

Measuring the warm glow: players' behaviour self declared happiness in trust game experiments¹

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Abstract

We perform a standard trust game experiment in which questionnaires are alternatively administered to participants after the experiment and before even knowing the rules of the game. We find that self declared happiness is significantly affected by trustors' contribution only when survey questions are answered after having played. This result contributes both to the empirical happiness and behavioural experimental literature.

With respect to the first, we demonstrate that general questions on self declared life satisfaction evaluated over the entire life period are affected by most recent events.

With respect to the second, we interpret our findings as supporting the existence of "warm glow" preferences. We think that our contribution has also important methodological consequences: warm glow preferences cannot just be tested with the standard approach inferring implied preference structures from players' choices. Only when measuring ex post the effects on happiness of players' contribution, net of the outcome of the game, we may conclude that their choice to contribute is due to altruistic and not to strategic motivations.

Finally our finding is a confirmation of the importance of experience and not just procedural utility. In our experiment trustor happiness is not affected by the outcome of the game but by the specific pattern of chosen actions, irrespective of the final result.

Keywords: investment game, happiness, warm glow.

JEL Numbers: C91, A13.

¹ We thank Bruno Frey, Rafael Di Tella, Craig McIntosh, Lorenzo Sacconi and Bruce Wydick for their useful comments and suggestions. The usual disclaimer applies.

1. Introduction

By performing a standard trust game experiment combined with a questionnaire in which we control for the effects of administering the survey before or after players choices, we discover that trustor contribution has significant and positive effects on self declared life satisfaction. On our opinion, this result is relevant for two important strands of the literature: empirical happiness studies and lab experiments in which players' hidden preference structures are derived from their choices.

In this short introduction we briefly qualify this introductory statement by making references to the contributions in these two literature fields.

With regard to empirical happiness studies questions such as: "All things considered, how satisfied are you with your life as a whole these days?" or "Taken all together, how would you say things are these days?" are widely used to investigate the determinants of people's overall life satisfaction. They aim at measuring the global life satisfaction or happiness by considering self-declarations given within surveys. Since the seminal contribution by Easterlin (1974), studies based on this kind of questions have been receiving more and more attention.² The empirical results on the effects of income and wealth on happiness and satisfaction (Easterlin, 2001, Clark, Frijters and Shields 2007) and the phenomenon of adaptation (the hedonic or aspiration treadmill; e.g. Clark, Diener, Georgellis and Lucas 2003; Easterlin 2003, 2005 Di Tella, Haisken-De New and MacCulloch 2007) have kindled researchers' interest, in particular in consideration of their policy implications.

In spite of their extended use, an important issue related to these questions seems not to have been definitively settled. Do they correctly inform about people's global satisfaction or happiness and how much do they suffer from biases that affect the subjects' declarations?

To tackle this issue Kahneman and Krueger (2006) make a distinction between *experienced utility* and *remembered utility*, that is "the way people feel about experiences in real-time and the way they remember their experiences after they are over" (Kahneman and Krueger 2006, p.5). Several experimental results have shown that retrospective evaluations of past experiences are subject to systematic biases with respect to real-time reports (Kahneman, Fredrickson, Schreiber and Redelmeier 1993; Redelmeier and Kahneman 1996). The rationale being that remembered utility should be a sort of weighted average where the weights of moment utilities are not equal and more importance tend to be attributed to end of period experiences³. The role of most recent experiences in self declared life satisfaction is confirmed by lab experiments. After having invited subjects in a lab, Schwarz (1987) asked them to copy a paper before filling in a questionnaire. In doing the preliminary task, a randomly chosen half of the sample found a dime deliberately put on the copy machine. Life satisfaction of subjects who found the coin resulted positively affected by this experience. Finally, it has been shown that subjects' answers may also be influenced by the current weather (Schwarz and Clore, 1983)⁴. These considerations warn us about the reliability of survey questions when measuring people's

² For an overview of the field see the surveys of Frey and Stutzer (2002a and b) and Clark et al. (2006). Most of this literature admits that interpersonal comparisons of utility are sound and interpretable by arguing that individuals are able to recognize or predict self declared happiness of others (Ferrer-i-Carbonell, 2005; Diener and Lucas 1999) and respondents translate verbal labels moreless into the same numerical values (Van Praag, 1991).

³ More weight is also associated to the experience peaks. For example, with regard to a bad experience, the intensity of the worst moment greatly affects the remembered utility of the experience (Kahneman, Fredrickson, Schreiber and Redelmeier 1993).

⁴ They also show that weather does not influence reported life satisfaction if subjects are first asked expressly about it.

happiness or life satisfaction, since such questions tend to be strongly affected by contingent situations.⁵

With regard to the second strand of the literature (lab experiments and the evidence they provide for identifying players' preferences) we know how theoretical models and the huge experimental evidence collected over the last few years⁶ led to the definition of a wide range of non standard preferences which were able to explain deviations from the homo oeconomicus behaviour in lab experiments. Many contributions demonstrate that people with other regarding preferences may feel happy also by looking at the amount won by others⁷. Inequity averse players (Fehr and Schmidt 1999), for example, may feel happy if the game realizes a fair distribution of money among them. Other individuals may be interested in maximizing a social welfare function which is a combination of Rawls' maximin criterion and a utilitarian welfare function (Charness and Rabin 2002). Again, according to the "warm glow effect" discussed by Andreoni (1989, 1990), some people may feel the pleasure of giving which affects their utility. In this last case, for example, happiness declarations may be affected not by the result of the game, but by the same players' decisions. A person who feels the pleasure of giving, in the meaning used by Andreoni (1989, 1990), may feel happy at the end of the game if she decides to cooperate even if the other player betrays her trust.

Note that it is quite difficult to discriminate among these alternative preference structures if we just look at players choices and do not measure their potential effect on their happiness levels. By doing that we may instead test whether significant changes in satisfaction may be determined by pure pleasure of giving, satisfaction of player's taste for equity, or some combination of standard utilitarian and social preferences. Furthermore, it is completely impossible to test for the existence of warm glow preferences by just looking at player choices since it is difficult to say, unless a proper experimental design is defined, whether a player (the trustor in our case) gives more for strategic or for purely altruistic reasons.

The result declared at the beginning of this section is obtained by recruiting 256 students who took part in a very simple two player investment game. We find that the decisions made in the game significantly affect the level of happiness declared by students in a survey. The experiment is built in such a way to avoid that our empirical analysis be affected by problems of inverse causality⁸. In fact, a randomly chosen part of our sample students filled in the questionnaire after playing and the other part before playing (and knowing the rules of) the game so that their happiness declarations can not be correlated with their decisions in the game.

An original point in our analysis is that one of the variables currently affecting the level of happiness (for those who fill the questionnaire after the game) stems from a voluntary decision made in the game. It is not related to the payoff got by players but seems rather to be associated with a "pleasure of giving". In particular, we find that the amount sent by trustor (i.e. the player who must

⁵ The problem may be partially overcome by assuming that most recent experiences generate a random shock on self declared life satisfaction which tends to be independent from other regressors and zero mean normally distributed across respondents when the number of them becomes large as in many of these empirical studies.

⁶ We refer for example to the experimental results on Ultimatum games (Camerer and Thaler 1995), Dictator Games (Andreoni and Miller 2002), Gift Exchange Games (Fehr, Kirchsteiger and Reidl, 1993, Fehr, Kirchler, Weichbold and Gächter 1998), Trust Games (Berg, Dickhaut and McCabe 1995, Ben-Ner e Putterman 2006) and Public Good Games (Fischbacher, Gächter and Fehr 2001, Sonnemans, Schram and Offerman 1999, Fehr and Gächter 2000).

⁷ For a survey on social preferences models see Fehr and Schimdt (2000).

⁸ Causality is a crucial issue in this kind of studies. Almost all the relationships between happiness and its determinants may be affected by a problem of inverse causality. Are married people happier or happier people are more likely to get married? (Frey and Stutzer 2005). The same doubt concerns, for example, the relation between happiness and unemployment (Clark and Oswald 1994) or happiness and health (Graham, Eggers, Sukhtankar 2004).

decide how much of her endowment to send to the second mover) is significantly correlated with self declared happiness, even though her trust is betrayed.

The paper is divided into five sections (including introduction and conclusions). Section 2 deals with the issue of the relationship of players' choices and preferences revealed in questionnaire surveys investigating the empirical literature which combines experimental games with surveys. Section 3 describes our experimental design and the procedure implemented for our experiment. Section 4 illustrates and comments descriptive and econometric findings. Section 5 concludes.

2. The determinants of happiness and the use of attitudinal questions in empirical studies: evidence from an experimental analysis

In our experiment we ask subjects to interact in a very simple two-player strategic game, the Investment Game, and to fill in a survey with questions on socio-demographic data and subjects' attitudes, habits, feelings, satisfaction with their life and work. The Investment Game is a sequential game in which two players (the trustor and the trustee) are both endowed with an amount of money M . The trustor must decide which share of M to send to the trustee. The experimenter triples the amount sent by the trustor and the resulting amount is delivered to the trustee who must decide how much of the tripled amount he want to send back to the first mover (for details on the experimental design see the following section). One part of the subjects filled in the survey before playing the investment game, while another part of them filled it in after having played.

What we want to test in our analysis is the effect that the decisions taken by players in the game and the results of that strategic interaction have on their happiness declarations in the survey. In this way we aim at studying whether the effects of the latest experiences are significant on happiness declarations. The happiness question in our survey asks: "Taken all together, would you say that you are: from 1 (completely unhappy) to 10 (completely happy)" and it is in line with the usual questions used in the most important surveys collecting information about life satisfaction (World Values Survey, German Socioeconomic Panel, etc.). The use of happiness questions in empirical analysis assumes that self-declarations correctly reflect the respondents' happiness "all things considered" or "taken all together". If questions about happiness were biased by recent experiences researchers should try to avoid the effect of biases, for example by introducing in the surveys specific questions on recent experiences made by respondents.

By combining the experimental data and the declarations in the survey we are able to verify if recent experiences, represented by decisions made during the game and their result, affect self declared happiness. Moreover, by using attitudinal questions included in our survey, we are able to distinguish between people who, according to their declarations, should be more interested in their own payoffs and people who should consider important also other factors such as being generous with others. In this respect we test the reliability of these attitudinal questions in revealing the true agent preferences by combining the answers to attitudinal questions, the actual behaviour and the happiness declaration of subjects.

3. Experimental design and procedure

The experiment is based on a standard two-player Investment Game (Berg et al., 1995). At the beginning of the game the two players are endowed with 10 tokens (1 token=0,50 euros). The trustor, who is the first to move, must decide how much of her endowment (from 1 to 10 tokens) to send to the trustee. The experimenter triples the amount sent by the trustor and the resulting amount, which may

range from 0 to 30 tokens, is delivered to the trustee. The trustee must decide how much of the tripled amount to send back to the first mover. As it is well known, if we assume that players have purely self-interested preferences, the perfect Nash subgame equilibrium of this game is the strategy vector in which the Trustee sends 0 and the Trustor sends 0.

The experiment was combined with a survey which collected socio-demographic data and information about subjects' attitudes, habits, feelings, satisfaction with their life and work, and likewise⁹.

Subjects played the Investment Game under three different conditions. First, the experimental sessions have been realized in two Italian universities: University of Trento and University of Milano-Bicocca. Second, some subjects filled in the survey after having played the game and after having known the result and the final payoffs of the game, while other subjects filled it before reading the game's instruction.

We adopted a between-subjects design since each subject participated only in one treatment. We ran 8 sessions (each with 16 subjects) in Trento and 4 sessions (each with 32 subjects) in Milano, for a total of 256 subjects (figure 1). Each session lasted on average 45 minutes. Participants earned on average € 10,50 (including a show-up fee of € 3).

Figure 1. Experimental treatments

| Trento | | | Milano | | |
|-------------------------|------------------------------|------------------------------|-------------------------|------------------------------|------------------------------|
| | Survey beforehand | Survey afterwards | | Survey beforehand | Survey afterwards |
| No Encounter | | TB (64 subjects) | No Encounter | MBB (32 subjects) | MBA (32 subjects) |
| Encounter | T1B (32 subjects) | T1A (32 subjects) | Encounter | M1B (32 subjects) | M1A (32 subjects) |

At the University of Milano-Bicocca subjects were recruited by email¹⁰. At the University of Trento they were recruited by posting ads at various departments¹¹. The subjects who participated in the experiments were all students enrolled in different programs of study, even though most of them were students of Economics.

In all sessions, subjects played the game and filled in the survey by using a computer. The experiment was completely anonymous and without communication between players. Two experimenters were in the room during the sessions. The same two experimenters conducted all the sessions.

In each session, before the subjects arrived in the room, the two experimenters associated at random the role of trustor or trustee to each computer and linked each computer with another one in the room. When subjects arrived in the room, they picked a slip of paper with an alphanumerical identification code from a box and chose one of the computers at random. By choosing a computer, players automatically and at random decided their role (trustor or trustee) and their counterpart.

⁹ Glaeser et al.(2000) and Fehr et al. (2003) are examples of studies which combine classical survey methodology and experiments.

¹⁰ All students included in the mailing list of the Experimental Economics Laboratory (EELAB) of the University of Milano-Bicocca could potentially took part to the experiment.. Two weeks before the experiment they received an email in which the staff invited them to visit the Laboratory's website for information about the experiment and subscriptions.

¹¹ Ads were posted seven days before the experiment. Subscriptions by students interested in participating to the experiment have been collected by the staff of the Computable and Experimental Economics Laborator (CEEL) of the University of Trento.

The experimenters gave subjects written instructions (see Appendix 3) which were read aloud by one of the experimenters. The subjects signed in by entering their alphanumerical identification code on their computers. Thus they discovered their role and played the game. After each Trustor made her choice by deciding how many tokens to send to the Trustee, a message with the number of tokens sent by the Trustor appeared on the monitor of the trustee. Successively, the Trustee made her choice and the game finished. Finally the payoff of the players appeared on their monitors. Subjects were paid just after the end of the experiment¹².

In the two different versions of the game the questionnaire was administered respectively before giving the instructions of the game and after subject saw the game payoffs on their monitors.

4.1 Descriptive findings

In our empirical analysis we focus on the correlation between the amount sent by trustors and their happiness declarations in the survey¹³. The average trustor contribution is 4.49. It does not significantly change if we consider the two subsamples of trustors who filled in the survey before (4.73) and after (4.35) the game¹⁴. This seems to indicate that there is no survey effect on the trustor's decision. The amount sent by the trustor does not appear to be affected by questions included in the questionnaire.

Nevertheless, we find a relation between the survey and the decisions made in the game by looking at the correlation between the amount sent by trustors and their happiness declarations¹⁵. If we consider the total sample, a significant (at 5%) and positive correlation between the amount sent by trustors and their happiness declaration (0.211) comes out. However, this correlation disappears if we consider the sub sample of trustors who filled in the survey before the game (0.013), while it remains significant at 1% if we consider the sub sample of trustors who filled in the survey after the game (0.381). Even if we have not investigated the robustness of this relation yet, what is more interesting here is that the correlation between the level of happiness declared by trustors and their contribution in the investment game seems to be the expression of a specific causality direction that goes from the latter to the former. Trustors who contribute more in the game declare, after having played, a higher level of happiness, confirming that happiness declarations may be affected by previous recent experiences. Such pleasure of giving is a direct explanation of the paradox of departures from the standard Nash rationality according to which trustors should send zero since they expect the trustee to follow the same rationality and paying back nothing. The reasons for such departure in our results is that they are happy to do so irrespective of the outcome of the game.

According to the idea of "pleasure of giving" introduced in the previous section, we suppose that the correlation between the amount sent and the happiness declaration is connected with a pleasure that some people feel by contributing in the game. This may depend on the simple act of giving which may be reinforced in investment games by considering that a higher amount sent can be tripled and have enhanced effects on trustee wellbeing (*the benefits of the warm glow on the receivers are multiplied*). Since the monetary payoff got by trustors is negatively correlated with the amount sent (-0.323, significant at 1%, with regard to the trustors who filled in the survey after the game), we can suppose that subjects who feel happy by contributing in the game do not get their happiness from reasons related to the monetary gains, but from the decision to make a generous proposal.

¹² See appendix 2 for further details about the timing of the experiment.

¹³ We have not found any statistically significant correlation either between happiness declarations and payoffs got by trustors or between trustees' decisions or gains and their happiness.

¹⁴ Two-sample Wilcoxon rank-sum (Mann-Whitney) test= 0.494 Prob > |z| = 0.621

¹⁵ The descriptive statistics of all the variables are presented in Appendix 1.

4.2 Econometric findings

To verify whether composition effects may explain our descriptive results we perform regression analysis on our experimental data.

Given the descriptive findings commented before, we concentrate our analysis on trustors who filled in the survey after the game. In order to examine the effect of the amount sent on the happiness declaration we perform regressions in which the level of happiness is associated with the amount sent in the game and with various controls including the sex of players, the level of income¹⁶ and the number of family members which we a priori assume that may have an effect on the level of happiness (Tab.1). Both ordered logit estimates, which represent the most suitable method given the nature of the dependent variable, and OLS regressions, which are also usually implemented in this kind of literature (see Frey and Stutzer, 2006) show a positive and significant effect of the amount sent on the level of happiness. Our estimates are also robust to the introduction of the location dummy that considers the different places where the experiments have been conducted. In estimation 7 (Table 1), which includes the location dummy, coefficient magnitudes imply that a standard deviation increase in the amount sent is associated with an increase in the happiness declaration by 0.520 standard deviation.

In order to study more in depth the robustness of our result we check whether it remains significant when we introduce additional control variables. First, we identify in our database the variables that are usually considered in the literature as determinants of happiness or that we can reasonably consider important in explaining happiness declarations. The selected variables are: a dummy which discriminates between believers and non believers; six variables that refer to past negative experiences: such as psychological violence and health problems¹⁷; six variables that reveal the degree of trust towards others¹⁸; seven variables which inform about the respondent social networks¹⁹; how often subjects' trust has been betrayed by other people; the number of hours spent watching television alone or surfing the internet; a dummy taking the value of one for the subjects who had deaths in their family and when, in case, the unfortunate event happened; the perception of safeness in the place where one lives; a proxy of self-esteem given by the degree of agreement with the statement "I am completely trustworthy"; a dummy taking the value of one for the subjects who do voluntary work. Given the limited number of degrees of freedom these variables have been separately introduced in all the regressions presented in Table 1. This analysis confirms that the effect of the amount sent on happiness is always statistically significant at 1% (except when we introduce the variable related to the degree of agreement with the statement "most people take advantage of others if they can" that reduces the significance to 5%) (Table 2).

Moreover, we consider all the other regressors available in our database, identify 14 variables which are significantly correlated with the level of happiness and introduce them in the regressions presented in Table 1. Also in this case, the amount sent confirms its significant effect. It is always significant at

¹⁶ Given the high number of missing observations related to the income variable, we perform the regressions both with and without it.

¹⁷ More specifically such variables measure whether the respondent: i) has been pickpocketed, ii) burgled, iii) threatened with a weapon or iv) had financial difficulties.

¹⁸ These variables are the answers to the following questions: "Imagine you have lost your wallet. Generally speaking, how many people, out of a hundred, would return your wallet with all the contents after they have found it?" and "Generally speaking, would you say that most people can be trusted". Furthermore they measure the degree of agreement with the following statements: i) "Generally speaking, people can be trusted"; ii) "It is better not to trust anyone"; iii) "most people take advantage of others if they can"; iv) "It is correct to say that most people are more interested in their own personal well-being, even if they say the contrary".

¹⁹ i) Number of close friends and ii) acquaintances; iii) number of acquaintances and friends that would lend money in case of economic trouble; iv) number of relatives you would talk about your personal life to; v) how often the subject meets her friends in her leisure time; vi) number of hours spent watching television with friends.

least 5% except when we consider the number of donations to natural person as a control variable that reduces the significance to 10%.

The estimates presented in Table 1 are performed by considering the sample of subjects who filled in the survey after the game. Table 3 presents the estimations in which we analyse the relation between the happiness declaration and the amount sent in the sample of subjects who played after having filled in the survey. The results of the econometric analysis confirm descriptive findings. The relation between the amount sent and the happiness declaration holds only for subjects who answer the happiness question after having played the game.

5. Conclusions

Over the last few years, more and more attention has been given by economists to the empirical studies on happiness. These analyses, which have the principal aim of studying the determinants of life satisfaction, are usually run by considering people self declarations with regard to questions such as: “All things considered, how satisfied are you with your life as a whole these days?” or “Taken all together, how would you say things are these days?”. According to some experimental studies, these questions could not be easily interpreted because their answers would be influenced by recent experiences lived by the respondents before they answer. In this case, the answers would not actually reflect happiness of the individual “all things considered”, but they would change in considerations of contingent situations.

Our empirical analysis contributes to this discussion by showing that decisions made by subjects in a simple investment game affect their level of happiness declared in a survey filled in immediately after having played. In particular, we find that the amount sent by trustors significantly affects their happiness declarations. Our experimental design allows us to exclude the possibility of reverse causation that often characterizes this kind of study. We in fact document that the trustor’s contribution-happiness nexus disappear when the questionnaire is filled before starting and knowing the rules of the game.

Since the amount sent is not correlated with the material gain got by subjects, we interpret our findings as the expression of the “pleasure of giving” that trustors feel when they give trustees the possibility of getting a positive and higher payoff.

Our findings generate many questions and ideas for further research.

First, they open the way to an empirical approach which can directly test the relationship between players preferences and choices. The usual approach infers hidden players’ preferences from different observations of their choices, given the game structure. Such approach has however some limits as it does not allow, or makes it extremely difficult most of times, to single out among different concurring explanations. Considering our case, if we just look at revealed choices, in the trustor “generosity” example we cannot know whether the trustor gives more for strategic reasons or because of a warm glow effect. We can solve the problem by combining surveys which contain the happiness question with lab experiments and looking at the effect of choices on players satisfaction given the game structure. If we find as in this paper that, higher trust contributions have positive effects on players life satisfaction, irrespective of their outcome in the game (known at the moment of filling the questionnaire), we can definitely agree that the strategic giving assumption is rejected in favour of the warm glow one.

With this respect our result is a confirmation of the importance of experience and not just procedural utility. In our experiment trustor happiness is not affected by the outcome of the game but by the specific pattern of actions he chooses in the game itself notwithstanding its final outcome.

Second, they stress the importance of elaborating methods aimed at reducing the possibility that declarations on global happiness are biased. A possibility may be to verify the usefulness of explicitly

asking the subjects who fill in the survey about their latest experiences and the emotions they felt during them. It may help individuals not to confuse happiness felt in these experiences with their general level of happiness.

Appendix 1. Summary statistics

Amount sent: amount sent by trustor in the trust game

Happiness declaration: level of happiness declared by trustors (it takes integer values from 1 to 10)

Male: gender dummy taking the value of one if the subject is a male

Nmembers: number of subject's family members

Income: level of income

Believer: dummy which discriminates between believers and non believers

Pickpocketing: to have been pickpocketed; from 1 (never) to 5 (less than 6 months ago)

Burglary: to have had the home burgled; from 1 (never) to 5 (less than 6 months ago)

Rob: to have been threatened with a weapon; from 1 (never) to 5 (less than 6 months ago)

Psych: to have suffered psychological violence; from 1 (never) to 5 (less than 6 months ago)

Health: to have had health problems; from 1 (never) to 5 (less than 6 months ago)

Financial: to have had financial difficulties; from 1 (never) to 5 (less than 6 months ago)

People_tr: agreement (from 1 to 10) on the following statement: "Generally speaking, people can be trusted"

Not_to_trust: agreement (from 1 to 10) on the following statement: "It is better not to trust anyone"

Advantage: agreement (from 1 to 10) on the following statement: "Most people take advantage of others if they can"

Fidaldic: answer to the question: "Generally speaking, would you say that most people can be trusted?"

Wallet: answer to the question: "Imagine you have lost your wallet. Generally speaking, how many people, out of a hundred, would return your wallet with all the contents after they have found it?"

Selfint: agreement (from 1 to 10) with the following statement: "It is correct to say that most people are more interested in their own personal well-being, even if they say the contrary"

Nfriends: number of close friends

Nacquain: number of acquaintances

Npers: number of acquaintances and friends that would lend money in case of economic trouble

Freqfr: how often the subject meets her friends in her leisure time; from 1 (I do not have friends) to 6 (every day)

Relprob: number of relatives you would talk about your personal life to

Hourstvfr: number of hours spent watching television with friends in an average week

Trust_betr: answer to the question "How often have people that you trusted betrayed your trust?"; from 1 (never) to 10 (always)

Hourstval: number of hours spent watching television alone in an average week

Hoursinter: number of hours spent surfing on internet in an average week

Deaths: dummy taking the value of one for the subjects who had deaths in their family

Deaths_when: with regard to deaths in family, when did the last death happen; from 1 (never) to 5 (less than 6 months ago)

Safe: answer to the question: "Do you feel safe when you go out alone in the evening in the place where you live?"; from 1 (Not at all safe) to 10 (totally safe)

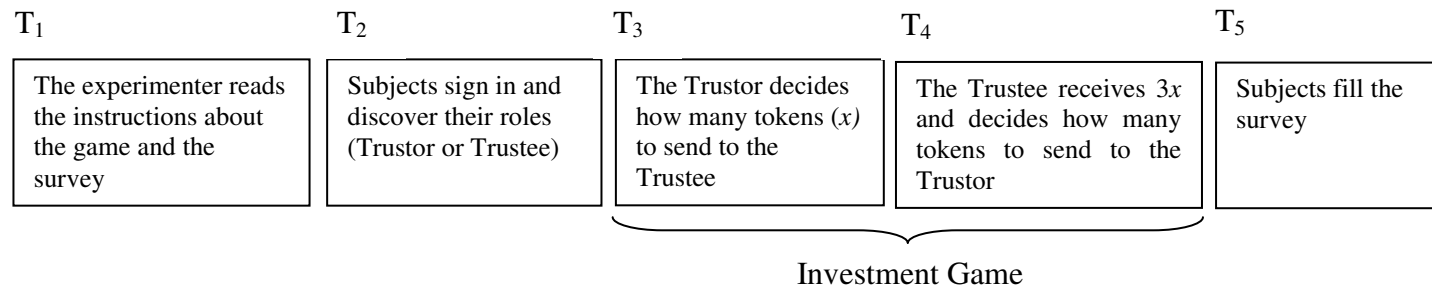
Trustworthiness: a proxy of self-esteem given by the agreement (from 1 to 10) on the statement "I am completely trustworthy"

Volunteer: dummy taking the value of one for the subjects who do voluntary work

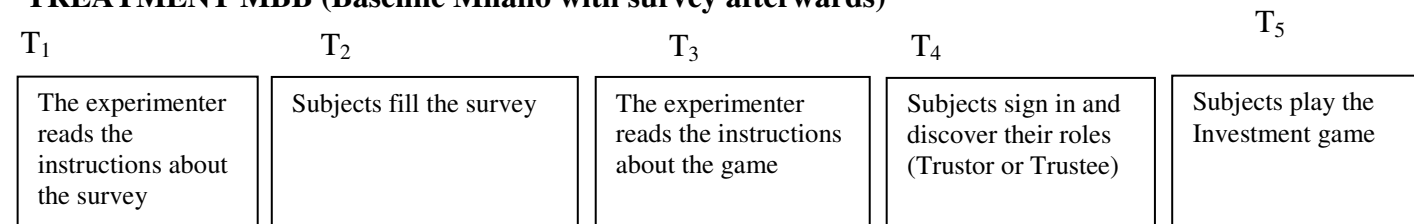
| <i>Variable</i> | <i>Obs.</i> | <i>Mean</i> | <i>Std. Deviation</i> | <i>Minimum</i> | Maximum |
|--------------------------|-------------|-------------|-----------------------|----------------|----------------|
| Amount sent | 80 | 4.350 | 3.230 | 0 | 10 |
| Happiness declaration | 78 | 7.436 | 1.584 | 1 | 10 |
| Male | 78 | 0.436 | 0.499 | 0 | 1 |
| Nmembers | 75 | 4.160 | 1.091 | 1 | 7 |
| Income | 40 | 3.850 | 1.511 | 1 | 7 |
| Control variables | | | | | |
| Believer | 128 | 0.75 | 0.435 | 0 | 1 |
| Pickpocketing | 128 | 1.820 | 1.405 | 1 | 5 |
| Burglary | 128 | 1.391 | 0.907 | 1 | 5 |
| Rob | 128 | 1.063 | 0.411 | 1 | 4 |
| Psych | 127 | 1.709 | 1.328 | 1 | 5 |
| Health | 127 | 2.252 | 1.527 | 1 | 5 |
| Financial | 127 | 1.906 | 1.576 | 1 | 5 |
| People_tr | 126 | 4.714 | 1.905 | 1 | 10 |
| Not_to_trust | 126 | 4.310 | 2.262 | 1 | 10 |
| Advantage | 127 | 6.890 | 2.262 | 1 | 10 |
| Fidaldic | 125 | 0.32 | 0.468 | 0 | 1 |
| Wallet | 126 | 22.667 | 22.416 | 0 | 99 |
| Selfint | 127 | 7.543 | 1.880 | 1 | 10 |
| Namici | 121 | 4.388 | 3.677 | 0 | 20 |
| Nacquain | 121 | 18.529 | 17.765 | 2 | 99 |
| Npers | 120 | 10.442 | 14.823 | 0 | 99 |
| Freqfr | 127 | 5.079 | 0.869 | 2 | 6 |
| Relprob | 123 | 3.195 | 3.045 | 0 | 20 |
| Hourstvfr | 119 | 3.134 | 4.310 | 0 | 30 |
| Trust_betr | 127 | 5.181 | 2.158 | 1 | 10 |
| Hourstval | 120 | 6.092 | 6.270 | 0 | 30 |
| Hoursinter | 121 | 9.207 | 10.707 | 0 | 80 |
| Deaths | 100 | 0.14 | 0.349 | 0 | 1 |
| Deaths_when | 65 | 1.446 | 1.016 | 1 | 5 |
| Safe | 127 | 6.961 | 2.571 | 1 | 10 |
| Trustworthiness | 128 | 7.859 | 1.446 | 4 | 10 |
| Volunteer | 128 | 0.242 | 0.430 | 0 | 1 |

APPENDIX 2. Timing of the experiment

TREATMENTS TB AND MBA (Baseline Trento and Baseline Milano, with survey beforehand)



TREATMENT MBB (Baseline Milano with survey afterwards)



**Table 1 The determinants of self declared happiness
(sample of subjects who filled in the survey after the game)**

| Equation | <i>1</i> <i>OLS</i> | <i>2</i> <i>Ologit</i> | <i>3</i> <i>OLS</i> | <i>4</i> <i>Ologit</i> | <i>5</i> <i>OLS</i> | <i>6</i> <i>Ologit</i> | <i>7</i> <i>OLS</i> | <i>8</i> <i>Ologit</i> |
|-----------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|
| Amount sent | 0.192 (0.059)*** | 0.199 (0.073)*** | 0.237 (0.070)*** | 0.333 (0.109)*** | 0.200 (0.060)*** | 0.214 (0.075) | 0.255 (0.071)** | 0.363 (0.112)*** |
| Male | -0.243 (0.375) | 0.010 (0.450) | 0.669 (0.487) | 1.051 (0.672) | -0.284 (0.380) | -0.092 (0.459) | 0.590 (0.487) | 0.949 (0.678) |
| Nmembers | 0.024 (0.164) | 0.095 (0.190) | 0.040 (0.209) | 0.163 (0.293) | 0.060 (0.171) | 0.155 (0.199) | 0.122 (0.218) | 0.303 (0.317) |
| Income | | | -0.285 (0.157)* | -0.342 (0.221) | | | -0.326 (0.159)** | -0.421 (0.232)* |
| Province | | | | | 0.295 (0.380) | 0.514 (0.470) | 0.591 (0.476) | 0.868 (0.672) |
| Constant | 6.519 (0.699) | | 7.012 (1.040) | | 6.173 (0.830) | | 6.504 (1.109) | |
| cut1 | | -3.179 (1.272) | | -2.890 (1.675) | | -2.625 (1.367) | | -2.225 (1.754) |
| cut2 | | -2.460 (1.058) | | -2.068 (1.512) | | -1.910 (1.169) | | -1.437 (1.600) |
| cut3 | | -1.724 (0.936) | | -0.924 (1.383) | | -1.171 (1.060) | | -0.244 (1.490) |
| cut4 | | -1.099 (0.876) | | -0.475 (1.346) | | -0.535 (1.014) | | 0.237 (1.463) |
| cut5 | | -0.103 (0.820) | | 0.988 (1.325) | | 0.472 (0.973) | | 1.803 (1.487) |
| cut6 | | 1.135 (0.820) | | 2.695 (1.411) | | 1.731 (0.987) | | 3.597 (1.598) |
| cut7 | | 2.661 (0.873) | | 4.675 (1.581) | | 3.291 (1.053) | | 5.515 (1.734) |
| cut8 | | 4.657 (1.053) | | | | 5.277 (1.202) | | |
| Adj R-squared | 0.102 | | 0.289 | | 0.100 | | 0.300 | |
| Prob > F | 0.014 | | 0.003 | | 0.030 | 0.032 | 0.004 | |
| Prob > χ^2 | | 0.025 | | 0.002 | | | | 0.002 |
| Number of obs. | 74 | 74 | 39 | 39 | 74 | 74 | 39 | 39 |

Legend: dependent variable: level of happiness declared by trustors (it takes integer values from 1 to 10). *Amount sent*: amount sent by trustors; *Male*: gender dummy taking the value of one if the subject is a male; *Nmembers*: number of subject's family members; *Income*: level of income; *Province*: provincial dummy taking the value of one for the subjects who participated in the experiments held in Trento

* significant at 10%; ** significant at 5%; *** significant at 1%; Standard errors in brackets

**Table 2 A sensitivity analysis with control variables
(sample of subjects who filled in the survey after the game)**

| | <i>Other variables included beyond one of those listed as control variables in Appendix 1</i> | <i>Method</i> | <i>Minimum</i> | <i>Maximum</i> | <i>Mean</i> | <i>Std. Deviation</i> |
|--|---|------------------|------------------|------------------|-------------|---------------------------|
| Coefficient of the amount sent when control variables described as control variables in appendix 1 are separately introduced in all the regressions presented in Table 1 | Male; Nmembers. | OLS | 0.168 (0.055) | 0.276 (0.084) | 0.199 | 0.020 |
| | Male; Nmembers. | Ordered logit | 0.198 (0.075) | 0.395 (0.127) | 0.225 | 0.037 |
| | Male; Nmembers; Income. | OLS | 0.176 (0.071) | 0.305 (0.086) | 0.236 | 0.021 |
| | Male; Nmembers; Income. | Ordered logit | 0.297 (0.110) | 0.584 (0.184) | 0.351 | 0.051 |
| | Male; Nmembers; Province. | OLS | 0.173 (0.056) | 0.286 (0.082) | 0.208 | 0.021 |
| | Male; Nmembers; Province. | Ordered logit | 0.210 (0.074) | 0.458 (0.137) | 0.241 | 0.046 |
| | Male; Nmembers; Income, Province. | OLS | 0.192 (0.075) | 0.316 (0.081) | 0.251 | 0.021 |
| | Male; Nmembers; Income; Province. | Ordered logit | 0.317 (0.114) | 0.698 (0.203) | 0.379 | 0.076 |

Dependent variable: level of happiness declared by trustors (it takes integer values from 1 to 10). *Amount sent*: amount sent by trustors; *Male*: gender dummy taking the value of one if the subject is a male; *Nmembers*: number of subject's family members; *Income*: level of income; *Province*: provincial dummy taking the value of one for the subjects who participated in the experiments held in Trento. Standard errors in brackets

**Table 3 The determinants of self declared happiness
(sample of subjects who filled in the survey before the game)**

| Equation | <i>1</i> <i>OLS</i> | <i>2</i> <i>Ologit</i> | <i>3</i> <i>OLS</i> | <i>4</i> <i>Ologit</i> | <i>5</i> <i>OLS</i> | <i>6</i> <i>Ologit</i> | <i>7</i> <i>OLS</i> | <i>8</i> <i>Ologit</i> |
|-----------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|---------------------------|
| Amount sent | 0.014 (0.080) | 0.001 (0.079) | -0.058 (0.094) | -0.076 (0.894) | -0.033 (0.085) | -0.054 (0.087) | -0.116 (0.105) | -0.129 (0.102) |
| Male | 0.090 (0.561) | 0.475 (0.549) | 0.460 (0.686) | 0.852 (0.653) | 0.222 (0.561) | 0.073 (0.560) | 0.512 (0.683) | 0.967 (0.657) |
| Nmembers | -0.243 (0.251) | -0.253 (0.236) | -0.306 (0.311) | -0.362 (0.281) | -0.030 (0.269) | -0.028 (0.268) | -0.160 (0.333) | -0.188 (0.306) |
| Income | | | 0.134 (0.193) | 0.111 (0.187) | | | 0.182 (0.196) | 0.151 (0.194)* |
| Province | | | | | 0.943 (0.642) | 1.231 (0.680) | 0.961 (0.816) | 0.932 (0.790) |
| Constant | 7.783 (0.980) | | 7.729 (1.528) | | 7.025 (1.096) | | 6.913 (1.669) | |
| cut1 | | -4.601 (1.377) | | -4.398 (1.701) | | -3.589 (1.458) | | -3.640 (1.789) |
| cut2 | | -3.460 (1.102) | | -3.658 (1.539) | | -2.459 (1.205) | | -2.912 (1.637) |
| cut3 | | -3.149 (1.061) | | -3.203 (1.475) | | -2.152 (1.170) | | -2.469 (1.570) |
| cut4 | | -2.519 (1.005) | | -2.606 (1.412) | | -1.508 (1.130) | | -1.870 (1.526) |
| cut5 | | -1.338 (0.961) | | -1.535 (1.351) | | -0.250 (1.124) | | -0.737 (1.495) |
| cut6 | | -0.622 (0.955) | | -0.735 (1.348) | | 0.492 (1.130) | | 0.083 (1.502) |
| cut7 | | 0.887 (0.961) | | 0.944 (1.360) | | 2.040 (1.152) | | 1.765 (1.516) |
| cut8 | | 3.166 (1.327) | | 2.971 (1.620) | | 4.406 (1.500) | | 3.847 (1.777) |
| Adj R-squared | -0.047 | | -0.052 | | -0.019 | | -0.039 | |
| Prob > F | 0.816 | | 0.673 | | 1.822 | 0.284 | 0.590 | |
| Prob > χ^2 | | 0.648 | | 0.459 | | | | 0.409 |
| Number of obs. | 47 | 47 | 34 | 34 | 47 | 47 | 34 | 34 |

Legend: dependent variable: level of happiness declared by trustors (it takes integer values from 1 to 10). *Amount sent*: amount sent by trustors; *Male*: gender dummy taking the value of one if the subject is a male; *Nmembers*: number of subject's family members; *Income*: level of income; *Province*: provincial dummy taking the value of one for the subjects who participated in the experiments held in Trento

* significant at 10%; ** significant at 5%; *** significant at 1%; Standard errors in brackets

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