Cheap Talk and Authoritative Figures in Empirical Experiments *

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Abstract

Cheap talk refers to non-binding, costless, non-verifiable communications that agents may participate in, before or during a game. It is difficult to observe collusion through cheap talk in empirical experiements. One reason for this is our cultural programming that causes us to obey authority figures.

1 Introduction

Cheap talk is a term used by game theorists used to describe the communications that take place between agents before the start of a game. The purpose of cheap talk depends on the game being played. For example, if cheap talk is allowed before the start of Battle of the Sexes game, it is used for assisting in the coordination between the agents onto one of the Nash equilibria as shown by Cooper et al [4]. Although cheap talk generally leads to better results in games of coordination as shown by Farrell [2] and Farrell and Rabin [1], this is not always the case. It is known that cheap talk before a singleton Prisoner's Dilemma does not contribute to the cooperation result, if the agents do not have externalities in the result (that is, the agents do not have any utility for a preference to coordinate). Let us examine the attributes of cheap talk:

1. Non-binding - There is no direct penalty for declaring or promising actions and not following through.

2. Costless - There is no cost to the communications. However, it is not completely unlimited. The agents (in real-life and in theory) often have limitations in the communications language and the duration of the cheap talk that limits the possible communications exchanges. There are also other papers that explore the results of cheap talk and other signaling games when there is a cost that is built into the model. In fact, Aumann and Hart [3] has shown that more can be achieved by long conversations than a single message.

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3. Non-verifiable - Being able to reliably verify what communications were exchanged during cheap talk is valuable. Usually, in real-life we do not go around carrying a tape-recorder to record what was said, but instead rely on our possibly faulty memories. Another way to interpret the non-verifiable attribute is that the communications channel may not be reliable so the actual messages exchanged by cheap talk may have been corrupted before reaching the agents.

2 Cheap Talk in Real Life

In the introduction we discussed some attributes of cheap talk that are usually implied in theoretic "paper" models. The real life situation adds new complexity to the situation that paper models try to address.

1. Reputation - In the singleton prisoner's dilemma, the analysis stops at the point when the choice to defect or cooperate is made, and the outcomes are decided. In real life, there are consequences to being reputable and following through on one's word. A person has a history that is not swept off the table after each game is played.

2. Imperfect analysis and imperfect recall - Not all actions in real life are totally calculated perfectly for maximizing utility. Real humans are not totally risk-neutral. There may be externalities not seen in a particular situation that makes it beyond paper analysis.

3. Multi-dimensional - Anything more complicated than a single sender and single receiver quickly gets difficult to analyze.

4. Difference in information - This is especially apparently in bargaining, where the party with more information could have an edge in the process.

5. Preference for a cooperative result - This could be a cultural and social aspect that is difficult to capture in models. There is a paper by Li [6] to model the relation between the agents in this way.

6. Patience or lack thereof - If the cheap talk is frictionless, totally costless, it could result in an impasse if neither side refuse to adjust their position. In 2001, a public transit strike lasted for over four months, until it was ended by provincial legislation [8]. Apparently it was the patience of the angry transit users that ran out before the union and transit company.

Despite the pessimistic view of the analysis of cheap talk, empirical studies have shown that coordination is improved by cheap talk. It is particularly interesting to note that the Cooper et al. paper which discussed the results of an empirical study on a Battle of the Sexes game, one-way only communications achieved better coordination than two-way communications, inducing a master-slave protocol mechanism. Somehow the results of this experiment are

unsatisfying because the messages allowed were so restricted that they resemble more of a network protocol than real human communications.

So, the question is whether we can design a cheap talk empirical experiment that explores the issues in a meaningful way.

3 Designing an Experiment

Now let us consider the following scenario. Suppose that we have the following congestion setting from Monderer and Tennenholtz on k-implementation [5]. Now let us consider an interested party who wishes to influence the actions of

	f	s
f	3, 3	6, 4
s	4, 6	2, 2

Figure 1: Congestion Game

the players to use different service providers. Can we achieve the results using plain cheap talk? Note that this game looks similar in structure to Battle of the Sexes. Although there are two pure-strategy Nash equilibria in this game, it somehow seems like an unsatisfactory situation as it would be difficult to convince the agents to coordinate appropriately.

Suppose that the interested party offers the following specific incentive to the agents.

	f	s
f	13, 3	6, 4
s	4, 6	2, 12

Figure 2: Congestion Game with Incentive from Interested Party

Notice now that the agents will now pick the appropriate dominant strategies to end up in such a way that agent 1 will pick f and agent 2 will pick s. Also notice that the interested party has influenced the results in such a way that did not require any payments to the agents. So in fact, the collision problem between agents were achieved without any cost to the interested party.

A complication that may be introduced by cheap talk between agent 1 and agent 2, is that they may choose to deliberately collude to obtain the payment from the interested party. This would be a useful to conduct an empirical experiment to help us determine how vulnerable k-implementation is to collusion in real life.

4   Empirical Experiment Analysis

Let us start with a simple analysis of the collusion scenario with k-implementation. Perhaps a more interesting question to consider is what happens when the agents' belief of the interested party's reliability is some probability distribution. Also, what if we consider that the agents are not truly risk-neutral in the evaluation of the interested party's reliability, how it would affect the actions. In the case of collusion, the mutual trust in each other to follow through on the agreed actions.

It is given that real humans are hard to model. No matter, the results of an empirical experiment on k-implementation would be useful. The question is: If the agents have truly been able to collude, how does the experimenter set up a mechanism to reveal that such an agreement has occurred?

5   Authoritative Figures in Experiments

Indeed, a paradox is apparent in trying to formulate a satisfactory experiment. The subjects may not want to "break" the experiment by colluding. Yet, if the experimenter let the subjects know that collusion is an available option, this will totally break the experiment, which is to see whether the agents can come to a collusion with cheap talk without any prompting.

There are also other factors that make it difficult to create an empirical experiment on collusion. Stanley Milgram in various experiments have shown how subjects are submissive to the instructions of the experimenter and authoritative figures [7]. To be able to collude for maximum mutual benefit feels like a revolt of lab mice against the maze and cheese structure of the experiment.

We present one more example of authoritative figure affecting the results of an experiment: Four auctions for monetary currency (three different styled-auctions of five-dollar bills and one sealed-bid auction of a collection of coins of in a clear plastic cup) were held by a professor of a graduate level class at UBC in 2005. All four auctions resulted in a net positive for the professor, which is rationally impossible since the value of the item being auctioned off is known. In fact, students bid for the glory of winning the auction, rather than bidding for maximizing their profit. Indeed, the professor, purposely or not, convinced the students that the value of winning the auction was worth more than the actual value of the currency being auctioned off. Even though the auctions were held to demonstrate the mechanisms of auctions, it appears that this is more of a demonstration on the persuasiveness of authority figures. I am certain that if Stanley Milgram is still around today, he would have wanted to run such an auction himself. It would be interesting to see if such an auction would have had a different result if it was conducted by a student, secretly or publicly on behalf of behalf of the professor, instead of the professor himself.

6 Concluding Remarks

Suppose we would like to conduct an experiment where we would like to see if two subjects are capable of coming up with a collusion result on their own through cheap talk, say in our congestion game with k-implementation. We have the following points to consider:

1. The experimenter's influence on the subjects may be so much that the collusion results from cheap talk may not arise.

2. The participants may deny collusion have happened after the fact, even if it has taken place.

3. It is possible for the collusion to go badly where the one subject refuses to share the proceeds after, successfully deceiving the other subject.

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