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# Reciprocity: theory and facts

## Introduction to the special issue

Luigino Bruni · Mario Gilli · Vittorio Pelligra

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**Abstract** The importance of reciprocity is not new in economics. Contractual market exchanges and long-run interactions are both situations based on self-interested reciprocal behaviour. However, reciprocity is not only a behaviour but also a motive that sometimes appears to be inconsistent with self-interest. This fact produces a tension between those who try to explain reciprocal behaviour within the standard framework and those who aim at enlarging it with the introduction of additional behavioural principles. This special issue collects a selection of papers presented at the International Conference “Reciprocity. Theory and facts” where the two perspectives were compared and discussed. In this Introduction note we provide first a broad view of the role of reciprocity in economics and then a quick introduction to each of the contributions enclosed in this special issue.

**Keywords** Reciprocity · Social preferences · Behavioural economics

**JEL Classifications** A13 · C9 · C72 · Z13

“There is no duty more indispensable than that of returning a kindness (...) all men distrust one forgetful of a benefit” (Cicero).

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## 1 Introduction

This special issue collects a selection of papers presented at the International Conference “Reciprocity. Theories and facts” organized by the Center in Interdisciplinary Studies in Economics, Psychology and Social Science, the Department of Economics of the University of Milano-Bicocca and the Department of Economics of the University of Cagliari.

In this introductory note we will provide first a broad view of the role of reciprocity for social studies in general and for economics in particular, and then a quick introduction to each of the papers enclosed in this special issue.

## 2 An overview of the role of reciprocity in economics

### 2.1 On the notion of reciprocity

Reciprocity is, at the same time, a new and old word in economics. Since Adam Smith and the classics of the discipline, political economy has been associated with acts of exchange, and exchange implies necessarily some form of reciprocity, if we intend with such an expression a mutual relationship where two or more subjects give and receive either simultaneously or sequentially. For this reason, reciprocity does not reduce to mere altruism or to unconditional gift, or to a simple joint-action. The Latin word *reciprocus*, in fact, means “going back and forth” (*retro-procus*): giving and receiving. In other terms, the underlying meaning is mutual exchange, not logically equivalent to the notion of equal give and take. The opposite concept is that of unconditional behaviour, the search for satisfaction without being under any obligation to give anything in return. Psychology sees this unconditional behaviour as the primitive object relation that characterizes children in their early attachments and that if left ungoverned may later lead to pathologic narcissism. Adults meanwhile substitute reciprocity to this desire for unconditional attachment. Therefore, from a psychological point of view, reciprocity is the standard of behaviour that should characterize the social interaction of normal adults.

For this reason reciprocity is an old word in economics and in general in social sciences. Up to recent time, however, the form of reciprocity with which mainstream standard economics was familiar, mainly the one represented by the market exchange, based on a contractual structure. With the spreading of game theory, economics also developed a second way of looking at reciprocity, the one described and rationalized within the framework of the so-called folk-theorem: in interactions where cooperation is the best long-run strategy but defection and opportunism is the best one-shot strategy, reciprocity can emerge and sustain cooperation if the interactions are repeated for indefinite number of times. If the players know that there is positive, even though small, probability that there will be one further round, they may be motivated to forgo an immediate gain to foster a long standing and more remunerative cooperative relation. In this form, reciprocal behaviour can emerge out of self-interest without the need of assuming other-regarding motives. These two forms of reciprocity (the contractual and the repeated

games one) describe, *de facto*, cooperative behaviour within the standard *homo oeconomicus*'s reasoning. Self-interest is all what we need from a motivational point of view: altruism, intrinsic motivation, fairness (the key words of the “new” reciprocity) are not necessary for this kind of reciprocity.

Indeed, when talking of reciprocity in today's social sciences, scholars normally intend something more than, and often different from, this former view of reciprocity and cooperation. Reciprocity, in fact, turns out to be a much more complex principle that pervades a much wider class of situations than those described both by contractual exchange and by the folk theorem. The papers forming this special issue deal with this “new” reciprocity or, more precisely, with this new way of approaching the notion and the role of reciprocity in social interaction. To distinguish the two ways of studying the topic, the notion of reciprocity analysed by this new paradigm is called “strong reciprocity”.

## 2.2 Reciprocity and self-regarding behaviour

In the last 30 years a new use of the expression reciprocity as a new category of economic reasoning has emerged along with the rise and development of experimental economics and behavioural economics.<sup>1</sup> To acknowledge the novelty of this use of reciprocity does not mean that there were no previous theories of non-self-regarding or altruistic behaviours within economics: a few marginalist economists (Edgeworth or Pantaleoni were among the first at the end of nineteenth century), had in fact hypothesized, without departing from the *homo oeconomicus* paradigm, that agents might undertake actions not motivated by self-regard even in an economic context. Such behaviours, though, were not considered as especially significant in accounting for economic phenomena, which, in turn, were conveniently restrained to the simple but realistic assumption that agents, when operating in the market, do not take into account other agents' well-being or humanity, but only their own.

Empirical and experimental analyses have then brought up a new series of results providing sound and robust evidence of economically relevant behaviours not motivated by self-regard. Cooperative choices registered through prisoner's dilemma experiments (even in one-shot interactions) were among the earliest “anomalies” to be investigated: “Laboratory experiments routinely find that some agents defect but others cooperate” (Samuelson 2005, p. 490).

The tentative explanations of such an “anomaly” draw attention on specific assumptions. One of the earliest theoretical models is Sugden's (1984), which explains voluntary contribution to public goods on the basis of the hypothesis that every agent has her own idea of what amount of contribution ( $\varepsilon$ ) she would like others to give. If the effective contribution is equal or greater than  $\varepsilon$ , then the agent perceives a moral obligation to contribute by at least  $\varepsilon$ : “I shall call this the principle of reciprocity” (p. 775). Sugden's model employs the category of “moral rule” to make sense of the rise of reciprocity: the emergence of cooperation is explained

<sup>1</sup> On the differences between behavioural and experimental economics, both developed in the 1970s, see Bruni and Sugden (2007).

without referring to economic rationality as the ethic rule is seen as an alternative to (economic) “rationality”. In other words, a social norm is rational in a different sense compared to the standard account of rationality (as individualistic and instrumental maximization):<sup>2</sup> in this case the agent does not systematically come to choice through calculation, but conforming—on a rational basis—to an ethic rule, which applies to a wide range of actions (Gauthier 1986). However, these explanations remain within the domain of conditionality: the social norm of reciprocity is not unconditional to other players’ response.

Many, among the first studies on reciprocity, were built on the assumption of altruism, but it soon became clear that mere altruism could not provide an adequate explanation for anomalies, to fit laboratory evidence; they needed assumptions to be more sophisticated from the relational and motivational point of view. It is in this light that through the 1990s principles such as *warm glow* (Andreoni 1990), *iniquity aversion* (Fehr and Schmidt 1999), *trust responsiveness* (Pelligra 2005), *team-thinking* (Sugden 1993; Bacharach 1999) and others<sup>3</sup> were introduced. One of the first authors who formally incorporated the concept of reciprocity in a theoretical model was Rabin (1993). Using psychological game theory, developed by Geneakoplos et al. (1989), Rabin formalises his key idea in the very first lines of his now classic work appeared in the *American Economic Review*: “People may care not only about their own well-being, but also about the well-being of others. Yet psychological evidence indicates that most altruistic behaviour is more complex: people do not seek uniformly to help other people; rather, they do so according to how generous these other people are being” (Rabin 1993, p. 1281). According to this theory, it is not the case that agents are generous (or non-generous) vis-à-vis anyone, but instead they show a certain degree of conditionality and selectivity in their reciprocating action: “Indeed, the same people who are altruistic to other altruistic people are also motivated to hurt those who hurt them” (Rabin 1993, p. 1281). People, thus, “react” in different ways to others’ behaviour depending on the intentions they attach to it. The same move can be read as *helping* or *hurting* depending on the alternatives available to the decision-maker when the choice is made. This is the reason why the role of *intentions* is particularly important in Rabin’s work and in the literature on reciprocity in general. In his equilibrium model, he proposes a simple set of equations representing the mechanism adopted by the agent as she tries to figure out other agent’s intentions and to assess her *degree of (un)kindness*. The agent does not only consider the way in which the other has in fact acted, but also examines what she could have done and did not (the other feasible options). Rabin’s theory of psychological games, both in the original and in the versions that were later extended to dynamic contexts, has undergone extensive development and has been subject of experimental applications.<sup>4</sup>

<sup>2</sup> Elster (1989) and Hollis (1998) both aim at establishing a kind of social rationality different from economic rationality, in order to explain the rise of cooperation in a market context.

<sup>3</sup> For a recent and convincing review, see also Sobel (2005), while among the first economists to study reciprocity in economics was Kolm (1984).

<sup>4</sup> See for example Attanasi and Nagel (2007), Battigalli and Dufwenberg (2005), Dufwenberg and Gneezy (2000), Dufwenberg and Kirchsteiger (2004), Guerra and Zizzo (2004), Kolpin (1992).

### 2.3 The role of empirical evidence

Rabin's theory was originally based on assumptions he describes as "stylized facts", that is, folk-psychological generalities observed in everyday situations. However, the methodological turning point for economic studies on reciprocity has been, in recent years, the abundant empirical results obtained through carefully designed laboratory experiments which, as mentioned above, have led to question the paradigm of rational egoism. A rather less aprioristic and more pragmatic approach has consequently emerged for the purpose of studying the real behaviour of people.

This experimental literature has produced new models and theories, providing the essential tools for game theory and decision theory, and in general for the analysis of behaviour. In such theories, reciprocity is seen as a phenomenon to assess empirically and, at the same time, as a theoretical assumption aimed at explaining *anomalies* in theories built on self-regarding behaviour. Experiments with numberless variants of the *gift-exchange game*, the *public-good game*, the *ultimatum game* and the *dictator game* have shown behaviours in which players tend to trust and to respond more generously than rational choice theory would predict, and reciprocity plays a central part in all of them. In particular, many experiments indicate that economic agents (at least in laboratory interaction) are willing to accept lower monetary returns to reward or punish other players on the ground of a norm of reciprocity.

One explanatory variable of many theories on reciprocity is *fairness*: the other player is rewarded (or punished) according to the persuasion that she behaved fairly (or unfairly) in the first place. Therefore, in this approach, *intentions matter*.<sup>5</sup> This position, however, has to be distinguished from other theories of fair behaviour where (un)fairness concerns refer to the outcome of interaction<sup>6</sup> and not the action itself. In this distributional account of fairness, people are willing to forgo some money to produce a more egalitarian distribution of payoffs. The main difference between this account and the theories of reciprocity is that in the context of the former agents are essentially forward-looking, while reciprocators are backward-looking agents capable of sophisticated forms of counterfactual reasoning.

### 2.4 Behavioural economics and reciprocity

This first and influential work by Rabin was later extended into a *Theory of Reciprocity* (2006) by Armin Falk and Urs Fischbacher of the University of Zurich,

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<sup>5</sup> The key element in Rabin's theory is the existence of a "psychological" pay-off in addition to the monetary pay-off when the player plays kind (whereas in monetary terms she would be better off by not trusting the other). The idea of the psychological payoff has been disputed by those who, like Binmore for example, endorse a "revealed preferences" approach (if an agent has chosen a strategy, this reveals, ex post, what she prefers). As a matter of fact, if we interpret payoffs not in monetary terms but in *utility* terms, the distinction between material and psychological loses its analytical meaning (although it conserves a hermeneutical value). On this topic see also Battigalli and Dufwenberg (2005), Pelligra (2005).

<sup>6</sup> Fehr and Schmidt (1999) and Bolton and Ockenfels (2000).

who are among the leading contributors to the “strong reciprocity” theory<sup>7</sup> Their model, just like the one they adopt from Rabin, ascribes a key role to intentions. Yet, as they point out, “intentions alone cannot be the whole story” (Falk and Fischbacher 2006, p. 298). They assume that players’ utilities depend on the payoffs achieved and on the *kindness* and *reciprocity* they perceived during the game. Falk and Fischbacher, like many other economists who have worked on this subject, use the terms “positive reciprocity” and “negative reciprocity” to refer to *a kind response to a kind action* and to *a hostile answer to a hostile action*, respectively. They also observe that these responses, be they kind or unkind, in the case of reciprocity cannot be explained on the account of self-regarding preferences merely directed at material gains.<sup>8</sup> The results of the “Zurich school” suggest that reciprocity is in fact a kind of rule, able to promote cooperative relationships resulting in an increase of collective well being, especially in those contexts in which it is not conceivable or possible to work out a contractual constraint.

## 2.5 Collective action and reciprocity

Many other models incorporate the principle of reciprocity in the setting of voluntary contribution to public goods.<sup>9</sup> In a “public good game” each person is endowed with a certain stock of money and she has to decide the amount of her stock she wants to contribute with to the public pot (the public good). Every player, at the end of the game, will be rewarded with her own contribution and with part of the total contribution to the public pot, on condition that a minimum amount has been achieved for the realization of the public good. This game can also be interpreted as a prisoner’s dilemma game with  $n$  players, where each player has non-cooperation as her dominant strategy, necessarily resulting in a non-cooperative outcome. Experimental results have shown instead that very few players behave according to standard economic theory, whilst many decide to contribute from the first round of the game. If the game is one-shot then players tend to contribute on average with half of their initial endowment. In repeated games, though, a declining proportion of public contribution is observed after half of the rounds have been played, until the last round in which the amount contributed drops to zero. Some authors explain this behaviour with “learning”, assuming that players do not initially realize that non-cooperation is more profitable, but round after round they eventually understand that non-contribution is the unique rational strategy. Such an explanation, nevertheless, does not account for the fact that when the game is run

<sup>7</sup> The two authors particularly stress one innovative aspect of their theory (partly deviating from Rabin’s), as they claim that it «explains the relevant stylized facts of a wide range of experimental games. [...] Further, the theory explains why subjects behave differently in treatments where they experience the actions of real persons compared to treatments where they face “actions” caused by a random device. [...] Finally, the theory explains why in bilateral interactions outcomes tend to be “fair” whereas in competitive [and anonymous] markets even extremely unfair distributions may arise» (Falk and Fischbacher 2006, p. 293).

<sup>8</sup> They also make a point on the differences between reciprocity and inequality aversion.

<sup>9</sup> Many among the strong reciprocity models are set in the context of public good games (see Bowles and Gintis 2004).

again with the same subjects (so-called “re-start effect”), the level of contribution still tends to reach about half of one’s endowment (Gintis 2000, p. 317). Andreoni interprets this anomaly in the light of the category of reciprocity: the reciprocators planning to behave according to this rule start by contributing but, if free riders persist with their strategy, they can only punish them in one way, that is to say by not cooperating (not contributing). When the game is restarted, they hope that reciprocity will prevail and therefore they choose to contribute again: if, however, free riding occurs again, a punishment is delivered: “Social norms tend to be self-enforcing, punishing those who do not comply with them” (Andreoni 1988, p. 301). Andreoni’s theory seems to be confirmed by the circumstance that in the public good game, when retaliation, that is, the opportunity to punish by other means than defection, is allowed, players choose other available punishments rather than interrupting their contribution (Gintis 2000). Moreover, in the experiments carried out by Fehr and Gächter (2000) in which participants are guaranteed that punishment towards defecting players will not bring them any future benefit (because games are not repeated and there is no random matching), retaliatory behaviour is nonetheless observed; this might serve to answer the potential objection of those who claim that the punishment of defecting subjects might be strategic and instrumental to one’s own advantage, and hence that it could be explained in terms of pure self-regard, with no need to call upon reciprocity.<sup>10</sup>

### 3 The articles of this special issue

This special issue, that collects some of the papers presented at the Conference “Reciprocity. Theories and facts”, intends to offer in a compact form an overview of different approaches, methods, perspectives, theories all dealing with the issue of reciprocity. The aim of the Conference was to gather scholars that considered reciprocity (1) an instance of enlightened self-regarding behavior favoured by repeated encounters, or (2) as “strong reciprocity”, a social norm that prescribes cooperation with cooperators and punishment for non-cooperators even at personal cost but also (3) a form of joint action grounded on collective intentionality. Each of these perspectives seems to consider the other as a special case not particularly relevant in social matters. Therefore by organizing the Conference we tried to convene economists, as well as political scientists, anthropologists, neuroscientists and psychologists, to initiate a dialogue that confront these different approaches, to show that there can be important complementarities between the different ways of understanding reciprocity. This cooperation was aimed at overcoming the

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<sup>10</sup> Fehr and Gächter (2000) have carried out several experiments in the attempt to explain and verify reciprocating behaviours. In particular they have come to the following significant conclusions: (1) reciprocity has been observed also in one-shot games and in contexts in which it is “costly” to implement; (2) reciprocating behaviours are displayed also when agents ignore the identity of the subjects they are interacting with (anonymity); (3) reciprocity has also been ascertained when players are guaranteed that their behaviour cannot be observed; (4) reciprocating behaviours have also been reported when monetary payoffs are particularly high. For a review see Sobel (2005) and Bowles and Gintis (2004). Pointedly, the key question arising from these experiments is: what *kind* of reciprocity are we talking about?



traditional disciplinary boundaries that have thwarted attempts to develop generally valid models of human behaviour, combining and now offering to the readers different insights from different disciplines. Therefore this special issue is to be ascribed to a general movement towards a transdisciplinary search for a common understanding of the reasons and the effects of reciprocal behaviour in social settings. The reasons to stress a multidisciplinary approach to these problems is twofold:

1. As a powerful heuristic device for generating new and interesting questions and ideas through odd and original associations and analogies;
2. As a knowledge machine that tries to provide a unified theory of real phenomena.

As a consequence of these two theses we believe that interdisciplinary studies can deliver something that disciplinary science cannot, because the different social disciplines are not substitutable ways of looking at the social world but complementary structures that we should try to synthesize to get more powerful tools to understand individual behaviour, social interaction and social outcomes.

Following this methodological approach we have decided to collect in this present special issue a rich range of different disciplinary approaches to the topic of reciprocity. To help the reader, we provide a sort of map, grouping the papers in four different sections according to their approach.

### 3.1 General methodological views of reciprocity

In the first part we have a collection of papers that set forward the analysis by eviscerating the concept of reciprocity and by casting light on many of its facets.

**Crespo** notes that reciprocity is not characterized by the return of things of “same value” as it is the case of other exchanges but it rather requires a certain equilibrium in the reciprocated things that often result in an overabundant return up to the point that the reciprocated things are often heterogeneous and incommensurable to the original one. Crespo argues that these reciprocal exchanges have less to do with the mean of what is indeed exchanged and more with the values that the exchange conveys and that is of some meaning to the parties involved. In other words, reciprocity is about the ends and not the means of the exchange.

A reciprocating behaviour is nowadays often juxtaposed to a self-interest one. **Theocarakis** goes back at the Aristotelean concept of reciprocity to neglect such a dichotomy and observes instead that the concept of reciprocity as exchange of equivalents was central in the Aristotle’s *Nicomachean Ethics* to the solution of business transactions. Also classical economists adopted the notion of equivalent exchange and self-interest eventually replaced reciprocity only after the advent of the marginalist school.

**Castelfranchi** stresses, from a cognitive standpoint, the differences and the similarities between the concept of trust and the one of reciprocity with which it is often confused.

The attitudes towards reciprocity that emerges from the experimental evidence, the rise of the *homo reciprocans* is hardly reconcilable with the paradigm of the *homo economicus* that has dominated economics in the twentieth century. **Wilson** and **Dixon** draw a parallel between the current challenges to the dominant paradigm and the almost three centuries old debate that led from the Hobbesian *homo homini lupus* (that called for the Leviathan) to the Smithian's *theory of moral sentiments* where the Scottish author set forward a theory of the human interaction that is intrinsically other-regarding since—Hobbes shows this so well—a co-ordination based on calculation is the road to mutual ruin.

### 3.2 Economic approach towards reciprocity

**Fiddick** builds on evidence coming from the psychological literature to confute Gintis' (2000) analysis for which strong reciprocity emerges to assure group survival even if it comes at the expenses of individual reciprocators. Fiddick sees reciprocity instead as emerging from the natural domain-specific competence for social cooperation that is distinct from prudential competence in dealing with potential hazards.

**Caruso** constructs a variant of a common contest model where two agents evaluate differently a contested stake where parties can invest in conflict management. While under asymmetric evaluations the cooperation is deemed to fail and conflict can be avoided only in limited cases through unilateral concessions, when instead the evaluations of the stake converge, reciprocal concessions can sustain cooperation.

**Randon, Bruni** and **Naimzada** build a dynamic model of relational goods that are produced by the current and past individuals' investments in socializing. The different outcome equilibria crucially depend upon the different individual attitudes towards the consumption of material or non-material goods and upon individual past behaviour. In particular they show the existence of a low-socializing trap with almost a null consumption of relational goods that can be reached if the system takes off with a poor socializing background.

### 3.3 Experimental economics and reciprocity

**Grimalda, Kar** and **Proto**'s experiment confronts two 3-player ultimatum games. In the first monocratic game, one player is randomly picked to make an offer while in the democratic game all the three players make an offer and only after the valid one is picked randomly. In both cases the proposal is implemented by a majority rule. Grimalda et al. observe that under the democratic rule, players make more fair offers and are less willing to accept uneven ones.

The experiments of **Farina** and **Sbriglia** are divided in two stages. In the first one, players are sorted out into three main social groups *selfish individuals*, *pure altruists* and *reciprocators* according to their behaviour in a two-stage trust game. In the second stage subjects, informed about their co-players' social preferences, play a repeated six-move "centipede game" with an increasing final

payoff. The game is played both between homogeneous and heterogeneous social groups. The results contradict previous literature (Gächter and Thoni 2005): heterogeneous groups end up to be more cooperative. The authors argue that this counterintuitive result may be explained by the sequential nature of the game that induces selfish players to try cooperation and this reinforces the behaviour of non-selfish types.

### 3.4 Social sciences and reciprocity

**Iannello** and **Antonietti** studied the attitudes of players in an ultimatum game to make and accept offers as depending upon certain important aspects of the interaction between the parts. To assess their offers, proposers rely on important psychological traits such as honesty, sense of justice and personal dignity of responders and tend to cast their offer upon their perceived likelihood of acceptance by their counterpart. Moreover, they disentangled offers formulated through analytical vis-à-vis intuitive processes and showed that, when forced to proceed intuitively, proposers tend to make fairer offers.

The paper by **Arena** and **Conein** analyses the role of reciprocity in the rising and development of virtual communities. Why do people, consumers or firms take part to these communities? Traditional explanations that refer generally to the participation constrains of individuals to organizations still hold but more emphasis needs to be paid vis-à-vis notions of reciprocity, we-thinking rationality and collective acceptance.

Finally **Axel** employs the concept of reciprocity to describe three types of power-relations that characterize the recent history of Africa: clientelism, colonialism and cleptocracy. Clientelism is in fact based on the implicit feudal pact that obedience is reciprocated with protection; colonialism scattered out the vertical often personalistic and clan-centric sort of vertical reciprocity and substituted it with a more state and ethnic centric type that however ended-up crowding out the moral boundaries between gift exchange, market deals and administrative performance and fuelled the current state of cleptocracy that characterizes many East-African societies today.

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## References

- Andreoni J (1988) Why free ride? Strategies and learning in public goods experiments. *J Public Econ* 37:291–304
- Andreoni J (1990) Impure altruism and donations to public goods: a theory of warm-glow. *Econ J* 100:464–477
- Attanasi G, Nagel R (2007) Psychological games: theoretical findings and experimental evidence. In: Innocenti A, Sbriglia P (eds) *Games, rationality and behaviour: essays on behavioural game theory and experiments*. Palgrave MacMillan, Houndmills/New York

- Bacharach M (1999) Interactive team reasoning: a contribution to the theory of co-operation. *Res Econ* 53:117–147
- Battigalli P, Dufwenberg M (2005) Dynamic psychological games. IGIER Working Paper No. 287
- Bowles S, Gintis H (2004) The evolution of strong reciprocity: cooperation in heterogeneous populations. *Theor Popul Biol* 65:17–28
- Bolton G, Ockenfels A (2000) ERC: a theory of equity, reciprocity and competition. *Am Econ Rev* 90:166–93
- Bruni L, Sugden R (2007) The road not taken. How psychology was removed from economics and how it could be brought back. *Econ J* 117:146–173
- Dufwenberg M, Gneezy U (2000) Measuring beliefs in an experimental lost wallet game. *Games Econ Behav* 30:163–182
- Dufwenberg M, Kirchsteiger G (2004) A theory of sequential reciprocity. *Games Econ Behav*, 47:268–298
- Elster J (1989) *The cement of society*. Cambridge University Press, Cambridge
- Falk A, Fischbacher U (2006) A theory of reciprocity. *Games Econ Behav* 54:293–315
- Fehr E, Gächter S (2000) Cooperation and punishment in public goods experiments. *Am Econ Rev* 90:980–999
- Fehr E, Schmidt KM (1999) A theory of fairness, competition and cooperation. *Q J Econ* 114:817–868
- Gächter S, Thöni C (2005) Social learning and voluntary cooperation among like-minded people. *J Eur Econ Assoc* 3:303–314
- Gauthier D (1986) *Morals by agreement*. Oxford University Press, Oxford
- Geneakoplos J, Pearce D, Stacchetti E (1989) Psychological games and sequential rationality. *Games Econ Behav* 1:60–79
- Gintis H (2000) Beyond homo economicus: evidence from experimental economics. *Ecol Econ* 35:311–322
- Guerra G, Zizzo DJ (2004) Trust responsiveness and beliefs. *J Econ Behav* 55:25–30
- Hollis M (1998) *Trust within reason*. Cambridge University Press, Cambridge
- Kolm SC (1984) Théorie de la réciprocité et du choix des systèmes économiques. *Revue Econ* 35:871–910
- Kolpin V (1992) Equilibrium refinements in psychological games. *Games Econ Behav* 4:218–231
- Pelligra V (2005) Under trusting eyes: the responsive nature of trust. In: Sugden R, Gui B (eds) *Economics and social interaction: accounting for the interpersonal relations*. Cambridge University Press, Cambridge
- Rabin M (1993) Incorporating fairness in game theory. *Am Econ Rev* 83:1281–1301
- Samuelson L (2005) Foundations of human sociality. A review essay. *J Econ Lit* 43:488–497
- Sobel J (2005) Interdependent preferences and reciprocity. *J Econ Lit* 43:392–436
- Sugden R (1984) Reciprocity: the supply of public goods through voluntary contributions. *Econ J* 94:772–787
- Sugden R (1993) Thinking as a team. towards an explanation on non-selfish behaviour. *Soc Philos Policy* 10:69–89