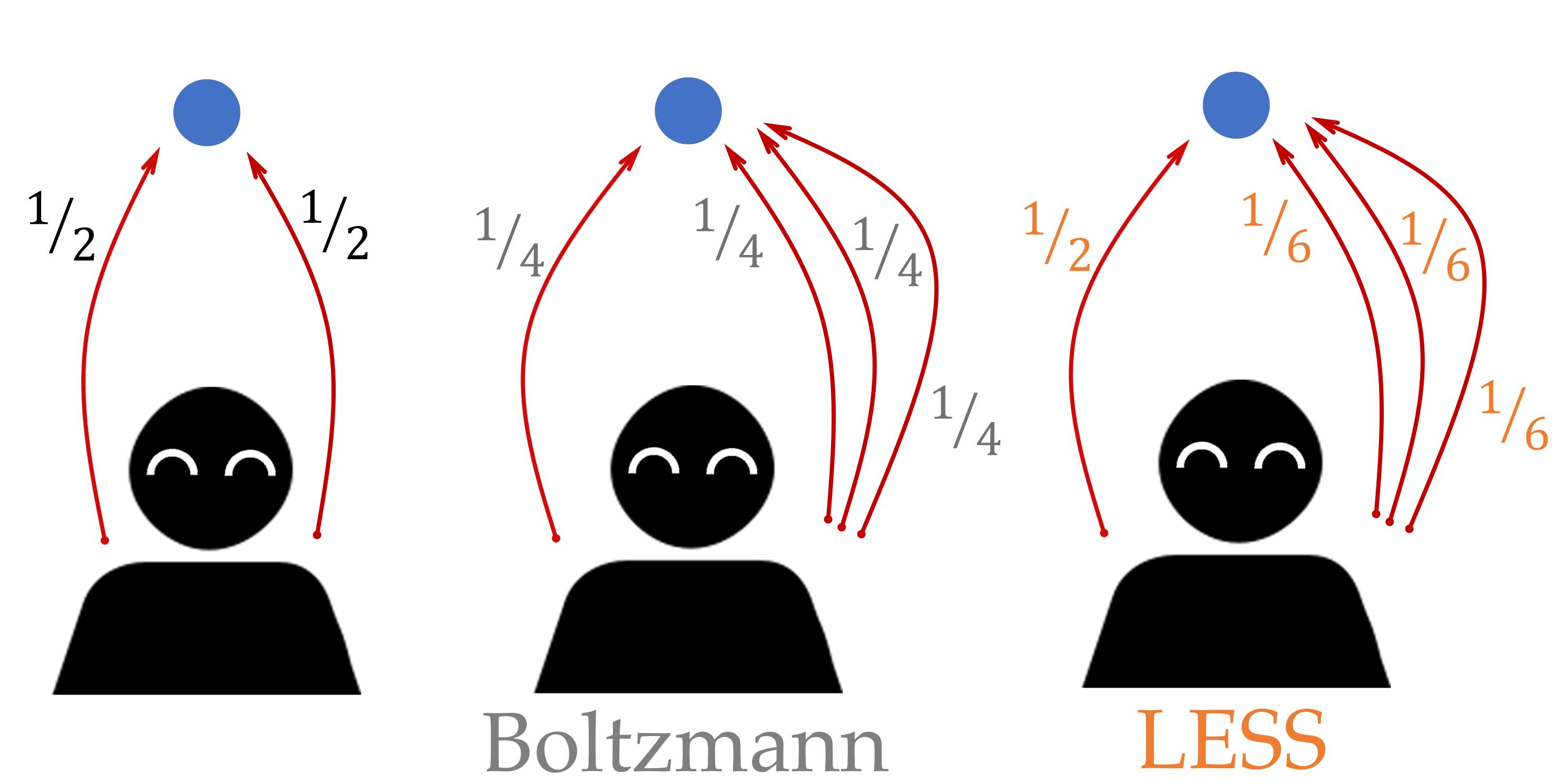
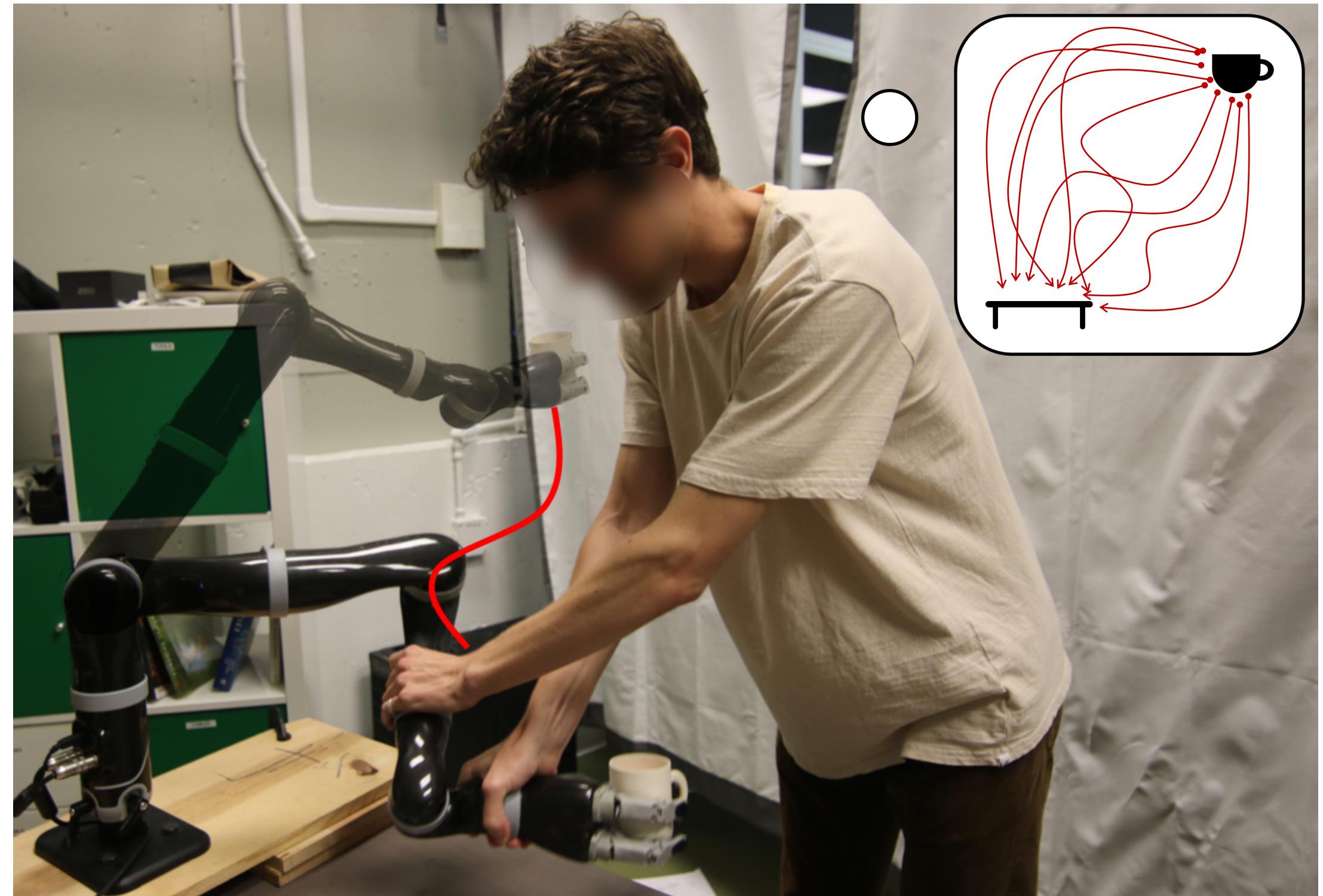


LESS is More: Rethinking Probabilistic Models of Human Behavior

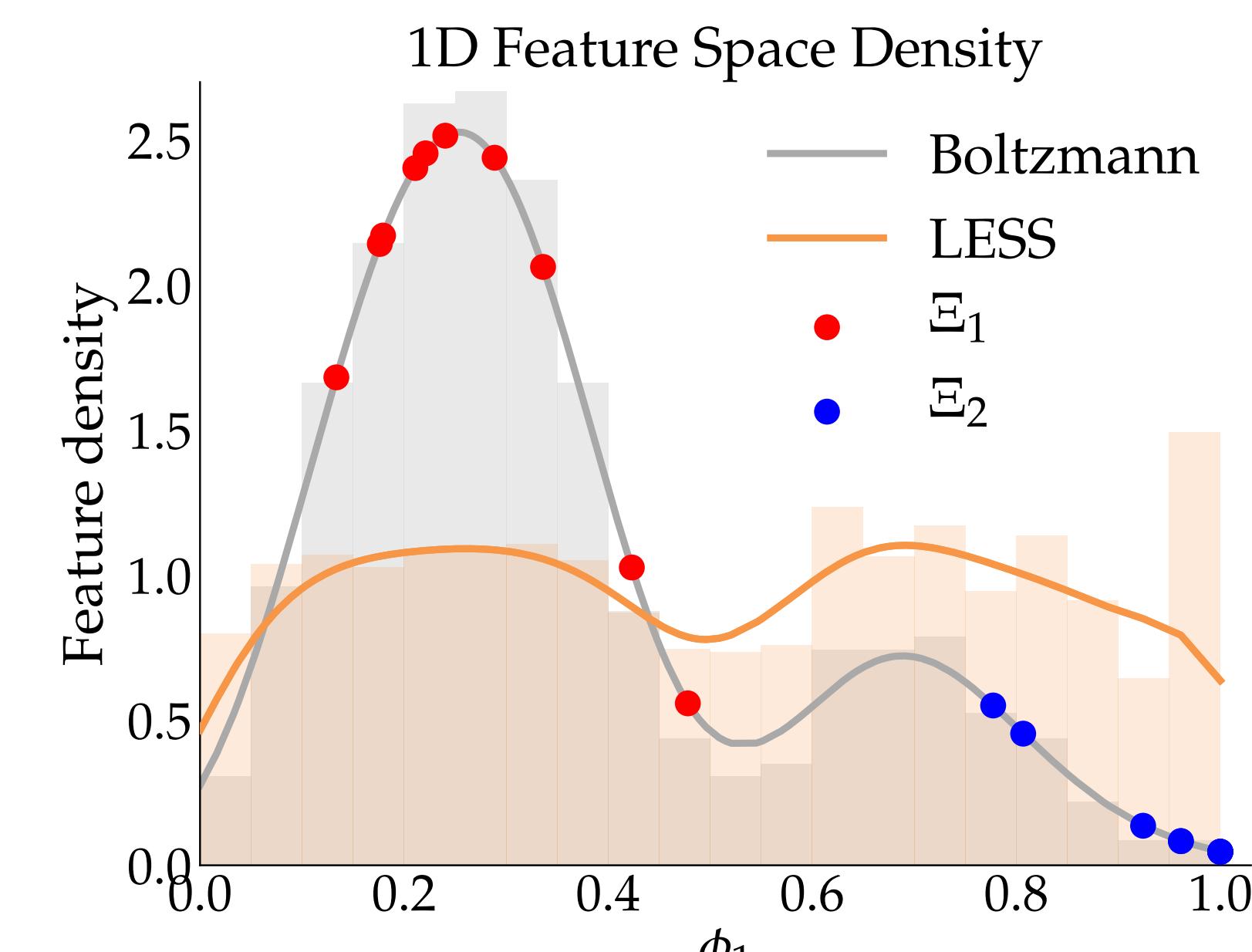
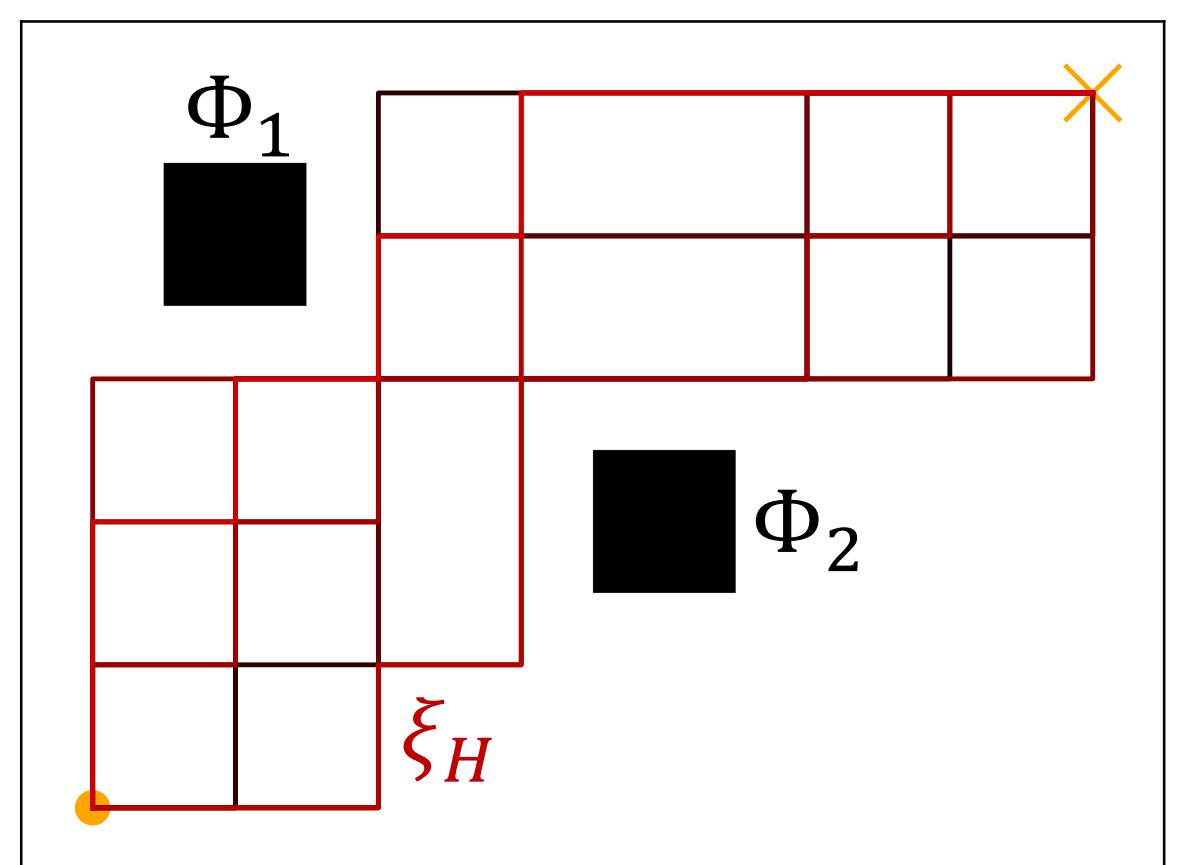
Andreea Bobu*, Dexter R. R. Scobee*, Jaime F. Fisac, S. Shankar Sastry, Anca D. Dragan

Problem Statement: How can robots model human decision-making in the continuous trajectory spaces encountered in robotics?



Key Insight: We need to rethink the Boltzmann model and account for how **similarity** in trajectories should influence their probability.

LESS: Limiting Errors due to Similar Selections

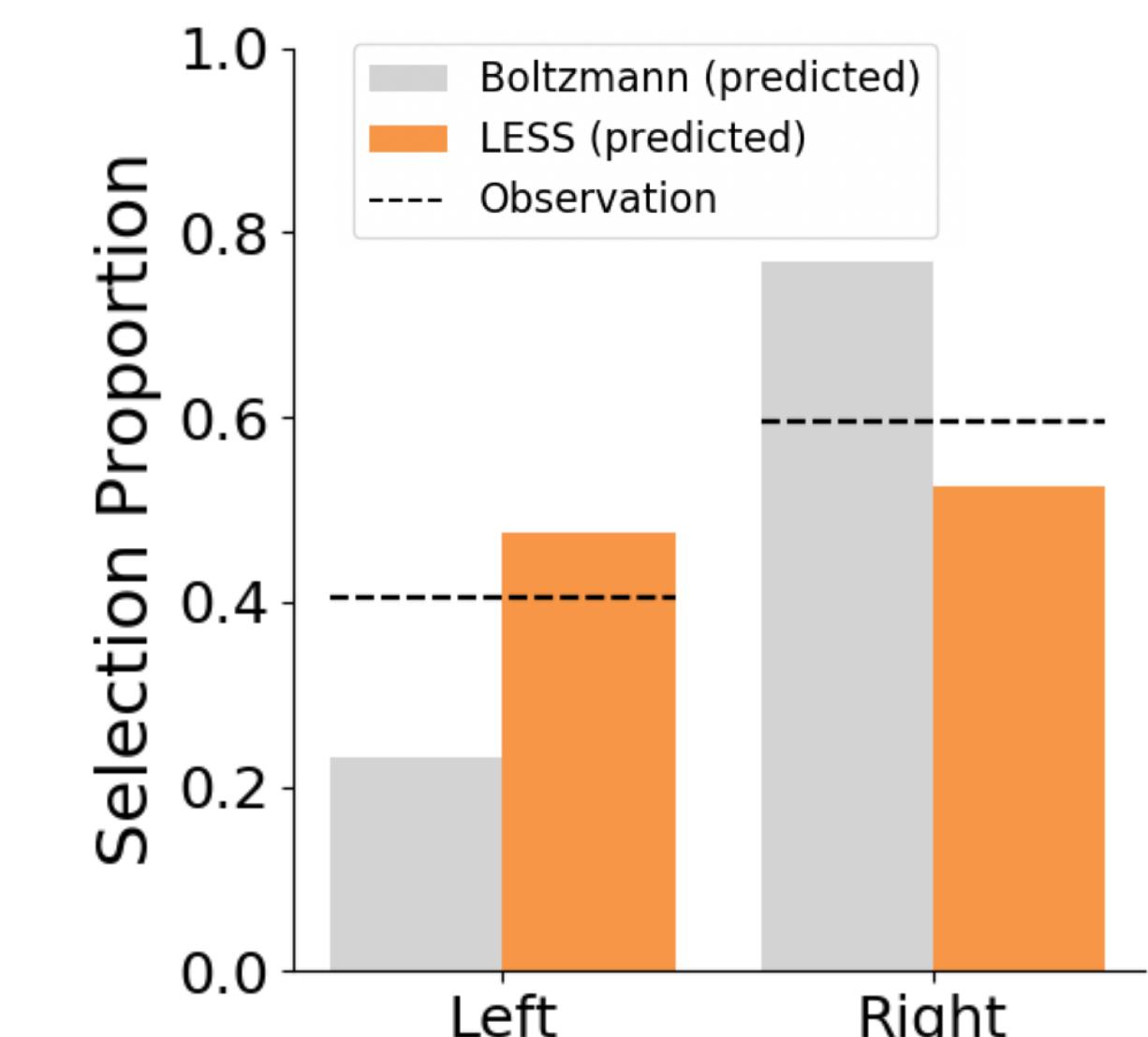
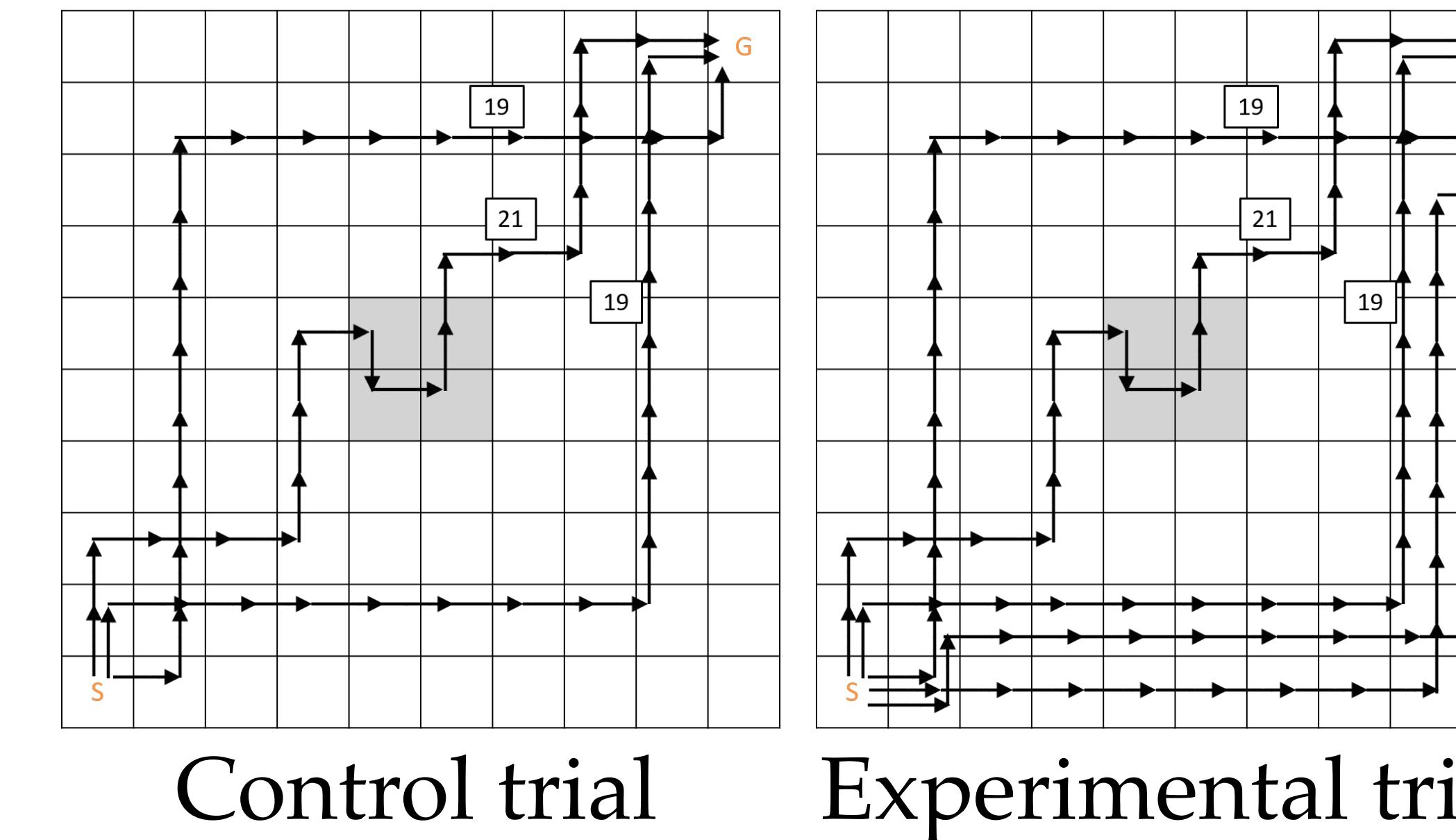


$$\text{Boltzmann: } P(\xi) \propto e^{R(\phi(\xi))}$$

$$\text{LESS: } P(\xi) \propto \frac{e^{R(\phi(\xi))}}{\int_{\Xi} s(\phi(\xi), \phi(\bar{\xi})) d\bar{\xi}}$$

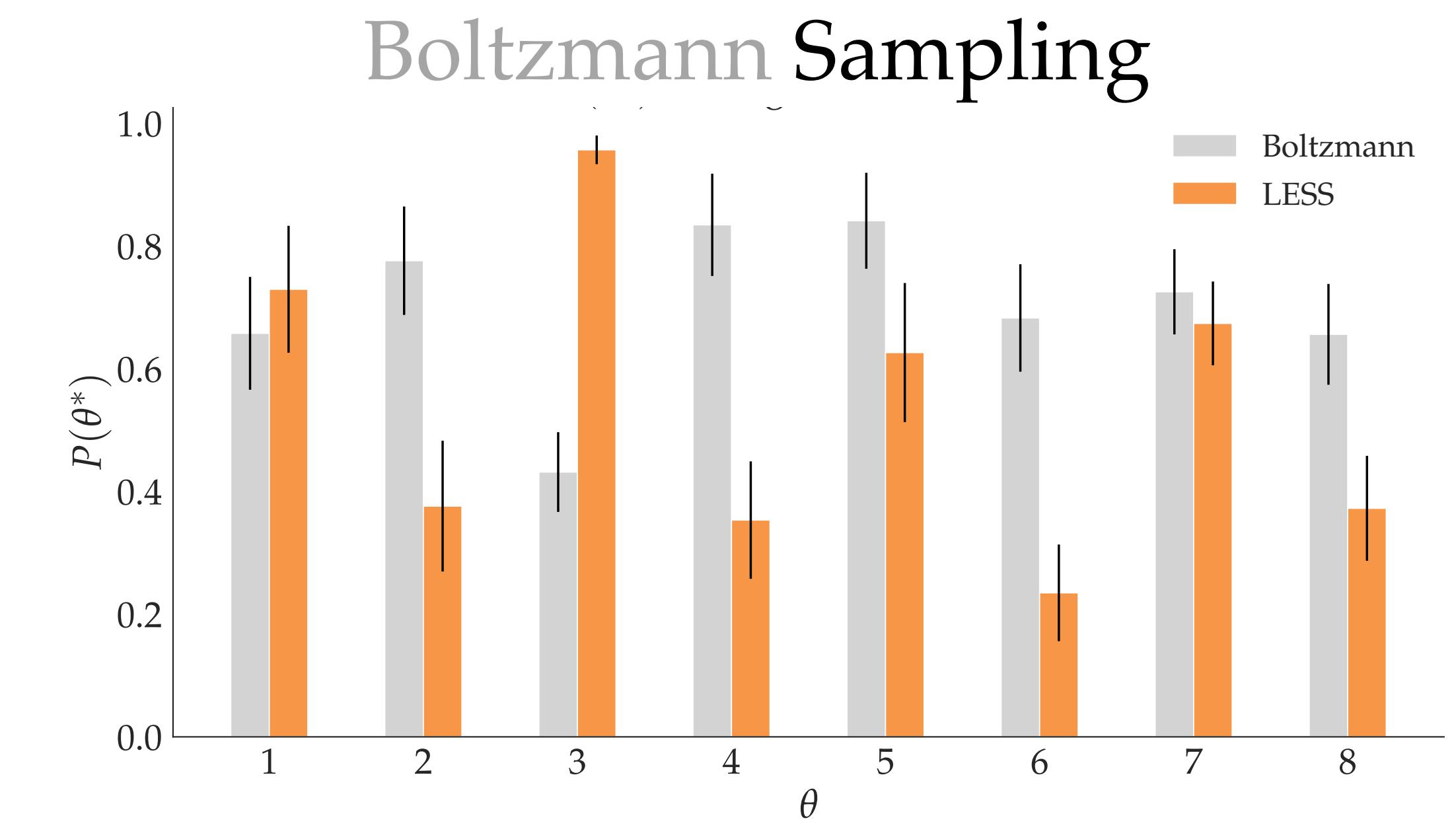
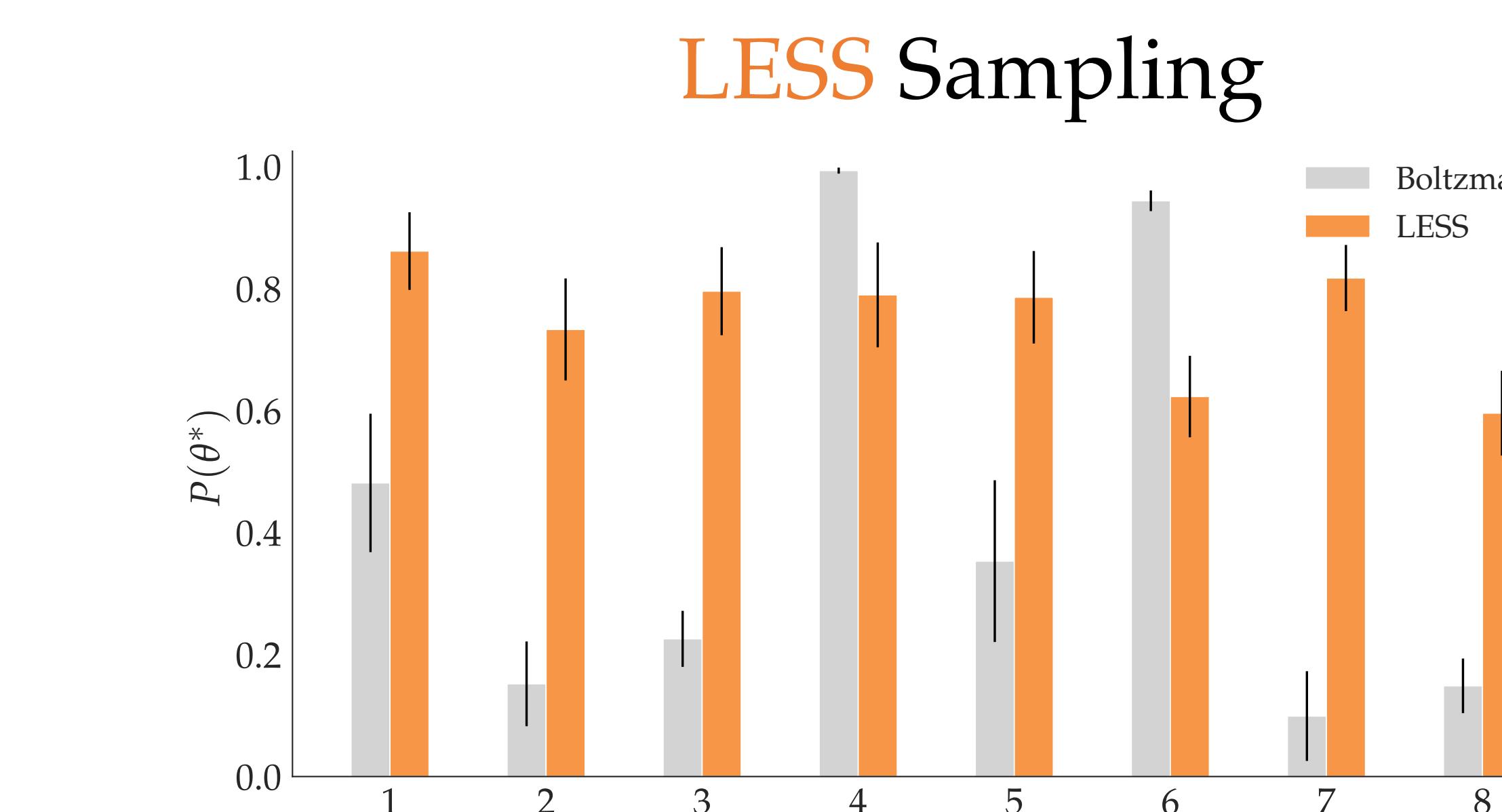
Similarity Metric

LESS as a Human Decision Model

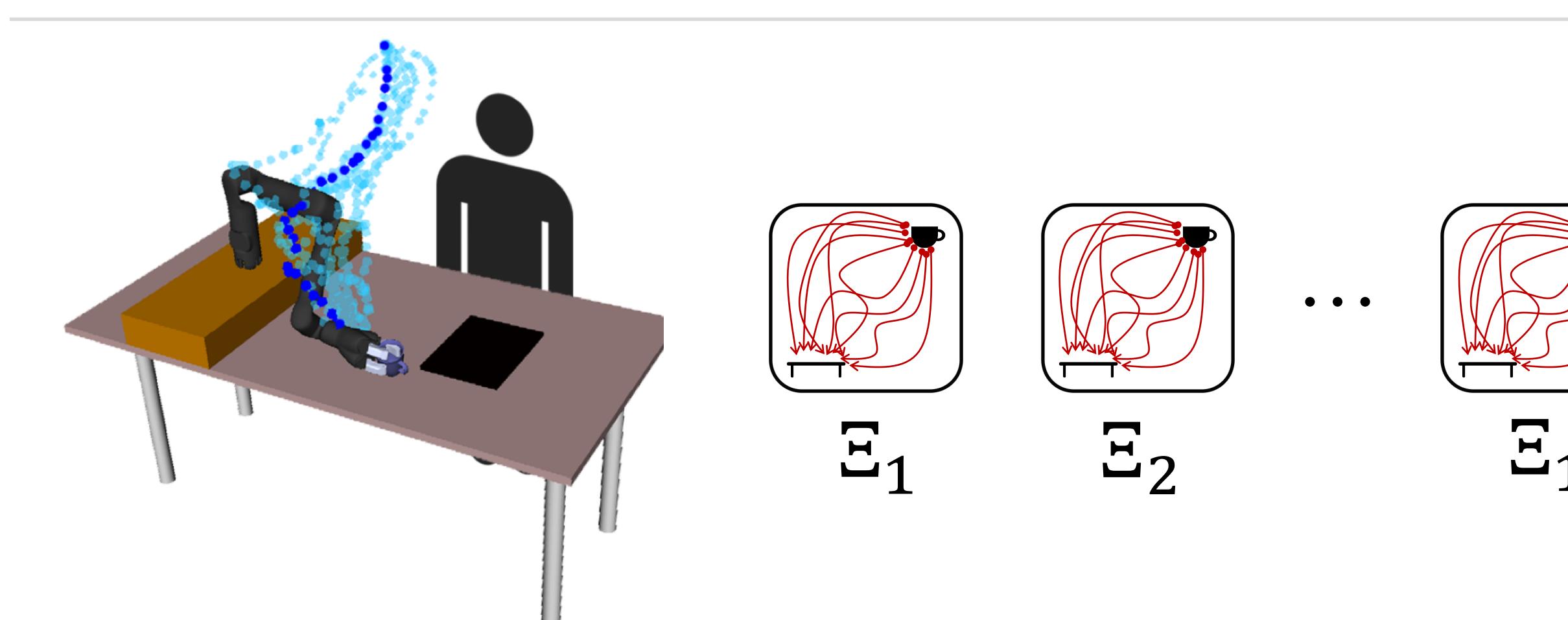


LESS predictions are closer to the observed proportions than Boltzmann predictions.

LESS for Robot Inference



When human input is generated using LESS, inference quality is significantly higher with LESS than with Boltzmann, and vice versa.



Performing inference with LESS results in higher robustness than inference with Boltzmann.

