

Herd Design

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Introduction

In an ideal world, markets fully aggregate information.

In reality, this doesn't always happen.

Striking example – social learning: Agents who learn by observing others may fail to aggregate information.

Has served as an explanation for

- **Herding and fads:** Bikhchandani et al. (1992).
- **IPO pricing, asset market bubbles/crashes:** Scharfstein and Stein (1990), Welch (1992).
- **Technology adoption:** Walden and Browne (2002), Duan et al. (2009).

Classic social learning model

A sequence of **rational** agents, each of whom observes

- a private signal from an exogenous information structure and
- the actions chosen by predecessors, may **fail** to aggregate information, leading to a **herd** on an inferior action.

The actions on which agents end up herding depend on the information structure.

Where does this information structure come from?

When agents learn through external information and by observing others, they may herd on an inferior action.

This action depends on the external information.

To what extent can a designer determine the action just by designing this information?



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This Paper

We study this question through the lens of Bayesian persuasion.

Bayesian persuasion: how can an informed party (a.k.a. sender) optimally share information in order to manipulate others to act in a way that benefits her?

We suppose a sender *designs* the information structure in the social learning model.

Question: Can the sender manipulate the crowd as well as she can manipulate any individual?

Main Results

We identify necessary and sufficient conditions under which the answer to the question is “yes”.

Our proof is constructive.

- The optimal structure is very different from the optimal structure in Bayesian persuasion.