DIRECT COMMUNICATION

Works if players have identical interests, for example in assurance-type games can achieve good outcome

Rousseau’s Stag Hunt game

<table>
<thead>
<tr>
<th></th>
<th>Barny</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Stag</td>
</tr>
<tr>
<td>Fred</td>
<td></td>
</tr>
<tr>
<td>Stag</td>
<td>2, 2</td>
</tr>
<tr>
<td>Rabbit</td>
<td>1, 0</td>
</tr>
</tbody>
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Now consider game with two stages (mixed sequential–simultaneous)
Stage 1. Fred can make an announcement "Stag" or "Rabbit", or not
Stage 2. Fred and Barney make choices
Consider strategies –
Fred – Stage 1. Announce "Stag"
Stage 2. Action = Announcement, Rabbit if no announ.
Barney – Choose "Stag" at Stage 2 if Fred has announced "Stag" at Stage 1, else choose "Rabbit"
These yield a subgame-perfect equilibrium

This is called a "cheap-talk" game – the Stage 1 announcement has no direct effect on payoffs (including no direct cost), only an indirect effect by selecting Stage-2 outcome

But can also have a "babbling equilibrium" for example one with strategies
Barney – choose Rabbit, ignoring Fred’s announcement
Fred – Make an arbitrary announcement at Stage 1
Choose Rabbit at Stage 2
Cheap talk does not work if players’ interests strictly opposed, so game is zero-sum (or constant-sum)

<table>
<thead>
<tr>
<th>Robbers</th>
<th>City</th>
<th>Suburb</th>
</tr>
</thead>
<tbody>
<tr>
<td>City</td>
<td>20</td>
<td>70</td>
</tr>
<tr>
<td>Suburb</td>
<td>80</td>
<td>30</td>
</tr>
</tbody>
</table>

If two stages where Robbers make announcement at Stage 1
No subgame perfect equilibrium where Cops’ Stage-2 choice differs from their ordinary Nash equilibrium mixture, depending in any way on Robbers’ Stage-1 announcement, because Robbers will manipulate this to their own advantage
So Cops must disregard Robbers’ announcement, and then the Robbers’ announcement can be arbitrary
Game has only the babbling equilibrium

More generally, extent of credible communication depends on extent of alignment of players’ interests
In reality, often this extent of alignment is itself a matter of information asymmetry between the players
Then must use costly actions as credible signals instead of costless cheap talk
MAIN TYPES OF INFORMATION ASYMMETRY

MORAL HAZARD

1. Firm’s owner can’t observe effort (quality) of manager or worker
2. Insurance company can’t observe contributory negligence of policyholder
3. Policyholder exaggerates amount of loss

Each player knows own action, but has only imperfect or inferential knowledge of other’s action

ADVERSE SELECTION

1. Employee’s innate skill, insuree’s innate riskiness
2. A player’s values or payoffs
   Common interests or conflict
   Patience, risk-aversion in bargaining
   Risk-tolerance in brinkmanship
3. Actions available to a player
   weaponry, war-readiness of country

Usually, each player knows (perfectly, or at least better) such information about himself than about the other
Call all such relevant personal info a player’s TYPE
Call a player’s information or type "good"
   if he gets higher payoff when others know this info/type
   and "bad" if he gets lower payoff when the info leaks

Then each player wants others to think he is a "good" type
   And each wants to find out the others’ true type
STRATEGIES TO MANIPULATE INFORMATION

FOR BETTER-INFORMED PLAYER -

1. SIGNALING – Revealing "good" information truthfully
   Examples: your skill or carefulness
   your commitment, threat or promise
   your lack of hostile intent
   Credible signal - observable action that someone with "worse" type would not mimic. Relies on differential costs of signal
   Example – signal or screen for skill by taking tough courses, signal for low-risk by accepting partial insurance

2. SIGNAL-JAMMING – Concealing "bad" information, misleading (bluffing in poker), involves mixed strategy
   Mimic actions of a "better" type

FOR LESS-INFORMED PLAYER

1. Coping with adverse selection (at a cost)
   employer - employee's skill or effort
   insurance company - applicant's risk class
   Screening by examination - test or audit
   Screening by self-selection -
   induce action by the other, more informed, player that is optimal for one type but not for another, so "separates" and reveals other player's type
   Example – air fares with restrictions, separate tourist & business

2. Coping with moral hazard
   incentive payments based on observable outcome
   Example – stock or options for managers

Sometimes better to remain ignorant – achieve deniability, remain immune from others' threats