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Information seeking and reciprocity: a transformational analysis

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Abstract

The motivation to reciprocate is analyzed within the framework of interdependence theory, with focus on the process of transformation of situations. A model of transformation is presented for the motivation to reciprocate and hypotheses regarding allocation behavior and information seeking are derived. The hypotheses are tested in two experiments implementing a game where participants allocate payoff to self and other in a sequential way, with one participant able to gather costly information regarding the other's previous behavior. Individual differences in the motivation to reciprocate are assessed with the Personal Norm of Reciprocity questionnaire. Results show that participants with high motivation to reciprocate seek information regarding other's past behavior, and react to this information as the norm of reciprocity prescribes. Participants with low motivation to reciprocate prefer information regarding the future of the interaction (Study 1), or no information (Study 2), and behave in a more selfish way. Results are discussed with respect of (1) the transformation of situation process, (2) the role of reciprocity as an interpersonal motive, and (3) the validity of the individual differences measure. Copyright © 2003 John Wiley & Sons, Ltd.

In situations of interdependence of outcomes, outcomes are often only one of the many components of the situation. Real-life interactions are characterized by a variety of behavioral and interpersonal options that enrich the interpersonal processes over and above the mere allocation of resources among self and others. People often choose when to interact, with whom, and under what conditions, actively shaping the interpersonal situation and their cognitive representation of it. This variety of decisions social actors encounter has been recently taken into account in research about interdependence of outcomes, as research about social dilemmas with the option to exit or enter a relationship (Orbell & Dawes, 1993; Schuessler, 1989; Stanley, Ashlock, & Tesfation, 1994), select the partner (Yamagishi & Hayashi, 1996), or move to different relationships (Gallucci, Van Lange, & Ouwerkerk, in press) testifies. These lines of research show that individuals actively change the feature of the interdependence situation in order to achieve their interpersonal goals.

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Following Kelley (1997), there are two main processes whereby actors can achieve their interpersonal goals: (1) by selection of situations; (2) by transformation of situations. The first process can be referred to as locomotion (Van Lange & Visser, 1999), that is, actions taken in order to change the level of interdependence among partners. The second process has been the crucial process assumed by interdependence theory (Kelley & Thibout, 1978), whereby an actor transforms a given situation according to her or his motives, and then acts upon the subjective view the transformation process provides. Whereas much of the research aimed at expanding the interdependence framework has been devoted to the analysis of selection of situations, here we focus on the *transformation process*. We focus on the personal norm of reciprocity as an important interpersonal motive and we show that the transformation process underlying reciprocal preferences is also responsible for the process whereby individuals seek information regarding the interdependent situation.

The rationale of our research is based on the following logic. Following interdependence theory, we assume that an interpersonal motive can be represented by a transformation process describing how actors transform the given situation into a subjective one. Different motives require the acquisition of different information, and thus, when the information is not available, the transformation process should guide actors to seek the necessary information. This simple logic stems from a wider principle. Interpersonal motives guide interpersonal behavior throughout different sequences of behavior in a consistent way, such that individual differences in a motive influence the allocation of resources as much as the other decisions necessary for satisfying the interpersonal goal (Kelley, 1984, 1997).

The application of this principle to the analysis of the transformation process serves three important purposes. First, from a theoretical point of view, it outlines the process whereby goals are attained beyond the simple allocation of outcomes, in particular the cognitive and motivational dynamics underlying interpersonal motives. Second, from an assessment point of view, it provides a tool to test the validity of instruments used to measure individual motives. As far as a measure is a valid indicator of a motive, in fact, it should be able to predict the process whereby transformation is carried out alongside the transformation outcome itself. Third, from an analytic point of view, it sheds light on the possible reasons why a situation enhances or reduces the enactment of a specific motive: By establishing the process whereby a goal is attained, we can characterize the situational features that makes a specific transformation easier, more difficult, or even impossible to carry out.

Although the previous considerations can be applied to any interpersonal motive, in this contribution we focus on reciprocity. We conceptualize the notion of reciprocity as a truly social motive, active independently of long term prospects of gains (Gallucci & Perugini, 2000), and rooted in the individual's personal values (Perugini, Gallucci, Presaghi, & Ercolani, 2002).¹ This characterization is the topic of the next section.

RECIPROCITY AS AN INTERPERSONAL MOTIVE

All the social orientations discussed by interdependence theory (reciprocity, cooperation, individualism, competitiveness, altruism, etc.) may be interpreted in two different ways (Kelley, 1997): (a) as behavioral rules that people consistently follow in interdependent situations; (b) as intrinsic motives that provide satisfaction by themselves, that is, by the mere adherence to the rule. Thus, a person's

¹Unpublished work cited in this article: Perugini, M., & Gallucci, M. (2002). Differences between equality, fairness and reciprocity: The role of valence. University of Essex. Perugini, M., & Gallucci, M., Presaghi, F., & Ercolani, A. P. (2002). The personal norm of reciprocity. University of Essex.

cooperation can be an instrumental rule to achieve long-term gains (interpretation (a)) or it can represent the person's ultimate interpersonal goal (interpretation (b)). A person can be satisfied by behaving altruistically (interpretation (b)) or may act in an altruistic way to gather social approval or better outcomes in the future (interpretation (a)).

This dual interpretation of social orientations is particularly salient for reciprocity. Reciprocity can be thought of as an effective behavioral rule to achieve long term mutual cooperation and thus higher outcomes in the long run (Axelrod, 1984), or can be conceptualized as an interpersonal motive that, by itself, represents the goal of the interaction. Differently to other social orientations, however, reciprocity has been mainly referred to as a behavioral rule, followed by 'rational' actors striving to maximize their own outcomes (Axelrod, 1984; Kreps, Milgrom, Roberts, & Wilson, 1982). Here we stress the characteristics of reciprocity as a truly interpersonal motive. For this aim, we can distinguish three main characteristics that define reciprocity as an interpersonal motive: Its ability to be a goal by itself, reliable individual differences, and a specific transformation process.

Reciprocity as a Goal

The norm of reciprocity, when internalized (Schwartz, 1977), is able to guide behavior in the absence of additional goals. Whereas a generic norm can be viewed as a rule sanctioned by a group and followed by its member (Gintis, in press; Grusec & Kuczynski, 1997; Elster, 1989), an internalized norm is accepted not as a constraint, but as a goal (Parsons, 1967; Schwartz, 1977). Thus, even if a specific behavior dictated by the norm can be beneficial in the long term (as reciprocity can be indeed), when the norm is internalized the rewards are no longer necessary for abiding by the norm. Thus, the key feature of an internalized norm is not whether it can provide advantageous outcomes, but that it is able to guide behavior *also* when it does not provide advantageous outcomes. As regard reciprocity as an internalized norm, the fact that it may serve self-interest in the long run is not relevant. The key issue is that people abide by the norm of reciprocity also in situations when reciprocity does not serve self-interest. Research on reciprocal behavior shows that people indeed reciprocate even when reciprocity is in conflict with self-interest, as in one-shot prisoner's dilemma, and games with few repetitions (Bolton & Zwick, 1995; Bethwaite & Tompkinson, 1996; De Cremer & Van Lange, 2001). In a similar vein, we have recently shown that reciprocity can be observed in an experimental situation where material incentives, social approval, desire for cooperation and other alternative motives were carefully ruled out by design (Gallucci & Perugini, 2000).

Reciprocity as an Individual Difference

As for other interpersonal motives, reciprocity shows pronounced individual differences, empirically measurable and consistent over times and situations (Perugini et al., 2002). Among different measures of reciprocity (e.g. Eisenberger, Cotterell, & Marvel, 1987), we have recently developed a measure, the Personal Norm of Reciprocity scales (PNR: Perugini et al., 2002), that conceptualizes the motivation to reciprocate along three main dimensions: positive reciprocity, negative reciprocity and beliefs in reciprocity. The three dimensions measured by the PNR were individuated operating two main theoretical distinctions in the general domain of the norm of reciprocity. A first main distinction was drawn between beliefs and behavior. The beliefs dimension measures the perceived efficacy of reciprocity and the beliefs concerning the widespread use of reciprocity-based behaviors. This dimension captures mainly the normative part of reciprocity, the perceived appropriateness, and the anticipation of reciprocity from others.

As regards behavior, a distinction was drawn within two behavioral domains, rewarding versus punishing behavior, associated to positive and negative reciprocity, respectively. Even though those domains are the manifestations of the same underlying mechanism (e.g. reaction to someone's else behavior), individuals might reliably differ in their propensities to react with negative actions to negative behaviors compared with positive actions following positive behaviors. Positive reciprocators are particularly prone to react to positive interpersonal behaviors whereas negative reciprocators are expected to be particularly reactive to negative ones. Therefore, whereas the former should be especially sensitive to kind behavior, the latter should be especially sensitive to unkind behavior. Furthermore, positive reciprocators are particularly willing to perform positive behaviors, or to deliver positive sanctions, following the other's positive action (e.g. be kind with someone if the other is kind to you) whereas negative reciprocators should be especially willing to perform negative behaviors, or to negatively sanction, when receiving negative behaviors by the other (e.g. retaliate against someone who has behaved negatively towards you). Research involving this instrument is providing evidence in support of the definitions of the three dimensions, as well as their relevance in accounting for different phenomena, from the evaluation of other's intentionality (Perugini & Gallucci, 2001, 2002), to behavior in bargaining situation (Perugini et al., 2002).

Finally, reciprocity can be described in terms of transformation of situation, that is, by a transformation process producing the effective situation upon which actors evaluate the allocation choices. As this third characteristic turns out to be crucial in understanding how the motive to reciprocate interacts with the features of the situation, we focus on it in detail in the following section.

TRANSFORMATION PROCESS AND RECIPROCITY

The process of transformation of situations can be metaphorically thought of as the act of filtering colours through a lens. Given an image that is, say, yellow and white, we assume that the actor judges the image after observing it through a lens of a specific colour. Thus, an actor equipped with a blue lens would see the image as green and blue, whereas an actor with a red lens would see the image as orange and red. The given situation (often called the given matrix) is our yellow and white image, the lens is the motivation a person holds, and the filtered image is the effective situation, that is the transformed matrix used by the actor to make her or his decisions.

Motives act as filtering lenses because they modify the objective situation into a subjective situation, that in turns varies from individual to individual depending on the motives an individual holds. Along this reasoning, several authors (Kelley & Thibout, 1978; McClintock & Liebrand, 1988; Messick & McClintock, 1968; Van Lange, 1999) have identified specific motives (prosociality, competitiveness, individualism, etc.) that transform the situation through a cognitive reconstruction of the elements of the situations. If we have, for instance, a situation with one option that gives 10 to the self and 5 to the other, an actor striving to maximize the joint outcome would perceive this option as worth 15 (i.e. $10 + 5$), whereas an actor striving to maximize the relative gains over the other, would perceive this option as worth 5 (i.e. $10 - 5$).

Reciprocity can be easily framed in this conceptual tool by defining the transformation process that it requires. Reciprocity can be defined as a norm prescribing that individuals should reward who rewarded them and punish who punished them (Gouldner, 1960; Komorita, Hilty, & Parks, 1991; Komorita, Parks, & Hulbert, 1992). Its representation in terms of transformation of outcomes can be readily provided by considering that the previous definition requires a comparison between what an actor has received by the other in the past and what the actor is presently giving to the other. If we call

ρ_{ijk-1} what the actor i has received by actor j at time $k - 1$, and ρ_{jik} what the actor i is giving to the actor j , the motivation to reciprocate can be described as minimizing the difference between the two values. That is,² $R = |\rho_{ijk-1} - \rho_{jik}|$ (Gallucci & Perugini, 2000).

To give a concrete example, assume that Adam is about to decide whether to give Eva (a) 4 apples or (b) 2 apples. Assume Adam knows that in recent past, Eva gave him 1 apple.³ If Adam is motivated only by reciprocity concerns, then he will transform this situation such that the value of option (a) would be 3 (4-1) and the value of option (b) would be 1 (2-1). Being motivated by reciprocity, Adam would choose the option that minimize the difference R , and thus would give Eva 2 apples. When we consider that not everybody is motivated by reciprocity with the same strength (Eisenberg et al., 1987; Gallucci & Perugini, 2000; Van Lange, 1999), we arrive at the following function (Gallucci & Perugini, 2000) which characterizes the transformation of the given outcome (GO) to the effective outcome (EO):

$$EO = GO - \lambda |\rho_{ijk-1} - \rho_{jik}| \quad (1)$$

Lambda (λ) represents the importance an actor gives to the norm of reciprocity. Its variation captures the range of transformations reciprocity can produce. The higher the lambda, the more the actor is motivated to reciprocate, the lower the lambda, the more the actor is motivated by the objective outcome.⁴

The transformation process depicted in equation (1) has several characteristics worth mentioning. First, it conceptualizes the motivation to reciprocate as an interpersonal motive, embedded in the personal value system and independent to material gains the behavior may provide. Second, this definition of transformation process conceives individual differences in a continuous fashion, allowing for testing its implications upon fine-grained behavioral options with fine-tuned individual differences measures. Third, it specifies the information an actor needs in order to consistently transform the given situation into an effective situation to choose from: When an actor is motivated by reciprocity, in fact, the crucial information needed by the transformation process is the interdependent other's behavior in the past, which is the point of comparison to judge the value of the available options. When the actor is not motivated by reciprocity, information regarding the objective outcomes, that is regarding the material gains available in the situation, should be more important, because the other's behavior is not part of the actor's transformation process.

This reasoning leads to identify a pattern of consistency among allocation preferences (motives), information seeking (information choices) and allocative actions (behavior): If the assumed transformation process is valid, in fact, we should observe that people gather the information that best suits their motives and behave according to their motives and the information they acquired. To test this consistency pattern, we consider a simple interdependence situation, where the main consequences of the described process can be translated into hypotheses and experimentally tested. We call this situation the information game.

²A detailed explanation of this formula, along with its similarities and differences with other formal models of social orientations (such as Conrath & Deci, 1969; Loewenstein, Thompson, & Bazerman, 1989; Messick & Sentis, 1984; Van Lange, 1999), can be found in Gallucci and Perugini (2000). See Perugini and Gallucci (presentation at the ESRC conference on Decision-making in Theory and Practice, Oxford, July 1998) for a broader discussion of the general properties of the model from which this formula derives. Details regarding the differences between this formula and other formal models of social orientations are not discussed here in that they are not relevant for the logic of the present contribution.

³No matter what consequence this apple may have on the couple!

⁴It should be noted that this model contrasts the motivation to reciprocate to the motivation to maximize outcomes to self. In fact, this model is not meant to capture a spectrum of social motivations, but rather the motivation to reciprocate as compared to the motivation not to reciprocate.

THE INFORMATION GAME

The information game is a two-person, sequential allocation task, where actors allocate resources to self and other, and one actor can acquire information about the ongoing situation. The game is played by two actors, the *starter* and the *seeker*. The game involves three steps: (1) the *starter* choice, (2) the *seeker* choice and (3) the *starter* final choice. In step 1 the *starter* chooses between a fair option and a selfish (unfair) option. In step 2 the *seeker* divides an amount of money between self and other. In step 3 the *starter* has 50% chance of dividing a new amount of money and 50% that the game ends in step 2. Which course of actions occurs is randomly determined in advance but unknown to both persons. Before the *seeker* makes a decision in step 2, s/he can choose between being informed about the *starter*'s previous choice or about whether the *starter* will play next. A diagram of the game is provided in Figure 1.

The *seeker*, therefore, faces the choice to be informed about the past or the future. From a rational, self-centered point of view, the choice is easily made: No matter what the other has done, the *seeker* would always be better off by giving nothing to the other in step 2, and thus the information about the other's past behavior is useless. To see that this is true, assume that the *seeker* is sure that the other is a fair person. If the *seeker* splits her endowment expecting a fair allocation from the other, she will pay 10 and receive 7.5 (overall outcome 17.5), which is dominated by giving 0 and receiving 0 (overall outcome 20). Giving 0 is also the best option when the *seeker* knows that the other has been unfair, because no expectation of future reward can be formed. It follows that giving 0 is the best option to maximize the outcome to self, independently of the other's behavior. Therefore, the information about the other's behavior is irrelevant for self-interest.⁵

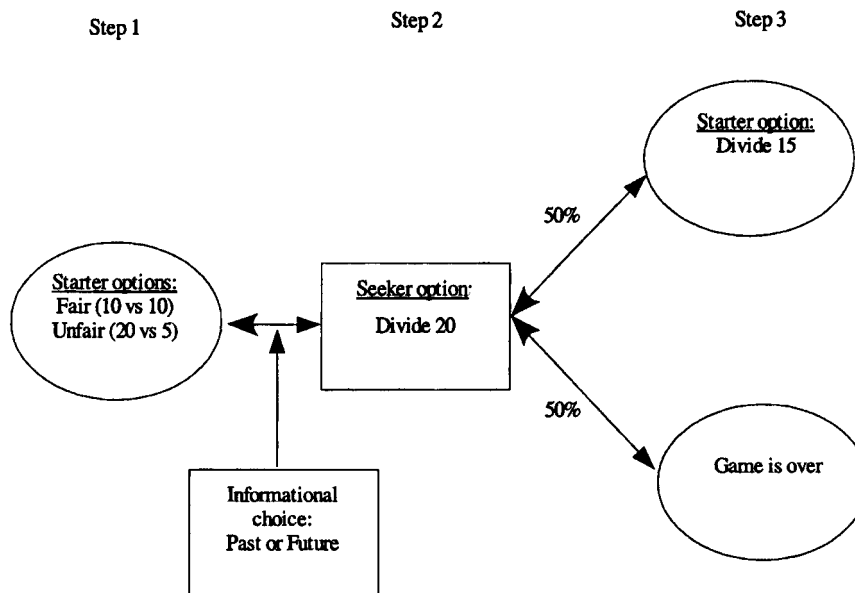


Figure 1. The information game. Note: Circles refer to the action of *starters*, rectangles to the actions of *seekers*

⁵The same reasoning applies if the actor has a competitive orientation, because giving 0 maximizes the difference between the actor's and the other's outcomes.

The picture is different if the *seeker* is motivated by reciprocity. The *seeker* needs the information about the other's past behavior in order to carry out the transformation of the situation, and thus this piece of information is the one to look for. From the viewpoint of reciprocity, in fact, to be informed about the future leaves the *seeker* with an ill-defined reconstruction of the situation, being the past, and not the future, the outcome that is part of the transformation process.

According to the previous reasoning, we can formulate a series of hypotheses that coherently link motivations, information seeking process and behavior.

HYPOTHESES

The hypotheses we derive from the reciprocity transformation process concern the behavior of actors in the *seeker* position. The first hypothesis concerns the link between information and motivation. Given that the information about the other's past behavior is vital for actors motivated by reciprocity, we should observe the following:

Motivation-information hypothesis: The stronger is the motivation to reciprocate, the more actors will ask to be informed about the other's past behavior, as opposed to be informed about the future interdependence of the outcomes.

The second hypothesis is strictly a consequence of the first. If actors motivated to reciprocate seek information about the past because they need it to transform the situation, they should act according to the transformed situation. Put differently, if the actors seek information about the past because they intend to reciprocate, they should indeed reciprocate. As a consequence, we should observe the following:

Information-behavior hypothesis: For actors informed about the other's behavior, the allocation of payoff should vary as a function of other's past behavior.

The third hypothesis is a consequence of our conceptualization of the motivation to reciprocate as continuous individual differences. The motivation-information hypothesis states that the ones who choose to be informed about the past should be motivated by reciprocity, at least more than the ones who choose to be informed about the future. But among the ones who choose to be informed about the past (i.e. the reciprocators), we should observe that the higher is the motivation to reciprocate, the more an actor would abide by the norm. That is, among the actors informed about the past, the stronger is the motivation to reciprocate, the stronger should be the difference between the payoff given to the unfair other and the payoff given to the fair other. Put differently, we should have a moderating effect of the motivation to reciprocate over the link between information and behavior.

Motivation-behavior hypothesis: The effect of the other's past behavior on the allocation of payoff should be stronger for actors highly motivated by reciprocity than for actors moderately motivated by reciprocity.

Note that given that the game emphasizes the rewarding rather than the punishing nature of the decisions, we expect that the aforementioned hypotheses concerning individual differences in reciprocity are especially relevant for positive reciprocity. Other experimental results have already suggested that the emphasis in the interaction as allowing for punishing vs rewarding sanctions is differentially associated with individual differences in negative vs positive reciprocity (Perugini & Gallucci, 2001, 2002; Perugini et al., 2002).

STUDY 1

To test the set of hypotheses we have derived from our interdependence framework, we carried out a first experiment which implements the information game as outlined above.

Method

Participants

Participants were 170 Italian undergraduate students with an average age of 20.82 years ($SD = 3.25$). Fifty-six were male and 114 female. The participants originated from 12 different faculties and were contacted at the University of Rome campus. They were invited to participate in an experiment where they could earn some money.

Experimental Procedure

The experimental procedure provides an implementation of the information game described above. Half of the sample participated in the experiment as *starters* and half as *seekers*. Experimental sessions were scheduled in groups of 16 to 20. Upon arrival, participants were randomly divided in two groups (*starters* and *seekers*), and each group was brought in a separated room. In each room an experimenter explained the whole procedure. Participants were informed (a) that each participant would be paired with a participant in the other room; (b) each participant would be identified by a secret code number, with no possibility of learning the identity of the other one, both for the participant and the experimenter (double-blind anonymity); (c) the experiment involved real money that would be paid according to a lottery to be held at the end of the session.⁶ Questions were asked to the participants to be sure they understood the task.

- *Step 1, starters room.* Participants in the group of *starters* chose between a fair allocation (labeled A: £10,000-£10,000) or an unfair one (labeled B: £20,000-£5,000). They were informed that the other (i.e. the *seeker*) could choose later on between being informed about the future and being informed about their choices.
- *Step 2, seekers room.* Participants in the group of *seekers* were asked to decide whether they wanted to learn the other's choice or if the other had to play again in step 3. After having learned the information they asked for, they divided the amount of money endowed to them (£20,000). Before making their decision, they were also informed that the other (i.e., the *starter*) would have been informed about their allocation at the beginning of step 3.
- *Step 3, starters room.* When step 2 was over, participants in the *starters* room were first informed about the other (the *seeker*) allocation, and then informed if they should play again. Half of the participants learned that they had to divide an extra amount of money (£15,000) and half were informed that the task was over.

The procedure involved no deception. Participants were actually paired and the choice made by the paired participant was really the actual choice. All the experimental choices were written by the participants in pre-printed forms, and put in envelopes marked by the participant's secret code. One

⁶All the payoffs involved in the game were equivalent to those depicted in Figure 1, multiplied by 1000 and expressed in Italian Liras (£). Italian £1000 is equivalent to 0.52 Euro and approximately to 0.50 US dollar at the time of the experiment.

experimenter brought the envelopes from one room to the other when exchange of information was needed. The two rooms where the experiment was held were in front of each other, with glass windows on the door. The participants could therefore see that the experimenter was really going back and forth to the two rooms, and that he had no time to change or manipulate the envelopes.

Upon the end of the session, all the participants received an envelope with a brief debriefing note. A randomly extracted 20% of the participants had the envelope containing also the money they gained in the experiment.

Measurement When the experimental task was over, each participant filled in the Personal Norm of Reciprocity scales (PNR; Perugini et al., 2002). Three dimensions measured the individual's norm of reciprocity with 27 items (see Appendix). Positive reciprocity represents the willingness to reward positive behavior (P, 9 items); negative reciprocity represents the willingness to punish negative behavior (N, 9 items); Beliefs in reciprocity measures beliefs regarding reciprocity, namely the belief concerning the effectiveness of the norm and anticipation of others' reciprocity (B, 9 items). In the present sample, the three dimensions showed reasonable internal consistencies ($\alpha = 0.70$ for P, $\alpha = 0.83$ for N and $\alpha = 0.61$ for B). The correlations of the three dimensions were as expected: positive correlations between positive reciprocity and beliefs in reciprocity ($r = 0.18$, $p < 0.05$) and negative reciprocity and beliefs in reciprocity ($r = 0.39$, $p < 0.001$), and no correlation between positive and negative reciprocity ($r = 0.04$, ns). The psychometric properties of the PNR scales were comparable to those emerging in the validation of the instrument (Perugini et al., 2002). Across an overall sample of almost 1000 respondents, the three-dimensional structure of the PNR was confirmed in different subsamples, Italian and British, and tested using confirmatory factor analysis. The instrument also showed convergent validity (with other instruments tapping the construct of reciprocity) and discriminant validity (with instrument measuring social motivations but not reciprocity), as well as were able to differentially predict several relevant criteria.

Results

The theoretical analysis we have articulated is focused mainly on the behavior of the *seekers*. Consequently, we report the analyses germane with the hypotheses, reporting data and statistics concerning *starters* behavior when necessary.

Preliminary Statistics

To begin with, 31% of the *starters* ($n = 26$) chose the advantageous unfair option, whereas 69% ($n = 59$) chose the fair option. As regard the *seekers*' information choices, 55.3% of the *seekers* ($n = 47$) asked to know about the past and 44.7% ($n = 38$) asked to know about the future. We present in the following a series of analyses in order to understand the reason underlying this pattern of choices.⁷

Hypotheses Testing

The *motivation-information hypothesis* has been tested using a logistic regression model with the informational choice (future vs past) as dependent variable and *positive reciprocity* (P), *negative*

⁷In both experiments presented in this contribution gender had no effect in any of the dependent variables, so we collapsed the data of male and female participants.

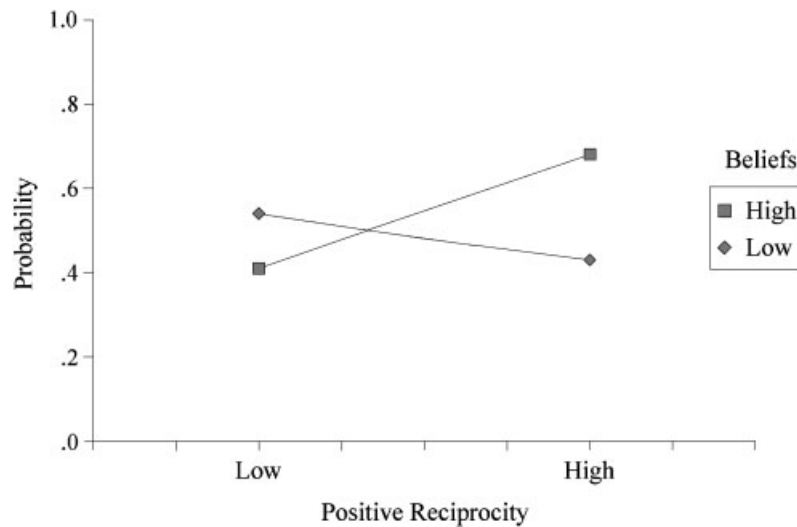


Figure 2. Probability to ask about the past as a function of Positive reciprocity and reciprocity Beliefs (experiment 1: sample of *seekers*, step 2)

reciprocity (N), and *beliefs in reciprocity* (B) and their interactions (P*N, P*B, N*B) as independent variables (predictors). Following Cohen and Cohen (1983), the independent variables have been centered to their mean and the multiplicative terms have been entered in the regression equation after the linear terms. This guarantees that the interactions do not absorb artificially the linear effect of the predictors.

Results showed a significant interaction of *belief in reciprocity* and *positive reciprocity* in predicting the informational choice ($B = 0.97$, $\chi^2(1) 4.35$, $p < 0.05$). Figure 2 shows the probabilities of choosing to know the past as a function of different levels of the two dimensions of reciprocity.⁸

It is apparent that the probability to ask about the past is higher for combination of high values of beliefs in reciprocity and positive reciprocity than for any other combination. Put differently, it appears that when participants have both beliefs in reciprocity and positive reciprocity they are more likely to choose to know the past. All other conditions do not differ significantly from each other.

Thus, our first hypothesis received support from our data with a qualification. Individual differences in the norm of reciprocity are indeed able to predict informational choices regarding the other's past behavior, especially for participants that held both beliefs that reciprocity is an effective and widely adopted behavior, and are willing to reciprocate positive actions. When lacking either these beliefs or willingness to reward others' positive behavior, participants do not preferentially seek to know about the past.

The second prediction of our theoretical analysis regards the allocation behavior (*information-behavior hypothesis*). Participants who asked for the past should reciprocate the observed behavior,

⁸For the previous and the remaining hypotheses concerning individual differences we used a regression approach: note that the regression analysis is more accurate than an ANOVA conducted over the median or mean split groups formed by dichotomizing the independent variables. In fact the regression approach does not rely on an arbitrary split of the variables and is able to capture the interaction effect at different levels of the variables. It is also more appropriate with small samples (Cohen & Cohen, 1983). However, for ease of presentation, our tables and figures are based on two groups split according to the values of the independent variables. Furthermore, whenever we found a significant effect in a regression analysis involving many predictors, we reran the analysis by using only the significant predictors, to test whether the low ratio between predictors and participants could have biased the results, given the relatively small sample size at our disposal (Cohen & Cohen, 1983). In no case did we find evidence of such a bias.

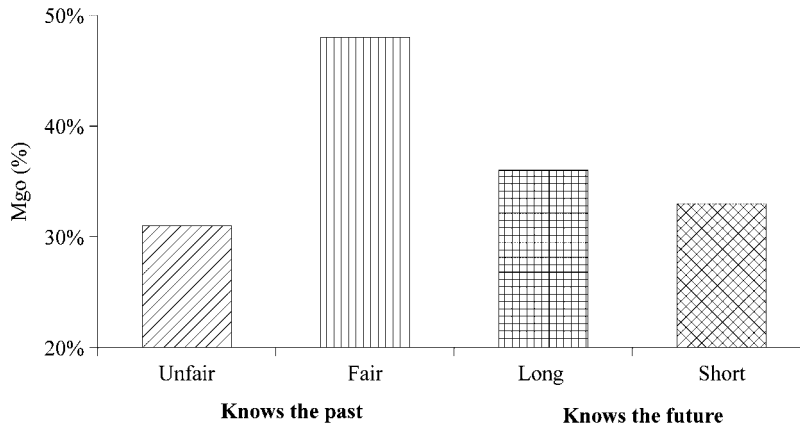


Figure 3. Percentage of money given to the other as a function of *seekers* information. (experiment 1: sample of *seekers*, step 2)

whereas participants who asked for the future should show a self-interested allocation. To investigate the pattern derived from the hypothesis, a series of planned comparisons has been conducted on the basis of a one-way ANOVA, with four groups representing what the participants knew after they acquired the information: group (1) the other chose unfairly ($n = 13$); group (2) the other chose fairly ($n = 34$); group (3) the other will play again ($n = 18$); group (4) the other will not play again ($n = 20$). The ANOVA model was significant ($F(3, 84) = 3.49, p < 0.05$). Figure 3 reports the average amount of money given to the other (M_{go}) in the experimental conditions, expressed in percentage of the total amount available to the participants.

To test the specific predictions we ran a set of planned comparisons. First, among the participants who asked for the past (group 1 versus group 2), the ones who observed the other to be fair gave a significantly higher reward ($M_{go} = 47\%$) than those who observed the other to be unfair ($M_{go} = 31.5\%$) ($F(1, 84) = 6.71, p < 0.01$). Thus, participants clearly reciprocated the other behavior. Second, the participants who asked for the future gave a lower amount of money to the other (groups 3 and 4 $M_{go} = 34.2\%$), as compared to the participants who reward fairness (group 2, $M_{go} = 47\%$), $F(1, 84) = 10.93, p < 0.01$. On the contrary, their allocation was about the same as participants who punish the unfair behavior ($F(1, 84) = 0.90, p = ns$). Thus, participants informed about the future were clearly unfair and self-interested in their allocation. Finally, participants informed about the future were not influenced by this information, giving about the same if the other was to play again or not ($F(1, 84) = 0.34, p = ns$).

The third prediction of our theoretical analysis regards the relation between allocation and personal norm of reciprocity (*motivation-behavior hypothesis*). To test this hypothesis we conducted a regression analysis with the amount of money given to the other as dependent variable and other's choice (fair vs. unfair) and the norm of reciprocity factors (P, N, and B) as independent variables, for *seekers* who asked about the past. Given that the reciprocity norm prescribes different allocations as a function of the other's choice, we examined also the interactions among the reciprocity factors and other's choice.

The regression analysis yielded two significant effects. First, consistently with the above-mentioned planned comparisons, the other's choice had a strong effect on the participants' allocation ($\beta = 0.49, t(1) = 3.24, p < 0.01$). Second, there was a significant interaction between the other's choice and positive reciprocity ($\beta = 0.41, t(1) = 2.36, p < 0.05$). Figure 4 shows the nature of this interaction.

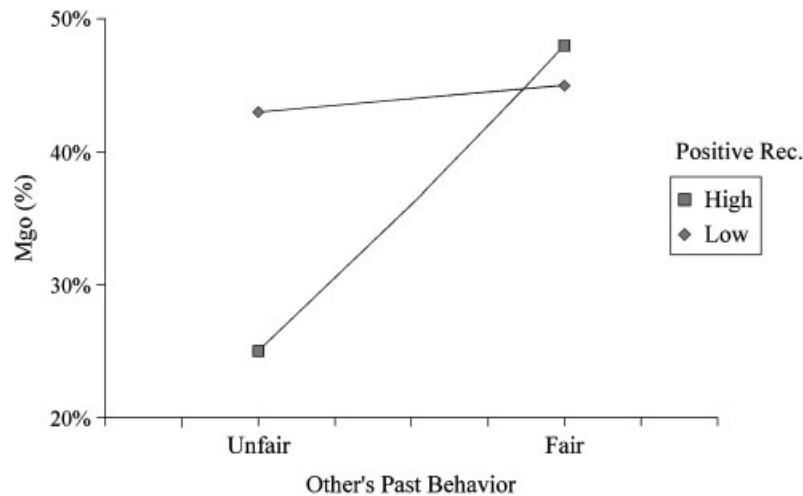


Figure 4. Percentage of money given to the other as a function of Positive reciprocity and other's past behavior (sample of *seekers*, step 2)

Individual differences in positive reciprocity amplify the general effect of reciprocity. Thus, the difference between the money given to a fair other and the money given to an unfair other was increasingly larger for participants with high positive reciprocity. In fact, whereas low reciprocity scorers were not influenced at all by the other's choice, participants with high scores were extremely influenced (cf. Figure 4). This result is supporting the hypothesis. Notably, also negative reciprocity produced an effect in the same direction, despite the fact that it is a dimension defined in terms of punishing and therefore less relevant in this context. This effect, however, did not reach a full statistical significance ($\beta = 0.26$, $t(1) = 1.78$, $p = 0.08$).

As an additional support to our second hypothesis, our design allows us to test the *motivation-behavior hypothesis* also in the sample of *starters*. Fifty percent of the *starters*, in fact, had to allocate an additional amount of money among themselves and the other in step 3. They were informed about the allocation of the other in step 2, and were informed that their allocation would terminate the game. Thus, any strategic reason to reciprocate is ruled out by design. Furthermore, this sample is an independent sample, randomly selected among the *starters*, that allows for an independent test of the *motivation-behavior hypothesis*.

To test this hypothesis we performed a regression analysis with the money given to the other in step 3 as the dependent variable and the money received in step 2 and the reciprocity factors as independent variables. Once again, given the conditional nature of reciprocal behavior, the effects of the norm of reciprocity should be evaluated in terms of interactions with the money received in step 2. Accordingly, the interactions between money received and the dimensions of reciprocity have been included in the analysis. Results showed a highly significant effect of the money received on the money given to the other ($\beta = 0.41$, $t(1) = 2.91$, $p < 0.01$), indicating the strength of reciprocal behavior in absence of any strategic or self-centered incentive. More interesting for our hypothesis, an interaction between *positive reciprocity* and money received by the other was significant ($\beta = 0.40$, $t(1) = 2.56$, $p < 0.05$). Figure 5 shows the nature of this interaction.

Whereas participants with low positive reciprocity give an almost equal share of their endowment to the others, irrespective of what they have received, participants with high positive reciprocity give to the other proportionally to what the other gave to them. To see the strength of this interaction, we performed a regression analysis of money received on money given, separated for high versus low

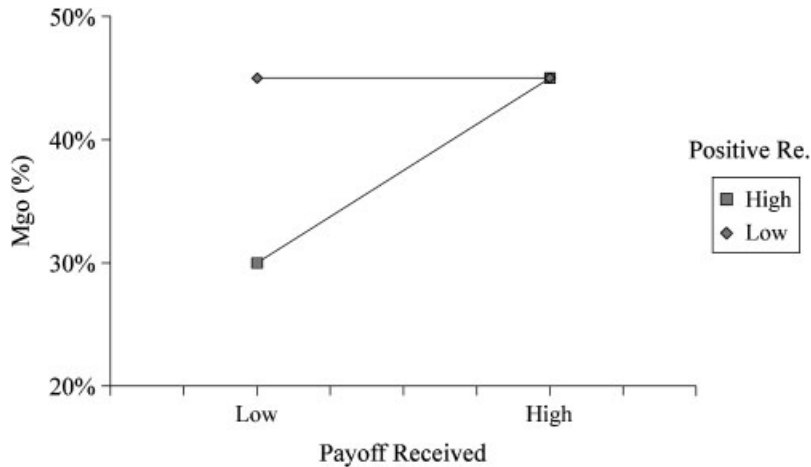


Figure 5. Percentage of money given to the other as a function of Positive reciprocity and other's past behavior (sample of *starters*, step 3)

positive reciprocity participants. Whereas for low reciprocity there is no link between money received and money given ($\beta = 0.01$, $t(1) = 0.06$, $p = 0.95$), for participants with high positive reciprocity the link is remarkably strong ($\beta = 0.67$, $t(1) = 3.73$, $p < 0.001$): In this latter case the money received explained 47% of the variance of the money given to the other. Combining the findings in both samples, we can confidently conclude that the stronger is the norm of reciprocity as measured with the PNR, the more the participants adhere to the norm and thus reciprocate, as the motivation–behavior hypothesis suggests.

Recapping our results can help to clarify our findings. Participants in the *seeker* position chose to know about the future or the past as a function of their preference for reciprocity (Motivation–information hypothesis). Thus, the ones who asked for the past consistently reciprocate the observed behavior, giving a low amount of money to the unfair other and a high amount to the fair one (Information–behavior hypothesis). This effect was stronger for participants with high motivation to reciprocate. Participants with low willingness to reciprocate and more self-oriented, chose to know about the future and gave a low amount of money to the other, independently to the other's future options (Motivation–behavior hypothesis).

As regards the motivation–information hypothesis, however, some doubts can be cast concerning the strength of the results. First, the results were statistically significant, but not overly strong. A replication of the results with a fresh sample would be desirable. Second, the informational choice was a costly choice only in terms of strategic information, but it did not actually affect participants' outcomes. For example, a participant who decides to give a certain amount to the other irrespective of the other's past or future choices, might have asked for the past just out of curiosity, or perhaps in order to gather information about the type of person he or she was paired with. Third, some participants might have mistakenly thought that reciprocating a fair other could have been a way to maximize their outcomes, leading them to seek information about the past. Fourth, the individual differences measurement has been carried out after the experimental task. Although the latter choice has been made to minimize the influence of the measurement on the experimental behavior, we cannot rule out the possibility that the experimental task has influenced the answers to the questionnaire. To rule out these possibilities and to test the strength of the hypothesis, we conducted a second experiment.

STUDY 2

If participants in the role of *seekers* ask for the past in order to gather information about the type of person the other is, in view of a third choice, we should have different results if we remove the possibility of a third step. Moreover, without a third step, participants who reciprocate the other's fair choice cannot be motivated by expectations of future rewards, even if this motivation would have been irrational (i.e. not producing any gain) as in the first experiment. Finally, if participants seek information about the past just to satisfy their curiosity given that it is not costly in terms of outcomes, they should not be willing to pay in order to gather this information.

We therefore conducted a second experiment implementing a reduced version of the information game, with two steps (one and two), where participants in the role of *seekers* should pay a fee if they want to know how the other behaved in the previous stage. In this version of the game, therefore, asking for the past is costly and there is absolutely no self-interested reason to do so.

Participants

Participants were 80 Dutch undergraduate students with an average age of 20.52 years ($SD = 3.21$). Twenty-eight were male and 52 female. The participants originated from different faculties and were contacted at the Free University bar, in Amsterdam. They were invited to participate in an experiment where they could earn 5 NLF as a show up fee, plus additional money accordingly to their experimental outcomes.

Method

The experimental sessions were organized in groups of 8–10 participants. Upon arrival each participant was escorted to a cubicle of the laboratory, where the instructions of the game were displayed using a computer. Participants were informed that they were to perform decision-making tasks, randomly paired with another person in another cubicle, allegedly connected via the intranet. Each participant was told that the game involved two people. Person 1 was to choose between two allocations of payoffs, allocation A yielding 10 NLF for each person, and allocation B yielding 20 NLF for person 1 and 5 NLF for person 2. Person 2 had to freely allocate an endowment of 20 NLF, after which choice the task was over. Before making her or his decision, person 2 had the option to be informed about the other's choice. In order to receive this information, person 1 had to pay a fee of 5 NLF, to be discounted from the final outcome (1 NLF = 0.45 Euro, 1 NLF = 0.40 USD). Participants were also informed that a lottery prize of 25 NLF would have been given to 10% of the sample, and that the probability of winning the prize was proportional to the amount of payoff they gained in the experimental task.

All the participants were informed that they would have played as person 2. Person 1 was fictitious. Given that we were interested in testing whether participants reciprocate a fair choice when there is no chance of future interaction, all the participants who chose to be informed about the past were informed that the other had chosen option A, that is, the fair option.

Measurement

Before the experimental game was explained, participants filled out the PNR questionnaire, introduced as a separated section of the experiment. We used a Dutch version of the 27 items. In the present sample, the three dimensions showed reasonable internal consistencies ($\alpha = 0.74$ for P, $\alpha = 0.76$ for N and $\alpha = 0.60$ for B). The correlations of the three dimensions were as expected: Positive correlations

between positive reciprocity and beliefs in reciprocity ($r = 0.24, p < 0.05$) and negative reciprocity and beliefs in reciprocity ($r = 0.26, p < 0.001$), and no correlation between positive and negative reciprocity ($r = 0.04, ns$). The factor congruence between the factor structure in the Dutch sample and the overall PNR structure was also quite remarkable, considering the limited size of the Dutch sample: Tucker's phi were 0.91, 0.93, and 0.97, for positive reciprocity, negative reciprocity, and beliefs in reciprocity, respectively. These values clearly testify that the factor structure is very much the same across countries.

Results

Twenty-two (27%) participants asked to be informed about the past. The *motivation-information hypothesis* has been tested using a logistic regression model with the informational choice (yes vs. no) as dependent variable and *positive reciprocity* (P), *negative reciprocity* (N), and *beliefs in reciprocity* (B) and their interactions (P*N, P*B, N*B) as independent variables. Results showed a significant effect of *positive reciprocity* ($B = -0.68, \chi^2(1) = 6.33, p < 0.01$) in predicting the informational choice. This main effect was in the hypothesized direction, with participants with high Positive reciprocity asking more about the past (*probability* = 0.35) than participants with low Positive reciprocity (*probability* = 0.19). Unlike the first study, where an interaction between beliefs and positive reciprocity qualified the results, here we found a main effect only. However, it should be noted that the inspection of the means for the groups of high and low positive reciprocity and beliefs reveal basically the same pattern of the first study. Figure 6 shows the probabilities of choosing to know the past as a function of different levels of the two dimensions of reciprocity. When the pattern of means is analyzed, the interaction between Positive reciprocity and Beliefs is marginally significant ($F(1, 80) = 2.79, p = 0.09$). Moreover, the probability of the group with high positive reciprocity and high beliefs is significantly different from the three other groups ($F(1, 80) = 12.66, p < 0.01$), which are not significant between each other ($F(1, 80) = 0.67, p = 0.41$).

Thus, the same pattern of results qualify the relations between positive reciprocity and information seeking in the two experiments, even though a full statistical effect is achieved only in the first

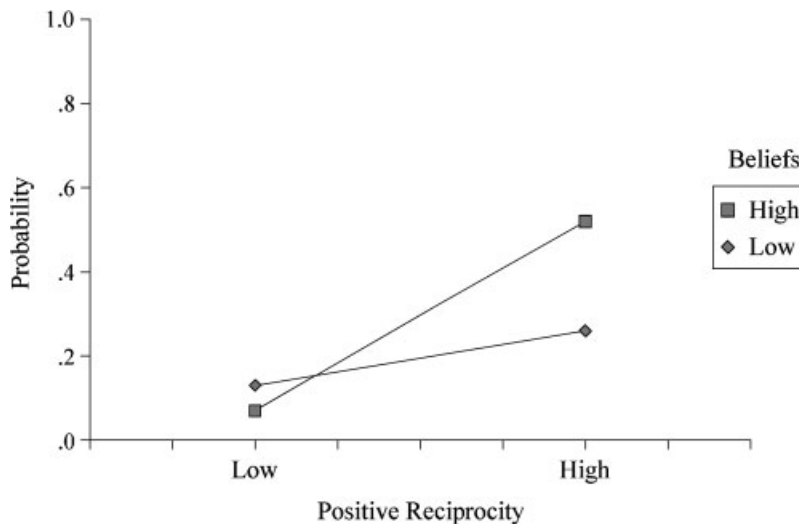


Figure 6. Probability to ask about the past as a function of Positive reciprocity and reciprocity Beliefs (experiment 2: step 2)

Table 1. Comparison of reward behavior in Experiments 1 and 2

Experiment	Information about the past		
	Other fair	No info	
1	0.47 (34)	0.35 (38)	0.40 (72)
2	0.43 (22)	0.32 (58)	0.35 (80)
	0.45 (55)	0.33 (96)	

Note: The cell sizes are in parentheses.

experiment. It should be noted that in Study 2 not only was the sample different in nationality and culture, but also the task was more stringent, in that the decision to know about the past was obviously a costly decision. This is reflected in the smaller overall probability of choosing to know that past, which is in line with the fact that costly decisions are less likely to be made. In our opinion, this is reflected also in the neater results we have found. When decisions are costly, a motivation to reciprocate should play a more important role, whereas beliefs, although still relevant, may become less crucial in making such a choice. We can therefore conclude that the motivation to reciprocate seems associated with the choice to seek for information about the past.

Study 2 allows us to test simply and directly whether participants who get to know that the other has been fair, reciprocate this action because they want to maximize their future outcomes or because they are intrinsically motivated to reciprocate. In Study 2, in fact, there is not future action to be made, and thus the former possibility is ruled out by design. We therefore compared the amount of payoff given to the other when the other has been fair with the amount of payoff given to the other when no information was gathered. Results show that participants significantly gave more to the other when they knew the other was fair ($M_{go} = 0.43$) than when they did not know how the other behaved ($M_{go} = 0.32$). Moreover, bear in mind that the reciprocating participants also paid to be allowed to reciprocate. As shown in Table 1, the pattern of results is remarkably similar to the results obtained in experiment 1. In both experiments, when information about the past is available, because the participants actively seek it, fair allocations were reciprocated with higher rewards than when the relevant information was not selected by the participants. The fact that in Study 2 was practically impossible for participants to believe that by reciprocating the other they could maximize their own outcomes, provides stronger support to the interpretation of the results in terms of reciprocity.

DISCUSSION

In this contribution we have explored some of the consequences of conceptualizing the process of transformation of situations as a dynamic processes, actively shaped by the individual in order to suit her or his motivations and orientations. We have also shown that reciprocity can be a strong interpersonal orientation, able to guide behavior in absence of additional incentives to be achieved. Finally, we have also provided evidence that individual differences in preferences for reciprocity can reliably predict behavioral choices and informational choices as well. These three points deserve a more detailed discussion.

The Transformation Process

The transformation of situations process has been described long ago in the literature (Kelley & Thibout, 1978), and has been the basis for many pieces of interesting research. As for many other

psychological processes, however, the transformation of situations can be primarily inferred by its consequences at a behavioral level. Allocational choices have been primarily used to infer the transformation process underlying different orientations (McClintock & Liebrand, 1988), including reciprocity (Van Lange, 1999). More directly related to the process itself, Dehue, McClintock, and Liebrand (1993) have shown that the transformation process required by different orientations can be more or less time consuming, indicating that individuals with different orientations process the information embedded in the situation in different ways. Along this line, Grzelak (1981) has shown that people with different social value orientations ask for different information regarding the interdependent other, indicating that people with different orientations process different information. In our contribution, we have pushed this line of reasoning further ahead. We have tried to investigate the process of transformation analyzing its role as the *mediating process* between individual differences and behavior. In our experiments we have shown that individual differences in the norm of reciprocity predict information seeking (motivation–information hypothesis), thus providing evidence that differences in motivation lead to different transformations. We also provide evidence that participants who sought information consistent with the reciprocity transformation process indeed reciprocated (information–behavior hypothesis), showing that information is processed according to the active goal, and consequently that the process of transformation leads to different behavioral consequences. Combining the motivation–information hypothesis with the information–behavior hypothesis reveals that the information process appears to mediate the relationship between motives and actions, and thus characterizes the transformation process that occurs.

This does not mean, however, that the information process is the only process that mediates the relationship between motives and actions. An important part of the decision process, we believe, can be accounted for by the emotional reaction to the situation. There is now an increasing number of studies that are showing that the emotional underpinning of the decision process plays a crucial role in situations of interdependence of outcomes (Fehr & Gächter, 2002; Mikula, Scherer, & Athenstaedt, 1998) and in decision making in general (Damasio, 1994). Reciprocal behavior is very likely to be associated with specific emotional reactions, which should vary as a function of the other's actual behavior, the actor's intention, and her expectations about other's behavior. The emotional reaction seems particularly important in differentiating positive and negative reciprocity, given that these two dimensions are likely to represent also different sensibility to particular emotions. Whereas negative reciprocity should be associated more with feelings of anger and distress (Mikula et al., 1998), positive reciprocity should be associated with both positive emotions (towards the other who behaves nicely) and anticipation of guilt (if the actor will not reciprocate positive behavior). Those differences may explain, for instance, why we did not find an effect of negative reciprocity in our experimental situation, which was not particularly suitable for eliciting anger. It appears therefore crucial to investigate the role of emotions in the transformation process, both as antecedents and as consequences of the transformation process. Future research should address these important issues.

Reciprocity as a Social Motive

The second point we emphasized in our contribution is reciprocity as a social motive, as opposed to reciprocity as a strategic device. Whereas many studies regarding reciprocity have stressed the importance of the strategic benefits of reciprocal behavior in attaining future outcomes (Axelrod, 1984; Kreps et al., 1982; Komorita et al., 1991, 1992), we have explicitly contrasted the motivation to reciprocate with strategic considerations. In our two experiments, in fact, participants could collect information useful to reciprocate at the cost of losing information strategically relevant (Study 1) or money (Study 2). In both experiments, furthermore, reciprocal behavior always yielded outcomes to

self inferior to outcomes provided by self-centered allocations. These results clearly show that the long term advantages are not necessary for the norm to be effective. This observation, however, does not imply that the norm could not be advantageous in the long term (in terms of material rewards, social approval, etc.). We believe that the implication is that a norm can have two motivational levels: extrinsic and intrinsic. The extrinsic levels regard the long-term advantages that a social norm provides, in terms of material outcomes and social approval. The intrinsic levels regard individual motivation to abide by the norm even in absence of any material reward or punishment, or when, as in our experiments, following the norm requires to forego material advantages. The distinction between the two levels is based on the process of internalization (Schwartz, 1977; see also Sherif, 1936). When internalization has occurred, what was extrinsically motivated becomes intrinsically motivated. It follows that the same behavioral tendency (i.e. to reciprocate) can be motivated by completely different concerns for different people, depending on the situational features (e.g. availability of rewards and punishment), and on the personal characteristics (internalization of the norm). What remains to be seen, is how the two motivational levels interact to intensify each other ('I want to reciprocate and it's good for my pocket'), or inhibit each other ('I'm not doing that for the money'). We know a great deal about the interactions between extrinsic and intrinsic motives (Deci, Koestner, & Ryan, 1999; Lepper, Hederlong, & Gingras, 1999; Ryan, Mims, & Koester, 1983), but much less is known about these interactions in the development of interpersonal norms such as reciprocity (Miller & Bersoff, 1994). Our findings suggest that the conceptualization of intrinsic motivations can have much to offer to the understanding of interpersonal motives.

Establishing that reciprocity can be enacted in absence of advantageous material outcomes does not necessarily rule out the possibility that such behavior is motivated by some other social norms, as a general norm of fairness (Messick & Sentis, 1983), desire for equal outcomes (Van Lange, 1999), or the tendency to share unconditionally what is at stake (Allison & Messick, 1990). After all, if an individual reciprocates her partner, her behavior usually turns out to be also fair and often equitable. If this is true, one may wonder why we maintain that reciprocity is a more appropriate explanation of our results. To provide an answer, we need first to consider the generic tendency to be fair. Assuming that (some) people tend to be fair does not elucidate the specific motive a person holds, given that fairness can be achieved in many different ways: Splitting resources, achieving equal outcomes or, as we are arguing, reciprocating in kind. Fairness, furthermore, appears often to be more a justification of behavior rather than a motive by itself (Hertel, Aarts, & Zeelenberg, 2002; Thompson & Loewenstein, 1992).

More interesting is the idea that the information seeking decisions in our experiments might have been motivated by the desire to achieve equal profits rather than by reciprocity concerns. This possibility makes sense in light of the robust evidence concerning the adoption of equality-based rules in experimental games (Van Lange, 1999). Notwithstanding this evidence, we believe that concerns for equal outcomes cannot explain our results. Our argument is twofold. First, if seeking for information about the past is motivated by the goal of equal outcomes (equality), we should observe that the allocations made by the participants who were informed about the past yielded equal profits. Unfortunately the first experiment does not allow us to disentangle reciprocity from equality given that the predictions overlap (a motivation to reciprocate 10 or to divide equally 20 lead to the same choice), even though it does allow to rule out the possibility that individuals split unconditionally their endowment (which would be at odds with the information-behavior hypothesis). However, in the second experiment, the fact that participants had to pay for being informed about the past creates an asymmetry in the payoffs such that reciprocity and equality are no longer leading to overlapping predictions. In the second experiment, the (bogus) *starter* chose a 10:10 division. The *seeker* had 20 guilders to divide, but her overall outcome was reduced by 5 guilders because of the informational choice. Thus, reciprocating the other in kind would entail giving 10 to the other, whereas achieving

equal outcomes would entail giving 7.5 guilders (that is, the remaining 15 guilders equally shared). We have counted how many participants who asked for the past gave either of these amounts, and we found that 57% of the participants gave 10 whereas only 14% gave either 7 or 8. Thus, achieving an equal outcome does not seem the prevailing motivation in our experiment.

Second, because the informational choice was significantly predicted by our individual measure of reciprocity, if the underlying motive was achieving equal outcomes it follows that our measurement should be a measurement strongly overlapping with preferences for equal outcomes. In other words, if equality (or fairness) can provide a better or equally compelling explanation of our results, the PNR measure should be inherently confused with the motivation to achieve equal outcomes. We believe that this is not the case. In other studies (Perugini et al., 2002) we have shown that the PNR exhibits low correlations with the Decomposed Game Matrices (Kuhlman & Marshello, 1974), which is at the present one of the best measures of equality motivation (Social Value Orientation, SVO; see Van Lange, 1999). In particular, the SVO and the PNR have been administered to a sample of 146 Italian and 226 English participants. Participants were classified as prosocial or proself (including individualists and competitors, cf. Van Lange & Liebrand, 1991). In Italy, this reduced SVO was only modestly related with positive reciprocity ($r = 0.24$, $p = 0.004$), meaning that higher scores in the scale were associated with being classified as prosocial, whereas in the United Kingdom the only significant association was a negative correlation with the PNR scale of negative reciprocity ($r = -0.28$, $p < 0.001$), meaning that English cooperators tended to have lower scores in the negative reciprocity scale. Thus, whereas testing how people with different orientation toward equality would behave in the information game seems a very interesting extension of our research, we doubt that equality would have the same effects as the personal norm of reciprocity.

Overall, we acknowledge that in the information game, as for any other experimental settings, different motivations can be activated, and different people may be led to seek information and allocate resource for motives that go beyond the norm of reciprocity. Nonetheless, we believe that the vital regularities that we observed in our two studies can be coherently and parsimoniously understood only as a function of the internalized norm of reciprocity.

Individual Differences in the Norm

The third point we have addressed in this contribution is the validity of the Personal Norm of Reciprocity questionnaire in capturing individual differences in the motivation to reciprocate. The instrument operationalizes the internalized norm of reciprocity as composed by three dimensions that are tapping different domains of reciprocal behavior. Beliefs in reciprocity account mainly for the cognitive part of the norm, differentiating individuals who consider reciprocity more or less socially useful, effective, and more or less used by other people. Positive and negative reciprocity refer to the behavioral domain of the norm, the willingness to react to other's behavior with an equivalent behavior. In the present contribution we have shown that beliefs in reciprocity and positive reciprocity interact in predicting which information participants seek, and positive reciprocity predicts conditional behavior in the allocation task. Consistently with the definitions of the reciprocity dimensions, the task of choosing the information was indeed a more cognitive task than allocating payoff, and allocating payoff was indeed in the domain of rewarding other's positive behavior. Furthermore, the role of beliefs of reciprocity in predicting the informational choice is theoretically consistent with the fact that the dimension concerning beliefs entails also anticipation of others' reciprocity. A peculiar aspect of the norm of reciprocity, in fact, is that it can be consistently enacted only when both sides reciprocate. Thus, even though our participants who chose to know about the past did not know whether the other would have the chance to reciprocate or not, our findings concerning beliefs in reciprocity suggest that

some participants are more willing to enact reciprocity when they believe the other would do the same if the possibility would arise, which appears to us a sensible idea.

CONCLUDING REMARKS

In conclusion, interpersonal behavior is a complex matter that can be understood and analyzed from different perspectives and by focusing on different levels of analysis. Interdependency theory is certainly one of these perspectives and can give unique insights. By combining interdependency theory concepts with the notion of reciprocity, it is possible to generate hypotheses that go beyond the mere allocation of resources, and to unravel the links between different types of actions, along with their consistency. The experiments have provided robust evidence that (some) people reciprocate in absence of any material incentive, and that reciprocity can motivate both allocational behavior and the information seeking process. Future research should continue to explore the variety of actions that an important social motive as reciprocity can influence, as well as to deepen the analysis of the processes and mechanisms through which this influence occurs.

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APPENDIX: ITEMS OF THE PERSONAL NORM OF RECIPROCITY QUESTIONNAIRE

Beliefs in Reciprocity

- 1 To help somebody is the best policy to be certain that s/he will help you in the future
- 2 I do not behave badly with others so as to avoid them behaving badly with me
- 3 I fear the reactions of a person I have previously treated badly
- 4 If I work hard, I expect it will be repaid
- 5 When I pay someone compliments, I expect that s/he in turn will reciprocate
- 6 I avoid being impolite because I do not want others being impolite with me
- 7 If I help tourists, I expect that they will thank me nicely
- 8 It is obvious that if I treat someone badly s/he will look for revenge
- 9 If I don't leave a good tip in a restaurant, I expect that in future I will not get good service

Positive Reciprocity

- 1 I am ready to undergo personal costs to help somebody who helped me before
- 2 If someone does a favour for me, I am ready to return it
- 3 If someone is helpful with me at work, I am pleased to help him/her
- 4 I'm ready to do a boring job to return someone's previous help
- 5 When someone does me a favour, I feel committed to repay him/her
- 6 If someone asks me politely for information, I'm really happy to help him/her
- 7 If someone lends me money as a favour, I feel I should give him/her back something more than what is strictly due
- 8 If somebody suggests to me the name of the winning horses at the race, I would certainly give him/her part of my winnings
- 9 I go out of my way to help somebody who has been kind to me before

Negative Reciprocity

- 1 If I suffer a serious wrong, I will take my revenge as soon as possible, no matter what the costs
- 2 I am willing to invest time and effort to reciprocate an unfair action
- 3 I am kind and nice if others behave well with me, otherwise it's tit for tat
- 4 If somebody puts me in a difficult position, I will do the same to him/her
- 5 If somebody offends me, I will offend him/her back
- 6 If someone is unfair to me, I prefer to give him/her what s/he deserves instead of accepting his/her apologies
- 7 I would not do a favour for somebody who behaved badly with me, even if it meant foregoing some personal gains
- 8 If somebody is impolite to me, I become impolite
- 9 The way I treat others depends much on how they treat me

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