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**Economics and Social Psychology on Public Goods: experiments and explorations**

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REVISTA DA FACULDADE DE ECONOMIA DA UNIVERSIDADE DE COIMBRA

## Economics and Social Psychology on Public Goods: Experiments and Explorations



José Maria Castro Caldas; João Rodrigues; Luís Francisco Carvalho DINÂMIA /ISCTE

### resumo

### résumé / abstract

**Os Dilemas Sociais constituem um tópico de interesse crescentemente partilhado por economistas e psicólogos sociais. Este artigo passa em revista estudos experimentais em ambas as disciplinas relacionados com as situações de dilema social que de algum modo se enquadram na categoria de problema de provisão de bens públicos tal como é convencionalmente visto pelos economistas. As diferenças no enquadramento teórico e no uso do método experimental são assinaladas. Descreve e discute também as estratégias que têm vindo a ser desenvolvidas em economia para incorporar os resultados experimentais em novos quadros teóricos. Procura simultaneamente identificar tópicos não explorados nesta área.**

De plus en plus d'économistes et de psychologues sociaux s'intéressent aux Dilemmes Sociaux. Cet article passe en revue les études expérimentales, menées par ces deux disciplines, portant sur des situations de dilemme social, et plus spécifiquement sur le problème de la provision de biens publics tel que conventionnellement envisagé par les économistes. L'article souligne les différences théoriques associées au recours à la méthode expérimentale dans les deux disciplines et il décrit et discute les stratégies récemment mises en œuvre en économie pour incorporer les résultats expérimentaux dans de nouveaux cadres théoriques. Finalement, des axes de recherche encore non explorés dans ce domaine sont identifiés.

Social dilemmas have become the focus of shared interest of economists and social psychologists. This essay surveys experimental studies in both disciplines related to those dilemma situations that somehow fit into the economist's category of public good provision problems. It focuses on their differences in theoretical framing and their use of the experimental method. It also describes and discusses the strategies that have been developing in economics in order to accommodate the experimental findings in new theoretical frameworks. Simultaneously it tries to identify unexplored topics in this field.



## 1. Introduction\*

No doubt men, even now, are capable of much more unselfish service than they generally render: and the supreme aim of the economist is to discover how this latent social asset can be developed most quickly, and turned to account most wisely.

Marshall in *Principles of Economics*, 1920

Economics and social psychology come from different traditions in social science, and in the past they seldom met. Their territories seemed to be well delimited. The former discipline's mainstream focused on market mediated interactions, making sense of an a-social concept of action by referring it to "the ordinary business of life" (Marshall, 1920: I.II.1) where agent's choices are supposedly independent from those of other parties in the transactions (Sugden, 2002a); on the other hand, the second discipline descends from a socialized view of man and was stimulated by questions on why and how the immersion of individuals in the multitude, or the simple presence of others, appeared to transform behaviour.

Lately, however, economics has started moving in a direction that reduces this gap. In a double but interrelated move, economics is adopting experimental methods familiar to those of social psychology, and is becoming more concerned with the relevance of rational choice in contexts where there is clear inter-individual dependence, raising questions to which social psychologists have already devoted considerable time and effort<sup>1</sup>.

As a part of this movement, social dilemmas, that is, "situations in which (a) individual group members can obtain higher outcomes (at least under some circumstances) if they pursue their individual interest while (b) the group obtains higher incomes if all group members further the group interest" (Dijk and Wilke, 1998: 110) have become the focus of shared interest of both economists and social psychologists.

The motivation for the study of social dilemmas does not differ much in economics and social psychology and it arises out of two major types of challenges. The first (Fontaine, 2002) is related to the growing consciousness of the pervasiveness of market failures, combined with government failures, concerning issues of major social urgency like pollution and the use of scarce resources. The second, (Dawes, 1991) cropped up out of the finding that people both in real-life and experimental contexts fail to behave systematically in the way depicted by standard game theory, often opting for more benign strategies.

Interest in social dilemmas is thus related, on the one hand, with the concern with problems that the market cannot solve, and, on the other, with understanding the reasons that may drive people to act in ways that are not in line with rational self-interest. For economics those are

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<sup>1</sup> In a recent survey on the interaction between economics and social psychology Frey and Benz (2002: 11) state that "in the future, the main emphasis should not lie in exporting economics but rather in importing aspects and insights from other social sciences, like psychology". And they add that "there is already a considerable amount of literature pointing the way this future development may go". The fact that the Nobel Prize was awarded in 2002 to David Kahneman and Vernon Smith, a psychologist and an experimental economist, may signal the same trend.

arcane questions<sup>2</sup> that were never ignored by the best minds in this discipline. Marshall's sentence in epigraph is a clear instance of this concern.

This essay does not intend to cover the whole scope of existing approaches to social dilemmas since it only deals with dilemma situations that somehow fit into the economist's category of public good provision problems and with the experimental studies in economics and social psychology<sup>3</sup>. On the basis of an exploratory joint survey of experimental literature from both disciplines, it focuses on their differences in theoretical framing and on their use of the experimental method, as well as on the potential for dialogue and collaboration.

The following points will be argued:

(a) Twenty five years of experimental research in both disciplines have produced an impressive accumulation of coherent results showing that in spite of the free-riding prediction, there is a tendency to voluntary contribution in "small" groups;

(b) Notwithstanding the abundance of experimental studies, several interesting problems remain unexplored. In economics, the research focus has been on "are the game theoretical predictions corroborated by experimental evidence?", whereas in social psychology it has been on "what may cause the voluntary disposition to contribute". Questions pertaining to "what institutional contexts might hinder or foster voluntary contribution" still offer a vast domain of unexplored possibilities.

(c) In spite of all efforts, the conceptual framework that may account for the contributive disposition in public good dilemma situations and help "discover how this latent social asset can be developed" remains rather sketchy.

## 2. Public Goods, Game Theoretical Predictions and Experimental Settings

Collective or public goods, that is, goods that are collectively produced and consumed, are generally defined by the two well-known properties of non-rivalry (one individual's consumption does not reduce the amount available to others) and non-excludability (individual's cannot be excluded from the consumption of the good irrespective of their contribution to its production). A pure public good satisfies both these properties, impure public goods satisfy only one of the two or each one (or both) imperfectly.

In public good provision situations, individual members of a group typically have to decide whether or not to contribute to the provision of a good (or avoidance of a bad) from which all benefit, including those who decide not to contribute. In such a context, theories of rational choice in economics, and elsewhere, tend to predict that individuals will try to "free ride" on the contribution of others – they will attempt to enjoy the good without contributing. Obviously, the situation contains the potential for social disaster – generalised free riding, that is, failure to provide the good.

In order to overcome the under-provision of the public good, standard economic theory conceives only two solutions: public provision of the good through state intervention, or the

2 In Adam Smith we can find an understanding of the public provision problem. This is clear when Adam Smith (1976: 723) argues that the sovereign had the obligation of "erecting and maintaining those public institutions and those public works, which, though they may be in the highest degree advantageous to a great society, are, however, of such a nature, that profit could never repay the expense to any individual or small number of individuals, and which it, therefore cannot be expected that any individual or small number of individuals should erect or maintain".

3 The neglect at this stage of a host of contributions in several domains, ranging from sociology to political science and to recent developments in game theory, is acknowledged by the authors.





setting up of incentive compatible mechanisms, that is “those mechanisms for which participants in the process would not find it advantageous to violate the rules of the process” (Ledyard, 1991: 740). However if either one of this solutions is feasible and therefore actually implemented the social dilemma situation is transformed in such a way that the possibility of cooperation (voluntary contribution) ceases to be problematic.

The research reported in this paper draws from the assumption that the two above mentioned solutions may be either unfeasible or undesirable in many real life contexts. It explores the possibility of cooperation even when no state provision nor incentive compatible mechanisms are present.

Although there is a remarkable diversity of public goods experiments in economics, a standard one uses the following procedures: a group of  $n$  individuals (generally between four and ten, but sometimes more) is brought into a room (the lab); each of the participants is given a certain amount of money (an endowment  $z_i$ ), which he has to divide into a part,  $x_i$ , that he keeps to himself, and another part,  $t_i = z_i - x_i$ , which is “invested” in the production of the public good. The total amount invested,  $T = \sum_{i=1}^n t_i$  is then used to produce the public good  $y$ , with  $y = g(T)$  being the public good production function. The individual payoffs are then determined, depending on the choices  $x_i$ , and on the amount produced of the public good,  $y$ , by the function  $U_i(x_i, y)$ <sup>4</sup>.

As Ledyard (1995) shows in his survey the shape of the payoff functions, the public good production functions, and the domain of feasible contributions may be used in a taxonomy of experiments, in the sense that they determine the structure of incentives and therefore the nature of the game being played, and the corresponding game theoretical predictions.

In the *linear symmetric variable contribution environment*  $g$  and  $U_i$  are linear functions, endowments and payoff functions identical across individuals, and feasible contributions are real numbers. This environment corresponds to a  $N$  person prisoner’s dilemma, where standard game theory clearly predicts a single equilibrium, with all agents playing the zero contribution dominant strategy.

Another possibility is the *linear symmetric threshold environment*, where the payoff function is linear but the production function is given by  $g(T) = 1$  if  $T \geq \bar{T}$ , and  $g(T) = 0$ , otherwise. In this case the game no longer is a prisoner’s dilemma but changes instead to a game of chicken with multiple equilibria.

As can be easily seen, even if we concentrate on this limited number of features of the experiment, there is a large range of possible environments. However this taxonomy is unsatisfactory because the relevant aspects of the experiment are not only those related to the structure of incentives and information. They include a large number of other factors that standard game theory dismisses as irrelevant<sup>5</sup>.

### 3. Pioneering experimental studies in economics and social psychology

The experimental study of public good provision dilemmas, as stated above, is a multidisciplinary field.

According to Ledyard (1995), one of the first systematic experiments in this area was developed by two sociologists, Marwell and Ames (1979 and 1980), who found in a single- play public good game (the so-called one shot game in experimental jargon) that people tend to invest an average of 40% to 60% of their endowments in the public good. This result held for a varying range of monetary stakes and for groups with different numbers of persons.

4 It should be noticed that the shape of functions  $g(T)$  and  $U_i$  must be such that while the public good is increased by each individual contribution, the resulting increment of utility is always lower than the utility of the invested amount. This means that everyone has an incentive to invest but only as long as others also do so.

<sup>5</sup> For a synthesis of the main features of the experiments mentioned in this article see the Appendix.

Simultaneously a group of social psychologists, including Robyn Dawes and John Orbell were initiating a series of (one shot) experiments, different from Marwell's and Ames's in respect to environment and in that they focused on the role of communication as a factor favouring voluntary contributions to the public good, that is cooperation. They consistently found that without communication there were significant rates of cooperation, and more importantly that communication dramatically increased those rates.

The results of those pioneering public good experiments clearly challenged the economists' established theoretical frame in two respects: (a) subjects contribute (only some of them free ride); (b) communication matters, talk is not necessarily "cheap" as supposed by standard game theory.

#### 4. Developments in experimental economics

The economist's response came only a few years later (Kim and Walker, 1984; Isaac et al., 1985). These authors modified the experiment of Marwell and Ames (1981) in several respects, the more noticeable being the repetition of the game. Their purpose was "to explore the behaviour of groups within a set of conditions where we expected the traditional model would work with reasonable accuracy" (Isaac *et al.*, 1985: 51). They observed that, on average, first round contributions were identical to those of Ames and Marwell's experiments, but that by the fifth period the average contribution for the public good declined substantially, reaching only an average of 9% of the subject's total endowments. They took this result as explaining the troubling high levels of contribution in one shot experiments: the subjects simply needed repetition to fully understand the game and only learned that free riding was dominant over time. After this, repetition became standardised in experimental economics<sup>6</sup>.

Soon after Isaac's *et al.* (1985) experiment, Andreoni (1988) successfully challenged the learning hypothesis by slightly changing the experimental set-up. Subjects were told that they would play a ten-period public good game, and that afterwards they would play it again with the same players. In the first ten rounds Andreoni found the by now widely established result of a declining contribution, but in the next game, with the same persons, the initial pattern of contributions was restored. This result was replicated by Cookson (2000) who enacted a public good game with 32 rounds presented as 4 phases of 8 repetitions, with a break and results summary in between. As in Andreoni's experiment, contributions declined but then persistently returned to the 50% level after each re-start.

These and other experiments undermined the experimental economist's confidence on the robustness of the standard game theoretical predictions, and led to a new phase where factors beyond the traditional incentive structure were taken into account.

An example of this is the so-called "framing effect" which is said to be present "when different ways of presenting the same choice problem change the choices that people make, even though the underlying information and choice options remain essentially the same" (Cookson, 2000: 55). The framing effect seems to be operative. Andreoni (1995) and Sonnemans *et al.* (1998), for example, have found that cooperation was lower when the incentive structure of the game was framed as a negative externality rather than as the usual positive externality. This framing effect has been interpreted as a violation of an axiom of rational choice, known as descriptive invariance (Cookson, 2000).

Another interesting dimension that has been explored in economics is the effect of different marginal payoffs of the public good relative to the private good. It seems to be well established that the marginal per-capita return (MPCR)<sup>7</sup> influences the voluntary contributions. This has been

6 The economists' response, as Ledyard (1995) shows, might have been given along theoretical rather than experimental lines. In fact, the structure of payoffs in Marwell and Ames's experiments is such that not contributing is not a dominant strategy.

7 According to Fisher *et al.* (1995: 250), "broadly defined, it is the marginal gain in moving an incremental unit of wealth to the public good relative to the cost of doing so".





summarised by Isaac *et al.* (1985: 64) when they say that “individuals in the high payoff condition contribute more than individuals in the low payoff condition”. The same result has been obtained by Isaac and Walker’s (1988) experiment in which the contribution of groups facing a low MPCR was more likely to decline to the free-rider prediction than those of groups with a high MPCR.

According to the standard model of human behaviour it is expected that subjects with high or low MPCRs exhibit the same behaviour in heterogeneous and in homogenous groups. This is so because each individual is only interested in his MPCR. Fisher *et al.* (1995) have investigated the effect of heterogeneous demand for the public good by varying the MPCR, not just among groups in the same period or between the same group in different periods, but for different individuals within the same group. Contrary to standard model, they found that, when participating in heterogeneous groups, individuals with higher MPCRs contribute less and individuals with lower MPCRs contribute more than predicted.

Chan *et al.* (1996) turned to the study of effects of income distribution (that is of individual initial endowments). With non-linear pay-off functions they provide evidence that contradicts the Nash equilibrium prediction for individual contributions. It seems that low-income individuals tend to over-contribute relative to the induced Nash contribution, while high-income individuals tend to under-contribute.

Finally, the experimental economists were also led to test the effect of pre-play communication, reporting that: “communication increases the level of contribution (and efficiencies)” (Isaac *et al.*, 1985: 67). In fact Ledyard (1995), in his extensive review, concluded that communication seems to be one of the strongest ways of improving cooperation.

The social psychologist Amnon Rapoport (1988) organised the experimental literature on public goods into two categories: (a) experiments primarily designed to test economic models, focusing on the reward structure of the task rather than on psychological variables; (b) experiments, mostly conducted by psychologists, that are designed to refute the free rider hypothesis and are focused on the effects of psychological variables.

This categorisation is relevant for the pioneering efforts in both disciplines. However, while it is true that the theoretical frame behind economic experiments is still game theory, the accumulation of anomalies pushed economists to a much more sceptical attitude towards standard game theory. They began to acknowledge the importance of variables that were traditionally dismissed, many of which might be considered as “psychological”.

## 5. Developments in social psychology

Meanwhile social psychologists proceeded with their experimental research on cooperative dispositions of individual within groups.

The research by social psychologists differs from the economists’ approach in two respects: the use of the experimental method and the span of theoretical approaches followed.

As far as the use of the experimental method is concerned the following differences should be highlighted:

- contrary to psychologists, economists insist on linking money payoffs to the choices faced by experimental subjects;
- while for economists the deception of the experimental subjects is taboo, psychologist often use deceiving manipulations in their experiments.

What is at stake in the later remark is not an ethical question – non-ethical manipulations are excluded in both fields. The matter is one of information and belief. Experimental subjects act on the information available and they are supposed to believe that this information is trustworthy.



Experimental economists argue that transmitting false information may damage the experimental community's reputation and thus the reliability of future results.

A second feature of the social-psychological research on cooperation is that the underlying theoretical framing of experiments is more diversified than in economics. In social psychology, game theory is only one of several competing models of rational action, and rational action only one among different concepts of action<sup>8</sup>. For most social psychologists neither cooperation nor free riding may be taken as expected, both requiring an explanation, and a typical paper on public goods usually starts with one of the two questions: "Why do people cooperate in groups?" (De Cramer and Van Vugt, 1999) or conversely "why do they sometimes free ride?". The following examples of research on social dilemmas in this discipline are illustrative.

Yamagishi and Sato (1986) investigated "the motivational basis for contributing to a public good". Stating that "the term free riding may represent only a partial view of the motivational basis for the lack of cooperation in these situations because the term seems to imply that people are actively seeking to improve their own benefit without regard for the benefit of others, or in some cases, even by exploring others", they hypothesise that "the motivation behind so-called free riding behaviour may be something other than the egoistic pursuit of the individual's self-interest" (Yamagishi and Sato, 1986: 67), and point to lack of trust as one of these other major causes. The results, obtained in a complex experimental environment with Japanese student subjects, led them to conclude that free riding behaviours can be explained by the activation of two motivations "greed" and "fear" (of no reciprocity). Which of these will prevail is according to them situationally determined. However, they concluded that fear is more important than greed in determining the level of contribution to the public good.

By the beginning of the nineties Dawes (1991: 26) summarised his team's result: "Our experiments led us to conclude that rates of foregoing dominating but collective harmful choices can be radically affected by one particular factor that is independent of the consequences for the choosing individual. That factor is group identity. Such identity can be established and consequently enhance collective beneficial choice in the absence of any expectation of individual side-payments." In fact, Dawes' team research during the previous decade had led to a particularly interesting line of enquiry that became salient during the nineties.

When studying the effect of communication, Dawes' team (Dawes *et al.*, 1988) had compared the level of contributions under two conditions: (a) the beneficiaries of the contributions were the members of a group where a ten minute dialogue had taken place; (b) the beneficiaries of the contributions of group A were the members of a group B, whose contributions benefited members of group A. They had found that the positive effect of communication on voluntary contributions is strikingly different in both situations with much higher levels in condition (a). This and similar results led them to conclude that the ten minute discussion was enough to generate a sense of belongingness that might drive individuals to identify themselves with the goals of the group, and contribute to their achievement. In their view, if other factors, like moral commitment, or altruism, were operative in this case, there would be no difference in contributions under the two conditions.

Pursuing this line of enquiry, De Cramer and Van Vugt (1999: 872) ask how and why social identification has a role to play in dilemma situations and they consider two alternative responses: (a) "social identification blurs the distinction between peoples' personal welfare and the welfare of others or the group as a whole [...] they perceive each other as similar in terms of their goals and achievements" (social identification would give rise to a *transformation of motives*); (b) "it enhances perceptions of trust in other group members" (social identification would operate a *goal*

<sup>8</sup> Social psychologist seems to deal in a healthy manner with theoretical pluralism. If one belief seems to unite social psychologists it is the (perhaps unfounded) confidence that theoretical disputes may be resolved by the accumulation of empirical (mostly experimental) evidence.





*amplification*). Their experiments were designed to test which of these alternatives has more explanatory power, and they concluded that “social identification effects in social dilemmas can be attributed to a transformation of motives, whereby people forgo their immediate self-interest to act in the broader interest of the group” (De Cremer and Van Vugt, 1999: 890).

## 6. Experiments: some stylised facts

Twenty-five years of experimental research in both disciplines have produced an impressive accumulation of coherent results. The reviewed surveys [Ledyard (1995), Camerer and Fehr (2002) and Ostrom (1998)] point to the following stylised facts that seem to be quite at odds with the traditional model:

### 1. Subjects contribute considerable amounts of their endowment in the one-shot game

This result seems to be robust across a large range of experimental settings, both linear and threshold environments, and, more interestingly in absence or presence of pre-play communication.

### 2. With repetition contributions seem to unravel over time

In a ten period repeated public good game, subjects initially contribute as much as they do in a one-shot game, but contributions seem to decline substantially over time, with approximately 60 to 80 per cent of all subjects contributing nothing in the final period. This result holds irrespective of whether group composition remains the same or changes from period to period. However, as we have seen, the learning hypothesis has been conclusively dismissed by Andreoni's (1988) and Cookson's (2000) experiments. More interestingly, the unravelling of cooperation is only observed when opportunities for communication for any other type of face-to-face interaction are totally absent. Furthermore, with communication repetition leads to the opposite effect of increasing the contribution rates (Ledyard, 1995).

### 3. Communication strongly increases cooperation

The effect of communication is by far the most puzzling one. It is clearly so for those who work under the frame of standard game theory: when there is a unique dominant strategy, as is the case in linear settings, communication should play no role at all. But even for those that reject game theory it poses a challenge (Dawes *et al.*, 1988). Why does it matter? Is it because promises made during the pre-play talk are binding for the one who made them? Is it due to expectations created by promises made by others? Does communication trigger group identity making it operative? What are the foundations and mechanisms of group identity?

Posing a challenge to the prevailing concept of action, these results opened up avenues for new lines of research for economists and for theoretical efforts aimed at revising the traditional model of the self-interested and rational individual.

## 7. New lines of theoretical research

The acknowledgement by economists of psychological variables, or better stated, the “recognition of sociality as a characteristic of human life which impinges in the core subject of the discipline” (Sugden, 2002: 3) is leading to a fast growing literature.

Sugden (2002a) identifies three main strategies in this literature:

1. *Extending utility*, the most followed strategy, consists on representing “individual's social orientations as properties of their preferences – for example, as tastes for altruism, fairness or equality – and then to use standard theories of instrumental rational choice to explain the interactions of individuals with those preferences” (Sugden, 2002a: 3).

2. Developing new concepts of *collective rationality* is a second strategy; sociality is here represented by evoking principles of reciprocity, collective intentionality or 'team thinking'.

3. Thickening the ontology on which economics rests to encompass *affections* is a third alternative that Sugden (2002a) places outside the paradigm of rational choice.

Illustrative of Sugden's first strategy are models surveyed by Fehr and Schmidt (2000), that have emerged with the common feature of trying to retain the individual utility framework by enlarging the utility function to allow "social preferences", that is other individuals payoffs, to enter the scene: "Given these social preferences all agents are assumed to behave perfectly rationally and the well known concepts of traditional utility and game theory can be applied to analyse optimal behaviour and to characterise equilibrium outcomes in experimental games" (Fehr and Schmidt, 2000: 11). Let us briefly describe what are perhaps the most important versions of this utility enlargement: *warm-glow*, altruism and inequality aversion.

The term *warm-glow*, used by Andreoni (1990), captures the idea that subjects just like to give. Denoting individual  $i$ 's contribution to the public good by  $z_i$ , the utility function allowing for *warm-glow* is given by:  $U=U(x_i, z_i)$ . According to Schram (2000) the motivation underlying this equation allows for individual heterogeneity in preferences, that is, in the relative weight attributed to the arguments in the function.

Altruism is another approach advanced to explain the cooperation in public goods experiments: people may be motivated by taking pleasure in others' pleasure. According to Fehr and Schmidt (2000: 12), "a person is altruistic, if the partial derivatives of  $u(x_1 \dots x_n)$ <sup>9</sup> with respect to  $x_1 \dots x_n$  are strictly positive, i.e., if her utility increases with the well being of other people". Altruism and *warm-glow* seem to imply unconditional cooperation.

Inequality aversion, as elaborated by Fehr and Schmidt (1999), among others, is based on the assumption that, to some extent, people dislike inequality in payoffs and that they dislike it more if it is to their disadvantage than if it is to their advantage. Applied to the public good situation, as long as inequality-averse players believe that other players are contributing, they are willing to contribute too.

It is worth noting that the levels of cooperation found in the experimental literature seem to invalidate an explanation based on altruism and *warm-glow* in favour of a more conditional version of cooperation, compatible with observed positive and negative reciprocating behaviour<sup>10</sup>.

Illustrative of Sugden's (2002a) second strategy, of a non-instrumental collective rationality, are the works on "team preferences" (Sugden, 2000) and on "collective intentionality" (Davis, 2002)<sup>11</sup>. Those theories of team agency deal with the logic of choice of individuals who conceive themselves as members of a group, whose identity is shaped by group membership (Sugden 2002a), and use a *We* language to express their intentions ("we want to achieve this or that"), instead of the *I* language adopted when acting independently of others. Since those important theories cannot be summarized in a few paragraphs we just note, following Sugden (2002a), that they do not give an account on "how the perception of *being* part of a team" can be construed, or on how individuals can come to consider collective goals worth pursuing, even when this is done at cost to themselves.

Concern about these open questions, along Sugden's (2002a) third strategy, is the meeting point of the more recent trend of economic research and long standing efforts of social psychologists and moral philosophers.

9  $x_i$  denotes the material resources allocated to person  $i$ .

10 For a synthesis of how economists have been applying the concept of reciprocity see Fehr and Gächter (2000).

11 A line of research that draws on the work of philosophers like Tuomela and Searle.





Sugden (2002a) argues the need for a non-rational foundation for the theory of collective action on the basis of a discussion of Hollis' concept of reciprocity. According to Hollis the motivation to follow a cooperative practice is the sharing of a norm of reciprocity. For an individual to follow that practice he needs reassurance that others will follow it too. The puzzling fact is that, very often, that reassurance cannot be thought of as founded on past experience, nor on knowledge about the future – when we assist a stranger in the street with some information, or when we contribute to a public good in an experimental setting, no joint past experience nor future prospects of interaction exist. As stated by Sugden (2002a: 28), “on Hollis' account, the confidence that A needs is confidence that A and B are fellow-members of some meaningful social group (that is, a group that is identified by some feature that has meaning for its members), and that within this group, *enough* members follow the practice to warrant A's joining in it”. And he proceeds by arguing that in this account of the motivation to follow cooperative practices, there is a combination of rational and affective elements. The rational element is that of acting *as a member* of a group, with each individual performing *his part* in the collection of actions that may achieve a goal that is worthy for all the group members<sup>12</sup>. The affective component is involved in “the consciousness that other people share the motivation, and that they approve it in you”.

It is clear that this third strategy of inquiry contains a potential for fruitful dialogue between economists and social psychologists, since it establishes a link with Dawes' research on social identity and Tyler's relational model of justice.

To make sense of the affective motive any theory must assume not only that individuals seek to preserve their condition as living creatures (as all social and biological theories do), but also that “people want to understand, establish, and maintain social bonds” (Tyler, 1994: 851). One way to state this desire can be found in Tyler's (1994) discussion on the “justice motive”: “A key reason why people seek group membership is that groups provide a source of self-validation [...] For this reason, people find evidence that they are accepted members of social groups to be rewarding, and they are troubled by evidence they are rejected or excluded”, with the consequence that, “people are motivated by their desire for positive regards from important others” (Tyler *et al.*, 1998: 184).

Interestingly, at least for economists, is the fact that the very same idea can be found in Adam Smith's *Theory of Moral Sentiments*: “Were it possible that a human creature could grow up to manhood in some solitary place, without any communication with his own species, he could no more think of his own character, of the propriety or demerit of his own sentiments and conduct, of the beauty or deformity of his mind, than of the beauty or deformity of his own face.” (Smith, 1759:162).

In both Tyler's and Smith's accounts an individual can develop the sense that a goal is worth pursuing, even at a personal cost, if he perceives that pursuing that goal grants him the approval of others, with the qualification that for Smith, a point that Sugden (2002a) seems to underestimate, those others (the man without) could (and should) not be the concrete fellow-members of the group, but an “impartial spectator” (“the man within the breast”) that we all develop as a result of sustained social interaction.

To the modern reader Smith's account of moral sentiments owes nothing to, and could be easily translated into, a modern socio-psychological theory of the development of conscience. Furthermore, what comes to mind reading Sugden (2002b), is that Smith's theory of moral sentiments may be considered as richer and more sophisticated than present day theories of social identity – Smith's mechanisms for the correspondence of sentiments, his “mutual sympathy”, can indeed help explain (rather than simply state) why “people's evaluations and their behaviours are altered when they are in groups [and their] evaluations become responsive to justice concerns, and [their] behaviours become responsive to issues of group interest” (Tyler and Dawes, 1993: 95). Or as Kramer and Brewer (1984: 1045) put it, why “members of a social group

<sup>12</sup> This is the form of rationality above mentioned as the second strategy.

tend to perceive other members of their own group in generally favourable terms, particularly as being trustworthy, honest and cooperative, a bias that emerges even when the basis for group identification is minimal and transient”.

Even though theoretical developments on the second of Sugden’s strategies, and his and others’ contributions for a theory of collective action founded on affections seem promising, at the present stage it is unavoidable to conclude that the conceptual framework that may account for the contributive disposition in public good dilemma situations remains rather sketchy.

## 8. Open questions and future experimental and theoretical research

In spite of the rapid growth of experimental literature in public goods, and of a sense that the domain is by now “very crowded”, a wide range of questions remains open for experimental and theoretical probing.

In the brief survey of the literature we found that the existing research mostly covers situations that fit into the category of pure public goods, and within pure public goods, symmetric environments. Results have been reported with unequal endowments, and differing payoff functions, but to our knowledge, a different type of inequality – inequality in the apportioning of the public good – has never been tested.

By introducing the possibility of unequal individual shares of the public good in the experimental setting, an impure public good situation is created. This situation is impure in the sense that: (a) the public good no longer is non-rival; (b) although it is still impossible to exclude from consumption anyone who has not contributed to production, some type of relative excludability now exists.

The inequality in the distribution of the public good is a common feature of reality. After all, public lighting may be unequally provided in different quarters of a city, and even defence and security may be unevenly distributed over a territory.

Furthermore, introducing this rivalry dimension in a public good setting establishes a link between this type of social dilemma and the *team work* problem analysed by Alchian and Demsetz (1972). The team work problem arises in most situations where production is jointly undertaken by a group. Given that it may be hard or impossible to monitor and separately evaluate each individual’s contribution to joint production, it is impossible to adopt the apportioning rule that according to the standard economic model would lead to efficient outcomes – retribution proportional to marginal productivity. In such a context the opportunity exists for free riding and a social dilemma is present, with features common to the impure public good provision problem.

Beyond the traditional research questions “are the game theoretical predictions corroborated by experimental evidence?”, and “what may cause the voluntary disposition to contribute?”, a vast domain remains unexplored. In particular, questions pertaining to “what institutional contexts might hinder or foster voluntary contribution?” stand out as the most pressing.

The basic foundation of any institutional frame for impure public good provision (in the above stated form) or team work, is the distribution rule of collective benefits. The study of the influence of alternative rules and procedures in contexts where the monitoring of individual contributions is unfeasible seems therefore to be the natural starting point.

Raising the issue of the effects of alternative distribution rules on voluntary cooperative dispositions, immediately leads to the relationship between justice concerns and individual attitudes and behaviours, thus pointing to another field for dialogue and collaboration between economists and social psychologists.

The research on the justice motive by social psychologists (see, for example, Tyler 1994), and the abundant experimental evidence from economics show (see, for instance, Fehr and Gächter, 2000) that fairness, or justice considerations, strongly influence choices. In ultimatum games, recipients tend to reject unfair offers at a cost to them, and in public good experiments when opportunities for costly punishment on free riders are created, individual do pay the cost.





Theories of justice developed in social psychology (Tyler, 1994) establish a link between identity and the justice motive: “[...] identity models suggest that people also derive identity-relevant information from their position within groups. The respect that people feel they have within their group [...] also contributes to people’s feelings of self-esteem and self-worth (Tyler, 1994: 185)”. Consequently, “people use evidence that they are receiving distributive, procedural, and retributive justice as an indicator of the quality of their social relationship to the group and its authorities. If people receive unfairly low outcomes, are subjected to rude or insensitive treatment, or fail to have wrongs against them avenged, these experiences communicate information indicating marginal social status.” (Tyler, 1994: 186).

As research in social psychology also shows, the sense of a “marginal social status” may account for a wide range of uncooperative behaviours. Therefore, it may be worth testing the hypothesis that judgements on the justice (injustice) of existing distribution rules may affect the voluntary disposition to contribute to public provision.

Meanwhile, whether the justice motive, in its distributive, retributive, and procedural dimensions is (or is not) an important element in sustaining collective action remains an open question.

## 9. Final remarks

Twenty five years of experimental research in both disciplines have produced an impressive accumulation of coherent results showing that standard game theory does not give a reliable account of observed behaviours in social dilemmas situations.

The finding that voluntary contribution to public goods is somehow related and dependent on group identity should lead to the research of factors that influence its formation.

Based on Bowles and Gintis (1998) some of those factors can be identified as follows: (a) Frequent, non-anonymous and prolonged social relations among the members of a group, which presuppose a “maximal” dimension for the group; (b) Existence of high costs associated with leaving the group (at least from individual point of view); (c) Presence of credible sanctions, which may include the exclusion from the group (ostracism) for those which systematically violate the rules; (d) Well delimited frontiers restricting the access to outsiders; (e) Norms of distribution of material and symbolic resources perceived as legitimate by group members.

On the other hand, answering the question “why do individuals tend to behave in compliance to social norms?” by evoking group identity still leaves unresolved problems. As stated by Davis (2002) “when individuals are seen to be socially embedded in groups, the requirements upon them as members of those groups dictate that their behaviour be explained as [...] *deontologically rational*”. In fact, for the members of the group acting according to its norms may seem to be a moral act. But, as Davis also states “many if not most of the obligations and requirements that groups impose upon individuals have little to do with acting morally”. When Ricoer (quoted in Lopes, 2002: 5) speaks of morality as a “desire of living well with and for others in fair institutions”, the reference to “fair institutions” implies the possibility of an autonomy that gives the individual the capability of judging the fairness of institutions, trying to change them if found unworthy, or ultimately choosing Hirschman’s exit. The unresolved question now is where does this capability come from?

Questions on whether cooperative results in group-contexts (whose identity is partially built by contrast with “other groups”) can be transposed to contexts with no “otherness” or to contexts of inter-group interaction as in global public goods, and on the relevance for economics of a morality that transcends the group are worth identifying. However, the empirical assessment of these questions may be hard to achieve.

**Appendix – Main Features of Reviewed Public Goods Experiments**

Reference Variable	Production function	Payoff function	Domain of Feasible Contributions	Endowments	Communication	Repetition
<b>Marwell and Ames (1997)</b>	Threshold	Non-linear	Continuous	Equal/ unequal	Not allowed	No
<b>Isaac at al (1985)</b>	Linear	Linear	Discrete	Equal	Not allowed	Yes
<b>Kim and Walker (1984)</b>	Linear	Step-linear	Continuous	No endowments	Not allowed	Yes
<b>Andreoni (1988)</b>	Linear	Linear	Continuous	Equal	Not allowed	Yes
<b>Cookson (2000)</b>	Linear	Linear	Continuous	Equal	Not allowed	Yes
<b>Sonnemans et al (1998)</b>	Threshold	Linear	Boolean	Equal	Not allowed	Yes
<b>Andreoni (1995)</b>	Linear	Linear	Continuous	Equal	Not allowed	Yes
<b>Isaac and Walker (1985)</b>	Linear	Linear	Continuous	Equal	Not allowed	Yes
<b>Fischer et al (1995)</b>	Linear	Linear/ unequal	Continuous	Unequal	Not allowed	Yes
<b>Chan et al (1996)</b>	Linear	Non-linear	Continuous	Unequal	Not allowed	Yes
<b>De Cramer and Vugt (1999)</b>	Threshold/ Linear	Step-linear	Continuous	Equal	Not allowed	No
<b>Yamagishi and Sato (1986)</b>	Linear	Linear	Continuous	Equal	Allowed/ not allowed	Yes
<b>Dawes et al (1988)</b>	Threshold	Step-linear	Boolean	Equal	Allowed/ not allowed	No





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