Using Game Theory to Analyse the Coming Out Dilemma

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Introduction

Despite the decriminalisation of the sodomy law in 1991, the progress of the gay rights movement in Hong Kong is still disappointingly slow. For instance, there isn't any anti-discrimination legislation to protect lesbians and gays at the workplace, homophobic attitudes and behaviours are still quite common in the region, and many homosexuals feel that it is too risky to lead their alternative lifestyles openly. Around 2000, a heated debate took place in a Hong Kong based Yahoo egroup, called Tongzhi 2000,[1] regarding whether an individual should stop being selfish and come out in order to propel the gay rights movement or whether it is too demanding on the individuals. The issue here can be framed as a free-rider problem, and will be analysed by game theory.

Game Theory

The mathematical theory of games was established by John von Neumann and Oskar Morgenstern in 1944. Since then it has been developed into "the most important and useful tool in the analyst's kit whenever she confronts situations in which one agent's rational decision-making depends on her expectations about what one or more other agents [or nature] will do, and theirs similarly depend on expectations about her."[2]

There are two main types of games, namely, zero sum[3] and nonzero sum games. In the former, there is a complete conflict of interest between the players as the gain for one implies an equal loss to the other, and vice versa.[4] Game theory can provide persuasive formal solutions to two-person zero sum game, but many real strategic interactions are not purely competitive, in nonzero sum situations cooperation between players can in fact bring rewards to all parties. It is called nonzero sum because "the sum of one person's loss and another's gains need not be zero…. [And] the total profit all parties can make is determined by the parties' behavior."[5]

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[1] Tongzhi is a Chinese term literally meaning comrade, but in recent years it also refers to lesbian/gay/bisexual/transgender. For the actual online debate click http://groups.yahoo.com/group/tongzhi2000/

[2] Ross (1999).

[3] Also known as a constant sum game as the interests of the parties involved are perfectly and inversely related such that the total profit all parties can make is constant no matter who is winning.

[4] The conflicting economic interests of the buyer and the seller of a house or a car is a common example of a zero sum game in which the total profit all parties can make is fixed.

[5] Sabini (1995), pp. 356 & 375.

Social dilemmas

Social dilemmas belong to the nonzero sum category. They are dilemmas because, contrary to individual rationality which instructs one not to cooperate/contribute,[6] the collective payoffs (i.e. the sum of all players' rewards) of that choice is much less than if they all cooperate/contribute.
The most famous and simplest example of a nonzero sum game is the two-person prisoner's dilemma first described by A. W. Tucker.[7] (See Appendix for further details). Social dilemmas share many basic features with two-person prisoner's dilemmas, they differ mainly in complexity and the number of players, with the former having three or more players. Although differing in the specific conflict of interest, the situations of social dilemmas are usually either in the form of the players deciding whether or not to forego personal benefits, or whether or not to engage in costly actions. The former is also known as resource conservation dilemmas, tragedy of the commons[8] or social traps, and the latter is also called public goods dilemmas, free-rider problems or social fences.

The coming out dilemma

Unlike many examples of the public goods dilemma, the public goods generated by the gay rights movement are usually not in the form of commodities such as public roads or public health care. That is one reason why very few people saw the coming out issue as a free-rider problem in the Tongzhi egroup debate. It is nonetheless a public goods dilemma which can be analysed by game theory.

As alluded to earlier homosexuality is still a social taboo in Hong Kong, thus the contribution a player makes to the movement would often involve the risk of coming out.[9] Since the extent of the risk varies from person to person – ranging from being the topic of gossip at work or at school to being bullied to losing one's job to being disowned by one's family and friends – it is hard to generalise the amount of contribution each player has to make. Just like the free-rider problem in the blood donation issue in which some people are too ill to give blood, I'll only consider those individuals whose coming out won't bring about catastrophic results.

If everyone in the community comes out, it will enhance the visibility of homosexuals in society which not only can help diminish homophobia in general, but can also serve as a substantial lobbying force to pressurise the government to legislate anti-discrimination law and other appropriate public policies. Let's give +100 units of utility[10] to everyone's payoff if all players come out.

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[6] Because from an individual's own perspective, this allows her to maximize her own gains and minimises her own loses.
[7] See Luce & Raiffa (1957).
[8] Cf. Hardin (1968).
[9] Other form of contribution includes anonymous donation to gay rights groups, but I shan't go into those options for the sake of this particular analysis.
[10] The number of units is somewhat arbitrary, but the whole point is to present a mathematical difference to the payoffs of different outcomes.

There will be similar positive outcome (+100 units) even if one player does not come out. In such a scenario, a closeted player can enjoy the benefit from the movement while saving herself the hassles and risks of coming out, let's give +200 units to such a player. Nevertheless, if all or most players remain in the closet, then everyone will suffer from living in a society with no gay rights at all. Let's give –100 units to everyone in such a scenario. Alternatively, if only one or very few players come out while the majority doesn't, the former may be regarded as martyrs (if not suckers), but in the short term the effect from their contributions is negligible. So let's give –200 units to those martyrs and the rest gets –100 units. The following four-cell matrix represents the payoffs with respect to the combined choices made by an individual player versus the majority of players. The units on the left in each cell represent the reward/punishment of an individual player and the units on the right represent that of the majority.

		Majority of players	Majority of players
		Cooperate (come out)	Defect (closeted)
An individual player	Cooperate (come out)	+100 units; +100 units	-200 units; -100 units
An individual player	Defect (closeted)	+200 units; +100 units	-100 units; -100 units

According to the above analysis, the collective payoff is the highest if a sufficiently high number of players cooperate, such an outcome is called the maximum joint profit. Nevertheless, if an individual player applies the mini-max strategy[11] to calculate her own payoffs, then she is rational to defect (i.e. to remain closeted). Because if she defects whereas others don't she would receive +200 units (as opposed to +100 units if she cooperates), thus her gain is maximized by being a free-rider with a "clean conscience" that the collective outcome won't be diminished because one person doesn't contribute. Even if everyone defects, she would receive –100 units as opposed to –200 units for being a martyr/sucker to cooperate, thus her loss is minimized.

If all players are just concerned with their own individual utility – Thomas Hobbes would certainly think so – then the game would gravitate towards the outcome of everyone remaining in the closet. This is the saddle point of the game and it is perhaps one reason why the progress of the movement is still so slow. The irony of social dilemmas is that if all players adhere to their individual rationality, then all of them would be worse off collectively than if they "forego" their personal interests. This is a mixed-motive situation in which personal goals are in conflict with collective ones. Alas, given the social situation and the nature of the risk involved, many people find the motive for self-preservation much stronger than the motive to

[11] This is a strategy an individual deploys to control the situation so that her loses are minimized and her gains are maximized.

fight for a socially just world that would yield more payoffs for everyone in the long run. It looks like the queer community would need more martyrs to fight for some major breakthroughs until the rest of the community feels secure enough to join in.

Resource conservation dilemmas

Some experimental results[12] suggested that players are more willing to cooperate if the problem is framed as a resource conservation dilemma as opposed to a public goods dilemma, because it is easier to ask people to take less rather than to give more. For example, instead of asking people to clean up public areas (i.e. to give more), it would be more effective to ask them to refrain from littering (i.e. to spoil less clean space).

Despite the possible difference due to the framing effects, analysis of the resource conservation dilemma is similar to that of the public good dilemma. Thus, in the case of the littering problem,[13] if there isn't any structural solution – such as giving the litterbugs a fine which in turn would change the payoffs for defecting – players would be drawn towards the saddle point where everyone is tempted to litter for the sake of convenience with the comforting thought that "so long as other people are keeping the city clean, what difference would I make by leaving just an extra piece of litter on the floor?" And like the public goods dilemma, the collective payoff is highest if everyone cooperates.

Conclusion

As we've seen from the above examples, game theory is a useful tool to analyse social dilemmas, and its power has been supported by experimental games. E.g. the games developed by Jerdee and Rosen (1974) for the resource conservation dilemmas, and the games developed by Marwell and Ames (1979) for the public goods dilemmas.

Nevertheless, some may argue that the game theory analysis is too simple minded. In the case of the coming out dilemma, players may seek their guidance from, say, some deontological reasoning[14] rather than from some rational calculation that chooses the option yielding the most utility.[15] On the normative level it is perhaps a matter of an individual's ethical choice to deploy game theory for decision making, but if it is chosen, it is a powerful tool to analyse the utility of various options from the perspective of the whole group and that of the individual.

[12] E.g. Brewer & Kramer (1986). But see McDaniel & Sistrunk (1991) for contrary result.
[13] Like the tragedy of the commons, the clean space "replenishes" itself when the cleaners clean up the rubbish, but if everyone litters much more than the cleaners can clean, the region would turn into a dumpster, and the whole community may be wiped out as a result of contamination!
[14] E.g. one may see it as the right thing to resist the oppressions by the mainstream homophobic culture.
[15] Both the deontological (or Kantian) and the utilitarian methods are regarded as involving rational deliberation, but game theory is in favour of the latter.

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Appendix

Tucker's anecdote of prisoner's dilemma:
Two suspects of a robbery are caught but the district attorney doesn't have sufficient evidence to convict them, so he makes an offer to both of them separately that if one suspect confesses whereas the other doesn't, the former will get a three-month sentence and the latter 20 years. If both of them confess, each will get ten years. But if neither confesses, then he will trump up some charges and get each of them a one-year sentence. The following four-cell matrix is a typical representation of the payoffs with respect to the combined choices each player (in this case each prisoner) makes.

		Prisoner 2	Prisoner 2
		Cooperate (Refuse to confess)	Defect (Confess)
Prisoner 1	Cooperate (Refuse to confess)	1 year; 1 year	20 years; 3 months
Prisoner 1	Defect (Confess)	3 months; 20 years	10 years; 10 years

According to the above analysis, if both prisoners cooperate the collective payoff is the highest as the sum of sentences is merely two years, this is called the maximum joint profit. Nevertheless, if each prisoner applies the mini-max strategy to calculate his own payoffs, then he is rational to defect (i.e. to confess), because if he defects whereas his partner doesn't, he gets the lightest sentence (i.e. his gain is maximized). Even if his partner defects as well, he would receive ten years as opposed to 20 years for being the sucker to cooperate, thus his loss is minimized. If both prisoners are just concerned with their own individual goods, then the game would gravitate towards the outcome of both defecting which is the saddle point. The irony of the prisoner's dilemma is that if the players adhere to their individual rationality, then both of them would be worse off collectively than if they "forego" their personal interest. This is a mixed-motive situation in which personal goals are in conflict with collective goals.