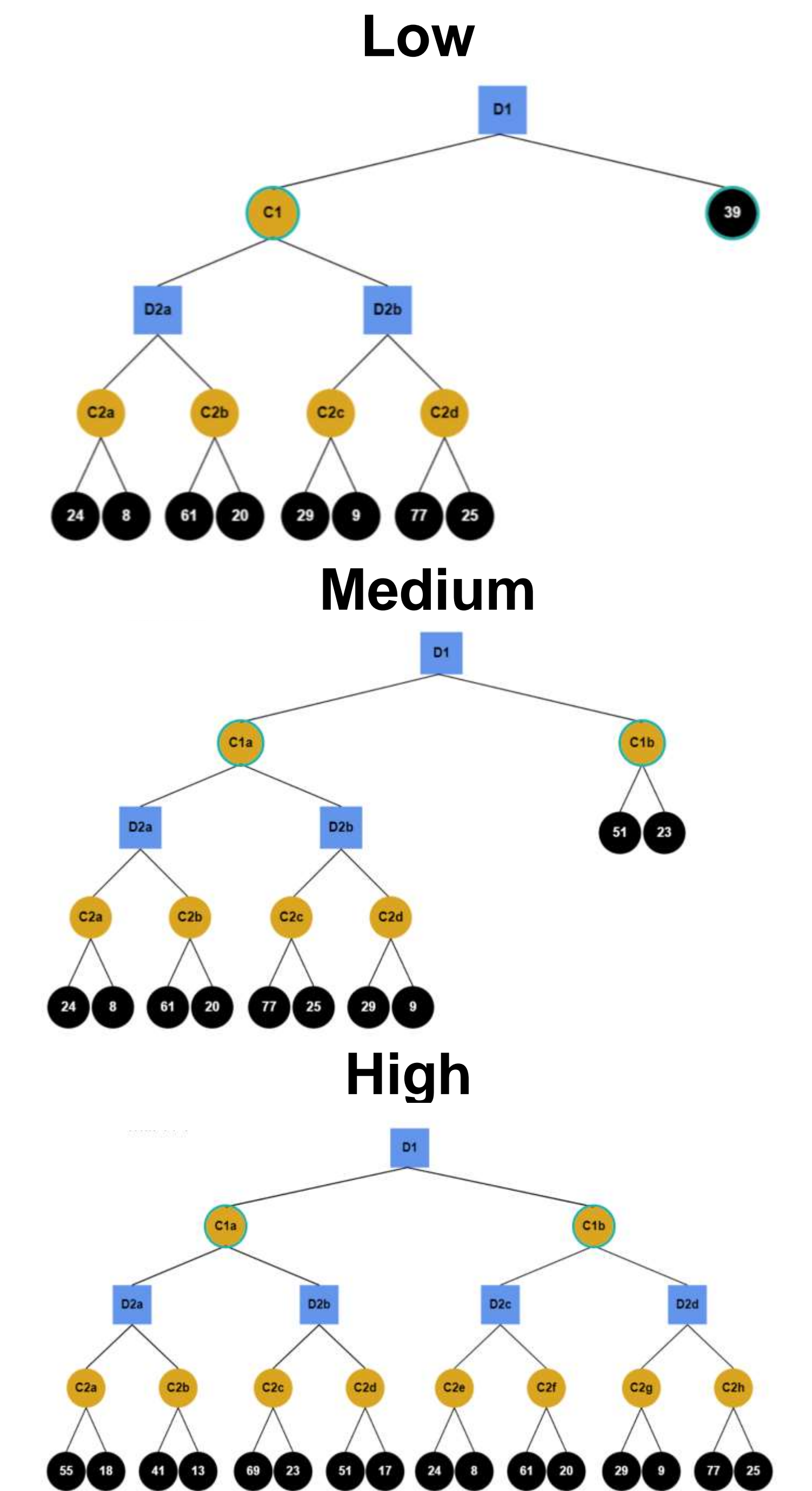
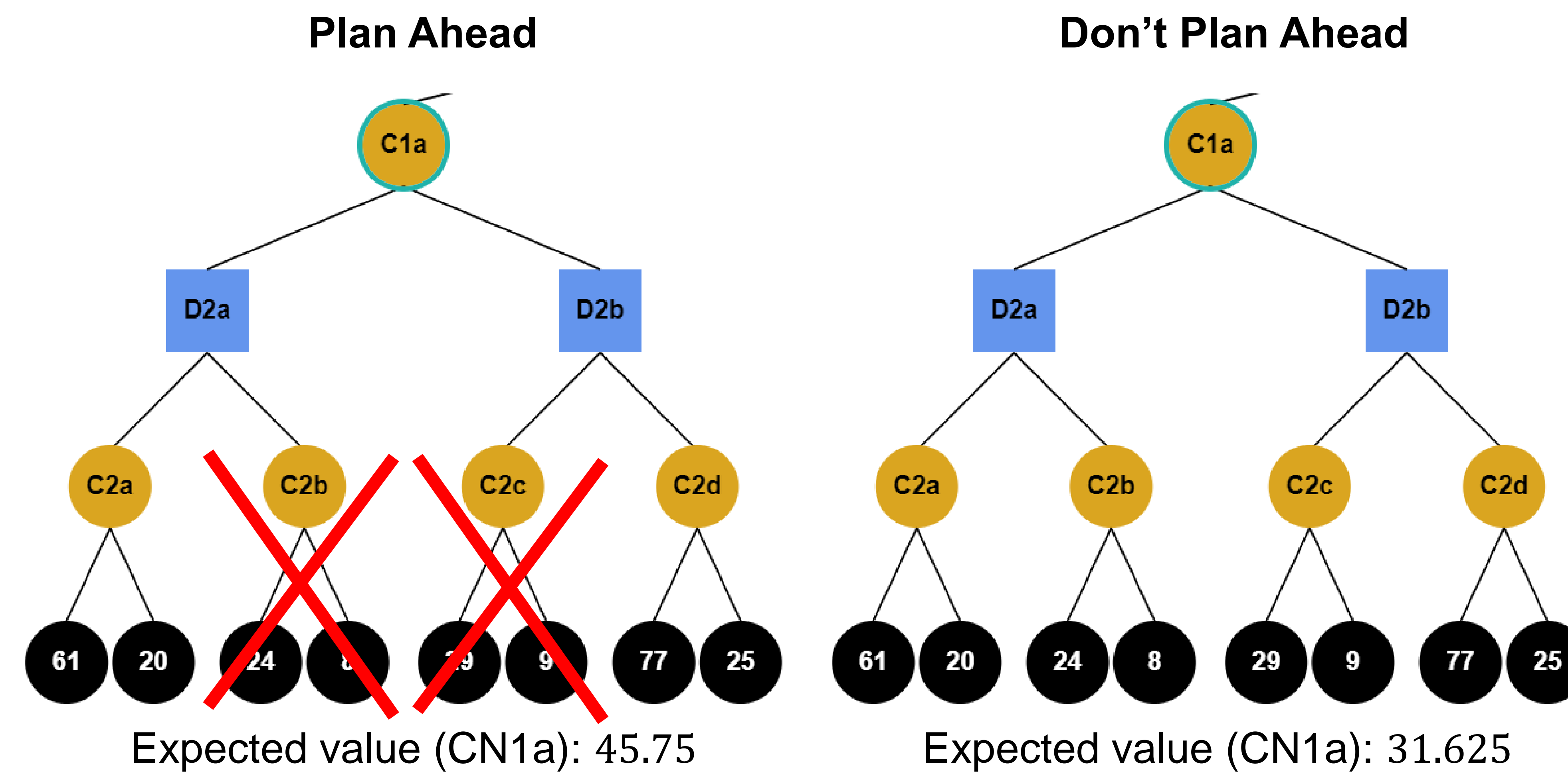
- Decisions in real life involve multiple interdependent events and actions
- People differ in how much they plan ahead in these kinds of situations (Hey & Knoll, 2011; Hotaling & Busemeyer, 2012)
- Previous work shows that complexity levels can affect individuals' decision strategies (Payne et al., 1988)
- Learning model under dynamic decision-making situations (Gonzalez et al., 2003)

Research Questions

- How do people adapt their planning strategies to different levels of complexity?
- How does adaptation interact with learning in dynamic decision making?

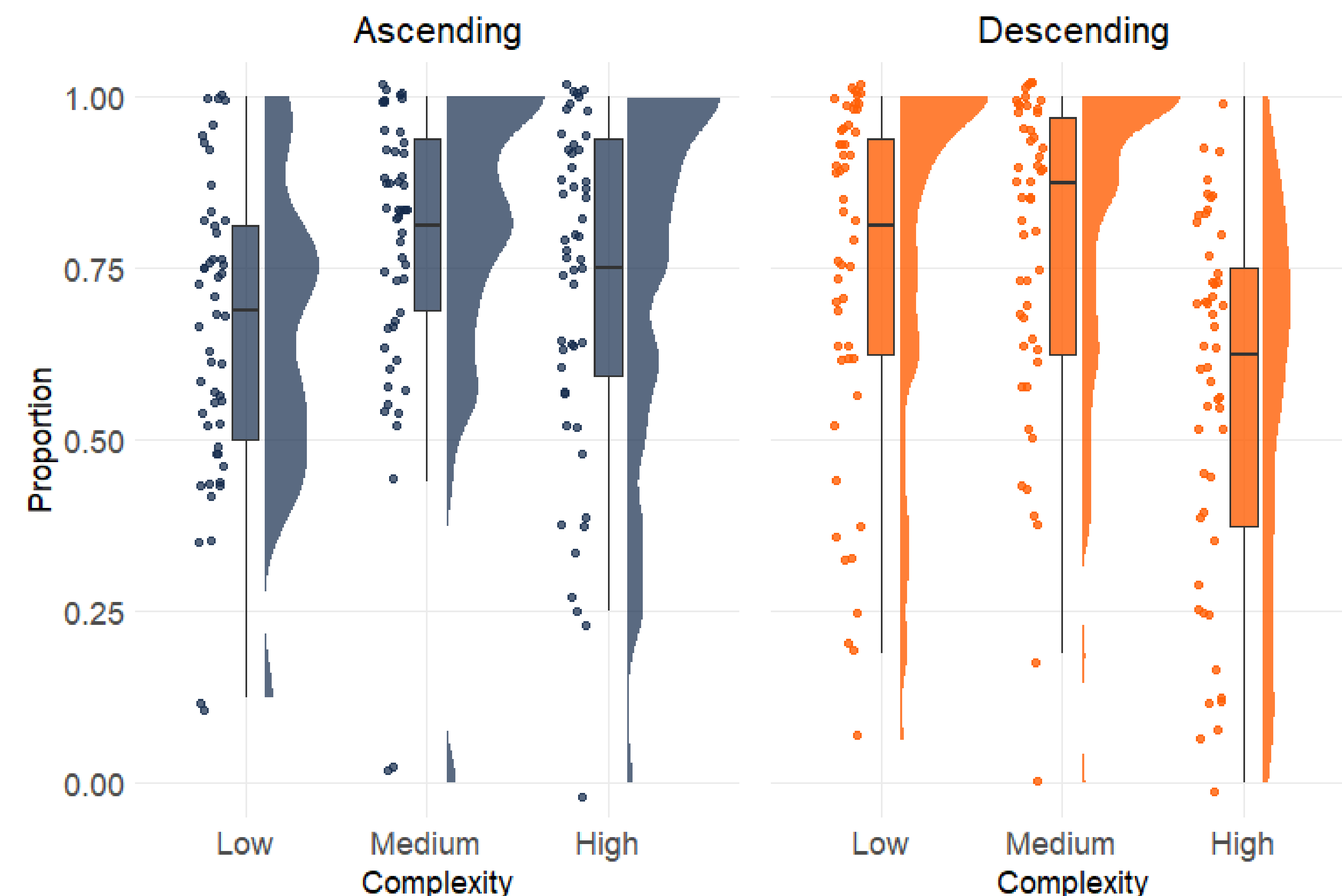
Method & Design

- 64 total trials
 - 16 low complexity (+ 8 fillers)
 - 16 medium complexity (+ 8 fillers)
 - 16 high complexity
- Ascending or descending order of complexity



Results

Planning Proportion at D1 by Complexity and Order



- Mixed effects of complexity on ordering
- Increase in planning proportion across blocks
- Effects of learning from previous trials and adapting strategies to different complexity levels

Future Directions

- Learning-only experiment to examine effects of experience alone on decision strategies
- Explore other definitions of complexities and whether similar changes in decisions can be observed
- Models to examine how decision strategies and processes change over time

References

Hey, J. D., & Knoll, J. A. (2011). Strategies in dynamic decision making – An experiment investigation of the rationality of decision behavior. *Journal of Economic Psychology*, 32(3), 399-409.

Hotaling, J. M., & Busemeyer, J. R. (2012). DFT-D: a cognitive-dynamical model of dynamic decision making. *Synthese*, 189(1), 67-80.

Payne, J. W., Bettman, J. R., & Johnson, E. J. (1988). Adaptive strategy selection in decision making. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 14(3), 534.

Gonzalez, C., Lerch, J. F., & Lebiere, C. (2003). Instance-based learning in dynamic decision making. *Cognitive Science*, 27(4), 591-635.