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Reciprocity, Exchange and Redistribution.
An experimental investigation inspired by Karl Polanyi's *The Economy as Instituted Process*[1]

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Abstract

Inspired by Karl Polanyi's writings on three allocation modes, namely reciprocity, exchange and redistribution, we first tested a reciprocity ring with ten players. The baseline treatment, with no possibility of socialisation, displayed very low levels of allocative efficiency. Consistently with the Polanyian approach to reciprocity, we found that inducing the notion of symmetry among the players increased efficiency levels significantly. We then simulated a market exchange, with significant allocative efficiency gains. We conclude that indirect-reciprocity rings among anonymous players can seldom function in the absence of definite institutional refinements, promoting forms of symmetry-acknowledgement.

Key Words: Reciprocity, Redistribution, Exchange, Comparative Institutional Analysis.

JEL codes: Z13, D02, C91.

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"Further significant advance in economic history requires that we succeed in defining and explaining the different allocation systems that have characterised economic organisation in the past five millennia. It was Karl Polanyi's intuitive genius that he saw the issues" (North, 1977: 715).

Introduction

The experimental investigation presented in this paper was inspired by an intuition, a permeating one in substantivist economic anthropology, that the institutional environment at large shapes individual decisions. The paradigmatic proponent of such an approach was Karl Polanyi (1886-1964), whose intuitions on three allocation modes in history form the theoretical starting point of our study.

The paper is organised as follows: Section 1 briefly discusses Polanyi's writings on three allocation systems, and illustrates the use we have made of Polanyi's works for our experimental investigation. The core idea is to test, in an artificial environment, the allocative efficiency of two of the three allocation modes described by Polanyi, i.e. reciprocity and market exchange, leaving aside for the moment the third, namely redistribution. Section 2 discusses the experimental literature on indirect reciprocity and illustrates the experimental design. Section 3 describes the results. Section 4 illustrates a market exchange game that we used as a comparative tool with respect to the reciprocity game. Final remarks follow.

1.1 Notes on Polanyian economic anthropology

The central contention of Karl Polanyi's *The Great Transformation* (1944), as well as of later works, such as *The Economy as Instituted Process* (1957a), is that the market is an embedded form only in a peculiar period of time. In other historical periods, other allocation modes have prevailed, with market trades playing only a minor role. The "great transformation" started in England around 1750, and had a phase of backlash in Europe and America between the 1930's and 1940's. Such alleged decline of the institutions of capitalism in the period between the two World Wars can be explained in Polanyi's interpretation as an

example of failure of those institutional settings that are "disembedded" from the institutions of society at large (Smelser and Swedberg, 2005: 13).

Polanyi's approach to allocation systems is markedly *substantivist*, that is to say, "man's economy is, as a rule, submerged in his social relations" (Polanyi, 1968a: 63-64). Emphasis is laid then on the institutional matrix within which individual choices occur, with an explicit denial of the cross-cultural applicability of the *homo oeconomicus* model, the latter being the cornerstone of *formalist* economic anthropology (Isaac, 2005: 19; Schneider, 1974: 9).

Polanyi contends that Western European history, until the end of feudalism, and with the exception of the last centuries, has witnessed economies organised around principles that are far from self-interested: he refers to redistribution and reciprocity, or a combination of these two systems with market exchanges (Polanyi et al., 1957a: 294)[3]. The three allocation modes are here shorthand notations for the mechanisms of integration of the processes of production and circulation of material goods within the wider society (Valensi and Godelier, 2003: 139). The qualifying elements of each circuit can be found in the way in which factors of production are organised. For instance, some traditional societies, like Melanesia, manage land and labour under social laws of kinship. The great empires of Hammurabi in Babylonia, and the New Kingdom of Egypt, which "were centralised despotisms of a bureaucratic type", on the other hand, depended on redistribution of land and (slave) labour (Polanyi et al., 1957a: 312).

It is in the behaviour of the Trobriand islanders, which Polanyi studied in Malinowski's *Argonauts of the Western Pacific* (2004 [1922]), that Polanyi found the best instance of long-distance trades, concerning several objects, requiring several years of circulation and, arguably, entirely based on the norm of reciprocity (Valensi and Godelier, 2003: 131). We shall return to the peculiarities of the Trobriand economy later on in this essay.

A necessary terminological distinction should be drawn between trades and (market) exchanges, a distinction that makes sense only if we extend the concept of trade beyond the narrow logic of markets. In this sense, in Polanyi's works, we find three different types of trade: gift trade, administered trade, and market trade (Polanyi et al., 1957a: 262):

[3] Together with reciprocity, redistribution and exchange, the *Great Transformation* describes also a fourth allocation system, the household economy (instances of which are manorial estates and subsistence smallholdings). This allocation mode shares important features with Aristotle's analysis of *oikonomia.* In the essay, *The Economy as Instituted Process,* this allocation system is practically dropped, as it can be subsumed into an example of a redistribution system among members of groups of reduced dimension, under a regime of autarchy.

"Gift trade links the partners in relationships of reciprocity, such as: guest friends, *Kula* partners, visiting parties. Over millennia trade between empires was carried on as gift trade […]. The organisation of trade is usually ceremonial, involving mutual presentation" (Polanyi et al., 1957a: 262).

At a certain point of modern history, *trade* came to be coextensive with the concept of *market*, overturning the historical tradition which saw trades taking place mainly under gift-like trading arrangements, Polanyi argues. Formalist anthropologists, however, in interpreting the same sources that Polanyi referred to, above all Malinowski (2004 [1922]) and Thurnwald (1969 [1932]), highlighted that these tribal economies share important features with economic systems of later stages of economic history. In light of this interpretation, the calculation on the fit between means and ends is common to all societies (Schneider, 1974). Polanyi strongly opposed this view, claiming that looking for economising behaviour in traditional societies would mean misinterpreting their functioning. An entirely different set of concepts is needed to interpret these economies: reciprocity and redistribution above all, and the substantive meaning of the word "economy", stressing satisfaction of both material wants and social needs, rather than formal microeconomic calculation based on the notion of scarcity (Dalton, 1990: 165; Polanyi, 1957a: 243).

One may wonder, at this stage, how formal economic concepts can fit within a theory stressing the organic link between economy and the social matrix within which the economy is embedded. Our attempt is to reproduce in a laboratory two institutional arrangements that can replicate, in a satisfactory fashion, two of the three allocation modes described by Polanyi. In a (controlled) laboratory environment, it is possible to introduce such refinements, suggested by the anthropological theory itself, which can favour coordination levels among the players. The *formal economics concept* we referred to above, is allocative efficiency. Throughout this essay, this is defined as the ratio of the sum of the actual gains of the players in the game, to the potentially attainable gains if optimal behaviour takes place (*cf.* e.g. Gode and Sunder, 1997). We have attempted to show that, while a market exchange setting can function well even in the absence of forms of induced socialisation, forms of induced *symmetry* need to be in place in order that gift-trade arrangements work.

A noteworthy attempt to carry out a comparative institutional analysis, based on instruments arising from Polanyi's theoretical apparatus, has been carried out by Douglass C. North. After recognising that "Polanyi was correct in his major contention that the nineteenth century was a unique era in which markets played a more important role than at any other time in history" (North, 1977: 706), he proposes a choice of the different modes of allocation based on the notion of *transaction costs*. In this approach, "reciprocity societies can be considered as a least-cost trading solution where no system of enforcing the terms of exchange between trading units exists" (1977: 713). In this sense, social norms underpinning gift-trades, i.e. the triple obligation to make gifts, accept them and give them back (*cf.* Mauss, 2002 [1924]), make such a system self-enforcing and capable of supporting complex trades among subjects and communities. In the approach that goes back to Malinowski and Mauss, gifts, unlike commodities, are never fully alienated from the giver, but give rise to reciprocal obligations, a feature which keeps (gift- and non-gift-) trades alive and frequent among the traders.

This peculiarity of gift-trade is best exemplified by Malinowski's description of *kula*-trade, which we hinted at above. Malinowski observed this complex ceremonial practice during his journeys in the Trobriand islands, an archipelago off the coast of Papua New Guinea[4]. In the interpretation given by Polanyi (1968b: 12), the *kula*-ring is one of the "most elaborate trading transactions known to man", and it is centred on the act of giving as valuable in itself, without the need for any formalistic reasoning:

"Trobriand economy […] is organised as a continuous give-and-take, yet there is no possibility of setting up a balance, or of employing a the concept of a fund. Reciprocity demands adequacy of response, not mathematical equality" (Polanyi et al., 1957a: 273).

In the interpretation of Singh Uberoi (1971), however, in the Trobriandese economy, exchanges of gifts create the conditions for exchange of acts of duty and support, both material and nonmaterial in nature. Therefore, according to this interpretation, the *kula* is not a purely ceremonial practice, but is imbued with an element of formalistic reasoning, which has probably been under-explored in Malinowski's *Argonauts*

[4] The influence that such a practice has gained in the modern theory of reciprocity is great, to the point that Lévi-Strauss (1965: xxxvii) claimed that the Melanesian people are the true authors of the modern theory of reciprocity.

(Singh Uberoi, 1971: 148; *cf.* however, Malinowski's remarks on pp. 105-106). The next section looks in great detail at Polanyi's three forms of integration of the economy into society.

1.2 Reciprocity, exchange and redistribution

In a key passage of the essay *The Economy as Instituted Process*, Polanyi claims:

"Reciprocity denotes movements between correlative points of symmetrical groupings; redistribution designates appropriational movements toward a center and out of it again; exchange refers here to vice-versa movements taking place as between "hands" under a market system. Reciprocity, then, assumes for a background symmetrically arranged groupings; redistribution is dependent upon the presence of some measure of centricity in the group; exchange in order to produced integration requires a system of price-making markets" (Polanyi et al., 1957a: 250).

Reciprocity can be essentially of two types: *direct*, whenever the parties are involved in a mutual presentation; *indirect*, whenever the original trusting act, and the reciprocity obligation arising from it, do not necessarily involve the same actors.

The second type of reciprocity is typical of the Trobriandese social organisation and, more precisely, it is embodied in the *kula* trade itself. The *kula* objects ("*vaygu'a*", in the Trobriandese language) are essentially of two types: bracelets ("*mwali*") or necklaces ("*soulava*"), both made of common seashells and therefore apparently lacking in any intrinsic value. To exchange with someone else a *vaygu'a* seems intuitively a costless activity, void of any strict economic significance. On closer inspection, however, the *kula* trade appears to attribute a symbolic value to each specific *vaygu'a*. The *kula* trade can, in fact, deeply modify the value of a *vaygu'a*, overshadowing its aesthetic features. Indeed, either a *mwali* or a *soulava* can be considered by the natives as very "beautiful" or "banally common", and therefore more or less valuable. When a *vaygu'a* has become very old, which means that it has passed through the *kula* circle many times, it gains an intrinsic value which completely prevails over any aesthetic consideration. This means that when someone decides to exchange a very old and important *vaygu'a*, he is consciously cooperating in favour of

the whole community of the *kula* circle. In other words, he is indirectly returning the favour previously received from the community which allowed him – even if for a limited time – to benefit from the honour of having had a transitory possession of such a valuable object.

Furthermore, we wish to contend that the indirect reciprocity mechanism that takes place within the *kula* circle, requires some form of balance in the interpersonal relationships. In practice, this means that two specific agents who start an interaction within the *kula* circle must share an almost identical hierarchical status. Hierarchical statuses that are too distant from each other prevent any potential trade, and, typically, each person belonging to the *kula* has a sort of "portfolio" of partners who are his privileged counterparts in the exchange of the *vaygu'a.*

What should be retained of this analysis is that reciprocity need not be direct: rather, there can exist a motional process of generalised trades resting on the presence of symmetrically organised groupings (Polanyi et al. 1957a: 253). The importance of indirect reciprocity for the development of large-scale cooperation systems has been stressed by, among others, Alexander (1984: 85-93) and Yamagishi (2002), . The latter claims that "complex human societies would be impossible to maintain if humans relied solely on direct exchanges between particular partners" (p. 17). This is so, because generalised reciprocity exempts the parties from costs due to the establishment of a specific relationship. This explains our emphasis on *indirect generalised reciprocity*. In a socio-economic arrangement based on this norm, the parties contribute, in the reasonable expectation that "someone" will do the same to her/him in the case she/he plays the role of the weak party.

Polanyi describes at length how reciprocity and redistribution are supported by peculiar social norms, which have been effectively summarised by George Dalton (Table 1).

Insert Table 1 about here

Market exchanges are different from the other transactional modes in that they are not expressions of any social obligation or principle: a market exchange is in fact "disembedded" from the "social matrix" (Isaac, 2005: 14), because it is intrinsically an expression of a formalist logic. Polanyi clearly states that the forms of integration he describes cannot be considered as projections of personal attitudes at an aggregate level. With

reference to reciprocity and redistribution, the presence of well-identified social norms, respectively symmetry and centricity, is necessary in order to produce integration. For example:

"reciprocity behaviour between individuals integrates the economy only if symmetrically organised structures, such as symmetrical system of kinship groups, are given. But a kinship system never arises as the result of mere reciprocating behaviour on the personal level. Similarly, in regard to redistribution. It presupposes the presence of an allocative center in the community, yet the organisation and validation of such a center does not come about merely as a consequence of frequent acts of sharing as between individuals" (Polanyi et al., 1957a: 251).

Polanyi predicted that only in symmetrically organised groupings will reciprocative behaviour result in economic institutions of some historical and anthropological importance. Similarly, only where there exists an allocation system organised around some authority-holder, will we observe a redistributive economy. In short, "the societal effects of individual behaviour depend on the presence of definite institutional conditions; these conditions do not for that reason result from the personal behaviour in question" (Polanyi et al., 1957a: 251).

After this introduction to Polanyi's works, we now come to the experimental part of our paper. Our attempt is to give a contribution to the theory of comparative institutional analysis, using as a starting point the three allocation modes described by Polanyi.

2. Reciprocity: the experimental literature

The game we devised in order to replicate a reciprocity ring shares important features with both the Investment Game[5] (Berg et al., 1995) and the Centipede Game[6] (Rosenthal, 1981; McKelvey and

[5] This game was replicated with a number of refinements. For a survey of the literature on the game, *cf.* Dickhaut and Rustichini (2001).

[6] In the centipede game, originally played with two players only, the players alternatively obtain access to a larger share of a continuously increasing accumulation of points. Subgame perfection dictates that the game should end immediately in the fear of opportunistic behaviour at later stages. However, experimental studies on this game provide very different results: in a six-move

Palfrey, 1992), and has been studied in similar forms by Greiner and Levati (2005). In Greiner and Levati, player *i* is aware of the choices of player *i-1*, but is unaware of the past histories of reciprocity of the players before *i-1*, and is similarly unaware of the future investment decisions. The Investment Game devised by Berg et al. (1995) is then rearranged within a ring of *n* players. Each player *i* can receive an investment from player *i-1*, and is free to choose the points to send forward to *i+1*. The last player is free to choose how much to return to player 1, a choice which ends the game. At each transfer of points from one player to the other, the amount is multiplied by three, a feature which renders cooperation beneficial.

The hypothesis that the authors wish to test is whether the cooperative attitude of the players monotonically increases with that of third parties. The authors test their results for group size by comparing 3- and 6-person rings. They repeat the game with the same players for a finite number of times, varying the rematching procedure. They test in particular a partner's condition (whereby it is the same group that interacts ten times), and a stranger's condition (groups are randomly formed after each round). In their experiments, they find that the average amount sent is positive for both partners and strangers, contrary to the game theoretic prediction. The average amount sent, however, is significantly higher for partners. The authors conclude that strategic reputation-building, indeed, plays a role in an indirect-reciprocity game. Furthermore, the 3-person groups tend to have higher average gifts than those observed in 6-person groups. Such a result is consistent with the argument by Boyd and Richerson (1989) that indirect reciprocity is likely to be effective in the case of small and close groups, in which the peers meet frequently.

In Greiner and Levati (2005), the authors created a full homogeneity of the initial conditions, assigning the same endowment to all players. By assigning the same endowment to all players, we aim at preventing potentially confounding "inequity aversion" effects. As we shall see, our game differs, in this regard, from Greiner and Levati's, as only the first player is endowed with a small amount of points, which gets multiplied as the points pass from one person to the other. In our experiment, moreover, the initial amount of points available to player number 1 was kept low, and this made it profitable for the first

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centipede game, McKelvey and Palfrey (1992) report that only in 37 of 662 games, do the players choose to close the game immediately. 23 games arrive at the end of the centipede. The remaining games lie between these two extremes.

player(s) to "trust", as the amount they could earn in the case in which trust prevailed consistently, was significantly greater than the payoff they would have earned, had they withheld the initial endowment (16 or 28 euro cents). As a result of the way the game is structured, the first player had to trust eight players (the tenth being a dummy player). In the case in which each player sent everything, her final payoff would have been more than 50 times the initial amount she had available. For the first player, the decision to trust is, therefore, both risky and profitable. The event that the first player sends a substantial amount of points to player number 2, who takes a similar decision *vis-à-vis* player number 3, is therefore crucially linked to her estimation of the probability of generalised exchanges taking place after her:

"a donor provides help if the recipient is likely to help others (which often means, if the recipient has helped others in the past). In this case, it pays to advertise cooperation, as the cost of an altruistic act is offset by an increased chance to become the recipient of an altruistic act later" (Nowak and Sigmund, 1998: 573).

We would like to test the following hypothesis:

Hypothesis 1: in the absence of forms of induced symmetry, the game reaches insignificant levels of allocative efficiency.

In other words, if the experimental design is perceived by the players as a game of gift-trades, then we should observe high levels of allocative efficiency. This, however, will require definite institutional refinements. The structure of the game implies, in fact, that player nine will be strongly tempted to behave opportunistically, since she has a very relevant amount of points if *all* previous players have sent *all* their endowment.

Thus, the decision problem involves both an element of trust, as outlined above, and an element of coordination, namely the requirement that all players deem a cooperative type of rationality as crucial.

3. The experimental design

3.1 PILOT EXPERIMENT

We tested a modified version of the game studied by Greiner and Levati in a pilot experiment we ran in December 2006. We randomly formed six cohorts of ten players, who voluntarily accepted to take part in the experiment after a public announcement. The subjects were all University of Trento students. The experiment took place at the Computable and Experimental Economics Laboratory (CEEL) of the University of Trento, and was entirely computer-based. After the reading of the instructions, the game started with a simple question meant to ascertain whether the essential features of the game were clear ("if you have 10 points, and you decide to send 5 to the next player, how much will she have available?"). Questions posed by the participants regarding general aspects of the game were answered publicly. The game works as follows: the first player has a very limited endowment of points (16 euro cents in Treatment 1, and 28 in Treatment 2[7]). The number of players and the constant multiplier were common knowledge. The players were not informed about the amount of points available to previous or subsequent players. The order of play was random and all the choices were anonymous. The first player decides the amount to withhold out of the endowment, and the amount to be sent to a generic "next player". The amount being sent is multiplied by a factor 2 by the experimenter. Player number 2 made a similar decision, with the multiplication of points taking place at each gift-decision of the players. In our experiment, player 10 is only a dummy player, as the amount that reaches him is divided equally among all the group-members. The final payoff of the players was calculated as the sum of the points they decided to withhold, and of the points that reached player number 10, divided by 10. At the end of the experiment, the points gained were converted into euros, with one experimental point being equivalent to one eurocent.

Figure 1 illustrates a reduced version of this sequential game, with the only choices being to "send ahead the whole endowment" or "withhold the whole endowment".

Insert Figure 1 about here

[7] All subjects were paid a show up-fee of 2 euros.

In the tree, x is the amount available to player 1, $b = 0.5e^{0.6931n}$, and n is the number of the node of the game, which is equal to ten in the case in which the game arrives at its final stage. Given that $\frac{(0.5e^{0.6931*10})x}{10} > (0.5e^{0.6931*9})x$, player 9 will have an incentive to defect before the last round. Subgame perfection dictates that, as in a standard centipede game, player 1 closes the game immediately, and pockets his initial endowment. Consequently, all other players gain nothing.

In the pilot experiment, players were subject to severe information conditions, as they were unaware of the endowment of previous players. No information was given on the image score of the recipient either. In this pilot experiment we tried to limit player opportunism by limiting the maximum amount payable to 25 euros.

Our game tries to mimic *imperfectly* a *kula*-ring type of arrangement, the major difference being that in our game each agent plays only once while the Trobriandese economy described by Malinowski is based on a continuous give-and-take with the local neighbour. We introduced this variant in order to model one of the most interesting characteristics of the *kula* trade, i.e. the generation of idiosyncratic non-tradable value embodied in a given *vaygu'a* which has passed through many "cycles" of exchange.

Generally speaking, our game shares some features with a generic productive process, in which the value of the commodity increases with the number of people who have taken a decision regarding it. At the end of the process, all participants typically share profits.

The results of the pilot experiment confirm in two cases (Group 1 and 2, Tr. 1) the game's theoretic prediction that player 1 will not send anything. In group 5 (Tr. 2), the game stopped at the second round. Group 3 (Tr. 1) and 4 (Tr. 2) stopped at round number 5. Finally, Group 6 (Tr. 2) was the only one in which all players took a decision, but with an insignificant redistribution of 8 points.

Two features, in particular, of our game seem to have undermined any cooperative attempt. Firstly, ignorance about the endowment of previous players probably led the decision-maker to end the game (by sending zero), as she likely thought that in previous rounds players had large sums available, and had decided to send very little ahead. As a matter of fact, however, the first players had a very limited amount of points. Spiteful behaviour seems, therefore, to have set in, in those sessions that have gone

beyond stage 1 of the game. Secondly, there seems to be a computational failure on the part of the players to understand the multiplier dynamics (i.e. that each could gain $\frac{2^9(x)}{10}$ points, in the case everyone sent everything, with x being the endowment of player 1).

By means of a series of amendments to the rules of the game, we have tried to take these criticalities into account.

3.2. THE BASELINE EXPERIMENT

In our baseline experiment, the subjects[8] (eight cohorts of ten players) played a game that functioned in the same way as our pilot experiment, with the following differences:

a. Payable-amount thresholds were removed;

b. There was common knowledge[9] about the number of points players could have gained in the case in which all players sent ahead all the points they had available. Faced with the challenge of easing a computational failure, we have made the information available in order to avoid the possibility that some players did not acquire this crucial datum.

c. It was common knowledge that the first player had to send a strictly positive number of points. With this, we tried to promote the willingness of the first player, who has no previous history to refer to, to send points.

d. The players could no longer send zero. Denoting with g the amount that could be sent, and with E the endowment of points, $g \in [1, \ldots, E]$. Still, the players could choose to adopt a smallest-granularity consignment decision, i.e. sending ahead 1 point only.

e. A further, distinct option was given to players number 2 to 9 (player 10, as usual, did not have any choice to make): such players could decide to end the experiment. In this case, the amount that the player has available is divided into equal shares between himself and all the *previous* players, with the *subsequent* players obtaining zero.

[8] Subjects who took part in the December sessions were not allowed to participate in this new experiment. No player has played any of our reciprocity experimental sessions twice.

[9] The instructions for the baseline experiment are reported in Appendix 1.

f. Finally, when the players had to make their decision, they could see on the screen the number of points that *on average* the previous players had available. Player number 2 saw exactly the amount of points that player 1 had available.

The new set of rules changed the Nash equilibrium of the game. In fact, it is no longer possible to send zero, and closing is unappealing for all players *but* player 2, who would be indifferent between closing the game and sending 1 point to the third player, in the case he has the smallest possible endowment (2 points). For all other players, the subgame perfect decision is to keep all the amount available and send one point[10] to the next player. This was a necessary refinement in order to observe the choices of all players, thereby preventing the unsatisfactory event in which a player closes the game at the very beginning, making it impossible to observe how the other players would have behaved in their turn.

3.2.1 EXPERIMENTAL RESULTS

With the exception of one session (with Tr. 1), the game always arrived at the redistributive stage. The points accumulated are, however, very modest. Figure 2 shows the paths of the average (mean) gift-decisions in Treatment 1 and Treatment 2 (4 sessions each), in absolute terms.

Insert Figure 2 about here

The figure shows that transfers are systematically higher in Tr. 2 sessions. Figure 3 shows the gift-decisions as a percentage of the sum players had available.

Insert Figure 3 about here

Figure 3 shows that gift-decisions tend to be highly cyclical, i.e. that their shape resembles a trigonometric function: decisions to send a consistent share of the available sum are, in fact, followed by decisions to withhold most of the amount available, and vice versa. Somehow, higher payoffs are

[10] In fact, this is the smallest granularity that it is possible to send.

concentrated at the end of the decisional chain, and can be observed only in Tr. 2 sessions, as shown in Figure 4.

Insert Figure 4 about here

The amounts earned are still very low, given the exchange rate of 1 experimental point to one euro cent. As a matter of fact, redistribution has been mostly inconsistent: the maximum amount of points that reached player number 10 was 288. This has determined very low levels of allocative efficiency: 1% on average, with statistically significant differences across the two treatments (two-sample Mann-Whitney test, prob> |Z| = 0.026). Thus, hypothesis 1 is verified. Furthermore, 38% of the subjects played the Nash equilibrium strategy to send one point only.

Using as a dependent variable the absolute amount of points sent by the players, a linear regression has been carried out to check the following model:

$$M_g = f(Y, E, F, G, O, GE, \varepsilon) \qquad [1]$$

Where:

M_g = players *i*'s transfer to player *i+1*;

Y = endowment of player *i*.

The following covariates are based on answers to the debriefing survey, which will be discussed in greater detail in § 3.2.2:

E = expectancy to receive back more (or less) than the amount given (dummy variable; more = 0; less = 1);

$F \in [0, ..., 100]$ = the player's conception of a fair transfer;

G = gender (dummy variable; male = 1; female = 0);

O = the player's expectation about opportunistic behaviour taking place at stage 9 of the game (dummy variable; yes = 1; no = 0);

GE = this dummy captures the player's motivation in gift-exchanges, as approximated by the expectation of a return in a precise span of time (=1) or gratuity (= 2);

ε = stochastic error.

The hypothesis we wish to test through this specification is that M_g is influenced positively by *Y* and *F*, and by expectancies of different types, and by gender. The purported existence of a positive correlation between endowment and money given is not trivial, since a higher endowment could also have increased the opportunity cost of reciprocative behaviour, thereby increasing opportunism. Our regression model (r^2 = 0.729, F = 28.3, df = 6) yields a positive and significant correlation between the dependent variable and the endowment (p-value= 0.000), and their conception of fairness in gift-giving (p-value: 0.002). Other covariates are positively but insignificantly correlated with the regressand.

Ceteris paribus, but using as dependent variable the gift as a percentage of the endowment, the correlation between endowment and the dependent variable is no longer statistically significant (p-value = 0.601), and the regression model loses part of its explicatory power (r^2 = 0.483). On the other hand, the player's conception of fairness remains significantly correlated with the dependent variable (p-value = 0.000).

Thus, players seem to have an "ideal percentage figure" in mind, resulting from their own conception of a fair transfer. It seems that this rule of thumb is applied, regardless of the endowment. This consideration is supported by the significance of the covariate *F* in both regressions above.

3.2.2. ANALYSIS OF THE ANSWERS TO THE DEBRIEFING SURVEY

At the end of the experiment, but before being informed of their payoffs, the subjects were asked to answer some debriefing questions[11], which allow us to understand more fully the players' approach to the decision-problem. In our analysis, we took into account only the answers to the debriefing of the players who made a choice, i.e. from round 1 to 9, excluding also the only player who closed a game ($n = 71$). The first question asked was whether the players expected to receive back more, or less, than the amount they sent (variable *E* of our regression models): 64% of the subjects gave a positive answer. This shows clearly their

[11] A translation of the debriefing survey is reported in Appendix 2.

reliance on the consignment decisions of the others. The second question tried to elicit the players' conception of fairness, by asking them what was the fair share they deemed they should send to the next player (variable *F*). The median here is 50%, with a mean value of 59%. Hence, players' perception of fairness dictates that about half of the endowment should be sent to the next player, contrary to both the Pareto-efficient and the game-theoretic predictions.

Furthermore, we thought it useful to check whether this fair share that the players reported in the debriefing, mirrored the choices that the players made during the game. To this end, we compared the percentage of the available sum that the players sent, and their answer to question number 2 of the debriefing. Using a $\pm 10\%$ interval, 58% of the players passed this coherency test. Using a $\pm 20\%$ interval, the figure rose to 72%. Therefore, the majority of the players seems to have followed a "fair share" rule, which they consistently expressed in the debriefing question, whose aim was to catch this particular aspect.

In the third question, the subjects were told to imagine that they were the first player, and then they were asked whether their choice of the points to be withheld would have changed, had they been the ninth player, in lieu of the first (variable *O*): 68% of the subjects gave a positive answer to the question. Hence, players understood correctly that the way the game was structured implied that the ninth player's trust-decision was more demanding than the first player's, an expectancy that probably discouraged all players from sending points, if they foresaw that opportunistic behaviour would have prevailed at stage 9. Furthermore, the great majority of the players declares that gratuity, and not reciprocity considerations, motivates them in gift-making (87.5%). The sample was balanced as to gender (52% of males, 48% of females).

3.2.3 DISCUSSION OF RESULTS

A possible line of criticism is that a multiplier of 2 was not large enough to offset the risks involved in cooperating. In this sense, a larger multiplier would have probably promoted their willingness to send points. This line of reasoning is suggested by Van Huyck et al. (1995), where the authors used a game not dissimilar from Berg's investment game, with the result that the investors' willingness to trust increases as the multiplier becomes larger. Secondly, it may be that our game lacked the Polanyian attributes of *symmetry*, or, in other words, that our laboratory environment favoured a game-theoretic approach, rather

than a gift-exchange one, to the decision problem, which in turn did not favour the diffusion of trust. As we shall see later, we have made a (rather conservative) attempt in this sense by allowing players to communicate before playing the game. We would like to point out, however, that different solutions, such as introducing the consumption of relational goods, or an *ad hoc* choice of participants in the experiment (such as volunteers of a not-for-profit organisation), are conceivable too.

3.4 THE GAME WITH A PRE-PLAY COMMUNICATION STAGE

Through this variant with respect to the baseline, we tried to raise the sense of belonging of the players[13] to a symmetrical grouping via a stage of pre-play communication (*cheap talk*). Our hypothesis is that:

Hypothesis 2: the pre-play communication stage promotes the allocative efficiency of the circuit, by slightly raising the percentage of the endowment transferred to the next player.

Cheap talk has been defined by Farrell and Rabin (1996: 116) as "costless, nonbinding, nonverifiable messages that may affect the listener's beliefs". The authors point out that in an incomplete information game, in which each player can be of several types (in our example, a reciprocative type, and an un-reciprocative one), allowing the players to communicate can serve as a way to map the type of the other players, if all the players share a correlation between their true type and their preference towards the others' beliefs about one's own type (Farrell and Rabin, 1996: 106). Accordingly, after reading the instructions and before the start of the game, we asked the experimental subjects to discuss three questions included in the instructions for five minutes. The experimenters were not present during the discussion, and communications were not recorded, as we believe that recording would have produced undesirable confounds the verbal behaviour of the subjects.. The questions were the following:

[13] We selected four cohorts of ten students each. The instructions (reported in Appendix 3) were analogous to the ones of the baseline sessions, with an add-up in which topics-for-discussion for the pre-play stage were provided. The PPC sessions were all conducted with treatment 1, i.e. with 16 points available to the first player.

1. according to you, if all the players send half of the sum they have available, how much will all participants win?

With this question, we wanted to prompt reasoning by the player as to the benefits arising from sending all the amount of points they had available.

2) do you think that the introduction of a rule of behaviour among yourselves could be helpful in order to raise the payoffs of all participants?

This question was meant to elicit the possibility of a shared pact among the players, thanks to which a Pareto-efficient outcome could be achieved.

3) do you think that this rule of behaviour that you have just discussed will be used by the players during the game? I would like to remind you that your choices will be anonymous and free.

With this question, the players were asked to discuss about issues of compliance with the rule they had considered, the most simple and salient of which is that all players send all the amount available, provided that the communication stage was not binding[14]. This question was also meant to prompt reasoning about the unequal positioning of the players, given that, if all players sent the whole amount available, player number 9 would have had a relevant sum at her disposal (about 40 euros). Since the players were discussing behind a veil of ignorance, i.e. they were unaware of their positioning within the game (the result of a choice of Nature), this question was meant to raise the awareness that all players faced a common weakness, arising from the problem of compliance with the agreed-upon rule of behaviour of those playing in the final part of the decisional chain. We have thus used these topics-for-discussion in order to raise the consciousness of a substantially *homogeneous* grouping, as all players at this stage shared a common condition of weakness. Homogeneity can be thought of as a proxy for the Polanyian notion of symmetry. As we have seen, Polanyi predicted that only in symmetrically organised groupings, will reciprocative behaviour result in economic institutions of some historical and anthropological importance.

A glimpse at the gift-decisions of the players confirms our hypothesis about the effectiveness of cheap-talk (Figure 6).

[14] *Cf.* in this regard, the remarks in Bicchieri (2005: 199) about informing subjects that agreements are non-binding.

Insert Figure 6 about here

Figure 7 shows the gift-decisions of the players as a percentage of their endowment.

Insert Figure 7 about here

The average allocative efficiency is 28%, versus 1% of the baseline experiment with treatment 1. Players pass, on average, their whole endowment (median: 100%). Hypothesis 3 is hence verified. Payoffs earned are shown in Figure 8.

Insert Figure 8 about here

Non-parametric tests between the pre-play communication sessions and the baseline sessions (Tr. 1), show us that the figures of the allocative efficiency, the percentage gift, and the payoffs earned, are all statistically different across the two samples (two sample Mann-Whitney test, prob> |Z| = 0.000, in all tests). Finally, no player followed the Nash equilibrium strategy of sending only one point.

3.4.1 ANALYSIS OF THE DEBRIEFING

In the debriefing survey, subjects report that the fair share to send ahead is 100% (median, mean: 78%). Furthermore, they are usually consistent with their choices (58 % with ±10% interval, 66% with ± 20%). Moreover, 84% of the subjects believe that the initial (pre-play) communication was useful in promoting the willingness to send points. Finally, the pre-play communication stage resulted in a decrease in the number of potential opportunists at stage 9 of the game: the figure drops to 55%, in contrast to 68% of the baseline treatment. Differences across the two samples are, however, statistically insignificant (two sample Mann-Whitney test, prob> |Z| = 0.22).

4. Exchange

4.1 EXPERIMENTAL DESIGN AND RESULTS

Our exchange experiment is designed as a bargaining game in which the sellers (5 per session) take two distinct decisions:

1. the amount to place "on the market", knowing that this amount will be multiplied by a factor 2 by the experimenter;
2. a proposed division of the multiplied amount of points[15].

Five buyers view the offers as they are formulated, knowing that they have four rounds available, that they can conclude one single transaction, and that they have to accept one offer in order to earn a strictly positive payoff. Similarly, sellers need to formulate a successful offer, in order that the points they have withheld and the part of the offer they have assigned to themselves, be converted into euros at the end of the experiment.

A possible criticism of such an experimental setting, is that the interaction-structure is so different from the reciprocity-ring that allocative-efficiency comparisons are meaningless. We believe, however, that the structures of market exchanges are best approximated as a bilateral exchange among anonymous players, where several offers are competing on the market. On the other hand, generalised systems of reciprocity, prototypically the Trobriand economy, are best mimicked as a continuous give-and-take, although the final redistribution of resources, which we have introduced in our reciprocity game, is a feature which is extraneous to the *kula*-trade arrangement.

Returning to the experimental design, we have studied two different treatments. In one treatment (four sessions), there was common knowledge that buyers saw on their screen the amount initially available to sellers (from now on, FI tr., for "full-information treatment"). Thus, in this case buyers could form a preference for equitable offers. In the second treatment (four sessions), such information was removed, so that sellers were uncertain about the information package available to buyers (they only knew that buyers would have seen their "offers"), and buyers saw on their screen only the amount of points offered to them by each seller, without any further information (from now on, NI tr., "no-information treatment"). The game-theoretic prediction for this game is straightforward, assuming no time-discounting by the contractors: sellers will always place the whole endowment E on the market, in order to decide a division over $2E$, and offer

[15] The instructions for the market exchange experiment are reported in Appendix 4.

throughout the rounds the smallest granularity possible ε to buyers, an offer which is accepted by buyers given that $\varepsilon > 0$.

Figure 9 shows that the great majority of transactions have been concluded immediately. There was only one case in which a couple of players did not manage to conclude a transaction, with the buyer not accepting the proposed offer at round 4.

Insert Figure 9 about here

The average allocative efficiency of the market exchange game is 75%, regardless of the information package available to buyers (two sample Mann-Whitney test, prob> |Z| = 0.738). It should be pointed out that the initial endowment of points was designed in such a way that, if sellers decided not to withhold points initially, and if they divided the amount in equal parts, then all players would have earned the same amount of points that players in the reciprocity game (Tr. 1) could have earned, had all players sent ahead the whole endowment.

It is then interesting to look at the distance of buyers' and sellers' median payoff from the equitable and Pareto-optimal division of the sum (820 points for both players). Experimental data show that such a figure is zero for sellers, whose median payoff is exactly 820 points, across the two treatments. Buyers, on the other hand, have gained a payoff that is located about 50% below the equitable threshold, with insignificant differences across the two treatments (two sample Mann-Whitney test, prob> |Z| = 0.883). With reference to the accepted bids, sellers propose to buyers on average (median) 50% of the amount on the market but, given that they usually withhold points (the average amount of points on the market is 48% of the endowment), this results in a divider's advantage accruing to sellers, as we have seen above.

The rules of the game, based on bilateral interaction between one random buyer and one random seller, seem to have favoured the allocative efficiency of the experimental setting, irrespective of the information package available to buyers.

4.2 THE DEBRIEFING SURVEY

In order to gain insight into the players' strategies, we asked them to answer a debriefing survey contingent upon their specific role within the game (buyer or seller)[16]. Sellers are usually confident about their choices: in most cases, they would have accepted as a buyer the offer they have formulated as a seller (80% in the FI tr., 90% in the NI tr.). The perception of fairness, however, changes. In the FI tr., 90% of the sellers state that they think they were fair to the buyers. In the NI tr., however, 65% of the sellers answer negatively, showing that sellers have presumably taken advantage of the lack of a crucial piece of information, in order to make what they deemed inequitable offers.

Furthermore, sellers state that it is fair for them to earn 59% of the sum "on the market" (FI tr.). In the NI tr., this figure drops to 52%. When we asked sellers to describe, in their own words, the criteria they used in order to formulate their offers, 50% of the sellers in the FI tr. stated that equity was their overriding concern, with payoff-concerns being expressed by 35% of the sample. The remaining answers were unclassifiable. In the NI treatment, on the other hand, 45% of the sellers expressed an overriding concern for payoffs (and only 10% for equity), with a threshold being used by 15% of the subjects, with 10% of the subjects stating that they were afraid of future lower offers, and with 10% stating they were guided by necessity (i.e., it was the last round). The remaining answers were unclassifiable.

We turn our attention now to the buyers. We first asked them whether their offers would have been different had they been a seller instead of a buyer. 85% of the buyers in FI tr. and 90% in the NI tr. answered positively. When we asked them whether they thought they had been treated equitably by sellers, buyers in the FI tr. were equally split in their answers while, in the NI tr., 65% of the subjects answered negatively, though in this case equity was not readily ascertainable as buyers ignored the amount of points available to sellers.

The fear of not winning anything played an important role in the choices of the buyers (70% of the buyers in the FI tr. and 60% in the NI tr. state so). We asked buyers to describe the criteria they had followed in order to decide which of the offers to accept. In the FI tr., 35% of the buyers expressed an overriding concern for payoff, and 20% for equity. The remainder stated that they were guided by necessity ("it was the last round", 10%), by fear of future lower offers (10%), or by a threshold they had established (15%). The

[16] *Cf.* Appendix 5 for a translation of the debriefing.

remaining answers were unclassifiable. In the NI tr., payoff was the overriding concern (45%), with equity playing only a minor role (10%), and with 15% of the subjects stating they used a threshold. The remaining answers were unclassifiable.

5. Final remarks

We have seen, in our reciprocity sessions, that if the game is played without any form of induced symmetry, its allocative efficiency level is very modest: such result is marked confirmation of the anthropological literature, especially Polanyi's notion of symmetry, as well as Marcel Mauss' description of gift-exchange as a *fait social total* (Mauss, 2002: 64).

A criticality of our comparative institutional analysis, requiring further study, is the fiduciary aspect within different allocation modes. This is an element of overriding relevance in our reciprocity experiment, which however does not directly enter our market exchange design. Meeting this challenge would certainly help us in carrying out more sensible comparisons across different interaction structures.

Of the other possible improvements to the experimental design, one of the most relevant would be to try to mimic the "bi-directional" nature of the *kula* trade system. This would mean allowing the players to play more than once or introducing some form of bi-directionality. This could be implemented by allowing players to send experimental points, not only forward, but also backwards. In this way, the institutional peculiarities of the *kula* arrangement would be better approximated in the artificial setting of the laboratory and, from our theoretical departure point, this would increase the allocative efficiency.

APPENDIX 1

Instructions for the baseline experiment

(originally in Italian)

Welcome and thank you for your participation. Please read the following instructions carefully. From now until the end of the experiment, we kindly ask you not to communicate with your neighbours. If you have any doubts, at the end of the reading of the instructions, you can raise your hand, and we will answer any questions you may want to ask.

Your group consists of 10 people. At the beginning of the experiment, the computer will determine in a random fashion who the first player will be, and she will be the only one to know that she is the first. The first player will be given a certain amount of experimental points. She can freely decide how much to withhold, and how much to send to a second player, randomly chosen by the computer among the remaining players. The first player opens the game and, hence, she has to send an amount of points greater than zero to player number 2. The amount sent will be multiplied by two by the computer. If we denote with x the amount that the first player decides to send to the second, the second player will thus have at his disposal $2x$. The second player decides in his turn how much to withhold of this amount, and how much to send to a third player, randomly chosen by the computer. This gets repeated until the game arrives at the tenth player. At each passage of points from one player to the other, the amount sent will be multiplied by two. All your choices will be anonymous.

The tenth and last player will not make any choice. The amount that arrives to him, in fact, will be divided in equal shares among all the participants in the experiment.

Your final pay off will be calculated as follows:

Amount that you decide to withhold +

Everything that reaches the 10^{th} player, divided by 10

Your final payoff

For your information, if all the players send all the amount at their disposal, the average final payoff will be about 800 (*in treatment 2*: 1,400) points per each single player.

The players from number 2 to number 9 have a further option: they can close the game. In this case, the closing player determines the end of the experiment. Thus, the remaining players are not allowed to play. In the case of closure, the amount that the player who closes has at his disposal, is divided between himself and the players who played before him. The points withheld by the players who played before the closure are summed to this amount. The remaining players obtain nothing from the game.

At the end of the experiment, you will be asked to answer a few short questions. You will then be informed of your payoff.

The experimental points you have gained will be converted into euros at the following exchange rate:

1 experimental point = 1 eurocent (0.01 €).

In thanks for your participation, you have already gained 200 points. How much more you can earn, will depend on your choice, as well as on the choice of all the other participants in the experiment.

Are there any questions?

APPENDIX 2

Debriefing of the baseline experiment

(*originally in Italian*)

1)

Leaving aside the amount that you have kept for yourself, do you expect to receive back MORE or LESS than the amount you have sent?

2)

In your opinion, what is a fair share (in percentage terms) to send to the next player?

3)

Supposing that you were the first player, would your decision as to how much to withhold differ from the one you would make if you were the ninth player?

4)

Which of following statements describes you best?

1. When I give a present to an acquaintance, I expect to receive a present back within a short period of time;

2. When I give a present, I do so regardless of the possibility of receiving one back;

5)

What is your sex?

Female

Male

APPENDIX 3

Instructions for the pre-play communication experiment

(originally in Italian)

The instructions were completely analogous to the ones reported in Appendix 1. At the end of the instructions, the following lines were added:

You can now discuss for about five minutes among yourselves, apropos the experiment. To help you in the discussion, we suggest that you reflect upon the following points:

1. According to you, if all the players send half of the sum they have available, how much will all participants win?
2) Do you think that the introduction of a rule of behaviour among yourselves could be helpful in order to raise the payoffs of all participants?
3) Do you think that the rule of behaviour that you have just discussed will be used by the players during the game? I would like to remind you that your choices will be anonymous and free.

Debriefing

(*originally in Italian*)

The debriefing was completely analogous to the one reported in Appendix 2. The following question was added:

6. Do you think that the initial communication stage has been useful in promoting the willingness to send points?

APPENDIX 4

Instructions for the market exchange experiment

(originally in Italian)

[sentences added in the full-information treatment]

Welcome and thanks for your participation. Please read the following instructions carefully. From now until the end of the experiment, we kindly ask you not to communicate with your neighbours. If you have any doubts after reading the instructions, please raise your hand, and one of us will answer your questions.

Your group consists of 10 people. At the beginning of the experiment, the computer will determine in a random fashion your role in the game. You can be either a seller or a buyer. Five of you will be sellers and five buyers. If you are a seller, you will have a certain number of points at your disposal, and you will be able to decide how much to withhold of this sum, and how much to send to the anonymous buyers as an offer. Everything you send as a seller will be multiplied by two by the experimenter. If you are a seller, you will also decide upon a division of the offered sum between yourself and the anonymous buyers. As the sellers send their offers, these will appear on the screen of all the buyers, who are free to choose, or not, one of the several offers. The total time available to sellers (to formulate an offer and its division) and to buyers (to accept, or not, one of the offers) is four [eight] minutes.

If you are a buyer, and you accept an offer, this will disappear from the screen of all the other buyers. In this case, you and the seller, whose offer you have accepted, should wait until the end of the experiment.

If you are a buyer and you do not want to accept any of the offers received, you then simply wait until the four [eight] minutes are over, when the remaining sellers will formulate a new offer. If within the four [eight] minutes, no buyer accepts an offer, in fact, the seller will formulate a new offer when the four [eight] minutes are over, and everything will be repeated in the same way.

The maximum number of offers for each seller is four. The total duration of the experiment is at maximum 16 [32] minutes.

If no buyer accepts the proposal of a certain seller within the four possible rounds, this seller will lose the possibility to convert into euros the points he had decided to withhold in the last offer he had formulated.

[The sum initially available to sellers will appear on the screen of the buyers].

For those who formulate an offer which is accepted, and for the person who accepts an offer, the payoff is thus calculated:

If you are a seller:

Amount you withhold	+
Part of the amount, multiplied by the experimenter, that you have kept for yourself in the accepted offer	=

FINAL PAYOFF

If you are a buyer:

Part of the amount, multiplied by the experimenter, that the seller has offered you, in the offer you have accepted	=

FINAL PAYOFF

If you formulate offers which are not accepted, and if you do not accept any offer, within the four possible rounds, your final payoff will be zero. At the end of the experiment, you will be required to answer a few questions. You will be then informed about your payoff.

The experimental points you have gained will be converted into euros at the following exchange rate:

1 experimental point = 0.01 eurocent

You have already gained 200 experimental points just for your participation.

Are there any questions?

APPENDIX 5

Debriefing of the market exchange experiment

(originally in Italian)

DEBRIEFING FOR SELLERS:

With reference to the accepted offer, or to the last offer, in the case in which none of your offers were accepted, please answer the following questions:

1. If you were a buyer, would you have accepted the offer you formulated as a seller?
2. Do you think you were fair to the buyers?
3. Are you satisfied with your offer choice?
4. If you had had more rounds available, would your choices have changed?
5. Can you briefly describe which criteria you have used in order to formulate your offer?
6. In your opinion, what is a fair division of the multiplied amount of points?
7. Did the fear of not winning anything play a role in your choices?
8. In which year were you born ?
9. What is your sex?

DEBRIEFING FOR BUYERS:

1. Would your choices of offer have been different, had you been a seller?
2. Do you think you have been treated fairly by the seller?
3. Are you satisfied with the offer you have accepted?
4. Can you briefly describe on the basis of which criteria you decided which offer to accept?
5. In your opinion, what is a fair division of the multiplied amount of points?
6. Did the fear of not winning anything play a role in your choices?
7. In which year were you born ?
8. What is your sex?

TAGS USED IN ORDER TO CODIFY SELLERS' (BUYERS') ANSWERS TO QUESTION NUMBER 5 (4):

Necessity: The player explains that it was the last offer he thought he could profit from (or the fourth offer) and, hence, he was "forced to accept" (or "forced to send", in the case of sellers).

Payoff: In this case, buyers and sellers express an overriding concern for their material payoff.

Equity: The buyer (or seller) expresses a clear concern about the equity of the division, although the interpretations of equity are quite different. For example, a number of sellers stated it was fair to divide the sum almost equally, with the greatest part for themselves, since they thought they were in a privileged position.

Fear: The players express a feeling of fear or anxiety because they were not able to conclude one transaction.

Threshold: The players state they had fixed a threshold of acceptability and have accepted offers that exceeded such threshold.

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Figures

FIGURE 1

TREE-REPRESENTATION OF THE DECISIONAL PROBLEM

(PILOT EXPERIMENT)

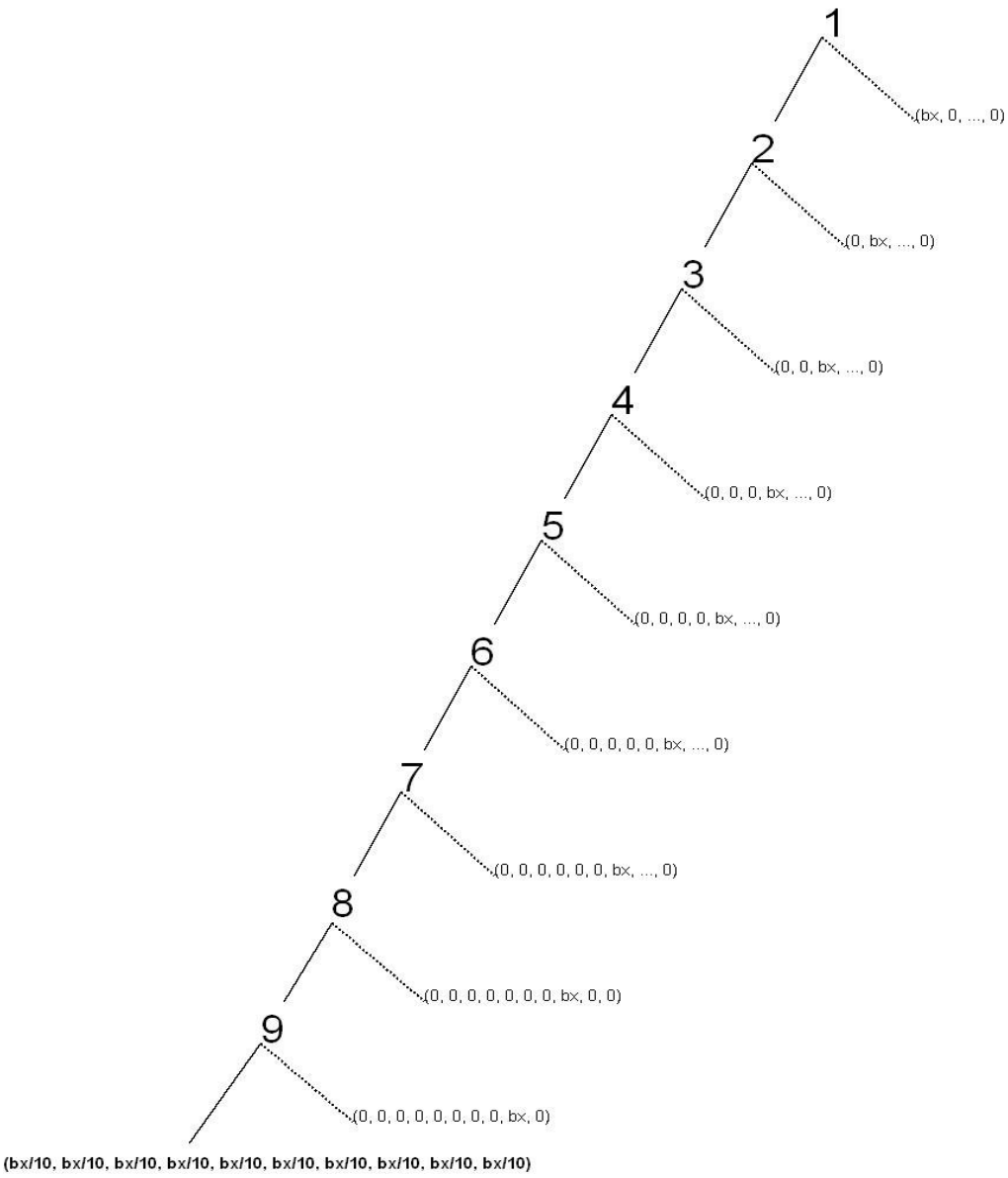


FIGURE 2

BASELINE EXPERIMENT: AVERAGE GIFT DECISIONS (ABSOLUTE FIGURES)

(PLAYER 1 TO 9)

FIGURE 3

BASELINE EXPERIMENT: AVERAGE GIFT DECISIONS (AS PERCENTAGE OF THE ENDOWMENT)

(PLAYER 1 TO 9)

FIGURE 4

BASELINE EXPERIMENT: THE PAYOFFS (BY POSITION WITHIN THE GAME)

FIGURE 5

REPEATED GAME: AVERAGE GIFT DECISIONS (ABSOLUTE FIGURES)

(PLAYER 1 TO 9)

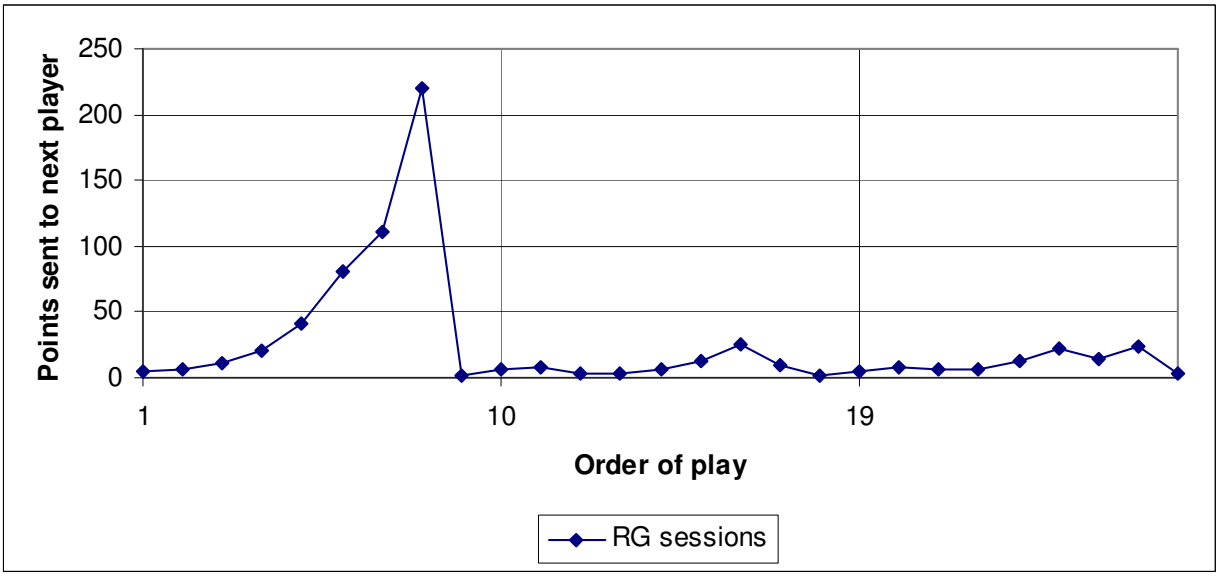


FIGURE 6

PPC GAME: AVERAGE GIFT DECISIONS (ABSOLUTE FIGURES)

(PLAYER 1 TO 9)

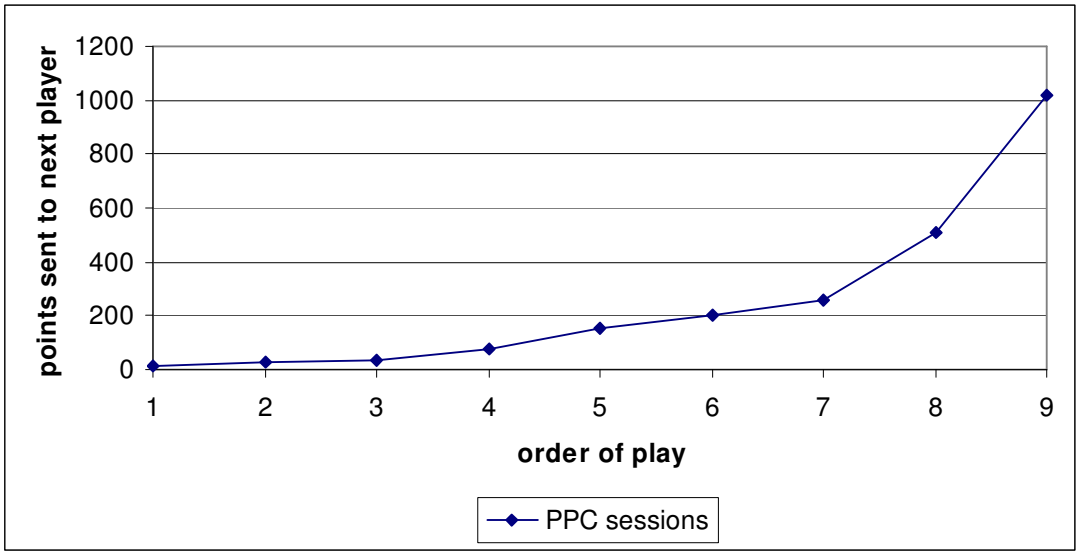


FIGURE 7

PPC GAME: AVERAGE GIFT DECISIONS (AS PERCENTAGE OF THE ENDOWMENT)

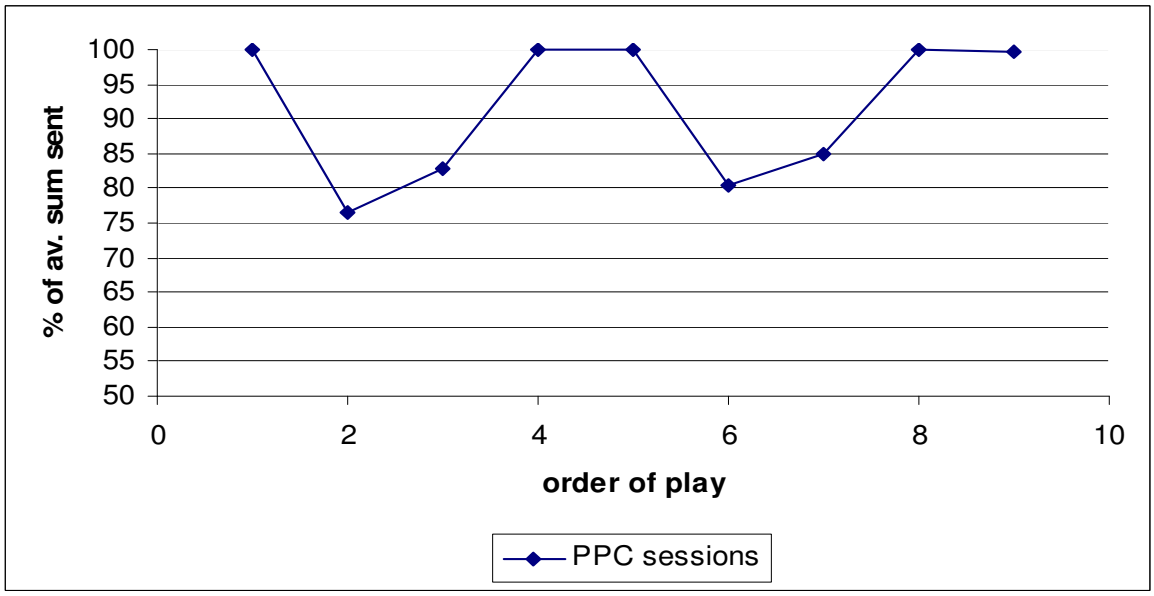


FIGURE 8

PPC GAME: THE PAYOFFS (BY POSITION WITHIN THE GAME)

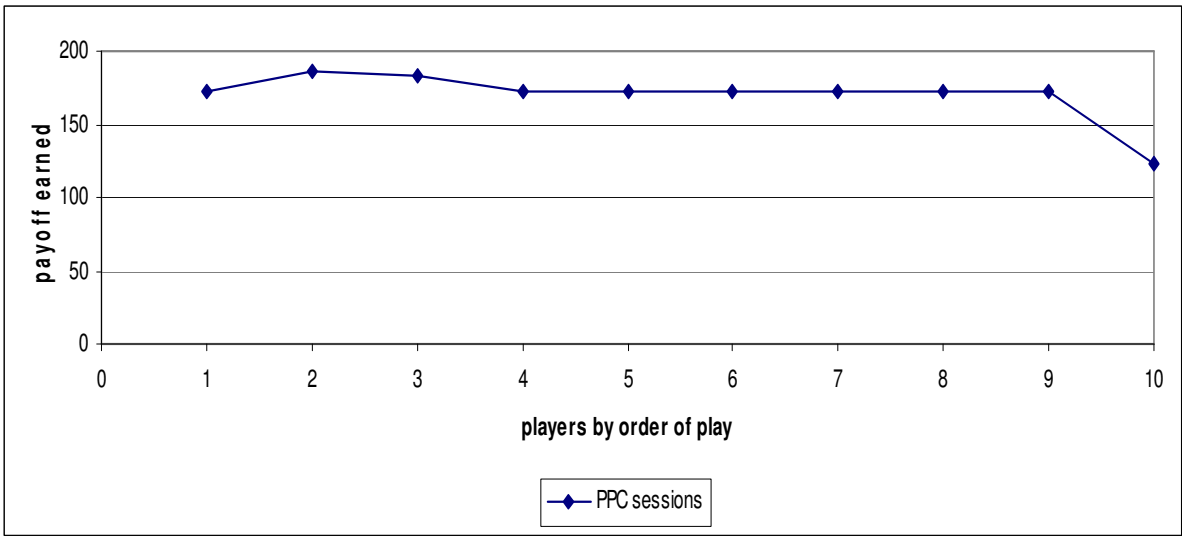
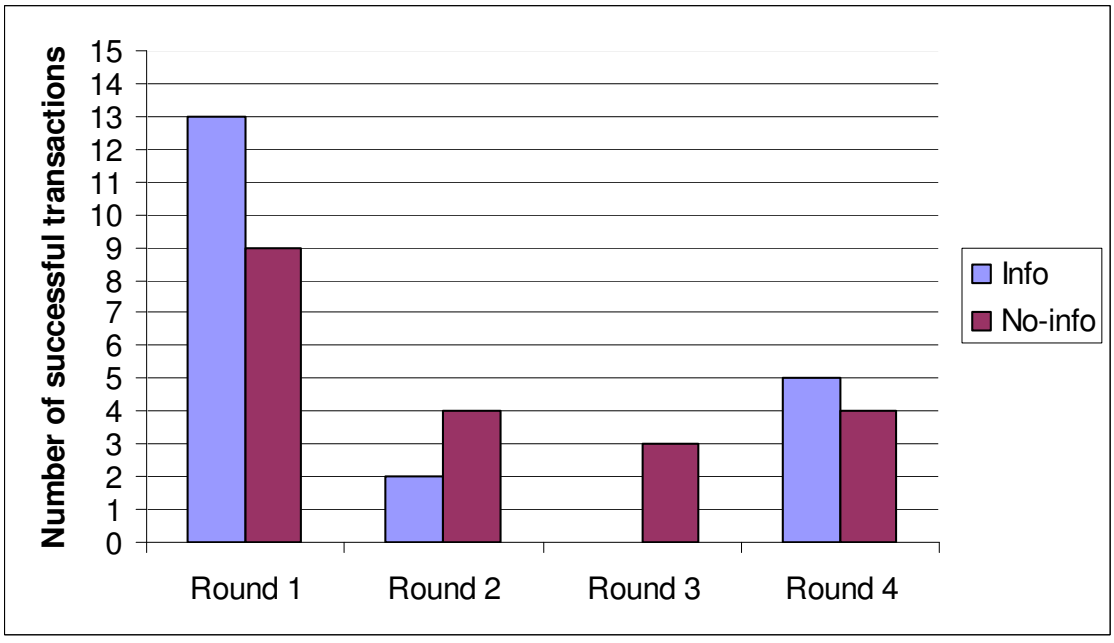


FIGURE 9

EXCHANGE: NUMBER OF TRANSACTIONS CONCLUDED PER ROUND



Tables

TABLE 1

	TRANSACTIONAL MODE		
	RECIPROCITY	REDISTRIBUTION	EXCHANGE
UNDERLYING SOCIAL RELATIONSHIP WHICH IS EXPRESSED BY THE TRANSACTION	Friendship, kinship, status, hierarchy	Political or religious affiliation	None

Source: Dalton (1968: xiv).