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Ten possible experiments on communication and deception☆

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ABSTRACT

I describe ten situations in which experimental data may provide useful guidance to the study of cheap-talk games. *Journal of Economic Literature* Classification Numbers: C92, D8.

1. Introduction

This paper describes ten problems in which experimental data might help direct or constrain theories of communication.

Three themes that arise in the examples are the importance of a message space that has meaning exogenous to the game, the implications of heterogenous attitudes towards honesty, and the likelihood of non-trivial communication in which the Sender prefers the payoffs in the babbling equilibrium to those in a communicative equilibrium.

Throughout the paper, the underlying game involves one or more informed Senders who learn the state of nature, send a message or messages to one or more uninformed Receivers. The Receivers take an action that is payoff relevant to all players. Talk is cheap in the sense that the message does not enter directly into payoffs. Some games have additional choices for the players and some are sensitive to the possibility that preferences may depend on behavioral factors.

2. Conflict of interest over equilibria

Many papers (perhaps starting with Cooper et al. (1992)) demonstrate that communication can improve coordination. Cai and Wang (2006)'s results suggest that theory predicts less communication than one observes in laboratory settings. Experimental studies of games in which the Receiver and Sender have different preferences over equilibria provide an opportunity to test the generality of these findings. In this section I describe an environment in which the Sender may play

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a babbling strategy even when revealing equilibria exist. *****Section 3 describes a different kind of example in which the babbling outcome may be robust.

Consider the situation described by the payoff table below.[1] In the figures, there is a Row for each type of the Sender and a Column for each action of the Receiver. In each cell the first number is the Sender's payoff and the second number is the Receiver's payoff.

	Home	Italian	French
French	10, 0	5, 5	0, −10
Italian	10, 0	0, −10	5, 5

Here is a story. The Sender and Receiver are a couple. The Receiver despises a co-worker of the Sender (the Enemy). The Enemy is going out to a restaurant in the evening. The Sender knows the location (it is either a French restaurant or an Italian restaurant). The Receiver believes that the Enemy is equally likely to go to either. The couple can do one of three things for dinner: they can eat at home, go to the Italian restaurant, or go to the French restaurant. The Receiver would like to go out to dinner, provided that the Sender's enemy is not there, but the Receiver would rather stay home than face a .5 probability of meeting the Enemy. The Sender prefers to stay home, but prefers to go to the restaurant without the Enemy if she does go out.

This game has a babbling equilibrium outcome in which the Sender sends an uninformative message and the Receiver chooses to stay home. It also has a fully revealing equilibrium in which the Receiver infers the Enemy's location and goes out to other restaurant. Plainly, the Sender prefers the babbling equilibrium and the Receiver prefers the informative equilibrium.

Is there a systematic tendency to play one equilibrium over another? As long as messages are available, the informative equilibrium exists. On the other hand, one might expect that the Receiver will not update the prior if the Sender is silent. An experimental design might vary whether the Sender can remain silent.

3. Categorical communication

Increasing the complexity of the state space increases opportunities for effective communication. Experiments might clarify conditions under which players take advantage of the opportunity to communicate.

Imagine a cheap-talk game in which the only equilibrium outcome is babbling. For example, consider

	Bad	Good
Low	4, 4	8, a
High	5, 0	10, 4

where a is a parameter. In this game the Sender knows the ability of a worker. Ex ante, the Receiver believes that the worker is equally likely to be high or low ability. The Receiver must assign the worker to a job. The Receiver wants to place a low-ability worker in a bad job and a high-ability worker is a good job. The Sender prefers the worker to be in a good job (regardless of the true quality of the worker). The only equilibrium of this game involves babbling. Receiver's optimal action is to always assign the worker to a bad job if $a < 0$ and to a good job if $a > 0$.

Now imagine that the Sender has information about two workers, whose abilities are independently and identically distributed. Chakraborty and Harbaugh (2007) provide the theory of categorical cheap talk that applies to this class of games. They identify conditions under which there exist informative equilibria in which the Sender identifies the better worker.[2] In the example, suppose that the Sender can make statements of the form "worker i is better than worker j." Provided that $a \in [-8/3, 8/3]$ there is an equilibrium in which the Sender makes these statements honestly (identifying the better worker when exactly one is good and randomizing over the messages otherwise) and the Receiver responds by assigning the worker the Sender favors to the good job and the other worker to the bad job.[3] There also exists a babbling equilibrium (whether the Receiver assigns both workers to the good job or to the bad job depends on whether a is positive).

In the example, there is only a babbling equilibrium when the Sender reports on only one worker, but there may be an informative equilibrium (in addition to the babbling equilibrium) when the Sender reports on two workers. When $a \in (0, 8/3)$, the Sender prefers the babbling equilibrium, while the Receiver prefers the informative equilibrium for all a. One would like to know whether players take advantage of the opportunity to make categorical statements and to what extent this depends on whether the players have the same preferences over equilibrium payoffs.

4. Factors that lead to over-communication

Experimental evidence suggests that agents are more honest and more credulous than equilibrium theory predict. The mechanism underlying this phenomenon is uncertain.

There are two theories that may organize the findings. The first theory assumes that preferences depend on messages, leading to what typically is interpreted as costly lying. Charness and Dufwenberg (2006), Gibson et al. (2013), Gneezy (2005),

[1] Example 2 in Farrell (1993) has a similar form.

[2] Chung and Harbaugh (2012) provide experimental evidence for categorical cheap talk.

[3] When $a > 8/3$ the Receiver will assign both workers to the good job and when $a < -8/3$, the Receiver will assign both workers to the bad job.