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The Value of Vulnerability
The Transformative Capacity of Risky Trust

LUIGINO BRUNI AND FABIO TUFANO*

Abstract: *The 'grammar of trust' is one of the most explored loci in behavioural and experimental economics. This experimental study aims at contributing to the understanding of new dimensions of trust by exploring how risky trust may foster a trustee's behavioural change. It investigates trustee's behaviour when the intentional trustor's risk is both manifestly salient and dependent upon the trustee's revealed type, namely trustworthy or untrustworthy. The results support the transformative nature of risky trust, which generates more trustworthy and reciprocal behaviour in untrustworthy people.*

JEL classification: C72; C92; D01

Keywords: experiment; gift-exchange game; organization; trust; vulnerability

1. Introduction

Behavioural economics and social sciences are more and more dispelling the 'grammar of trust' (e.g., Balliet et al., 2013; Fehr, 2009; Johnson and Mislin, 2011). Yet, still much needs to be understood about the nature of trust in non-enforceable, personalised interactions in markets and within organizations. The paper aims at contributing to such understanding by exploring the capacity of *vulnerable* trust to elicit positive responses. It investigates experimentally trustee's response when

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the intentional vulnerability of the trustor is both manifestly *salient* and clearly *dependent* upon the trustee's revealed trustworthiness.

That genuine (i.e., not purely self-interested and instrumental) trust involves vulnerability is acknowledged in interdisciplinary literature on trust (e.g., Rousseau et al., 1998; Schoorman et al., 2007). Vulnerability, however, is often interpreted only in a negative way, as involuntary 'exposure' to other people's action or events, normally due to lack of resources, rights, capabilities, empowerment or freedom.[1] The development of human wellbeing and dignity is usually measured in terms of reduction or elimination of this negative and un-chosen vulnerability. At the same time, some philosophers and social scientists claim also for a *positive* value of vulnerability, related to the inherent fragility associated to *good* life: "Mutual activity, feeling, and awareness are such a deep part of what love and friendship *are*… that there is anything worthy of the name of love or friendship left, when the shared activities and the forms of communication that express it are taken away" (Nussbaum, 1986, p. 344). However, vulnerability emerges when we consider that "these components of the good life are going to be minimally self-sufficient" (1986, Ib.). Without this positive vulnerability, human life does not flourish fully, and even economic organizations do not fulfil entirely their potential in terms of wellbeing of people.

By means of a gift-exchange experiment, in the paper we study the transformative capacity of vulnerable trust, that is, the possibility that trusting untrustworthy individuals may change their responses from untrustworthy responses to trustworthy ones. To the best of our knowledge, no experiment has been conducted so far to investigate the effects of trusting untrustworthy individuals, when this specific vulnerability is common knowledge and is made *salient*. In what follows, we refer to the trustor's risk to be potentially betrayed by the trustee, who proved to be untrustworthy (i.e., by sending back less than what received) in a recent interaction with a third person, as trustor's vulnerability. We posit that trustors' vulnerability may have positive effects on the trustees' responses and a transformative effect on untrustworthy trustees: that is, does vulnerable trust increase trustees' transfers and transform their attitudes by making their behavioural tendency more trustworthy and more reciprocal? Our laboratory evidence says unambiguously *yes*. Salient vulnerability of trust shows sizeable effects on trustee's transfers. Both the degrees of trustworthiness and reciprocity of trustees' behaviour increase when vulnerability is made salient. Overall, in our experimental setting, the transformative nature of vulnerable trust finds consistent support as shown by its capacity of generating higher, more trustworthy and reciprocal transfers by trustees. In the light of this consistent evidence, it is not difficult to derive significant policy implications in relevant domains of social and

[1] On the concept of 'exposure' see Pelligra (2007) and also Bruni (2012).

economic life such as management, education, and social care, where personalised interactions are characterised by non-enforceable trust.

The paper is structured as follows. Section 2 presents the relevant literature and the theoretical framework of our analysis. Section 3 describes the experimental design. Section 4 discusses the predictions to be tested. Section 5 presents the results. Section 6 concludes with a discussion of the main findings and implications of the analysis.

2. Trust, Risk and Vulnerability

Berg et al. (1995), Pillutla et al. (2003), Malhotra (2004) and Strassmair (2009) deal with issues similar to our own by explicitly investigating in an experimental setting the role of trustors' risk exposure with regard to trustees' behaviour.[2] These studies do not find any significant effect of the trustor's exposure on the trustee's behaviour. These results depend on critical features of the experimental designs, which – we believe – were not purposely built to disentangle what we refer to as the transformative effect of vulnerability on trustee's behaviour.

In particular, in Berg et al. (1995) and Pillutla et al. (2003), whenever trustors took higher risks by sending larger portions of their endowment, they provided greater benefit to trustees as a consequence. Thus, there is no possibility to know whether trustees reciprocated because they valuated the risks trustors had undertaken, or for distributional reasons – or for both.

Malhotra's (2004) study is the closest to our own study, with a specific acknowledgement of the role of trustor's risk. He finds no significant impact of the trustor's risk on the trustee's trustworthiness, which is instead significantly affected by the benefit provided to them by the trustor. In contrast with previous studies, Malhotra (2004) maintained separate the effect of the trustor's risk from the trustee's benefit by treating these factors as control variables of the decision-making context, but still the trustor's risk was not manifestly salient and was not linked to the trustee's behaviour and revealed trustworthiness. In fact, in his study the only dimension of risk of exposure is measured by the variation in the trustor's material payoff: exactly this variation is used in every interaction to determine the intentionality and risk of trust. We claim that this strategy is not able to disentangle the trustor's vulnerability, namely the specific risk of being betrayed inherent to trustor's interaction with a given (untrustworthy) trustee.

Strassmair (2009) studies the effect of expected future rewards on actions' perceived kindness and relative reciprocal responses. To this aim, she varies the probability for the trustee to make a return transfer. In Strassmair's (2009) low treatment the probability for the trustee of deciding on

[2] Cialdini (1993) and Reagan (1971) deal with risk and reciprocity, but the issue of vulnerability is not among their analyses.

their return transfer is 50%; in her high treatment the respective probability is 80%. Therefore, in the low treatment the trustee would perceive the trustor as kinder than in the high treatment, ceteris paribus, and therefore return more in the former than in the later treatment whenever asked to make a decision. The results, however, did not show this correlation. In fact, in Starssmair's (2009) experiment participants seem more sensitive to distributional fairness rather than their opponent's expectation of future rewards. This therefore suggests that trustees are insensitive to the specific risk faced by the trustors and, consequently, how risky trustors' trust was.

The vulnerability of trust is explained as a disposition of the trustor to accept the risk to be betrayed by the trustee (Baier, 1986). This represents the fundamental element that distinguishes genuine or authentic trust from other forms of general trust as reliance; the authentic trust, unlike the non-genuine, emerges only in context of human relationships in which the presence of people – rather than machines (i.e., computer) – explains the possibility to feel betrayed rather than the mere possibility to be disappointed. Thus, we consider such a presence as a first necessary condition for the vulnerability of trust as we intend it. However, it does not constitute a *sufficient* condition to explain it. As also Holton (2004) underlines, one person could choose to undertake actions based on trust without taking the risk to be betrayed, that is without undertaking any vulnerability. This leads to what we consider a second necessary condition for the vulnerability of trust: that is, the risk of trusting depends on the trustee's revealed level of trustworthiness.

Upon maintaining the first condition in each and every experimental treatment as in previous related studies (e.g., Blount 2005, Falk et al. 2008, Stanca et al. 2009; Stanca, 2010), we design our experiment to explore the effect of the second condition whenever made manifestly salient. In fact, we posit that an element that unequivocally supports the trustor's willingness to be potentially betrayed by the trustee is the risk to trust an individual who proved to be untrustworthy in a recent interaction with a third person. We hypothesise that this kind of trustors' *vulnerability* may have a transformative effect on the response of untrustworthy trustees. This is what we investigate by means of our experiment as detailed below.

3. Experimental Design and Procedures

We employ a two-player symmetric gift-exchange game (Stanca et al., 2009). Both players receive an initial endowment of 5 tokens each. In line with the literature on trust (e.g., Bohnet, 2008), we refer to the first mover as the trustor and the second mover as the trustee. In Stage 1, the trustor decides how many of her 5 tokens (only integers could be disposed) to send to the trustee. Then, the 'x' tokens sent by the trustor are multiplied by 3 by the experimenter. Therefore the trustee receives '$3 \cdot x$'. In Stage 2, the trustee decides how many of his 5 tokens (only integers could be disposed) to send to the trustor. Then, the 'y' tokens sent by the trustee are multiplied by 3 by the experimenter. Therefore, the trustor receives '$3 \cdot y$'. In summary, the trustor's final payoff of the game is '$5 - x + 3 \cdot y$', while the trustee's final payoff is '$5 + 3 \cdot x - y$'.

Within each experimental session, the game was played three times. We refer to those three times as Game 1, 2 and 3, respectively. Players learned about the games step by step. Players' roles – namely either trustor or trustee – were fixed across games. A stranger matching protocol was in place: that is, Game 1-3 were each played with a different co-player. Only in Stage 2 of Game 3 we applied a variant of the strategy method similar to the one implemented in Fischbacher et al. (2001): that is, the active player in such a stage had to make a *set of six decisions* (i.e., one per possible number of tokens they could receive from their co-player. In all other stages, the decision method was always applied entailing a *single decision* about how many tokens from the initial endowment a player sent to their co-player.).

One between Game 1, 2 and 3 was randomly selected for payment. Experimental earnings were obtained by converting the payoffs of the selected game in euros (exchange rate: 2 tokens = 1 euro), plus 5 euros as show-up fee.

There are two treatments in the experiment: the Information treatment (I-treatment *for short*) and No-Information treatment (N-treatment *for short*). The experimental manipulation across treatments entails the disclosure or not of information about the trustee's choice in Game 1. In fact, in Game 2 and 3 of the I-treatment, trustors are informed whether their co-player made either a "trustworthy" or an "trustworthy" choice in Game 1, while the trustees were made aware that their co-players received such information. By contrast, in Game 2 and 3 of the N-treatment, no information about Game 1 was disclosed. A trustee's choice in Game 1 was labelled as "trustworthy" (*resp*. "untrustworthy") if they sent to their co-player a number of token larger than or equal to (*resp.* lower than) the tokens they received. (Incidentally, the experimental instructions rather than trustworthy used the more neutral Italian term "equo" – or its negation – that could be more closely translated in English with the word "fair"). The two treatments were identical in all other respects.

The experiment started with instructions read aloud by the experimenters to set ground rules. Then, participants were led step by step by computerized instructions in z-Tree (Fischbacher, 2007). After going through Game 1-3, subjects learned the game randomly selected for payment, their choice, their opponent's choice and their earnings. The experiment ended with a standard background questionnaire.

Two-hundred eight students (of whom 59.62 percent enrolled in undergraduate degrees) drawn from a range of academic disciplines (with Business and Economics summing up respectively to 50.96 percent and 17.79 percent of the whole sample) participated in our experiment, which took place at the Experimental Economics Laboratory of the University of Milano-Bicocca (Italy) and lasted on average one hour. Participants were paid individually and anonymously at the end of each experimental session.[3]

4. Predictions

The present study focuses on the behavioural implications of the vulnerability of trust. To explore those implications, it is necessary to concentrate the attention on the second mover. Therefore, in what follows, the predictions are stated exactly with regard to second movers' behaviour.

Upon assuming that players are purely self-interested and this is common knowledge, the second mover who is at the game terminal node will always send zero tokens to the first mover. By backward induction, the first mover will rationally choose to not send any token to the second mover. Therefore, the standard equilibrium prediction is that both players will send zero tokens. However, if standard social preferences are postulated, second movers may optimally choose a non-zero transfer leading to possible predictions with positive transfers of tokens. Those predictions should hold irrespectively of our treatment manipulation.

Differently, if second mover's preferences show concerns for the vulnerability of trust, the amount of tokens sent back by them should be higher when the first mover's vulnerability is salient.

Hypothesis 1. If second movers' preferences present concerns for the vulnerability of trust, their behavioural strategy implies higher numbers of tokens transferred in the I-treatment.

In the I-treatment, higher transfers of tokens by second movers do not imply per se a higher share of fair choices and, consequently, of trustworthy players. In other words, when vulnerability is salient, it is conceivable that second movers' behavioural strategies could imply more generous but not yet fair transfers, which would leave unchanged the share of trustworthy players.

Hypothesis 2. If second movers' preferences show concerns for the vulnerability of trust, the share of trustworthy second movers is larger in the I-treatment.

Whatever is the impact of trust vulnerability on the implied level of transfers and on the share of trustworthy people, its transformative capacity may also impact on the reciprocity attitudes of second movers. In fact, both an increase in the transfer levels and a higher share of trustworthy people may result simply from an upward shift of second movers' behavioural strategies. By contrast, a

[3] All participants received the total sum of the actual earnings from the experiment as described in the main text plus a € 5.00 show-up fee. Total payments ranged between € 5.00 and € 15.00 with an average payment equal to € 9.40 (standard deviation of € 3.12).

change in the second movers' reciprocity attitudes would require a different correlation between first and second movers' transfers, or in other words, a change in the 'slope' of second movers' behavioural strategies.

Hypothesis 3. Assuming concerns for the vulnerability of trust, there is higher correlation between first and second movers' transfers in the I-treatment.

5. Results

Table 1 reports summary statistics by treatment, game and type of players. First of all, both trustors and trustees transfer on average non-zero amounts of tokens to their co-player. Therefore, as it should be expected on the basis of the abundant experiment literature, a prediction made upon assuming purely self-interested players should be rejected. In Game 1 of the N-treatment (*resp*. I-treatment), trustors sent on average 3.077 (*resp*. 2.846) tokens to their respective co-players; trustees responded by sending back on average 1.885 (*resp*. 1.712), which are still positive but lower than what full reciprocity would imply. A set of Wilcoxon rank-sum tests (p-values > 0.40) demonstrate that there is no statistically significant difference in Game 1 between the average amounts sent by trustor (*resp*. trustee) across treatments, showing a successful random assignment of participants in treatments and roles.

TABLE 1—SUMMARY STATISTICS OF TOKEN TRANSFERS BY TREATMENT, GAME AND TYPE OF PLAYER

	N-treatment						No. Obs.
	Game 1		Game 2		Game 3		
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	
Trustor's transfer	3.077	1.702	3.192	1.783	2.135	1.961	52
Trustee's transfer	1.885	1.843	1.885	1.916	1.474	0.996	52
	I-treatment						No. Obs.
	Game 1		Game 2		Game 3		
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	
Trustor's transfer	2.846	1.564	2.365	1.794	2.731	2.097	52
Trustee's transfer	1.712	1.73	1.981	1.873	1.962	1.108	52

Notes: In Game 3, the raw data for calculating the mean and standard deviation for the trustee's transfer were obtained by averaging the individual transfers elicited by the strategy method.

Game 2 of the N-treatment was a close replica of the previous game outcomes. On average, trustors transferred 3.192 tokens to their co-players who responded by sending back 1.885 tokens. In the I-treatment a slight change in the average behaviour was reported in Game 2: trustors and trustees transferred 2.365 and 1.981 tokens, respectively.

Game 3 presents a different overall picture. Trustors transferred on average 2.135 (*resp*. 2.731) tokens to trustees who in turn sent back 1.474 (*resp*. 1.962) tokens in the N-treatment (*resp*. I-treatment).

Figure 1 shows the distribution of transfers as resulting from the strategy method elicitation procedure in Game 3. By comparing the left panel (N-treatment data) with the right panel (I-treatment data) of Figure 1, it seems apparent a rightward shift of the medians of token transferred (see the thick black lines in the grey boxes) when moving from the left to the right panel; moreover, the distributions of the tokens sent back seem less dispersed as demonstrated by the reduction of the grey-shaded areas.

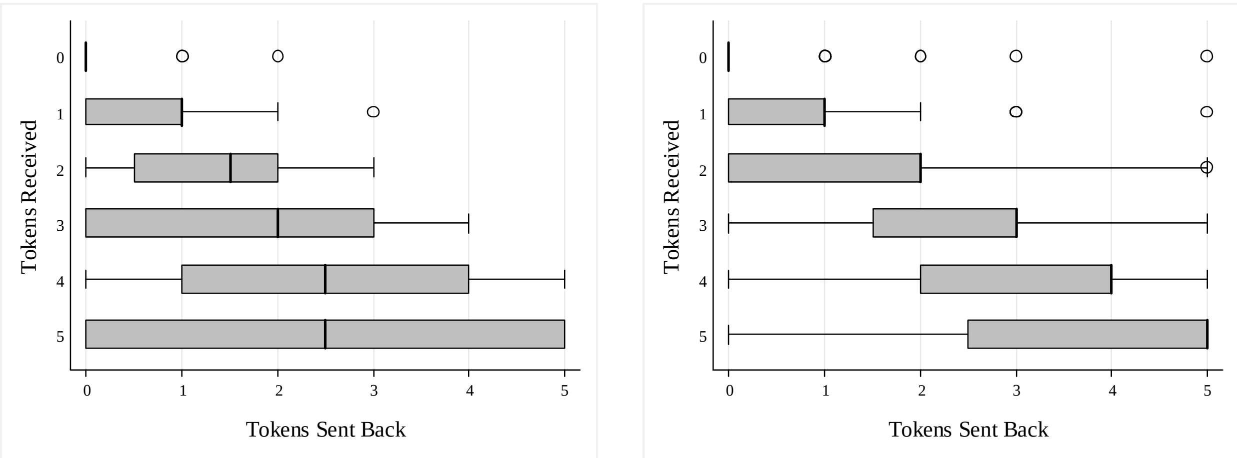

FIGURE 1. TOKENS SENT BACK IN THE N-TREATMENT (*left panel*) AND I-TREATMENT (*right panel*) FROM GAME 3 (STRATEGY METHOD)
Notes: The left (*resp*. right) hinge of each grey box reports the 25th (*resp*. 75th) percentile; the thick black line represents the median; the vertical line of the left (*resp*. right) whiskers shows lower (*resp*. higher) adjacent values; the spherical markers show outside values.

By comparing across treatments trustees' transfers in Game 3, it results a significant increase in the amount of token sent in the I-treatment (Wilcoxon rank-sum tests: $z = -2.275$; $p = 0.0229$). To further test the robustness of this evidence, Table 2 reports our econometric analysis. The OLS estimation of Model 1 demonstrates that participants in the I-treatment make higher token transfers in Game 3 than participants in the N-treatment; moreover, trustworthy second-mover participants do transfer more tokens. The estimation of Model 1 does not show any history-dependent pattern: in fact, the transfers of players in Game 3 do not depend on the transfers received in previous games. Both the OLS estimation of Model 2 and the ordered logit estimation of Model 3 provide further robustness to the evidence already obtained by examining Model 1. Overall, there is a significant increase in the amount of tokens sent in the I-treatment even when controlling for participants' trustworthiness, the history of plays and possible interaction effects.

TABLE 2—ECONOMETRIC ANALYSIS OF TOKEN TRANSFERS IN GAME 3 (STRATEGY METHOD)

Model	1		2		3	
Estimation Procedure	OLS		OLS		Ordered Logit	
Dependent variable	Average transfer		Average transfer		Individual transfer	
Clustering	No		No		Yes	
I-treatment (dummy)	0.568***	(0.207)	0.571**	(0.284)	0.548**	(0.215)
Trustor's transfer:						
• Game 1	0.091	(0.064)	0.091	(0.064)	0.108	(0.076)
• Game 2	0.048	(0.057)	0.048	(0.057)	0.054	(0.065)
Trustworthy (dummy)	0.532**	(0.208)	0.535*	(0.290)	0.597***	(0.217)
I-treatment × Trustworthy (dummy)			-0.006	(0.408)		
Observations	104		104		624	
Log likelihood					-1017.989	
R-squared	0.127		0.127			

Notes: In Game 3, the raw data for calculating the dependent variables respectively in Model 1 and 2 were obtained by averaging second-mover individual transfers elicited by the strategy method.

This inference is confirmed by Figure 2, which shows both effect sizes and absolute treatment differences across the whole schedule of choices.

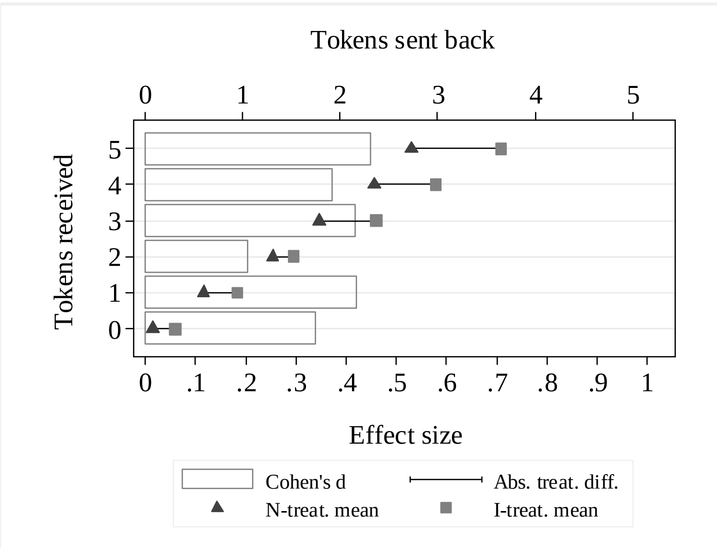

FIGURE 2. TREATMENT EFFECTS IN TRUSTEES' TRANSFERS (GAME 3, STRATEGY METHOD)

Notes: The Cohen's *d* can be read on the bottom horizontal axis labeled 'Effect size,' while the absolute treatment difference in the mean token transfers between the N-treatment and the I-treatment can be read on the top horizontal axis labelled 'Tokens sent back.' The vertical axis report the tokens received by trustees.

Result 1. The null hypothesis of no treatment differences can be significantly rejected in favour of sizable effects of the trustors' vulnerability on trustees' transfers.

In order to assess the transformative capacity of trustor's vulnerability, we compare the number of (un)trustworthy trustees across treatments. In Game 1, due to random assignment, there was no significant difference in trustees' trustworthiness (Wilcoxon rank-sum test: $z = 0.392$; $p = 0.695$). In Game 3, after calculating the average trustworthiness of each stated strategy (which ranges between 0 and 1, and is obtained by assigning value 1 to trustworthy choices and zero otherwise), a Wilcoxon rank-sum test ($z = 2.252$; $p = 0.024$) comparing average strategy trustworthiness across treatment shows a significant higher trustworthiness in the I-treatment.

Result 2. By comparing average strategy trustworthiness, the I-treatment presents a significant difference. Thus, trustors' vulnerability has a transformative capacity.

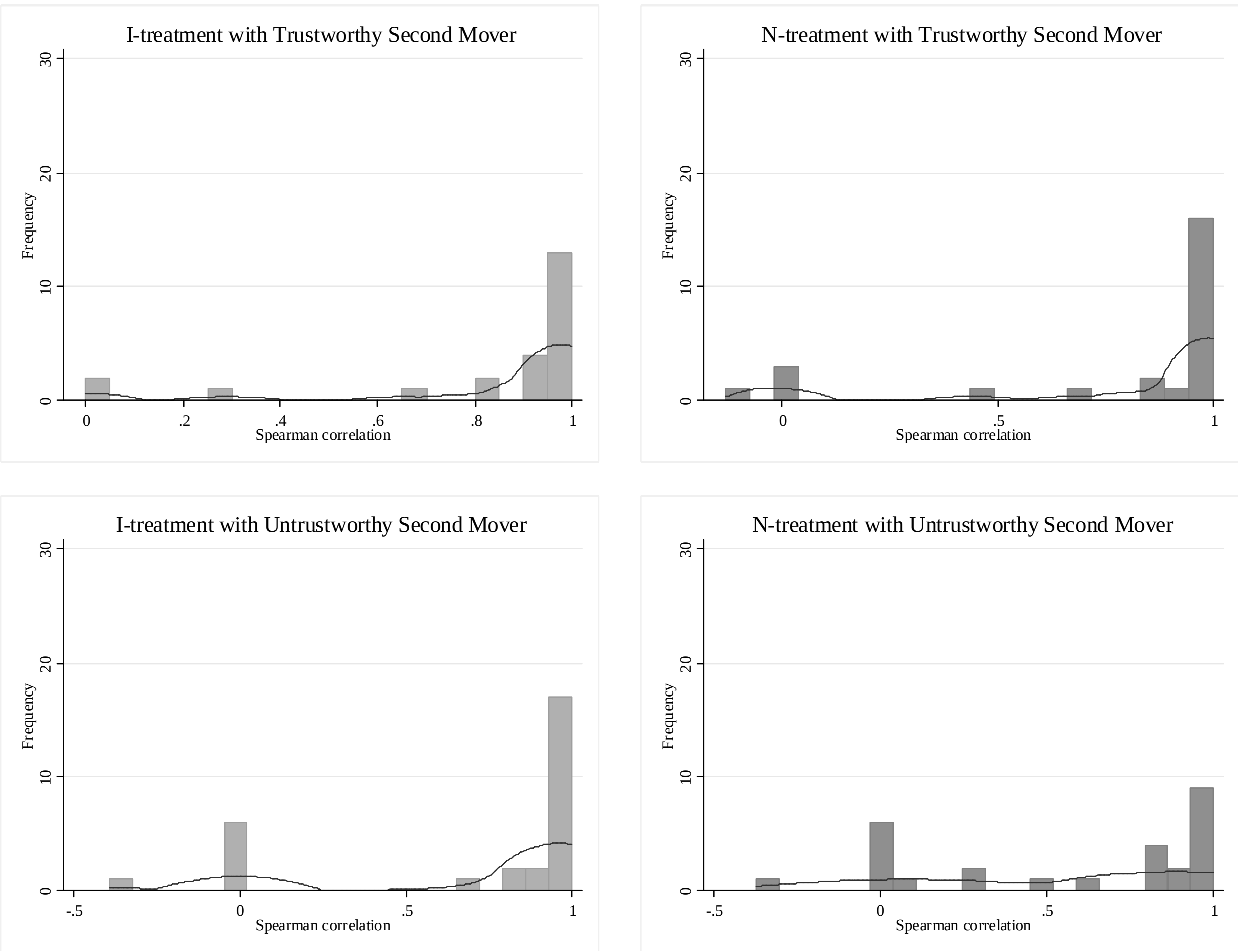

FIGURE 4. SPEARMAN CORRELATIONS ACROSS TREATMENTS AND TRUSTEES' TYPES (GAME 3, STRATEGY METHOD)

Notes: In Game 3, the Spearman coefficients are calculated by considering the correlation between the hypothetical first-mover token transfer and the second-mover one as stated on the trustee's transfer schedule.

Figure 3 presents the distribution of Spearman correlation coefficients in Game 3 between first and trustees' transfers across treatments and types (i.e., trustworthy and untrustworthy), respectively. By focusing on the bottom panels of Figure 3, the correlation coefficients for the I-treatment with untrustworthy trustees are higher than the respective ones for the N-treatment. A formal test confirms the qualitative insights from the graphical analysis: that is, the spearman correlation coefficient are higher for untrustworthy trustees in the I-treatment, but the difference across treatments turns out marginally non-significant (Wilcoxon rank-sum test: $z = 1.584$; $p = 0.1215$).

Result 3. The correlation between tokens received and untrustworthy trustees' transfers shows a treatment difference, which just miss to meet the significance threshold.

Therefore, the evidence collected is strongly suggestive that the vulnerability of trust transforms the reciprocity tendency of untrustworthy second movers, who increase the ratio between their transfer and the tokens received.

6. Concluding remarks

Our experiment has consistently shown across treatments that when trustors' vulnerability is linked to the trustee's revealed trustworthiness and is made salient by providing relevant information to the players, trustees do change their behaviour by increasing the amount of tokens transferred. In those circumstances, both trustworthy and untrustworthy trustees make more generous transfers, and the degrees of trustworthiness and reciprocity of trustees' behaviour rise. In synthesis, the transformative nature of vulnerable trust finds consistent support as shown by its capacity of generating higher, more trustworthy and reciprocal transfers by trustees. Vulnerability has shown a transformative capacity.

Both linking the trustor's vulnerability to the trustee's revealed trustworthiness and its salience have been the key elements in the study. Accordingly, we claim that the lack of these elements of trust vulnerability in previous experimental studies was the main reason of the absence of any significant role of the trustor's vulnerability in explaining the trustee's behaviour.

It is easy to envision relevant fields where our results may suggest policy implications and, in general, reflections and suggestions.

One domain is management. Our result may be relevant in the so-called "managerial subsidiarity", according to which the manager has to intervene in the decisions of a team only for those activities that would be worse without her *subsidiary* intervention (Melé, 2004). But for subsidiarity management to function it is essential that workers and work groups feel genuine trust, and therefore vulnerable. To make subsidiarity effective, it is important that the management should really trust the work group, and it should not want to control or 'contractualise' the entire process to prevent abuse of trust. If, however, those who are given "delegation" perceive that in fact the trust given to them is only instrumental to profit maximization, subsidiarity can stop producing its effects in eliciting creativity and innovation. Then, a key issue in subsidiarity management is the resilience after a crisis due to the abuse of the trustee, when untrustworthiness is known and the organization wants to keep its culture of trust. Our results support the effectiveness of subsidiarity and offer strength to the value of giving new trust to workers that have shown themselves as untrustworthy.

Subsidiarity is essential also in education, where teachers have to create an environment of genuine trust in order to elicit responsibility and freedom. Trust games are the common settings in most educational programs – in schools and in programs for adults with problematic and untrustworthy past experiences. To trust children, young and people with past experiences of untrustworthiness is a key issue on which mostly depends the success of the education process. In particular, our results suggest that making salient the vulnerable risk of the trustor (i.e., teacher or social worker) may produce a "transformative" effect on the trustee (Horsburgh, 1960). Vulnerable and risky trust can have a *therapeutic* value that can cure relational failures.

Finally we hope that our study will stimulate replications and further research in order to accumulate systematic knowledge on the grammar of trust, especially in non-enforceable, personalised interactions.

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The Value of Vulnerability
The Transformative Capacity of Risky Trust

Experimental Instructions

I. Oral Instructions

ORIGINAL IN ITALIAN

Benvenuto e grazie per la partecipazione a questo esperimento.

Durante l'esperimento non è consentito parlare o comunicare in alcun modo con gli altri soggetti. Se in qualsiasi momento hai una domanda alza la mano e uno degli assistenti verrà a risponderti.

Seguendo attentamente le istruzioni potrai guadagnare un ammontare in gettoni che dipenderà dalla tue scelte e da quelle degli altri soggetti.

L'esperimento è diviso in fasi. Ogni fase è composta da un gioco.

Al termine dell'esperimento, i gettoni che avrai guadagnato saranno convertiti in Euro al tasso di cambio di 2 gettoni = 1 Euro. Solo un gioco tra tutti quelli cui avrai partecipato ti verrà remunerato ed esso sarà scelto in modo casuale alla fine dell'esperimento.

ENGLISH TRANSLATION

Welcome and thank you for participating in this experiment.

During the experiment, you are not allowed to talk, or communicate in any other way with other subjects. If you have questions, please, raise your hand and an assistant will address your question.

By following carefully the instructions you may earn an amount of tokens that will depend upon your choices and those of the other subjects.

The experiment consists of several phases. Each phase involves a game.

At the end of the experiment, the tokens you will have earned will be converted in euros with an exchange rate equal to 2 tokens = € 1.00. Only one game among the ones you played will be paid for real and it will be randomly selected.

Ad ogni gioco partecipano 2 soggetti, tu e l'altro giocatore.

All'inizio dell'esperimento a te e all'altro giocatore, in modo casuale, saranno assegnati il ruolo di giocatore A o di giocatore B. Questi ruoli rimarranno fissi durante tutto l'esperimento sebbene, all'inizio di ogni gioco, verranno formulate nuove coppie di soggetti. Es.: se tu sei un giocatore A, rimarrai con questo ruolo per tutto l'esperimento e, ad ogni gioco, interagirai con un diverso giocatore B.

Ciascun soggetto, pertanto, in tutti i giochi, interagirà con soggetti diversi senza mai conoscerne l'identità.

For each game, 2 subjects will take part in: that is, you and another player.

At the beginning of the experiment, you and the other player will be randomly assigned to the role of player A and B, respectively. These roles will stay the same throughout the experiment even though, at the start of each game, new pairs of players will be formed. For instance, if you are a player 'A,' you will play in such a role throughout the experiment and, in each game, you will interact with a different player 'B.'

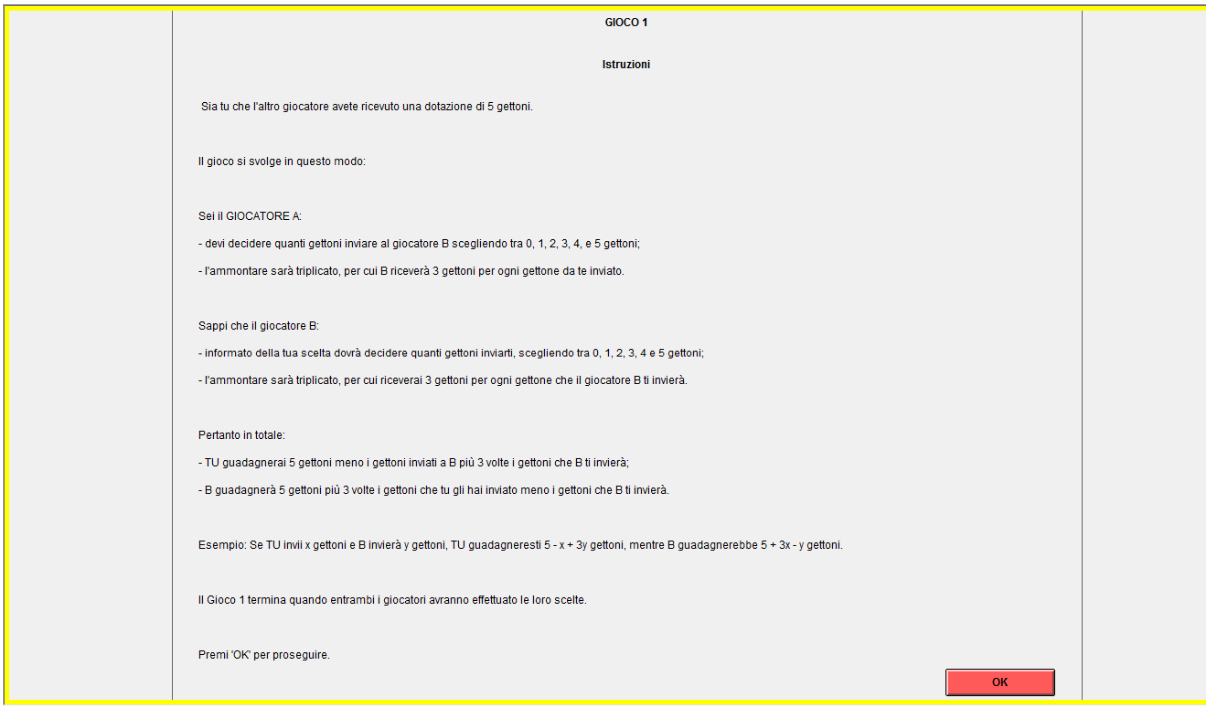
Thus, each subject will interact in every game with different subjects without knowing their identity.

II. Computerized Instructions

The screenshots (I-treatment) taken from the original z-Tree code used in our experimental sessions are reproduced below together with the English translation.

a. Player A

SCREENSHOT 1A



GIOCO 1

Istruzioni

Sia tu che l'altro giocatore avete ricevuto una dotazione di 5 gettoni.

Il gioco si svolge in questo modo:

Sei il GIOCATORE A:

- devi decidere quanti gettoni inviare al giocatore B scegliendo tra 0, 1, 2, 3, 4, e 5 gettoni;

- l'ammontare sarà triplicato, per cui B riceverà 3 gettoni per ogni gettone da te inviato.

Sappi che il giocatore B:

- informato della tua scelta dovrà decidere quanti gettoni inviarti, scegliendo tra 0, 1, 2, 3, 4 e 5 gettoni;

- l'ammontare sarà triplicato, per cui riceverai 3 gettoni per ogni gettone che il giocatore B ti invierà.

Pertanto in totale:

- TU guadagnerai 5 gettoni meno i gettoni inviati a B più 3 volte i gettoni che B ti invierà;

- B guadagnerà 5 gettoni più 3 volte i gettoni che tu gli hai inviato meno i gettoni che B ti invierà.

Esempio: Se TU invii x gettoni e B invierà y gettoni, TU guadagneresti 5 - x + 3y gettoni, mentre B guadagnerebbe 5 + 3x - y gettoni.

Il Gioco 1 termina quando entrambi i giocatori avranno effettuato le loro scelte.

Premi 'OK' per proseguire.

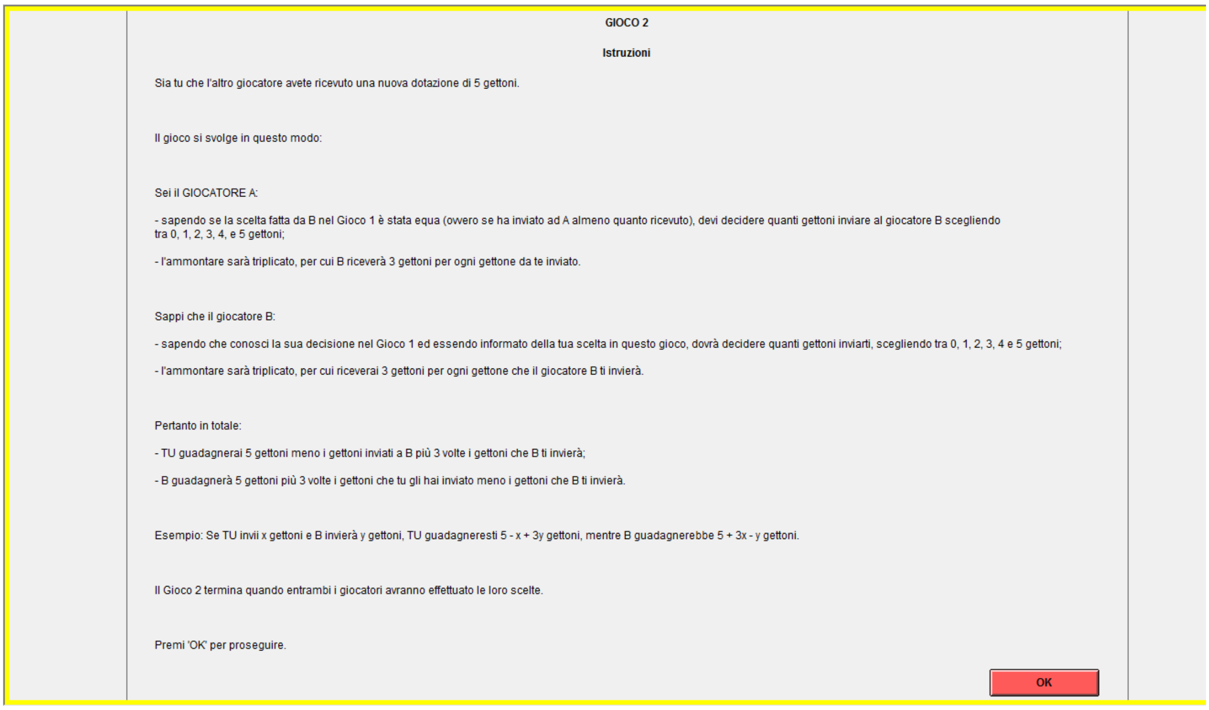
OK

English translation (top-down): Game 1 || Instructions || Both you and the other player have received an endowment of 5 tokens || The game goes as follows: || You are PLAYER A || - you should decide how many tokens to send to player B by choosing between 0, 1, 2, 3, 4, and 5 tokens; || - the amount will be tripled, thus B will receive 3 tokens per each token you sent. || Notice that player B: || - informed about your choice, will decide how many tokens to send you by choosing between 0, 1, 2, 3, 4, and 5 tokens; || - the amount will be tripled, thus you will receive 3 tokens per each token B will send you. || Therefore, in total: || YOU will earn 5 tokens minus the tokens sent to B plus 3 times the tokens B will send you || B will earn 5 tokens plus 3 times the tokens you sent them minus the tokes B will send you || For example: if YOU send x tokens and B will send you y tokens, YOU would earn 5-x+3y tokens, while B would earn 5+3x-y tokens. || Game 1 ends when both players would have made their choices. || Press ‘OK’ to continue. || OK

SCREENSHOT 2A

English translation (top-down): Game 1 || How many tokens do you want to send to PLAYER B? || Confirm

SCREENSHOT 3A


GIOCO 2

Istruzioni

Sia tu che l'altro giocatore avete ricevuto una nuova dotazione di 5 gettoni.

Il gioco si svolge in questo modo:

Sei il GIOCATORE A:

- sapendo se la scelta fatta da B nel Gioco 1 è stata equa (owero se ha inviato ad A almeno quanto ricevuto), devi decidere quanti gettoni inviare al giocatore B scegliendo tra 0, 1, 2, 3, 4, e 5 gettoni;

- l'ammontare sarà triplicato, per cui B riceverà 3 gettoni per ogni gettone da te inviato.

Sappi che il giocatore B:

- sapendo che conosci la sua decisione nel Gioco 1 ed essendo informato della tua scelta in questo gioco, dovrà decidere quanti gettoni inviarti, scegliendo tra 0, 1, 2, 3, 4 e 5 gettoni;

- l'ammontare sarà triplicato, per cui riceverai 3 gettoni per ogni gettone che il giocatore B ti invierà.

Pertanto in totale:

- TU guadagnerai 5 gettoni meno i gettoni inviati a B più 3 volte i gettoni che B ti invierà;

- B guadagnerà 5 gettoni più 3 volte i gettoni che tu gli hai inviato meno i gettoni che B ti invierà.

Esempio: Se TU invii x gettoni e B invierà y gettoni, TU guadagneresti 5 - x + 3y gettoni, mentre B guadagnerebbe 5 + 3x - y gettoni.

Il Gioco 2 termina quando entrambi i giocatori avranno effettuato le loro scelte.

Premi 'OK' per proseguire.

OK

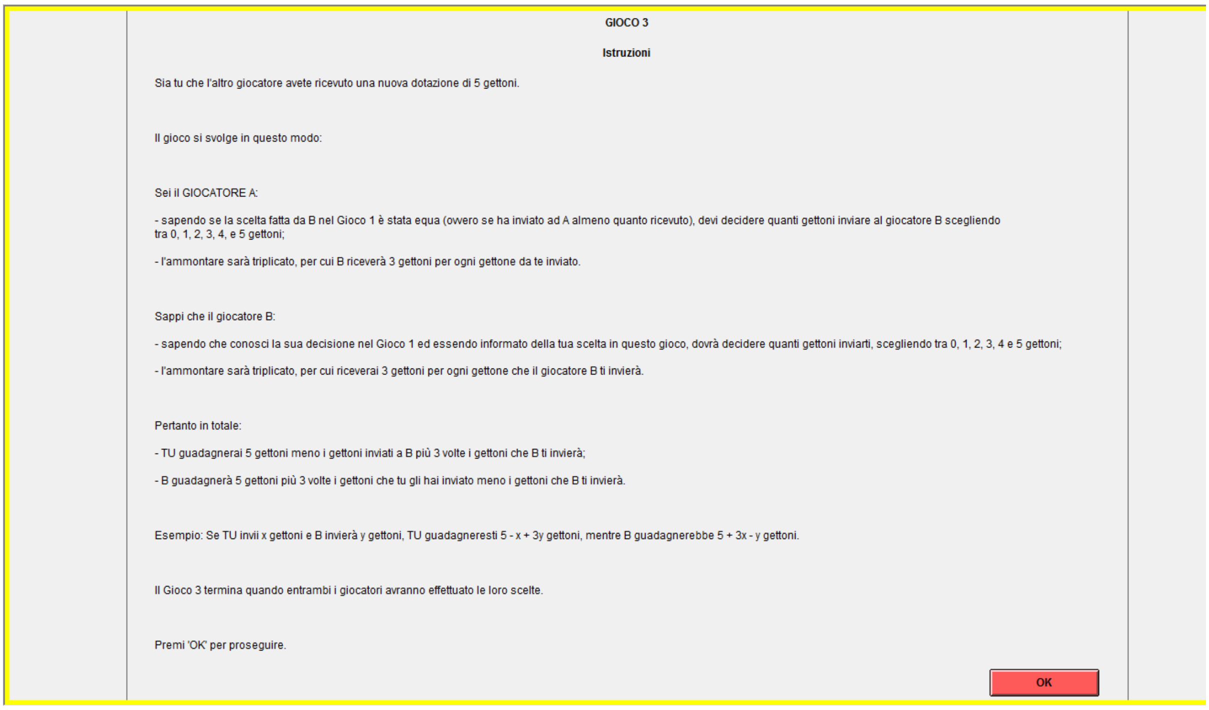
English translation (top-down): Game 2 || Instructions || Both you and the other player have received an endowment of 5 tokens || The game goes as follows: || You are PLAYER A || - knowing if B's choice in Game 1 was fair (that is, if you send to A at least as much as you received), you should decide how many tokens to send to player B by choosing between 0, 1, 2, 3, 4, and 5 tokens; || - the amount will be tripled, thus B will receive 3 tokens per each token you sent. || Notice that player B: || - knowing that you were aware of their decision in Game 1 and being informed of your choice in this game, will have to decide how many tokens to send you by choosing between 0, 1, 2, 3, 4, and 5 tokens; || - the amount will be tripled, thus you will receive 3 tokens per each token B will send you. || Therefore, in total: || YOU will earn 5 tokens minus the tokens sent to B plus 3 times the tokens B will send you || B will earn 5 tokens plus 3 times the tokens you sent them minus the tokes B will send you || For example: if YOU send x tokens and B will send you y tokens, YOU would earn 5-x+3y tokens, while B would earn 5+3x-y tokens. || Game 2 ends when both players would have made their choices. || Press 'OK' to continue. || OK

SCREENSHOT 4A

English translation (top-down): Game 2 || Notice that in Game 1 PLAYER B was unfair. || How many tokens do you want to send to PLAYER B? || Confirm

Notes: If player B in Game 1 sent to A at least as much as they received, the word “unfair” in the above text would have been substituted by “fair.”

SCREENSHOT 5A



English translation (top-down): Game 3 || Instructions || Both you and the other player have received an endowment of 5 tokens || The game goes as follows: || You are PLAYER A || - knowing if B's choice in Game 1 was fair (that is, if you send to A at least as much as you received), you should decide how many tokens to send to player B by choosing between 0, 1, 2, 3, 4, and 5 tokens; || - the amount will be tripled, thus B will receive 3 tokens per each token you sent. || Notice that player B: || - knowing that you were aware of their decision in Game 1 and being informed of your choice in this game, will have to decide how many tokens to send you by choosing between 0, 1, 2, 3, 4, and 5 tokens; || - the amount will be tripled, thus you will receive 3 tokens per each token B will send you. || Therefore, in total: || YOU will earn 5 tokens minus the tokens sent to B plus 3 times the tokens B will send you || B will earn 5 tokens plus 3 times the tokens you sent them minus the tokes B will send you || For example: if YOU send x tokens and B will send you y tokens, YOU would earn 5-x+3y tokens, while B would earn 5+3x-y tokens. || Game 3 ends when both players would have made their choices. || Press 'OK' to continue. || OK

SCREENSHOT 6A

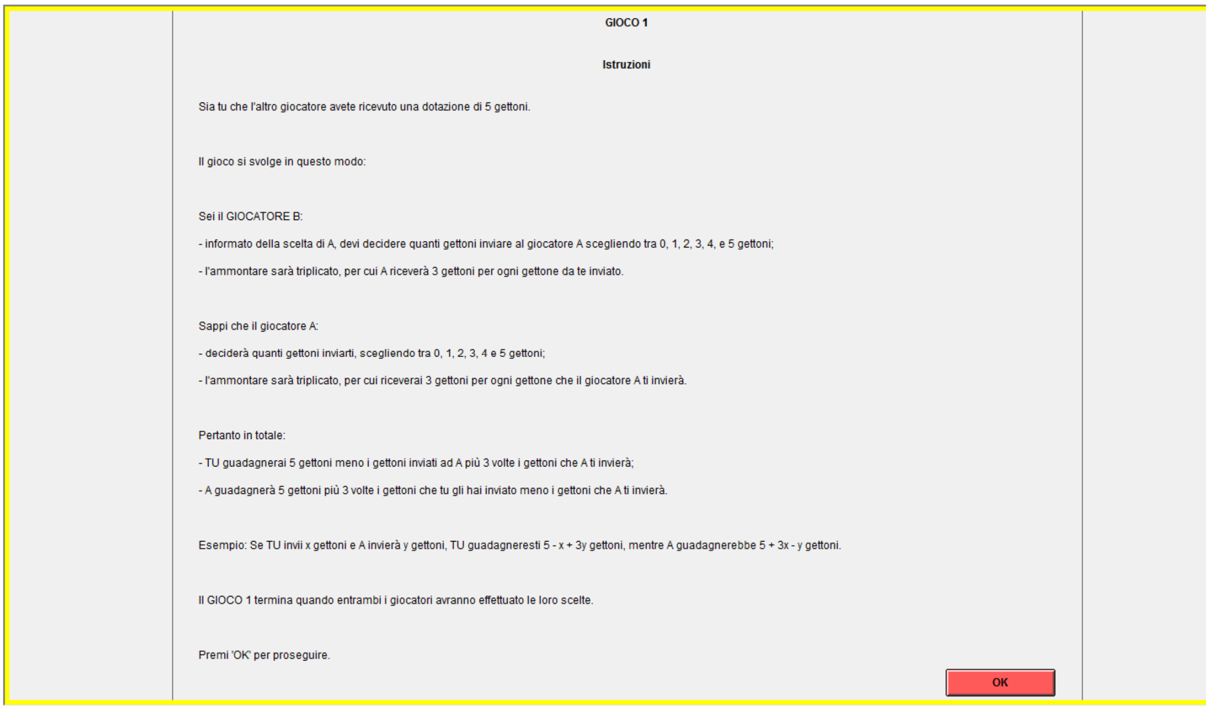
English translation (top-down): Game 3 || Notice that in Game 1 PLAYER B was unfair. || How many tokens do you want to send to PLAYER B? || Confirm

SCREENSHOT 7A

English translation (top-down): Your game earnings || Game randomly selected:3 || Your choice: 0 || The choice of the other player: 0 || Your earnings (in tokens): 5 || OK

b. Player B

SCREENSHOT 1B



GIOCO 1

Istruzioni

Sia tu che l'altro giocatore avete ricevuto una dotazione di 5 gettoni.

Il gioco si svolge in questo modo:

Sei il GIOCATORE B:

- informato della scelta di A, devi decidere quanti gettoni inviare al giocatore A scegliendo tra 0, 1, 2, 3, 4, e 5 gettoni;

- l'ammontare sarà triplicato, per cui A riceverà 3 gettoni per ogni gettone da te inviato.

Sappi che il giocatore A:

- deciderà quanti gettoni inviarti, scegliendo tra 0, 1, 2, 3, 4 e 5 gettoni;

- l'ammontare sarà triplicato, per cui riceverai 3 gettoni per ogni gettone che il giocatore A ti invierà.

Pertanto in totale:

- TU guadagnerai 5 gettoni meno i gettoni inviati ad A più 3 volte i gettoni che A ti invierà;

- A guadagnerà 5 gettoni più 3 volte i gettoni che tu gli hai inviato meno i gettoni che A ti invierà.

Esempio: Se TU invii x gettoni e A invierà y gettoni, TU guadagneresti 5 - x + 3y gettoni, mentre A guadagnerebbe 5 + 3x - y gettoni.

Il GIOCO 1 termina quando entrambi i giocatori avranno effettuato le loro scelte.

Premi 'OK' per proseguire.

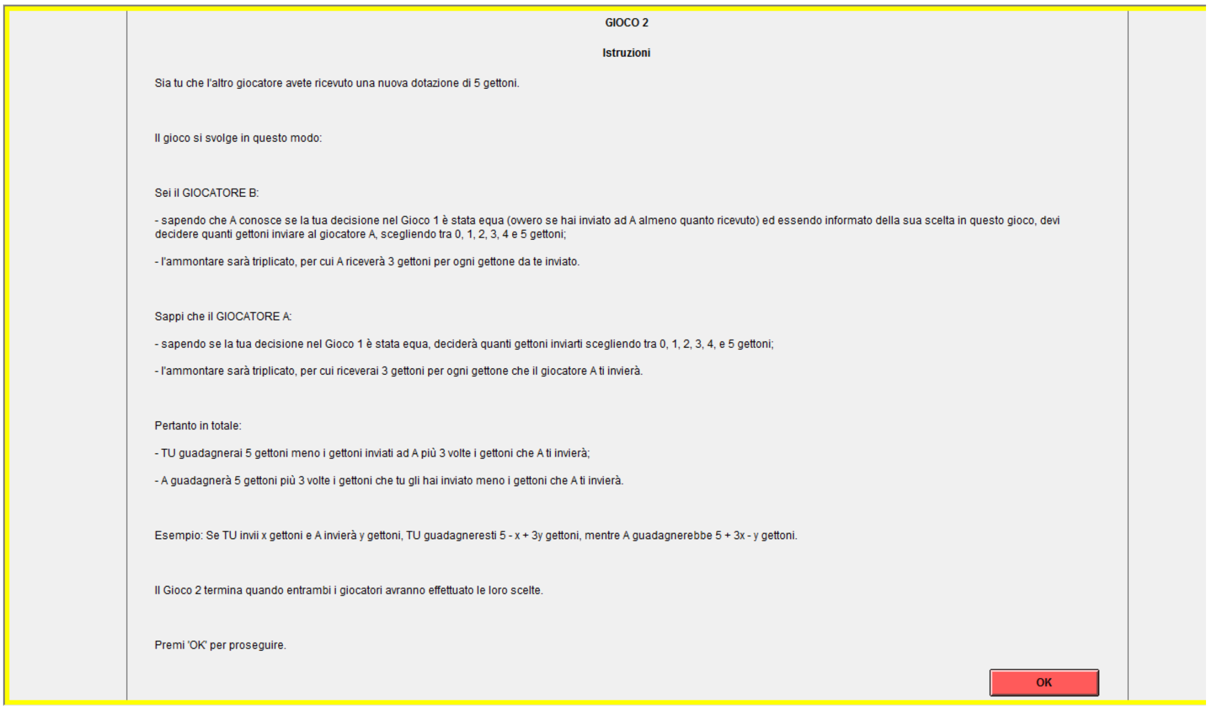
OK

English translation (top-down): Game 1 || Instructions || Both you and the other player have received an endowment of 5 tokens || The game goes as follows: || You are PLAYER B || - once you learn about A's choice, you will be asked to decide how many tokens to send to player A by choosing between 0, 1, 2, 3, 4, and 5 tokens; || - the amount will be tripled, thus A will receive 3 tokens per each token you sent. || Notice that player A: || - will decide how many tokens to send you by choosing between 0, 1, 2, 3, 4, and 5 tokens; || - the amount will be tripled, thus you will receive 3 tokens per each token A sent you. || Therefore, in total: || YOU will earn 5 tokens minus the tokens sent to A plus 3 times the tokens A will send you || A will earn 5 tokens plus 3 times the tokens you sent them minus the tokes A will send you || For example: if YOU send x tokens and A will send you y tokens, YOU would earn 5-x+3y tokens, while A would earn 5+3x-y tokens. || Game 1 ends when both players would have made their choices. || Press 'OK' to continue. || OK

SCREENSHOT 2B

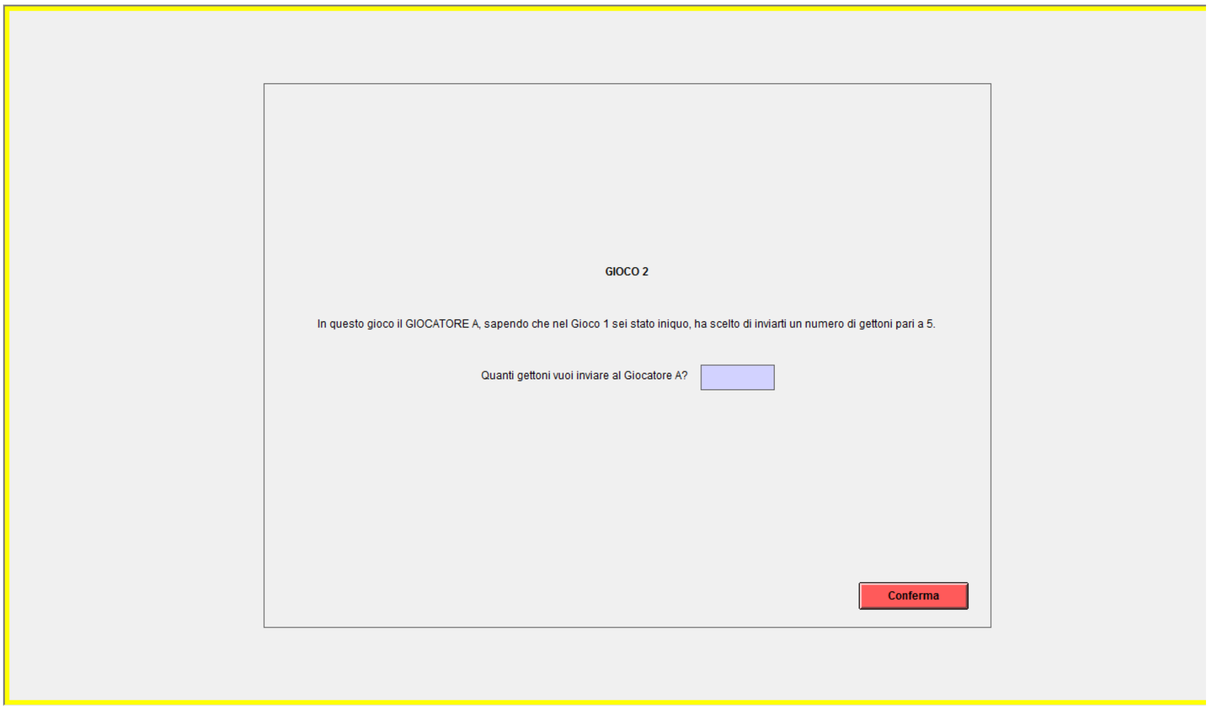
English translation (top-down): Game 1 || In this game, PLAYER A sent you a number of tokens equal to 5 || How many tokens do you want to send to PLAYER A? || Confirm

SCREENSHOT 3B



English translation (top-down): Game 2 || Instructions || Both you and the other player have received an endowment of 5 tokens || The game goes as follows: || You are PLAYER B || - knowing both that A is aware if your decision in Game 1 was fair (that is, if you send to A at least as much as you received) and their choice in this game, you should decide how many tokens to send to player A by choosing between 0, 1, 2, 3, 4, and 5 tokens; || - the amount will be tripled, thus A will receive 3 tokens per each token you sent. || Notice that player A: || - knowing if your decision in Game 1 was fair, will decide how many tokens to send you by choosing between 0, 1, 2, 3, 4, and 5 tokens; || - the amount will be tripled, thus you will receive 3 tokens per each token A sent you. || Therefore, in total: || YOU will earn 5 tokens minus the tokens sent to A plus 3 times the tokens A will send you || A will earn 5 tokens plus 3 times the tokens you sent them minus the tokes A will send you || For example: if YOU send x tokens and A will send you y tokens, YOU would earn 5-x+3y tokens, while A would earn 5+3x-y tokens. || Game 2 ends when both players would have made their choices. || Press ‘OK’ to continue. || OK

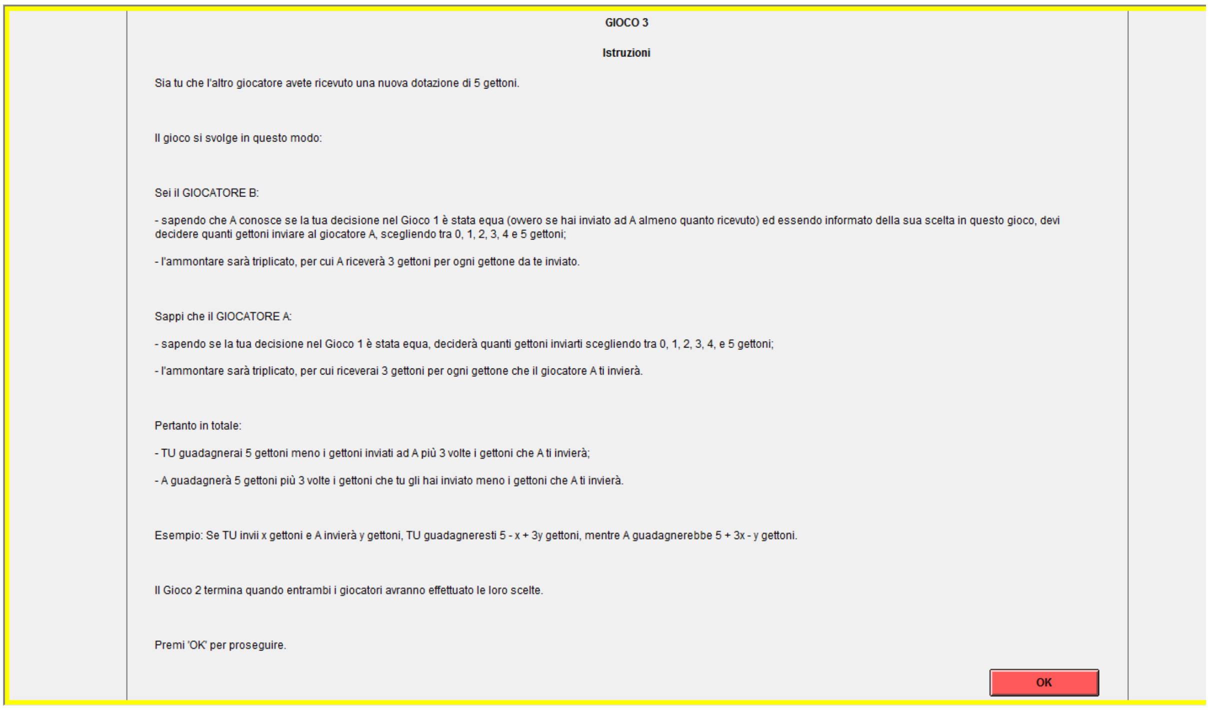
SCREENSHOT 4B



English translation (top-down): Game 2 || In this game PLAYER A, knowing that in Game 1 you were unfair, he decide to sent you a number of tokens equal to 5 || How many tokens do you want to send to PLAYER A? || Confirm

Notes: If player B in Game 1 sent to A at least as much as they received, the word “unfair” in the above text would have been substituted by “fair.”

SCREENSHOT 5B



English translation (top-down): Game 3 || Instructions || Both you and the other player have received an endowment of 5 tokens || The game goes as follows: || You are PLAYER B || - knowing both that A is aware if your decision in Game 1 was fair (that is, if you send to A at least as much as you received) and their choice in this game, you should decide how many tokens to send to player A by choosing between 0, 1, 2, 3, 4, and 5 tokens; || - the amount will be tripled, thus A will receive 3 tokens per each token you sent. || Notice that player A: || - knowing if your decision in Game 1 was fair, will decide how many tokens to send you by choosing between 0, 1, 2, 3, 4, and 5 tokens; || - the amount will be tripled, thus you will receive 3 tokens per each token A sent you. || Therefore, in total: || YOU will earn 5 tokens minus the tokens sent to A plus 3 times the tokens A will send you || A will earn 5 tokens plus 3 times the tokens you sent them minus the tokes A will send you || For example: if YOU send x tokens and A will send you y tokens, YOU would earn 5-x+3y tokens, while A would earn 5+3x-y tokens. || Game 3 ends when both players would have made their choices. || Press ‘OK’ to continue. || OK

SCREENSHOT 6B

English translation (top-down): Game 3 || In this game PLAYER A knew that in Game 1 you were unfair. || Answer the following questions, knowing that the answer corresponding to the actual A's choice could contribute to the determination of your earnings. || 1. If player A would have chosen to send you 0 token, YOU would send to A a number of tokens equal to 0_ 1_ 2_ 3_ 4_ 5_ || 2. If player A would have chosen to send you 1 token, YOU would send to A a number of tokens equal to 0_ 1_ 2_ 3_ 4_ 5_ || 3. If player A would have chosen to send you 2 tokens, YOU would send to A a number of tokens equal to 0_ 1_ 2_ 3_ 4_ 5_ || 4. If player A would have chosen to send you 3 tokens, YOU would send to A a number of tokens equal to 0_ 1_ 2_ 3_ 4_ 5_ || 4. If player A would have chosen to send you 3 tokens, YOU would send to A a number of tokens equal to 0_ 1_ 2_ 3_ 4_ 5_ || 5. If player A would have chosen to send you 4 tokens, YOU would send to A a number of tokens equal to 0_ 1_ 2_ 3_ 4_ 5_ || 6. If player A would have chosen to send you 5 tokens, YOU would send to A a number of tokens equal to 0_ 1_ 2_ 3_ 4_ 5_ || Confirm

SCREENSHOT 7B

English translation (top-down): Your game earnings || Game randomly selected:3 || Your choice: 0 || The choice of the other player: 0 || Your earnings (in tokens): 5 || OK