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The sources of happiness: Evidence from the investment game

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ABSTRACT

The paper draws on data collected in an investment game plus a questionnaire to investigate whether happiness is affected by the circumstances and/or outcomes of the game and to evaluate what motivations or preference structures (self-interested preferences, inequity aversion, altruism, warm glow, social-welfare preferences, trust or reciprocity) may explain that effect. Our results show that the amount given by trustors to trustees has a significant and positive effect on the former's self-declared happiness. To explain why only trustors and not trustees are significantly and positively affected by their giving decision, we argue that the happiness effect results from the trustor's internal satisfaction with his/her exhibition of trust or by a consequence of it, that is, the enactment of the "generating" (total payoff enhancing) power of the trustor's decision. The second interpretation hinges on characteristics of the investment game in which the trustor has a value-creating power while the trustee only has a redistributive power.

1. Introduction

The investment game has been widely used by experimental economists to test the central economic assumption that agents are motivated by the pursuit of their own self-interest.[1] According to the design proposed by Berg, Dickhaut and McCabe (1995) the investment game is played by two subjects (the "trustor" and the "trustee") who are both endowed with $10. The trustor must decide how much of his/her endowment to send to the trustee. The amount sent is tripled by the experimenter and delivered to the trustee. The trustee must decide how much of the amount received (if greater than zero) to send back to the first mover.

In their 1995 experiment, Berg et al. showed that theoretical assumptions based on self-regarding preferences fail to predict agents' behavior:

a) only 2 of 32 trustors in the no-history treatment sent zero ($5.16 was the average amount sent);
b) Eleven of 30 trustees who received a positive amount of money returned more than their counterpart sent.[2]

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[1] See, among others, Berg, Dickhaut and McCabe (1995); Camerer (2003), Dufwenberg, Gneezy, Güth, and van Damme (2001), Fershtman and Gneezy (2001), Cox (2004), Ben-Ner and Putterman (2009).

[2] Moreover, when the results from this experiment were communicated to subjects involved in a subsequent treatment (the "social history" treatment), the average amount sent by trustors increased (to $5.36) and the correlation between the amount sent and the payback became significant.

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Berg et al. interpreted their data by highlighting the role of trust in relation to trustors and the role of reciprocity with respect to trustees.

Cox (2004, p. 262) pointed out that the described investment game design does not allow discrimination "between actions motivated by trust or reciprocity and actions motivated by other-regarding preferences characterized by altruism or inequality aversion that are not conditional on the behavior of others". Cox (2004) implemented a triadic experimental design involving the investment game and two dictator games which gave a first or "second mover" the same possible choices as in the original game but removed the possible effects of the (observed or anticipated) actions of the other player. This design provided evidence of the role of both altruistic or inequality-averse other-regarding preferences and trust (with respect to trustors) or reciprocity (with respect to trustees).[3]

The novelty of the present paper is its investigation, through an investment game, of whether payoffs of players and/or their behavior – attributable to self-interested preferences, altruistic or inequality-averse preferences (Fehr & Schmidt 1999), other-regarding preferences (Cox, 2004), social-welfare preferences (Charness & Rabin, 2002), warm glow (Andreoni, 1989; 1990) and trust (on the part of trustors) or reciprocity (on the part of trustees) – affect self-declared happiness. To this end, questionnaires including the happiness question "Taken all together, would you say that you are: from 1 (completely unhappy) to 10 (completely happy)"[4] were randomly filled in by players either (a) after the game was ended and payoffs were communicated or (b) before players even knew the rules of the game so that the happiness declarations could not be affected by the decisions taken in the game. This procedure allowed us to tackle the problem of reverse causality, a crucial issue in happiness studies.[5]

Our analysis shows that no strategies or outcomes related to trustees are correlated with their happiness declarations. By contrast, we show that trustors' contribution (and, consequently, the total payoff generated in the game which positively depends on the amount sent by the trustor) has a significant and positive effect on their self-declared happiness. This effect arises only when questionnaires are filled in after the game, while there is no correlation when questionnaires are filled in before the game.[6]

Data analysis on trustors shows that neither self-interest (the amount sent is negatively correlated with trustors' payoffs) nor inequity aversion (Fehr & Schmidt, 1999) may explain this result. By comparing the data on trustors and trustees we also tend to rule out explanations related to altruism[7] or warm glow (Andreoni, 1989; 1990). One interpretation of our findings relates to the importance of social-welfare preferences in agents' behavior pointed out by Charness and Rabin (2002). Given the structure of the investment game, trustors have a value-creating power while trustees only have redistributive power (the amount sent by trustors is tripled by the experiment and it is the only way to increase the game's total payoff). Our empirical analysis shows that the act of sending and, consequently, the creation of social value by enlarging the total game payoff, affect trustors' happiness. This seemingly highlights a new motivation to act which may explain agents' decisions in the investment game and, more generally, in situations where individuals may act in order to generate social value even though it implies a personal risk. However, an observationally equivalent rationale is that trustors may be happy because of internal satisfaction with their exhibition of trust.

Even though questionnaires are commonly used in experimental economics, and even though happiness questions have been increasingly considered in economic analyses[8] (see the surveys by Frey and Stutzer (2002a, 2002b) and Clark, Frijters, and Shields (2006)), only a few studies have related data collected from experimental games with happiness declarations. By using simple binary decisions and self-reported happiness, Charness and Grosskopf (2001) showed that players who choose to assign the other person lower payoffs than their own are subsequently less happy. By studying a two player power-to-take game, Bosman and van Winden (2002) find that respondents' self-reported happiness measured after the game was negatively related to the take rate. Konow and Earley (2008) found that higher psychological well being is associated with both higher overall happiness (mainly measured before the experiment) and more generous giving in dictator games.[9] In a recent paper, Konow (2010)

[3] Cox and Deck (2005) used a triadic design, consisting of the trust game and two dictator control games, to investigate the role of trust and positive reciprocity in the trust game, which is a generally studied truncation of the investment game. They found that first movers' behavior was characterized by significant trust in positive reciprocity, while positive reciprocity of second movers only emerged when double-blind payoff protocol was not implemented. This provides evidence of a significant effect of social distance on reciprocating behavior in trust game.

[4] Very similar happiness questions are, for example, the ones used in the World Values Surveys (WVS): "Taking all things together, would you say you are very happy, rather happy, not very happy, not at all happy?" and in the General Social Survey (GSS): "Taken all together, how would you say things are these days – would you say that you are very happy, pretty happy, or not too happy".

[5] Almost all the relationships between happiness and its determinants may be affected by a problem of reverse causality. Are married people happier or are happier people more likely to get married? (Frey & Stutzer, 2006). The same doubt concerns, for example, the relationship between happiness and unemployment (Clark & Oswald, 1994) or happiness and health (Graham, Eggers, & Sukhtankar, 2004).

[6] Our results do not contradict some well-known intuitions on the importance of caring for others on personal happiness by Adam Smith ("Concern for our own happiness recommends to us the virtue of prudence: concern for that of other people"; Smith, 1759, p. 385) and Mill ("Those only are happy, I thought, who have their minds fixed on some object other than their own happiness, on the happiness of others, on the improvement of mankind, even on some art or pursuit, followed not as a means, but as itself an ideal end. Aiming thus at something else, they find happiness by the way"; Mill, 1893, p. 117).

[7] The utility of altruistic persons increases with the well-being of other agents i.e., a person is altruistic if the first partial derivatives of $U(x_1, \ldots, x_N)$ with regard to $x_1, \ldots, x_N$ are strictly positive (Fehr & Schmidt 2000).

[8] Most of this literature admits that interpersonal comparisons of utility are sound and interpretable by arguing that individuals are able to recognize or predict the self-declared happiness of others (Ferrer-i-Carbonell, 2005; Diener, Suh, Lucas, & Smith, 1999) and respondents translate verbal labels more or less into the same numerical values (Van Praag, 1991).

[9] These contributions show a positive relation between giving and happiness declarations in different games. As we will show, in our investment game we find a similar effect related to trustors (which is interpreted according to an original motivation to act) while we do not find any effect of giving on trustees' happiness. Even though this finding may be due to differences between the investment game and the other games already investigated by using happiness questions, it should be seen as a puzzle which could be analyzed in further research.