

Lecture 2 – Putting Yourself Into Other People's Shoes

At the start of the lecture, we introduce the "formal ingredients" of a game: the players, their strategies and their payoffs. Then we return to the main lessons from last time: not playing a dominated strategy; and putting ourselves into others' shoes. We apply these first to defending the Roman Empire against Hannibal; and then to picking a number in the game from last time. We learn that, when you put yourself in someone else's shoes, you should consider not only their goals, but also how sophisticated are they (are they rational?), and how much do they know about you (do they know that you are rational?). We introduce a new idea: the iterative deletion of dominated strategies. Finally, we discuss the difference between something being known and it being commonly known.

Prisoner's Dilemma Examples:

- Joint Project – Incentive to Shirk
- Price Competition – Incentive to undercut in price
- Common Resource – Incentive to overfish or pollute

Ingredients of a Game (Assume known)

- 1) Players (denoted by i, j).
- 2) Strategies (s_i : a particular strategy of player i , S_i : the set of all possible strategies of player i , s_{-i} : a choice for all except player i , s : a particular play of the game known as *strategy profile*).
- 3) Payoff (denoted by $u_i(s)$)

Strictly Dominated Strategy: Player i 's strategy s_i' is strictly dominated by player i 's strategy s_i , if $u_i(s_i, s_{-i}) > u_i(s_i', s_{-i})$. Player i 's strategy s_i' is strictly dominated by her strategy s_i if s_i always does strictly better, always yield a higher payoff for player i no matter what the other people do.

Weakly Dominated Strategy: Player i 's strategy s_i' is weakly dominated by her strategy s_i , if $u_i(s_i, s_{-i}) \geq u_i(s_i', s_{-i})$ for all s_{-i} and in addition, $u_i(s_i', s_{-i}) < u_i(s_i, s_{-i})$ for some s_{-i} .