

# **Cooperation**

## **A Social Science Perspective**

Contribution to MobileMAN Deliverable 10

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## **1. INTRODUCTION**

Under what conditions does an individual voluntarily cooperate to pursue a common goal, such as sharing his MobileMAN device with other users, as to allow the system to function? Indeed, the viability of the MobileMAN paradigm depends among other things to a large extent on people's willingness to cooperate.

However, as theory and research shows, people's cooperation, i.e. their voluntary participation to the provision and maintenance of a collective good, cannot be taken for granted. As this preliminary review of collective action theory shows, people's willingness to cooperate depends on a number of factors that need to be taken into account in the development of any ICT whose viability is contingent upon cooperation.

As will become clear in the following pages, cooperation as a social phenomenon stands at the centre of lively academic debates, whereby a clear distinction ought to be made between 'cooperation optimists' and 'cooperation pessimists'. This paper starts with a summary of the key arguments brought forward by cooperation optimists to be followed by a brief discussion of the most popular paradigms of collective action pessimism. From there, the discussion will move to some factors that are generally considered to affect people's willingness to cooperate. The paper will conclude with a discussion of the relevance of collective action theory for MobileMAN.

## **2. KEY THEORIES AND CONCEPTS**

Cooperation theorists may be divided in so-called 'collective action optimist' and 'collective action pessimists'. By 'collective action optimists' we refer to those social scientists who assume that wherever cooperation is required for the mutual benefit of a group of people, it will naturally occur. Participation optimism originates from orthodox group theories prevailing in political science in the 1950s. In those years political theorists believed that the existence of a collective interest constitutes a sufficient motive for joint action, and that, if given a chance, people would try to influence decisions that affect their lives. Failures to live up to these expectations were considered abnormalities, signs of individual or systemic pathologies<sup>1</sup>.

However, low participation in elections, voluntary organisations, and collective action in general, led political scientists to question the validity of these assumptions already during the 1960s. The costs of participation were recognised as a factor that may induce individuals to take a 'free ride' on other people's efforts instead of sharing the costs or burden of cooperation. This has led in the late 1960s to an increased pessimism in economics, political science and other disciplines about people's inclination towards voluntary cooperation. Three distinct paradigms have been particularly influential in supporting theories about the limited opportunities for people to further their common interests: the 'logic of collective action', 'prisoner's dilemma' and 'the tragedy of the commons'. Although these

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<sup>1</sup> For a critical summary of orthodox group theory see Nagel (1987) and Olson (1965)

three paradigms share some fundamental views about the inherent conflict between individual interests and group interest, each of them has had powerful influence in academic and policy circles.

## 2.1 The logic of collective action

'The logic of collective action' is the title of a book written by Olson in 1965, which even today may be considered the touchstone of collective action theory. Olson's theory is often used to demonstrate that rational individuals are unlikely to participate in a group endeavour to pursue a common goal. By 'collective action', Olson refers to group efforts to further common interests. His logic therefore encompasses almost all acts of cooperation aimed at goals shared by a group of people. These goals may relate to a tangible good, or to immaterial benefits, but they all have in common that if the goal is achieved, everybody benefits from it, regardless of whether he or she contributed to its provision. Economists, including Olson, refer to these sorts of group goals –characterized by jointness of supply and impossibility of exclusion– as 'public goods'. The problems related to the non-excludable nature of public goods and that economically rational individuals would not voluntarily contribute to pay for them was well understood in economics already before Olson. This author, however, recognised the link between collective action and public goods and that all group goals and group interests are subject to the same dilemma. Olson realized the relevance of the theory of public goods for the analysis of collective action, thus exporting its inherent logic to other social sciences. Contrary to Hardin's 'Tragedy of the Commons' and to the 'Prisoners Dilemma', Olson does not deny the possibility of rational individuals' pursuing a public interest; rather, he offers a radically different account of the logical basis of cooperation. As will be discussed later, size and other group characteristics are considered by Olson of central importance in determining an individual's attitude towards cooperation.

Another factor that often explains cooperation is coercion. For Olson, however, coercion is only one instance of a broader group of phenomena he calls '*selective incentive*', which are material or social rewards specifically oriented towards those who contribute to a collective action. Collective action, according to Olson, is always accompanied by private incentives to reward contributors or to punish non-contributors. Selective incentives are not oriented towards the group as a whole like a collective good but operate selectively, towards the individuals in the group. They must be selective, so that those who do not cooperate can be treated differently from those who do. Only selective incentives or private benefits would stimulate a rational individual to act in a group-oriented way. Selective incentives are one of Olson's central themes and may be considered his 'simple and sovereign' theory of collective action (Marwell and Oliver 1993:5).

Olson's logical theory should be known to those who are excessively optimistic about people's willingness to cooperate. However, it should not be embraced indiscriminately either. As argued by Marwell and Oliver:

Free riding is a real problem. And yet collective goods are everywhere provided. [...] Any reasonable theory must account for these phenomena, as well as for the equally obvious fact that many

collective goods ardently desired by some groups, or even a whole population, never come to pass. (1993:6)

There are many factors that may explain collective action other than those discussed by Olson. First of all, as pointed out by Melucci (1995:18), it is necessary to overcome 'the Olsonian individualism'; 'the naïve assumption that collective phenomena are simply empirical aggregations of people acting together' needs to be discarded. Secondly, by also considering non-material rewards as acceptable selective incentives, and by recognising that also 'extra-rational motivations' (such as moral motivations and self-realisation) may determine individuals' participation to collective action, it is possible to recognise many more situations under which it may occur<sup>2</sup>.

## 2.2 Prisoners' Dilemma

The Prisoners' Dilemma originates from mathematical game theory, which was one of the dominant frameworks for analysing social interactions in the fifties and sixties. It was discovered by Flood and Dresher, who were concerned with testing solutions for non-cooperative games. It was named "Prisoners' Dilemma" only later, by A.W. Tucker, a game theorist of Princeton University (Hardin 1982). The Prisoner's Dilemma shares with Olson's theory of collective action its generality and its apparent power in providing a solid basis for a profoundly disturbing conclusion –that rational people cannot achieve rational collective outcomes. The Prisoners' Dilemma suggests in a clear manner that it is impossible for rational people to cooperate, a conclusion that bears directly on fundamental issues in ethics and political philosophy. Indeed,

The paradox that individually rational strategies lead to collectively irrational outcomes seems to challenge a fundamental faith that rational human beings can achieve rational results. (Ostrom 1990:5)

Like Olson's logic of collective action, the Prisoners' Dilemma has been applied to a broad spectrum of situations. Several theorists have relied on this argument to provide the essentials of a theory of state, which would be needed above all to enforce contracts and punish deviants, so that social order can be maintained. It was also frequently used to explain the depletion of common pool resources and the failure of groups to provide or maintain public goods.

Its application to real life situations has been strongly criticised by many scholars<sup>3</sup>. In fact, not only does empirical evidence prove differently, but the way the game is structured has generally little in common with reality. Runge (1992), for example, calls attention to the fact that the game represents a special case of joint action that can only be understood if one recognises the structure of the game as a function of the institutional environment in which it is embedded. Those who see in the Prisoner's Dilemma an inevitable human tendency tend to confuse cause and effect, and that the result of the game is just an artefact of the way in which it is set up. If the rules for exacting confessions from apprehended prisoners are different,

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<sup>2</sup> The importance of extrarational motivations is recognized by Hardin, who dedicates a whole chapter of his book on collective action to this subject (Hardin 1982:101-124). This issue is also extensively discussed by Kollock (1999) and Rheingold (1993) with specific reference to cooperation in the cyberspace.

<sup>3</sup> See Bromley (1992), McCay and Acheson (1987) and Ostrom (1990) for comprehensive and empirically grounded critiques to the application of the Prisoners' Dilemma to common property resource management.

they will also have different strategies and better reasons to cooperate. Thus, as argued by Bromley:

It is essential to understand that the institutional structure of any game (or life situation) reflects the prior social purpose to be served by the human interaction under consideration ... . The existing institutional structure reflects, among other things, prevailing cultural and social norms regarding individualism and its relation to collective notions. In that sense we can say that people behave (or choose) in an institutional context –not a very surprising observation really. (1992:6)

The applicability of the Prisoners' Dilemma to real life collective action problems is also questioned by Wade (1988) for whom two key assumptions must hold if a situation is to be plausibly modelled as a Prisoners' Dilemma and its pessimistic conclusions drawn. The first is that the players choose in ignorance of each other's choices, that they have no contact with each other, cannot negotiate themselves and change the rules and have no previously established shared values or moral codes of behaviour. The second is that each player chooses only once before the payoffs are received, and so cannot change his mind upon finding out what the other has done. Quite obviously, where the situation is an enduring and recurrent one, the logic changes and individuals may find it convenient to cooperate. In particular, if they know what others have chosen and can alter their choice accordingly, the rational strategy may be one of 'conditional cooperation', or 'cooperate first, defect if the others defect' (Wade 1992:203).

### **2.3 The Tragedy of the Commons**

The still widely used metaphor 'tragedy of the commons' owes its origins to an article by Garrett Hardin appeared in *Science* in 1968. Hardin (1968) was not exclusively concerned with common property resources, but with what he names 'no technical solution problems' in general. These include a broad array of problems such as population explosion, air pollution, deforestation, industrial waste control, and so on. To make his point about the inevitable conflict between individual behaviour and collective interest, Hardin invites the reader to picture a pasture open to all. In such a situation a rational herdsman will seek to maximise his gain by adding more and more animals to his herd. The tragedy is caused by the fact that each herdsman will act the same way as 'each being is locked into a system that compels him to increase his herd without limit in a world that is limited' (Hardin 1968: 1244).

The powerful impact of this article may partly be explained by the time and socio-cultural context in which it was published. It was in those years that the western world became suddenly aware of the dramatic consequences of an unconcerned use of natural resources that was rapidly leading to their depletion and to an irreversible loss of biodiversity.

## **3. EXPLAINING COOPERATION: THE ROLE OF GROUP ATTRIBUTES**

The last pages presented the essence of two convergent perspectives about the possibility of collective action. The first is characterised by an overly simplistic optimism about people's capacity to cooperate, and the second by sweeping pessimism. Over the last decades these

extreme positions have been gradually abandoned and there has been a significant advance in understanding the conditions under which collective action emerges.

The point of departure for most research on determinants for collective action is Olson (1965), who explains collective action by focusing on group attributes. In this section we shall discuss the importance of group attributes by focusing on five key issues, namely group size, heterogeneity, interdependence, the role of organisations and the importance of 'community'.

### 3.1 Group size

One of the most controversial issues in contemporary literature on collective action is related to the effect of group size on the likelihood of group action. The focus of many scholars on this variable is partly due to the influence of Olson (1965), whose main conclusion about collective action is stated in terms of group size.

According to Olson (1965) a clear distinction ought to be made between the behaviour of individuals depending on some basic characteristics of the group to which they belong. To explain this point he uses two parallel typologies. The first one is based on group size whereby a distinction is made between small, intermediate, and large groups. The second typology differentiates between 'privileged' groups and 'latent groups'. A privileged group is defined as a group in which each of its members or at least some of them have an incentive to see that the collective good is provided, even if he has to bear the full burden of providing it himself. In such a group the collective good may be obtained even without any group organisation or coordination (Olson 1965:50). The concept of 'privileged groups' relates to the assumption of groups being heterogeneous and also draws attention to the role of organisations, two important issues that will be discussed further below. A latent group is defined as a very large group distinguished by the fact that whether a specific member contributes or not to provide the collective good, will not significantly affect other members. Therefore none has any reason to act. The distinction between latent and large groups is less clear and the two terms are almost used interchangeably. Although Olson is primarily interested in large or latent groups, he also discusses the behaviour of small groups and intermediate groups, which are more relevant for the social validation of MobileMAN.

According to Olson, small groups may be able to provide themselves with a collective good simply because of the attraction the good may have on the individual group member. The greater the interest of any single group member, the greater the likelihood that the member will get such a significant portion of the total benefit from the collective good that he will gain from seeing that the good is provided, even if he has to pay all the cost himself. The distribution of the burden of providing a public good in a small group is never proportional to the benefits conferred by the collective good. Olson even argues that in small groups '*...there is a systematic tendency for 'exploitation' of the great by the small!*'<sup>4</sup>. Selective incentives are not required in small groups; they may have the capacity to provide themselves with a collective good without relying on coercion or any positive inducement apart from the collective good itself. This is because each of the members, or at least one of them, will find

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<sup>4</sup> Olson (1965:29). Italics by the author, whereby he underlines in a footnote that "the moral overtones of the world 'exploitation' are unfortunate; no moral conclusion can follow from a purely logical analysis". The word exploitation is chosen because it is commonly used to describe situations where there is a disproportion between the benefits and the sacrifices of different people.

that his personal gain from having the collective good exceeds the cost of providing some amount of that collective good (Olson 1965:34). In small groups free riding is not really an issue because each member, or at least some among them, is sufficiently interested in the collective good to ensure its provision. The risk of free riding is further checked by the fact that an individual's shirking behaviour would be noticeable and sanctioned.

In 'intermediate groups' no single member gets a share of the benefit sufficient to give him an incentive to provide the good himself. However, intermediate groups do not have so many members that no one member will notice whether any other is or is not helping to provide the collective good.

The likelihood that large groups are capable to provide themselves with a collective good is considered by Olson to be very small. The larger a group is, the farther it will fall short of obtaining an optimal supply of any collective good and the less it is likely to obtain even a minimal amount of such a good. In short, the larger a group, the less it will be able to further a common interest (Olson 1965:36).

### 3.2 Heterogeneity

The above summary of Olson's theory of how the size of the group determines collective action calls attention to an equally important variable, namely *heterogeneity*. In fact, Olson's definition of 'privileged group' is closely related to the assumption of groups being heterogeneous. His concept of heterogeneity, however, does not relate to socio-economic or cultural differences among group members, but to the differential value individuals place on the public good and to the resources available to contribute to its provision. The fact that generally not all individuals belonging to a group share a similar interest in a public good may appear quite obvious, but constitutes one of Olson's more important contributions and had a strong influence on further collective action research. Although homogeneous groups may exist, it is indeed misleading to treat heterogeneous groups as if they were homogeneous and to examine only the aggregate group interest in a collective good. While for Olson heterogeneity explains why some groups are more likely to succeed in collective action than others, this factor is also considered the main reason for a sub-optimal provision of the collective good. The influence of group heterogeneity on collective action has attracted many scholars and has been subject to sophisticated mathematical modelling<sup>5</sup>.

Closely related to the concept of heterogeneity is the concept of *critical mass*, which is used by Marwell and Oliver (1988; 1993) to explain that collective action usually depends on a relatively small cadre of highly interested and resourceful individuals, rather than on the efforts of the 'average' group member. These individuals behave differently from a typical group member, for example by assuming leadership positions, covering initial costs, and making up for group members who fail to contribute their share.

However, heterogeneity does not necessarily increase the probability of collective action. Hardin (1982) analyses the issue of heterogeneity in terms of 'asymmetries' that complicate the analysis of collective action. Inequality or 'asymmetries in demand for a collective good'

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<sup>5</sup> Cf. Heckathorn (1993) and Oliver et al. (1988).

may lead to polar opposites: to enhance or dissipate prospects for collective action. Dissipation is likely when the collective good sought by a group may also be obtained privately, although perhaps at a higher cost. In such a situation the intense demanders may opt for the private good even if it has some disadvantages. This scenario basically refers to Hirshman's (1972) distinction between 'exit' and 'voice', whereby 'exit' refers to the individual response to turn to a different product available in the market, while 'voice' is the political response to obtain a good collectively. Exit as a response to the high transaction costs of collective action, cannot be explained by focusing exclusively on group attributes but depends to a large extent on whether the context provides alternative opportunities.

### 3.3 Interdependence

Early collective action theorists, including Olson, built their theorems upon the assumption that individuals make isolated, independent decisions whether or not to contribute to collective action. Nowadays, collective action theorists recognise the critical role of interdependence between group members. Marwell et al. (1988) are among the first collective action theorists who challenge the assumption that individuals decide independently by contending that in most decision making situations, people are aware of what others are doing, as they often have social relations that make influence, or even sanctions, possible. Independent decision-making may apply to very large or 'latent' groups, but not to the more frequent, smaller groups. It may thus be assumed that people take into account whether and how much others have already contributed, and that their decisions follow a sequential pattern (Marwell et al. 1988, Melucci 1995).

Marwell et al. (1988) argue that the organisation of potential contributors, to make their decisions interdependent, is a requirement to overcome the free-rider problem. However, they do not consider the potential to organise a group to be necessarily present. The possibility of group organisation depends on the social ties in the group, particularly the density and frequency of ties, on the extent to which they are centralised in a few individuals, and on the cost of communicating and coordinating actions through these ties. The overall density of social ties in a group improves its prospects for cooperation, whereby it is noticed that network centralisation is beneficial for collective action.

### 3.4. The role of organisation

The role of organisation in collective action is extensively discussed by Olson. Initially, it would appear that Olson indiscriminately supports the need for organisation to pursue a common goal by arguing that:

... when a number of individuals have a common or collective interest –when they share a single purpose or objective—individual unorganised action [...] will either not be able to advance that common interest at all, or will not be able to advance that interest adequately. Organisations can therefore perform a function when there are common or group interests, and though organisations often also serve purely personal, individual interests, their characteristic and

primary function is to advance the common interests of groups of individuals. (Olson 1965:7)

Later in his book, however, Olson specifies that the need for organisations to pursue collective action depends on the size of the group. He does not consider the formation of organisations necessary for small groups, in which by definition free riding and shirking would be noticeable. Moreover, given the fact that groups tend to be heterogeneous, in small groups it is likely that an individual member with a high interest in the good is willing to contribute to its provision independently of whether other group members do the same. Thus, in small groups it may not be worthwhile to bear the high transaction costs involved in establishing an organisation, an important conclusion that should be kept into account by external development agencies promoting the formation of organisations.

The situation changes in intermediate groups. Olson argues that for these type of groups, a collective good may or may not be obtained, but ‘no collective good will ever be obtained without some group coordination or organisation’ (1965:50). This is not the case in ‘privileged groups’, in which the good, like in small groups, may be obtained without any group organisation or coordination.

Finally, an entirely different explanation of why formal organisations are often absent and not required in relation to a particular group action is provided by the ‘by-product theory’. This theory also originates from Olson (1965), who uses the concept to explain the political power of some large groups. Hence, groups may succeed in providing their collective good as a by-product of organisations based on other, selective incentives. For Olson the membership and power of large pressure-groups does not derive from their lobbying achievements, but is a by-product of their other activities. This is considered a necessary explanation for the existence - against all odds- of large voluntary organisations. The theory has the merit of calling the attention to the possibility that groups may not need to be organised because they already have been organised for other reasons.

In the present context, however, it may be sufficient to regard by-product theory as one possible explanation of why cooperation often occurs without the institutionalisation of any specific organisation. This calls attention on a critical variable that has recently been ‘discovered’ by collective action theorists, namely, the role of ‘community’.

### 3.5 The role of 'community'

The discussion about the relevance of organisations, social ties and interdependence between group members leads to the ‘community’ concept, which has been highlighted by some authors as the key to understanding why some groups are able to solve their collective action problems without external coercion, while others are not. The importance of community for collective action was first emphasised by Taylor (1987) and further elaborated by Singleton and Taylor (1992), Taylor and Singleton (1993).

Singleton and Taylor (1992:315) define community as a set of people: (i) with some shared beliefs, including normative beliefs and preferences beyond those constituting their collective action problem; (ii) with a more-or-less stable set of members; (iii) who expect to continue

interacting with one another for some time to come; and (iv) whose relations are direct (unmediated by other parties) and multiplex). They maintain that a community group is more likely to arrive at endogenous solutions to its collective action problem if it comprises individuals who are mutually vulnerable. If a group has these attributes it is more likely to be capable of facing the transaction costs related to collective action, which are the main reason why many collective action problems remain unsolved.

**4. Towards a social validation of MobileMAN: the role of cooperation**

**5. Analytical summary and conclusions**