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*Reciprocity, Altruism and the Civil Society: In Praise of Heterogeneity*, Luigino Bruni. Routledge, 2008, xiii + 158 pages.

Luigino Bruni, Professor of Economics at the University of Milan-Bicocca, outlines in this book a new theory of reciprocity, understood as the bond or cement of society. A historian of thought with expertise in economic and social theory, Bruni is convinced that nothing can be said on this subject without taking game theory seriously (p. xiii). The book stands thus on a tripod: one foot on history, one on conceptual or theoretical analysis, and a third one on mathematical calculations of expected utility and evolutionary dynamics (with help from Alessandra Smerilli). Synthetic or bridge-building efforts like this one are welcome in today's highly compartmentalized scientific enterprise, although they risk leaving specialists in each field unsatisfied. Game theorists, for example, are unlikely to find anything new in the game theory used. However, game theory is only instrumental to the goal of the book. Its main message concerns a theory of reciprocity. The attempt to present a unified theory of the diverse forms of reciprocity is already, in my opinion, a durable contribution. Readers interested in a synthetic perspective will find the book rewarding. This review presents the main outlines of the theory and makes some critical considerations to the inclusion of unconditional reciprocity among its forms.

As Bruni notes, economic theory has tended to reduce all social bonds and relations to forms of contract, whereas social theory has seen contracts as opposed to, and destructive of, genuine social bonds. Bruni sees these contrapositions as ideological ('left' against 'right', p. xi). His main goal is to overcome them; to show that three forms of reciprocity, covering the ideological spectrum from left to right, are complementary and simultaneously required in a healthy society. These three forms are, in his words: '(1) the reciprocity of contract or 'cautious'; (2) the reciprocity of friendship or *philia* and (3) the 'unconditional' reciprocity, the one more controversial . . .' (p. x). In a sense, the book can be seen as an ingenious argument based on game theory to prove their complementary nature

against ideological contrapositions. To judge from a biographical anecdote (p. 91), it seems that Bruni himself suffered earlier from ideological bias and that he managed to overcome it through reflection on reciprocity. This must have been an important motivation for writing the book.

The first five chapters combine historical and theoretical analysis. The main claim is that, while economic theory has been dominated by a tradition that emphasizes instrumental rationality and leaves little room for relational goods and non-instrumental forms of rationality, social theory has often been drawn into the opposite mistake of banning instrumental rationality altogether from social theory. Bruni delineates a short history in chapter two. Mainstream economic thought, represented by theorists like Smith, Pareto and Wicksteed, conceived of the market as based on the reciprocity of contract. Antonio Genovesi, for one, had a different conception of the market as supported by the reciprocity of trust and friendship, but this conception never became mainstream. Genovesi did not oppose market and trust, but thought of them as enjoying a mutual connection. This is the idea that Bruni wants to pursue. While the critique of *homo economicus* is already a commonplace in our intellectual milieu, Bruni sees a difference between those social theorists who practice criticism as opposition to, and rejection of, contract reciprocity (Latouche, Polanyi, Kolm) and those who consider different forms of reciprocity and rationality as complementary. In this camp, Bruni locates social theorists and philosophers like Hollis, Sugden, Nussbaum and others.

He also situates himself within this latter camp. He intends to rehabilitate contracts and markets among social theorists who often view them as a corrupted version of reciprocity. But he has a similar message for those in his own camp, and likes to see his contribution as original also in this respect. Bruni sets out to prove the necessity of unconditional reciprocity for a healthy society '. . . a fully civil life is impossible . . . *without* . . . forms of unconditional behaviour' (p. xi, italics in original). This is in many ways an ambitious goal, for unconditional reciprocity does not even look like reciprocity in the first place. And ingenious, in any case, is to set out to show this with the tools of game theory.

A theoretical absence that weighs heavy on the book is the exclusion of indirect reciprocity and punishment from the overall project (p. xii). Appendix 1 contains a short review of the literature on punishment, but it does not replace a proper discussion of the role of punishment in a society based on reciprocity. Some readers will suspect in this absence and in Bruni's predilection for unconditional reciprocity the persistence of some ideological bias (91). For as we shall see, it is at least an open question whether some of the indispensable functions that are assigned to unconditional reciprocity could not be carried out by punishment instead.

Chapters three, four and five contain theoretical analyses and definitions of the three basic forms of reciprocity investigated in the

book. The first two forms, the reciprocity of contract and that of *Philia* or friendship, share the characteristic of being conditional. The difference is one of degree. The reciprocity of contract is pictured as unwilling to forgive or to risk: it is designed never to lose or sacrifice anything. This is the reason for the label: 'cautious reciprocity' (C). C evokes STFT (Suspicious tit for tat), a strategy introduced in one of the follow-up papers (Boyd and Lorberbaum, 1987) to Axelrod and Hamilton's seminal 1981 analysis of reciprocity as Tit for tat (TFT). Like STFT, C defects in the first round. C and STFT behave like ALLD (always defect) when playing against their own kind. ALLD receives from Bruni the label 'N': it never cooperates. C is rational in an environment of distrust and conflict, for example, in a Hobbesian state of nature (34). A sort of first theorem emerges here: *In a population of C or C + N agents, cooperation outside or without contracts never evolves* (35, 38). C strategists are 'sleeper reciprocators'. It is a bit odd that, throughout the book, Bruni invites us to conceive of C reciprocity as interacting with others outside contracts and their enforcement. But C reciprocity is precisely contract reciprocity; and one of its central characteristics is enforceability (31). In other words, it responds to punishment or to the threat of it. The decision to exclude punishing strategies from the discussion is at least questionable. Arguably, the case for the necessity of unconditional reciprocity profits from this exclusion. Unconditional reciprocity is sold as the only strategy that can lead C into reciprocating. But we shall see that other possibilities are available.

*Philia* differs from C reciprocity in its willingness to forgive and to risk unilateral moves of reciprocity or cooperation. It cooperates in the first move, like TFT and forgives, like TF2T (One tit for two tats). For simplicity, it is equated with TFT (43 and note 14). Bruni labels it 'brave reciprocity' (B) and remarks that it exhibits a 'degree of unconditionality', but only a degree. No friendship can be wholly unconditional. A sustained lack of response from the partner kills friendship. So B reciprocity remains conditional. B reciprocity is, moreover, conditional not only on the behaviour, but on the motivation of the partners. There can be no friendship between partners with unequal motivations. Bruni argues that no cooperation or reciprocity can exist between B and C, because C does not exhibit the required motivation. This determines a deficiency in friendship that is decisive for the argument: its inability to activate C agents into reciprocity (45). Although this follows from the motivation condition, it is less understandable from the rules that govern C and B, which have been described as versions of the conditionality typical of TFT (see p. 34 for C; p. 43 for B). If the dyadic games are simultaneous, interaction between B and C should take the form of an indefinite alternation of cooperation and defection (assuming no errors). Bruni seems to think that B throws a cooperative move in the first round, C a cooperative move on the second (where B defects) and thereafter they both defect as long as the game

lasts (63f; 79–80). But this pattern of continuous defection does not follow from TFT-like strategies in simultaneous games. Moreover, if games are sequential and B starts moving, rules of conditionality perfectly allow uninterrupted cooperation between them (assuming no errors). What is happening here? Bruni excludes sequential games, though we only learn this late in the book (see appendix 1, p. 102). If you are modelling society, this is suspiciously arbitrary. Moreover, in the case of simultaneous games, the pattern of cooperation Bruni describes only follows if B behaves like a strategy known as Grim-Trigger, which defects forever after one defection of its opponent. This important piece of information is only disclosed in note 3 to appendix 2 (147–148), at the end of the book. Surely, not the best arrangement; it should have surfaced already in chapter 4.

Regarding unconditional reciprocity, the main conceptual task is to show that it is a form of reciprocity. If cooperation is no longer conditional upon a reciprocal response, how can it be understood as reciprocity instead of as unilateral altruism? Bruni explains that reciprocity is not required for the agent to choose to cooperate; but it is required for the agent to experience 'full satisfaction'. As an example, artists act unconditionally, on 'vocation', but they are not fully satisfied if they receive no response from an audience (48). The welfare of the agent, if not her choice, is affected by the presence or absence of response (50). In this sense, interaction remains important. In contrast to B reciprocity, gratuitousness (i.e. unconditional or G reciprocity) is anti-elective and universalistic: it does not demand the equality of the partner. Bruni sees here the ground for G's ability to elicit cooperation from C. It is worth noting, critically, that this claim follows from a psychological conception of B, C and G. The attitude of B agents towards C agents depends on how the motivations of C are judged; more precisely, on the psychological interpretation that is projected into cautiousness. As an alternative to Bruni's projection, cautiousness could result from a pure circumstantial fear of being a sucker. C is cautious out of fear; but when it cooperates, an 'intrinsic' joy of cooperation could move it, as B requires.

Choice of G is psychologically explained by the idea of an 'intrinsic reward', or valuing cooperation for its own sake. This represents a reason for choice that transcends the estimation of consequences. Deontological ethics and the ethics of virtue emphasize this dimension; but evolutionary dynamics shows that the consequences are also important. The ethics of social responsibility requires paying attention to the social results of action (57). This is the rationale underlying the limitation of reward $\varepsilon$ to providing an explanation of choice in the model, and not letting it represent the utility of outcomes. For in the real world outcomes are only affected by the payoffs that are external and the same for all, regardless of 'intrinsic' rewards. If $\varepsilon$ is understood as payoff affecting outcomes and $\varepsilon > c$, then $b - c + \varepsilon > b$: the payoff for mutual cooperation is greater than the payoff for temptation

(R > T). This entails that the game is no longer a PD (56). ALLC would always win the evolutionary dynamics relating to the provision of public goods, despite its loss in material fitness. Nothing can be farther from real life.

At this point Bruni throws an idea that is interesting but remains unexploited in the book. The value of $\varepsilon$ can be interpreted as varying along a continuum. B can be interpreted as a strategy where $\varepsilon$ has a lower value than $\varepsilon$ has in G, and C as a strategy where $\varepsilon$ has an even lower, but still positive, value. Even N could be so interpreted, such that the value is so small that it is overridden by the gains of cheating. Thus, $\varepsilon$ is not a binary variable, but varies along a continuum (52), and so do all strategies, from N to G: there is '... no difference in nature among the various strategies of reciprocity, but only a difference in degree' (54). This allows for interpreting even G as conditional, with a high but yet finite value for $\varepsilon$, meaning that there is a limit to the lack of response it tolerates and that it is not indefinitely exploitable by N. A high value of $\varepsilon$ makes G much more generous and forgiving than B. In fact, if B is equivalent to TFT, or to Grim-Trigger, it is hardly generous or forgiving. Many authors have convincingly argued that more generous and more forgiving, yet conditional, strategies do better than TFT. Nonetheless, Bruni tries to argue for (absolute unconditional) G in note 19 to chapter 6. G, though redundant, is more general and capable of activating even more cautious Cs, those that only cooperate after experiencing $n$ rounds of cooperation. But still, less than absolutely unconditional G is required to elicit cooperation from any such variant of C. Intuitively, only a relative, not an absolute, unconditional character would be needed in societies where crises make the cost of cooperation (c) high and the probability of repeated interaction ($\pi$) low, negatively affecting the prospects of cooperation through reciprocity. In this case, only agents with a high, yet finite, $\varepsilon$ would keep cooperation going. Would this however affect the outcomes and help reciprocity thrive in the evolutionary dynamics? In the important case where $\pi$ is low because of the fear of disbandment, agents with a high value of $\varepsilon$ would also cause a higher value for $\pi$, which would certainly affect the outcome.

In chapter six Bruni calculates utilities and the winner strategy in repeated dyadic games with a PD structure. Interactions are random between two strategies at a time, where each strategy interacts with itself and the other at fixed frequencies. The social worlds investigated are dyadic ones composed of B and N, B and C, and G and C respectively. B can beat N if it is above a certain threshold; a result that Axelrod and Hamilton had established for TFT. B beats C because B cooperates with itself, whereas C cooperates neither with itself nor with B (B is here Grim-Trigger). In the world composed of G and C, these cooperate mutually

except in the first interaction, where G cooperates unilaterally. When G is at a low frequency it beats C, due to the fact that C interacts mostly against itself and obtains nothing. But when G is at a high frequency, their utilities converge towards equality.

Chapters seven and eight complicate the social world. Worlds are now composed of three and four types of agents respectively, each interacting randomly with itself and with the others in dyads. Utility (evolutionary dynamics also in chapter seven and the appendices) for each strategy is calculated for dyadic interactions in PD games. In the world with three strategies (N, B, G) the important result of the calculations is that high frequencies of G (e.g. 1/3) are bad for the fate of cooperation: this is because N profits immensely from exploiting G, whereas B achieves against G only the second best payoff. With low frequencies of G (e.g. 1/10) in contrast, a combination of B and G beats N and drives it to extinction in the evolutionary dynamics. This shows that too much unconditional reciprocity is bad, but a small amount is good. C is introduced in the social world again in chapter eight. This device serves the purpose of showing how important C can be for the fate of G: again, if G is fixed at 10%, the result is that B and G can beat N for high values of $\pi$. The novel result in relation to the previous chapter is that when the net benefit of cooperation (b–c) is high enough, G can even obtain the best performance beating both B and N (83). Perhaps to the astonishment of right and left, game theory shows how G and C are best allies in the social world. This happens because, as Bruni has defined the strategies, neither N nor B can extract a benefit from interaction with C; but G, and only G, can.

In this way Bruni is able to make his point about the need for the unconditional type if cooperation is to have a chance even in harsh times, where most cooperators can turn cautious. But, to return to the point made critically above, unconditional reciprocity need only be relative, not absolute, to achieve this. To the possible objection that this sort of B reciprocity would not cooperate with the C-type, the retort shall be made with a psychological consideration. Cautiousness will sometimes indicate the fear of being a sucker, determined by negative previous experiences. It does not necessarily reflect a lack of joy in reciprocity for its own sake. In this case B agents can happily engage in B-reciprocity with C agents. On the other hand, cautiousness may well indicate quite a different psychological turn of mind: a calculating disposition, intent on greedily grabbing any opportunity for free riding. Remember Trivers: individuals are untrustworthy *'who initiate altruistic acts out of a calculating rather than a generous-hearted disposition'* (1971: 51). This disposition is certainly not adequately met with generosity, but with punishment. An argument could thus well be made that a healthy society, to be able to work properly, does not require unconditional reciprocity, but only B reciprocity with a varying

and flexible degree of generosity (unconditionality) together with constant vigilance and punishment.

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*Representation and Structure in Economics*. *The Methodology of Econometric Models of the Consumption Function*, Hsiang-Ke Chao. Routledge, 2009, xiv + 161 pages.

In the last decades, concepts such as 'representation' or 'structure' have been widely debated by philosophers of science, notably in the quarrels between scientific realists and antirealists. Chao's book *Representation and Structure in Economics* adds to this literature. His contribution at once fits well into the philosophy of economics and into general philosophy of science. This is because Chao specifically deals with the methodology of econometric models, and within this context he raises epistemological questions that have been debated in other fields such as the natural sciences. This work is therefore an interesting and valuable attempt to bridge the scientific literature in economics and econometrics with the philosophical literature on scientific realism, which, as a matter of fact, dealt mainly with physics and the natural sciences, rather than the special sciences.

The title announces precisely what to expect in the book: a thorough analysis of the notions of representation and structure in economics. Even more precisely, the subtitle specifies that the particular area of interest will be the methodology of econometric models of the consumption function. As a general rule, it is better to analyse a particular domain systematically and then try to draw general lessons out of it. Chao scrupulously follows this precept, narrowing down the focus to the consumption function. Yet, having reached the end of the book, the reader is left wondering to what extent the results achieved can be extended to economics and econometrics more generally – the case for the analysis of consumption function as being paradigmatic of econometric methodology is understated.