COOPERATION GAMES

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Description

In games theory, there are two or more protagonists, two or more choices and a scenario where each party is faced with a kind of dilemma.

The scenario with which most people are familiar is called the 'Prisoner's Dilemma'. Two prisoners are suspected of an act, which cannot be proved by the interrogators. They are promised a harsh penalty if they deny the offense and a soft penalty if they confess. The prisoners would like to cooperate with each other, but because they are not able to communicate, they probably end up confessing.

Games theory tells us that communication and empathy, mutual understanding and cooperation can be achieved, but require a deliberate effort and access to information that is not easy to share.

There are three quite short scenarios suggested here, which can be done individually, or in a group. The first one 'X and 'O' is the simplest, quickest, and works better on an individual basis. The other two 'Heads and Tails' and 'Rock, Paper, Scissors' are alternatives that work better in groups.

Xs and Ys is useful because it demonstrates that any sequence of choices can seem logical and justifiable. The payoffs are known, but the number of participants makes cooperation difficult.

Heads or Tails is a simple version of three or more teams making choices without visibility of the payoffs. It can be organized with a larger number of teams.

Rock, Paper, Scissors includes a system of payoffs that complicate negotiations, and may lead to an equilibrium that is not optimum, thus showing that partnerships should seek improvements, even when all seems resolved.

Situation

This area of knowledge is essential for a complete understanding of the challenges of cooperation in circumstances where there are also competitive pressures or other conflicts of interest. It fits with the theme of conflict management, negotiation and negotiation. These exercises are useful for showing how easy it is to fall into dysfunctional behaviour patterns - lose/lose spirals - when there are two sides or more in a situation.

Aims

• To enhance skills in developing and pursuing negotiating tactics.
• To be able to recognise games theory type situations
• To know more about win-win style strategies, and avoiding lose/lose strategies.
• To explore the implications of games theory for decision making.

Learning Messages

The basic problem is one of choice. Typically, the choice is between two options and the decision is complicated by the presence of another player. The payoffs resulting from each option depend upon the actions of the other player. Since information about the possible actions of the other player is imperfect, games theory entails trying to anticipate and to influence what the other player will do.

Games: Xs and Ys

This game is run by the facilitator, who counts "1, 2, 3 … Display." And everyone displays either an **X** or a **Y**. Try not to let the participants speak beforehand.   (Even, if they do, well they probably still won't be able to participate.)

The facilitator writes this on the flipchart:

X => +1 point   *Y => -1 point*
All X => All get - 1 point   *All Y => All get +1 point*

Participants try to win as much as they can by displaying the **X** or **Y**, which they have written large on a sheet of A4 paper.   If every participant in the exercise displays **X** then everyone loses one point. If some display **Y** whilst others display **X,** then the **X**s gain one point, whilst the **Y**s lose one point. If everyone displays **Y** then everyone gains one point.

Xs and Ys lacks the team dimension, but makes it possible to present with clarity some of the key principles of games theory. Participants, acting individually, put up either an '**X**' or a '**Y**'. An '**X**' gains points, and a '**Y**' loses points, unless everyone puts '**X**', in which case everyone loses points, or everyone puts '**Y**', in which case everyone gains points.

Usually it is appropriate to do three iterations.

Xs and Ys is plainly a prisoner's dilemma scenario and therefore lends itself to a quick presentation on the flip-chart of the four different options, and the problem of the natural equilibrium not being the best possible outcome.

Interestingly, every possible strategy can be justified: XXX, because there is no chance of communication, and the prisoner's dilemma depends upon communication.   YYY, because this is a win-win problematic and those other 'idiots' will get it eventually. YXY, because of the tit for tat strategy (proven successful mathematically), XYX for the same reason. YYX because it's worth investing in cooperation, but if they still don't get it, XXY, because surely we can now see the error or our ways, etc.

Mathematical studies of large populations in the wild have demonstrated that tit for tat works the best of all strategies, with the possible exception of YYX, which outperforms tit for tat in many circumstances, simply because of the long term payoff of cooperation.

One key point is that in a project environment, YYX involves investing in trust at the beginning of the project, when the consequences are less severe than at the end, in order to gain goodwill for when it will be needed at the end of the project.

Notice that X and Y can also be used to refer to McGregor's Theory X and Theory Y. Theory Y believes people are responsible and can be trusted. Theory X believes that people will do anything to avoid work and have to be coerced into cooperation.

Preparation

A4 size paper for individuals to display their choices. This can be done in the session.
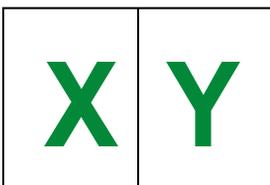
Timing

Total time: Fifteen minutes
-      5 minutes to introduce the exercise
-      2 minutes for three rounds
-      8 minutes to review learning

Games: Heads and Tails

This is an activity that uses some Games Theory in order to learn about cooperation and competition; where win-win is a desirable strategy, but where the underlying logic frequently conspires to push people apart and make them compete instead of cooperate. Once trust is betrayed it is almost impossible to re-construct in the short term. Worse, people may be prepared to go to any lengths to get even.

Heads or Tails is a game which is very popular with facilitators. It works well with a group of, say, 12 participants, who are divided into 3 teams. It can also work with 4, 5 or 6 teams.

In each round, each team decides whether to bid heads or tails and write their choice on a slip of paper before handing it' to the facilitator. There are five or six rounds altogether. In the first round, of course, the choice is random. If all three teams bid the same, then they all get points (say one point for each team). However, if one team bids differently then this team gets one point, and the other teams get nothing.

If there are four teams, all teams get maximum points if they bid the same, each team gets one point if they bid differently to the other teams whilst the other teams get no points and no teams get points if the teams are split, two heads and two tails. If there are five teams, being the odd one out gets, say, triple points, being amongst two out of five gets double points, all going the same means everyone gets their point. If there are six teams, three reds and three blues will be stalemate, with double or triple points if they break rank, as with five teams, and a point for all if they manage to agree. If the facilitator spins a coin, this adds a further dimension, for example doubling or adding points.

For the second round, the teams cannot be certain why the points were awarded or not. But, they know how many points each of the teams received, and what they bid themselves. They bid heads or tails again. The points are awarded. The teams may develop theories about why the points have been won, or they may be baffled, or they may think it's just random. But, there is logic at work. In the third round, perhaps for the first time, the teams are allowed to select a negotiator. As they team negotiators exchange information, they start to discover the logic. But, now with different amounts of points, can they cooperate? They will have another chance to negotiate in the fourth, fifth and sixth rounds.

With **Heads and Tails** the interesting thing is that there can be uncertainty, confusion, wavering and disagreement about which tactics to pursue. Team members within the teams do not always agree about the best approach. The teams may disagree with the negotiators. The negotiators find themselves caught between what they've agreed amongst themselves and what their original team wants. "Can we trust 'them'? What happens if we betray? Will we get ahead? Will 'they'" be able to catch us. The structure of the game aggravates mistrust. It is as if there are magnets pushing the teams apart.

There is a kind of systemic that makes it harder to cooperate. Mistakes get made. A negative spiral develops. This is similar to intercultural situations, where different assumptions and notions of 'us and them' often work against cooperation.

Preparation
Sticky notes for making choices

Timing
Total time: Thirty to forty minutes
- 3 or 4 minutes to introduce the exercise, 3 or 4 minutes per round on average, 6 to 10 minutes to review learning

Games: Rock, Paper, Scissors

Participants negotiate in teams. The scenario seems easy enough to decipher, but in practice it may be difficult to arrive at an optimised equilibrium. Many participants will recognise the rock-paper-scissors metaphor. Rock beats scissors, paper beats rock and scissors beats paper. However, this means that participants may assume they have to put the same value to succeed, but which will it be: rock, paper or scissors. Three scissors scores more than three papers, which scores more than three rocks. If they choose the wrong one, how to shift to the best one with everyone still in agreement.

This activity uses Games Theory in order to learn about cooperation and competition; where win-win is a desirable strategy, but the underlying logic frequently conspires to push people apart and make them compete instead of cooperate. As with **Heads or Tails** the purpose of the exercise is to appreciate that cooperative agreements often demand an intense deal of communication to build a high level of trust and to be able to stick to commitments.
The activity can be done with two or more teams, but is becomes more difficult for the facilitator the more teams there are. There are usually six rounds. The teams can negotiate after the first round, by selecting a representative As a facilitator, you can judge this, depending upon the degree of cooperation or competition that exists amongst the three teams. The more cooperation, the more you could continue the rounds without negotiation.

Each team decides whether to bid 'rock', 'paper' or 'scissors', then writes its choice on a post-it note and hands this to the facilitator. In each round each team gets two points for a win against each other team, one point for a draw, but zero for a loss. If all the teams choose rock, you may award an extra point to each team, if they all choose paper two points and three for all choosing scissors. Thus the optimum equilibrium is difficult to find.

Each team knows at the end of each round its own choice and the scores of each team, but they do not know all of the other team choices that gave the scores. The teams may develop theories about why the points have been won, or they may be baffled, or they may think it's just random. But, there is logic at work. As they exchange information, they usually derive the logic. But, once the points become different, will they ever be able to cooperate?

It is possible that the teams will stick on an optimum result, all on rock for example, or all on paper, but without managing to attain the optimum result, all on scissors. But, if they choose to shift there is a risk of relapsing into competition and misalignment.

If the teams arrive at all on scissors first, you could decide to make rock or paper the highest scoring equilibrium. The purpose is to underline the strong learning message that the first level of agreement, and the second level, may not be as interesting as what we could achieve if we could understand that there is an extra level of complexity, or that because the system is dynamic and could be evolving, we should evolve together.

Preparation
Sticky notes for writing the choices

Timing
Total time: Thirty to forty minutes
•   3 or 4 minutes to introduce the exercise, 3 or 4 minutes
        per round on average,   6 to 10 minutes to review learning