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Predicting How People Update Beliefs

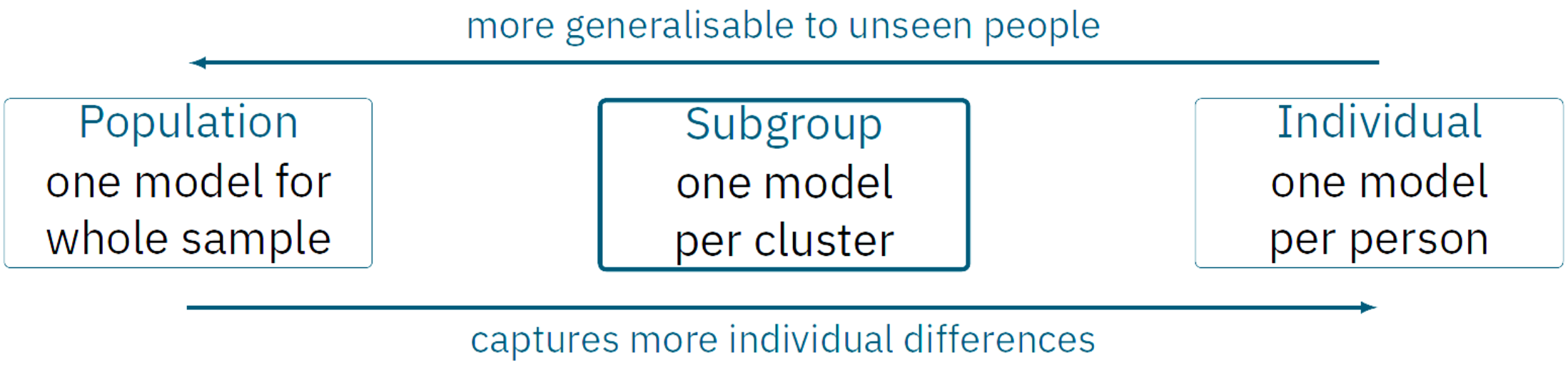
Individual-, Subgroup-, and Population-Level Dynamic Bayesian Networks

Rebecca von Engelhardt and Malte Luttermann

07.10.2026

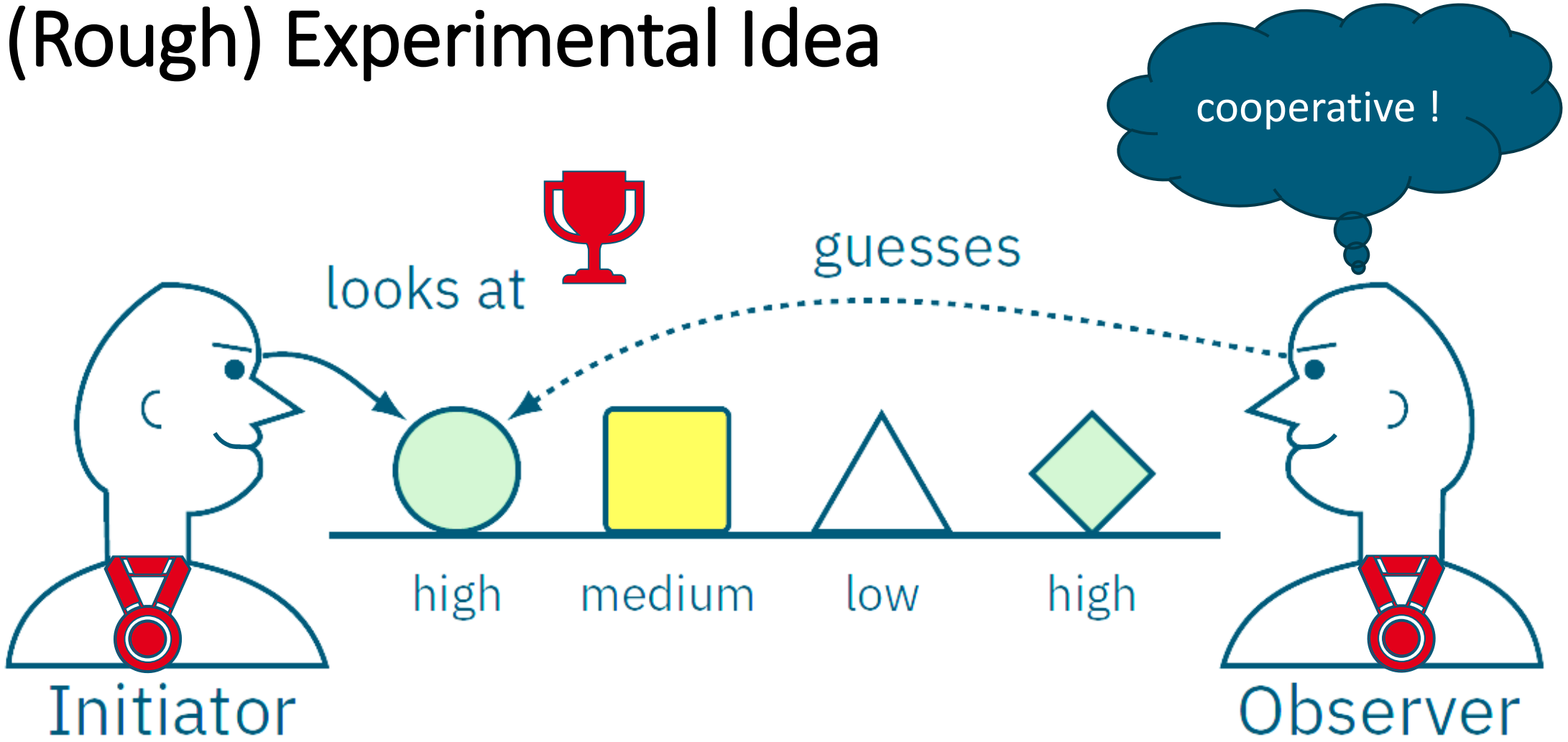
ACS 2026

Levels to Model Cognitive Processes

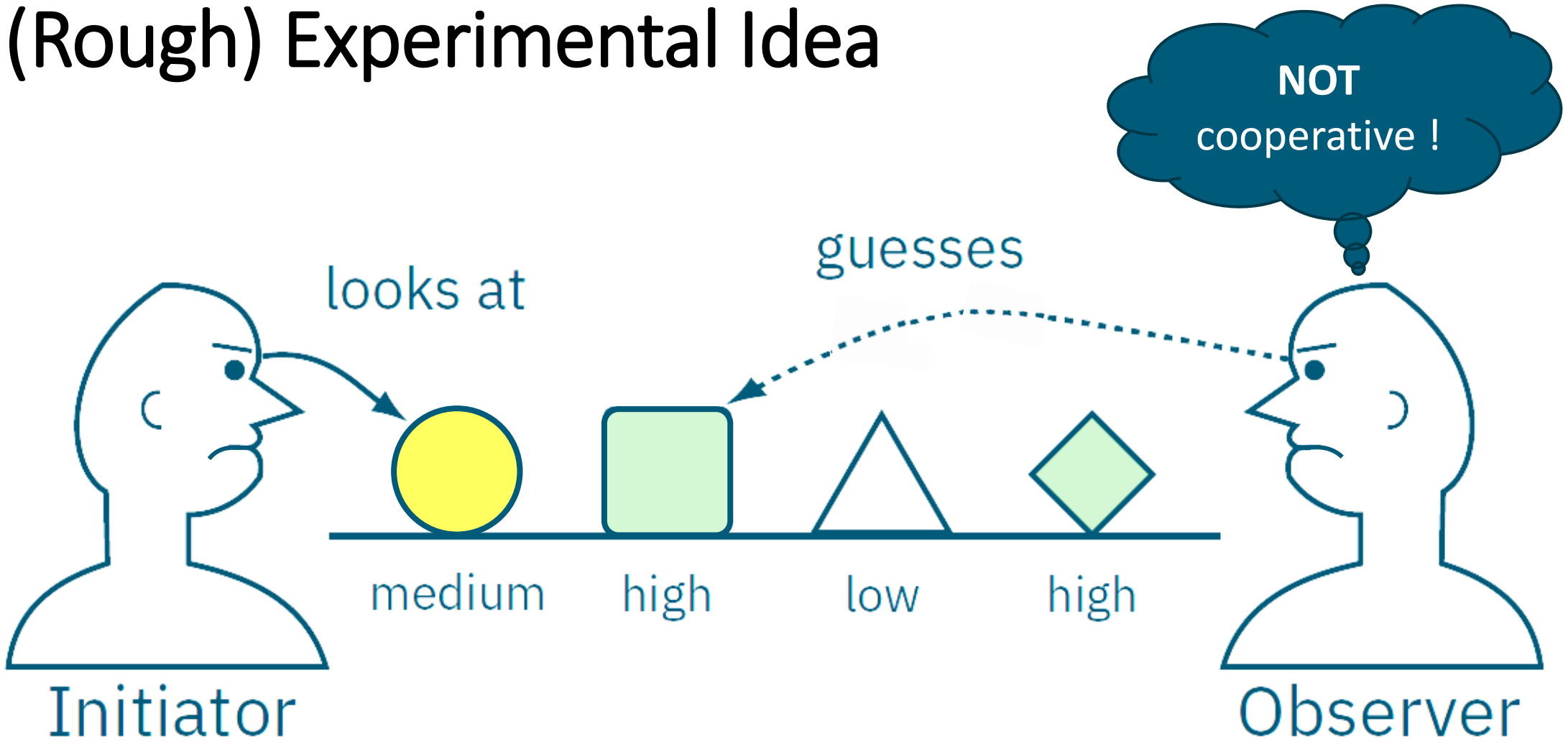


Goal: Cluster people with similar cognitive processes and use these cluster models for predictions

(Rough) Experimental Idea

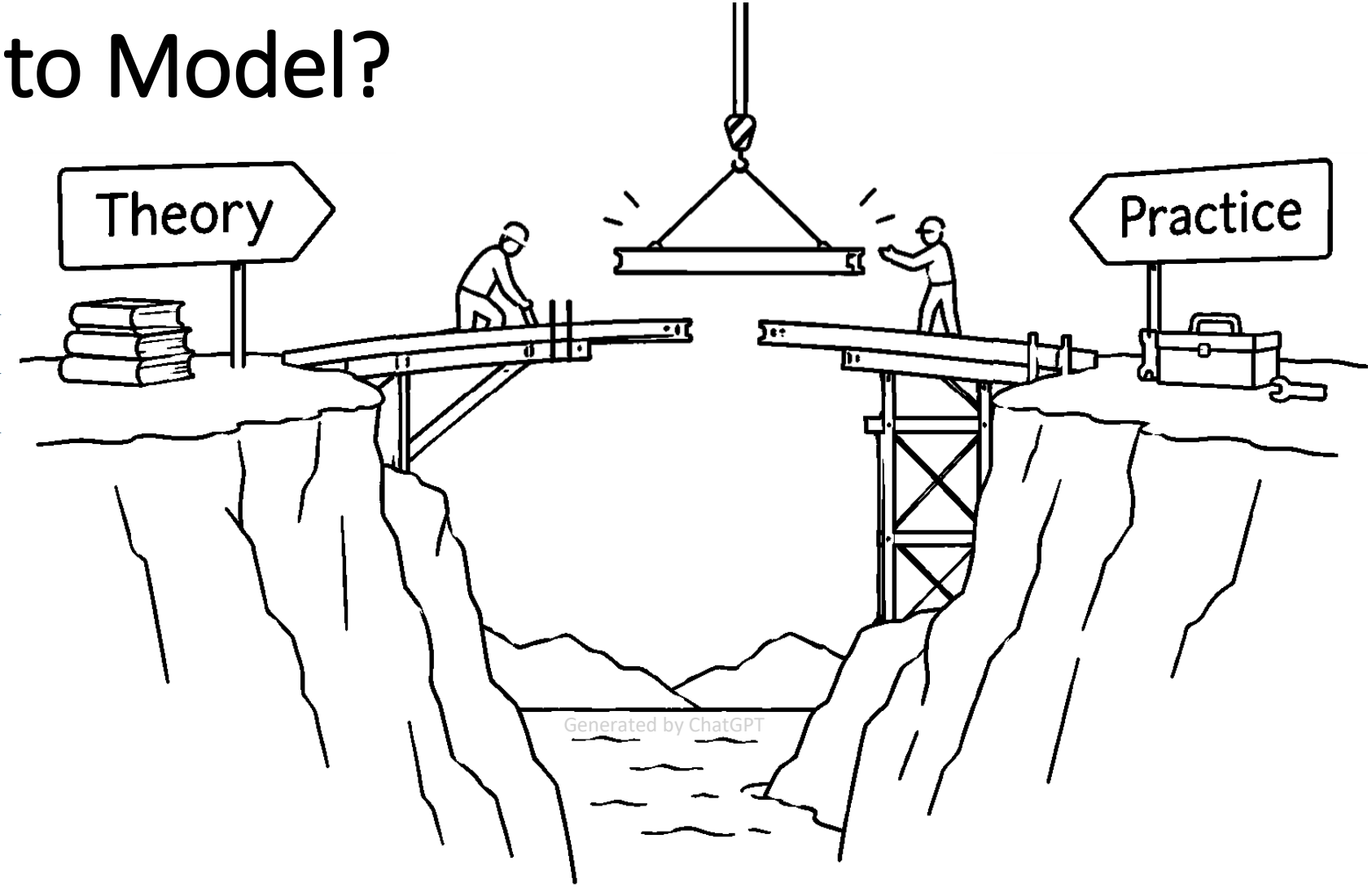


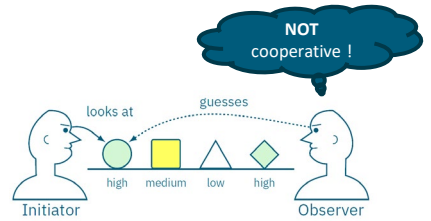
(Rough) Experimental Idea



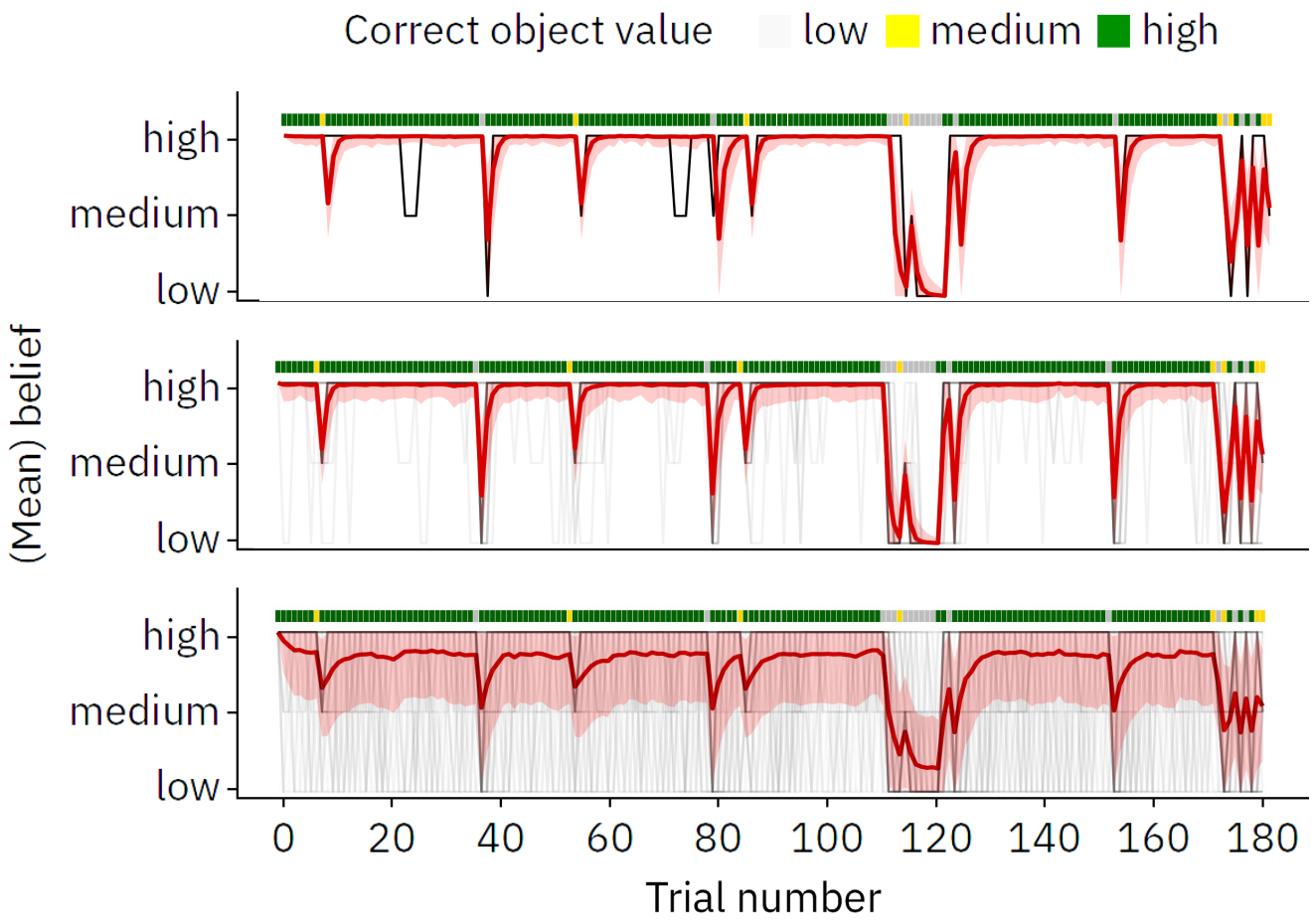
How to Model?

for $k \in \mathcal{A} \setminus \{i', j'\}$ **do**
  if $k > j'$ **then**
    $\tilde{\Lambda}_{i'k} \leftarrow \max\{\tilde{\Lambda}_{i'k}, \tilde{\Lambda}_{j'k}\}$
  else if $k < i'$ **then**
    $\tilde{\Lambda}_{ki'} \leftarrow \max\{\tilde{\Lambda}_{ki'}, \tilde{\Lambda}_{kj'}\}$
  else if $i' < k < j'$ **then**
    $\tilde{\Lambda}_{i'k} \leftarrow \max\{\tilde{\Lambda}_{i'k}, \tilde{\Lambda}_{kj'}\}$





Predictions From Different Models

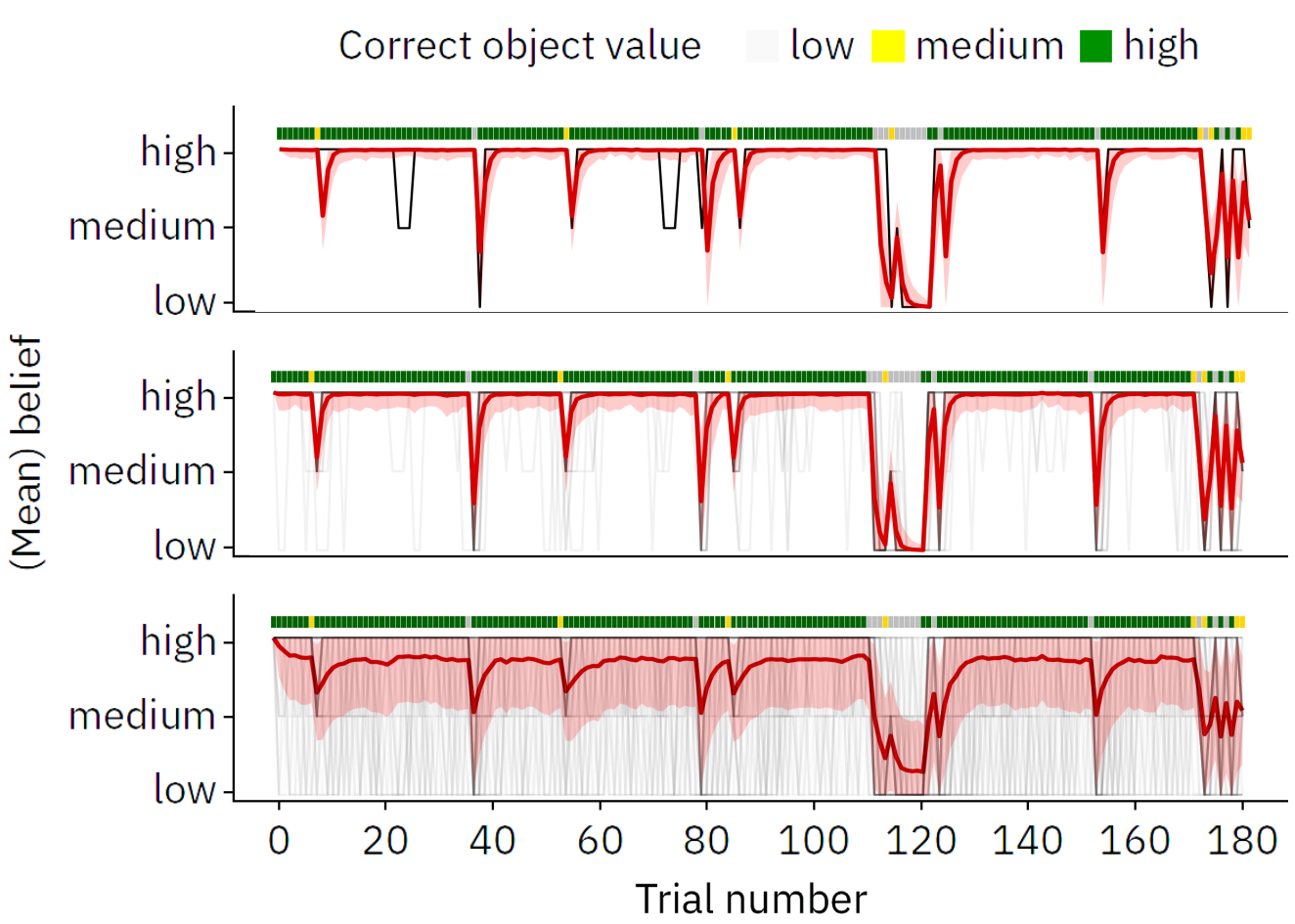


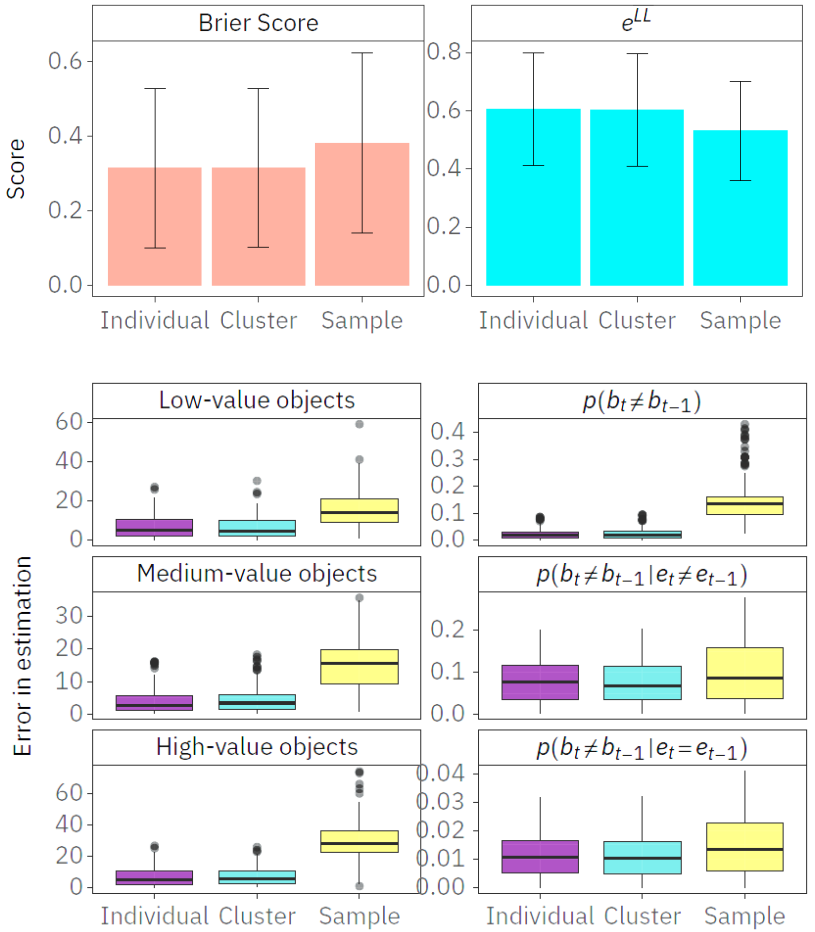
Individual model

Cluster-based model

Sample-based model

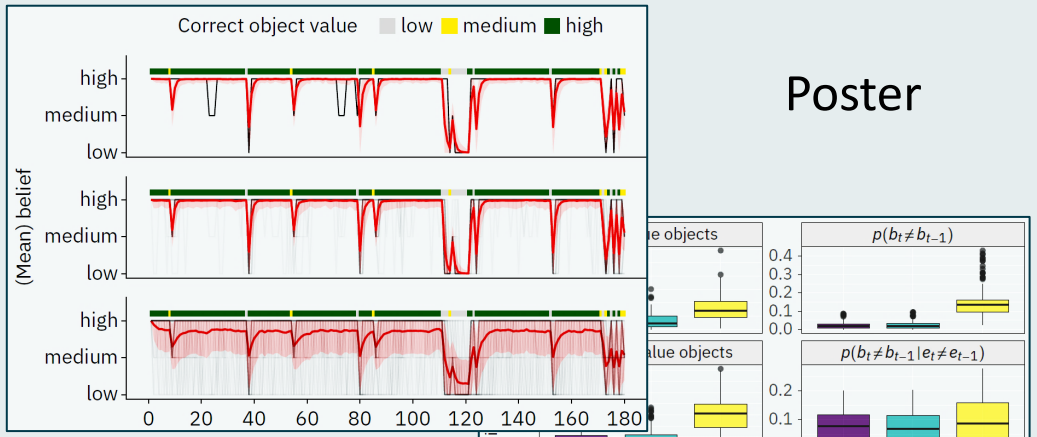
Predictions From Different Models





Has This Sparked Your Interest?

Thanks – see you later?



Poster

