

# An Experiment on Network Density and Sequential Learning

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**Question:** do people learn better from their peers when there are more social connections?

# Overview

**Sequential Social Learning:** people take turns guessing an unknown state, after observing a private signal and some predecessors' guesses (Banerjee, 1992 and Bikhchandani, Hirshleifer, and Welch, 1992)

**This paper:** an Amazon MTurk experiment comparing learning outcomes when people have many social observations (dense network) versus few social observations (sparse network)

## Results:

- Social learning is **worse** with more social observations
- Accuracy gain from social learning twice as large on sparse network vs. dense network
- Matches predictions of a naive learning model but not rational learning model

# Basic Setup

## Basic setup

- Binary state of the world  $\omega \in \{L, R\}$ , equally likely
- Sequence of 40 subjects indexed by  $i = 1, 2, 3, \dots$ , move in turn

## On agent $i$ 's turn

- Observe private signal  $s_i$
- Observe guess of each predecessor with probability  $\frac{1}{4}$  (sparse network) or  $\frac{3}{4}$  (dense network)
- Choose guess  $a_i \in \{L, R\}$  to match state

# Results

## Accuracy gain from social learning:

- In dense networks, last 8 agents guess correctly 5.7% more often than if they had no social observations
- This accuracy gain is 12.6% in sparse networks, more than *twice as large* ( $p$ -value 0.0239)

## Mechanism:

- This comparative static is consistent with a naive-learning model but not with the rational-learning model
- Under naive learning, early subjects' private signals are overcounted
- This overcounting is more severe on denser networks