

# Overcoming sparse and uneven evidence with natural language communication

Yuliya Zubak

Stanford, Palo Alto, California, United States

Robert Hawkins

Stanford University, Stanford, California, United States

## Abstract

Humans rely on social learning to go beyond their personal experience. This requires identifying 'experts' and resolving information duplication. Several models have been proposed to examine how networks may interact with difficult information conditions, without accounting for natural language. We provide an examination of the medium through which information is exchanged in varied epistemic contexts.

We report an experiment where N=1236 participants from Prolific were asked to make inferences about a probability distribution. We compared two communication modalities: a constrained slider and an interactive chat. The games were categorized on difficulty: information distribution, accuracy of individual sample, and network sample size.

All groups converged toward more accurate inferences, with rates varying across modality. Natural language reduced error in challenging epistemic conditions. Harder representation conditions also decreased error over time as a main effect, supporting the idea that one well-informed player in a connected network can significantly influence the game outcome.