

How Traders' Appearances and Moral Descriptions Influence Receivers' Choices in the Ultimatum Game

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Abstract—This work reports on a series of experiments involving 960 participants (aged between 20-30 years and equally balanced by gender), asked to play the receiver role in a modified version of the Ultimatum Game, where together with information on the offer's fairness (e.g. 40 (fair) vs 10 (unfair) of 100 euros), a photo depicted the trader's appearance (trustworthy vs. untrustworthy) and a text provided his moral description (honest vs. dishonest). Receivers were asked to motivate their decision in connection with the appearance, moral judgment, and fairness of the offer, and report on how these variables affected their emotional feelings. Data analysis shows that, in all conditions containing a fair offer, the trader's appearance plays a significant role in the receivers' decisions in terms of acceptance rate. Moral descriptions play a significant role only in conditions containing an unfair offer. However, when asked to motivate their choices, subjects do not feel the interference of the social appearance, rather they provide more or less equal number of motivations with reference to the amount of offers and moral judgments. As for the emotions driving their decisions, non-converging feelings are observed both at intra and inter group level.

Keywords—*Ultimatum Game; contextual information; social appearances; moral judgments; emotional behaviors; decisional behaviors; decision makings.*

I. INTRODUCTION

To our knowledge, this is the first investigation reporting on the effects of traders' moral descriptions and social appearances on receivers' choices to accept or refuse the Ultimatum Game offer [11]. Some works had shown that receivers are influenced in their decisions by the trader's gender and physical appearance [20], intended by the authors as attractiveness. Other authors ([8], [19], [21]) have shown that receivers' choices can be affected by the traders' intentions, as well as trader's reciprocity [9], the latter presented by the authors as acting similarly in response to traders' friendly behaviors, for example showing cooperativity in response to friendly actions.

The Ultimatum Game has been proposed by economists to investigate the rationale that drive receivers' choices when offered to accept or refuse a given amount of money. To this aim there are two agents interacting. The first agent, the trader,

has available a certain amount of money and offers part of it to a second agent, the receiver, who can decide to accept or refuse the offer. If the receiver accepts, the transaction ends and both the agents gain a certain amount of money. If the receiver refuses, the transaction ends and both the agents lose money. The trader can make a fair or an unfair offer, depending on the amount of cash s/he has available. An offer is fair if it amounts to between 40%-60% of the money available, whereas between the 20%-10%, the offer is considered unfair. Since the receiver always faces a profit, no matter the fairness or unfairness of the offer, there is, theoretically, no reason to refuse. However, contrarily to the rationality of this expectation, 77% of receivers refuse an unfair offer, and 90% accept a fair offer when the two agents are totally unknown to each other [16].

Cultural differences produce minor deviations from this behavior: it has been shown that from several places in the world, such as Slovenia, Israel, China, Ljubljana, Pittsburgh, Tokyo, Yogyakarta, Tucson, and Los Angeles (see [1], [22], [13], [14]), "proposers make similar mean offers (40 to 50% of the total), and responders frequently reject low "inequitable" offers" (see [12], p. 974), i.e. offers below 20% of the total. The only deviation from this behavior was observed on Machiguenga (people from the tropical forests of the south-eastern Peruvian Amazon), where proposers make mean offers of 27.5% and receivers accepted "many offers of 15% of the total" (see [12], p. 974).

The explanation provided for the receiver's irrational behavior is that receivers "do not only care about their own monetary payoff but compare their payoff with that of the proposer and become frustrated when their share is much lower" (see [10], p.5). This experimental finding demonstrates that there are conditions where individuals are actively determined to turn down a concrete monetary reward on the basis of personal, and emotional motivations.

The present study tests additional psychological and emotional factors - the social appearance and moral description of the trader - that may influence the receiver's decision-making process in the Ultimatum Game. The research responds to the quest for understanding human behaviors during

interactional exchanges in order to define, and implement socially, and emotionally believable ICT models of conducts [5], [6], [7]. In this context, the behavior and appearance of the “to be” developed ICT interfaces, and the trust the users give them, necessitate an efficient and effective modeling of users’ dynamics of signal exchanges in terms of shared meanings, cognitive competencies, beliefs, emotions, environmental information, and social rules [2], [3],[4], [15], [17].

II. EXPERIMENTAL SET-UP

A. Participants

Nine hundred and sixty (960) subjects, equally balanced by gender, and aged between 20-35 years (mean age =26.03 years, SD=2.9 years) were recruited for the experiment. They were bachelor and/or master students at the Università della Campania “Luigi Vanvitelli”. A small group of 30 students was recruited at the Università di Napoli “Federico II”. None were enrolled in the Psychology and/or Economy bachelor/master programs to avoid field-knowledge biases. Each subject received information on privacy issues, on the possibility to withdraw her participation at will, and on how to perform the required task. Subsequently, those who volunteered for the experiment were asked to sign an informed consent statement.

B. Materials

Two groups, each of 15 subjects, were recruited, to identify the most trustworthy/untrustworthy photos inspiring strongly positive or negative feelings respectively. The proposed pictures (four in total, two for trustful and two for untrustworthy appearances) were selected by the experimenters among a publicly available set of 18 pictures downloaded from the web. The selected pictures were those that received by the two groups of assessors the highest scores for being either the most trustworthy (<http://www.imagine-cs.com/software-erp-gt/> –last verified 08/2017) or untrustworthy (<http://www.nydailynews.com/news/world/russian-mafia-boss-shot-moscow-article-1.1241255> – last verified 08/2017) faces. Conduct was defined honest or dishonest by two texts conceived by the experimenters and reported in Table I. A total of 16 different possible conditions (Trustworthy/Untrustworthy Appearance x Honest/Dishonest Conduct x Fair/Unfair Offer; Honest/Dishonest Conduct x Fair/Unfair Offer; Trustworthy/Untrustworthy Appearance x Fair/Unfair Offer) were defined as reported in Table II. To each condition was assigned a group of 60 subjects equally balanced by gender in order to play the receiver’s role.

C. Procedures

Each group of 60 subjects watched in front of a computer screen, the PPT presentation of the assigned condition. The first PPT slide informed the participant that s/he was going to receive an amount of cash from a trader, reminded that s/he currently had 0 amount of cash available, and (depending on the condition) that the next slide is reporting either a picture, or a moral description of the trader, or both. The third slide was reporting either the fair (40 vs 100 euros) or unfair offer (10 vs 100 euros). In order to collect participants’ responses, the last slide was reporting the questionnaire illustrated in Table III.

D. Data Analysis

Statistical analyses conducted through the statistical package for social sciences (SPSS) exploited the answers provided by participants to the questionnaire reported in Table III (www.ibm.com/analytics/us/en/technology/spss/ – last verified 08/2017) in order to assess significant differences among receivers’ behaviors according to conditions.

TABLE I

The texts proposed for the honest/dishonest moral description.	
Dishonest moral description	Honest moral description
Mister Rossi works as director of an international trading company. He is married with two children. Mr. Rossi is considered a dishonest, egoist and unfair man by his workers. He do not show comprehension and generosity, denying their rights, and not allowing them to take work’s permits. In general, he do not share with his workers cash prizes provided by the company.	Mister Rossi works as director of an international trading company. He is married with two children. Mr. Rossi is considered an honest, generous and fair man by his workers. He show comprehension and generosity respecting their rights and allowing them to take work’s permits if needed. He established, for all workers who deserve it, substantial cash prizes provided by the company.

TABLE II

The 16 different conditions	
1. Trustworthy Honest Fair	9. Dishonest Unfair
2. Trustworthy Honest Unfair	10. Dishonest Fair
3. Untrustworthy Honest Fair	11. Honest Fair
4. Untrustworthy Honest Unfair	12. Honest Unfair
5. Untrustworthy Dishonest Fair	13. Trustworthy Fair
6. Untrustworthy Dishonest Unfair	14. Trustworthy Unfair
7. Trustworthy Dishonest Fair	15. Untrustworthy Fair
8. Trustworthy Dishonest Unfair	16. Untrustworthy Unfair

TABLE III

The proposed questionnaire assessing the choices	
1.	Which will be your decision: <ul style="list-style-type: none"> a. To accept b. To refuse
2.	What motivate your decision? <ul style="list-style-type: none"> a. The appearance of Mr. Rossi b. What you know about him (his moral description) c. The cash offered
3.	Which feeling driven your decision? <ul style="list-style-type: none"> a. Positive feeling b. Negative feeling c. Mixed feelings d. No particular feeling
4.	What caused your feeling ? <ul style="list-style-type: none"> a. The appearance of Mr. Rossi b. What you know about him (his moral description) c. The cash offered d. It was only a game for me

Significance was established at $p \leq 0.01$. Chi-square and univariate ANOVA analyses were performed to assess significant differences among conditions (16 in total as reported in Table II) on acceptance and rejection rates (question 1 in Table III), motivations (questions 2 in Table

III), emotional feelings (question 3 in Table III) and motivations driving the felt emotional feelings (question 4 in Table III). Chi-square and univariate ANOVA analyses were conducted separately on conditions 1-8, 9-12, and 13-16 (see Table II) for questions 2 and 4 in Table II. This was because the list of alternative options provided by questions 2 and 4 do not apply to all conditions. For example, since condition 9 considers only the moral description and amount of the offer, the option “a.” in question 2 does not apply.

In what follows, the analyses are discussed considering the effects on receivers of the following trader’s features:

- Social appearance: Trustworthy vs Untrustworthy
- Moral description: Honest vs Dishonest
- Offer amount: Fair vs Unfair Offer

III. RESULTS

A. Acceptance Rate

Significance of the acceptance rate with respect to conditions was assessed by a chi-square analysis. Fig. 1 shows the percentage of acceptance rates for each condition.

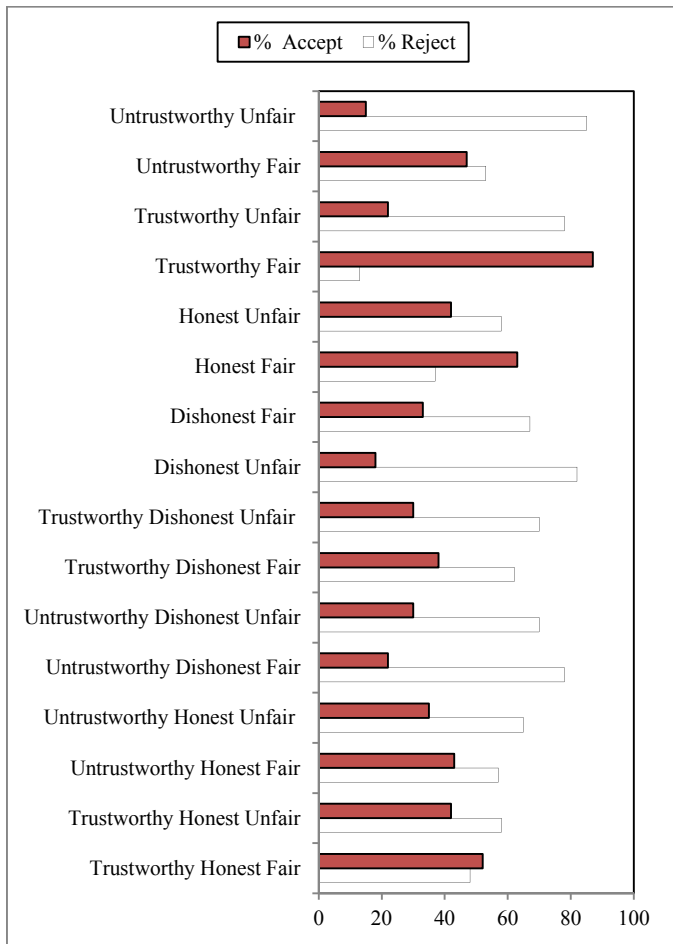


Fig. 1. Percentages of rejection (white bars) and acceptance (shaded bars) rates for each of the 16 conditions listed in Table II.

Chi square analyses revealed significant differences (chi square=52.267; $p < 0.001$) between acceptance and rejection rate categories. A univariate ANOVA on the acceptance rate

revealed significant differences among conditions ($F(15, 959)=9.673$, $p < 0.001$). Through Bonferroni post hoc tests it was possible to assess that these differences are due to the fact that the acceptance rate of the *trustworthy fair* (acceptance rate=87%) condition was significantly higher ($p < 0.005$) than all remaining conditions, except the *honest fair* (acceptance rate=63%, $p=0.69$) condition with which no significant differences are found. The acceptance rate of the *honest fair* condition was significantly higher than that of conditions *trustworthy dishonest unfair* ($p=0.008$); *untrustworthy dishonest unfair* ($p=0.001$), *untrustworthy dishonest fair* ($p < 0.001$), *trustworthy unfair* ($p < 0.001$), *dishonest unfair* ($p < 0.001$), *distrustful unfair* ($p < 0.001$). Finally, the acceptance rate of the *trustworthy honest fair condition* was significantly different than that of the *dishonest unfair* ($p=0.008$), and *untrustworthy unfair* ($p=0.001$) conditions.

In general, considering each single condition, the tendency is significantly to reject a **fair offer** when the trader is *untrustworthy* and *dishonest* (rejection rate=78%, chi square=19.26, $p < 0.001$) or *dishonest* (rejection rate =67%, chi square=6.66, $p=0.01$). Instead a **fair offer** is significantly accepted when the trader is *trustworthy* (acceptance rate=87%, chi square=32.27, $p < 0.001$). In addition, an **unfair offer** is significantly rejected either when the trader is *untrustworthy* (rejection rate =85%, chi square=29.4, $p < 0.001$), or *trustworthy* (rejection rate =78%, chi square=19.26, $p < 0.001$), or *dishonest* (rejection rate =82%, chi square=24, $p < 0.001$), or *trustworthy and dishonest* (rejection rate=70%, chi square=9.6, $p=0.002$), or *untrustworthy and dishonest* (rejection rate =70%, chi square=15, $p < 0.001$). No significant differences between acceptance and rejection rates were found for the conditions *trustworthy honest fair* (48% accept and 52% refuse), *trustworthy honest unfair*, (58% accept and 42% refuse), *untrustworthy honest fair* (57% accept and 43% refuse), *trustworthy dishonest fair* (62% accept and 38% refuse), *honest unfair* (58% accept and 42% refuse), *untrustworthy fair* (53% accept and 47% refuse). Considering that in the plain Ultimatum Game the unfair offer is significantly rejected by 77% (see [16]), it can be said that appearances and moral judgments reinforce receivers’ uncertainties and impact emotionally on their behaviors. Note that for the plain Ultimatum Game [11], the acceptance rate for fair offers was about 90%. Our data shows that trader’s appearances play a significant role in the receiver’s decisional behavior, since for the *trustworthy fair* condition the acceptance rate was significantly higher than that of all the remaining conditions containing a fair offer. The trader’s moral description (*honest vs. dishonest*) plays a role only when paired with unfair offers, since significant differences in the acceptance rate were found only when the offer was unfair.

B. What Drive Your Decision: Motivations

The receivers’ answers to question 2 (Table III) were analyzed separately for conditions 1-8 (Trader’s appearances vs Moral descriptions vs Offer amounts), 9-12 (Moral descriptions vs Offer amounts), and 13-16 (Trader’s Appearances vs. Offer amounts) through chi square and univariate ANOVA statistics analyses. Fig. 2, 3, and 4 report

percentages of receivers' choices among valid (according to conditions) alternative options provided by question 2 for conditions 1-8, 9-12, and 13-16, respectively. This analysis aims to investigate the rationale offered by receivers to justify their acceptance or rejection of the offer. The results are discussed separately for conditions 1-8, 9-12, and 13-16.

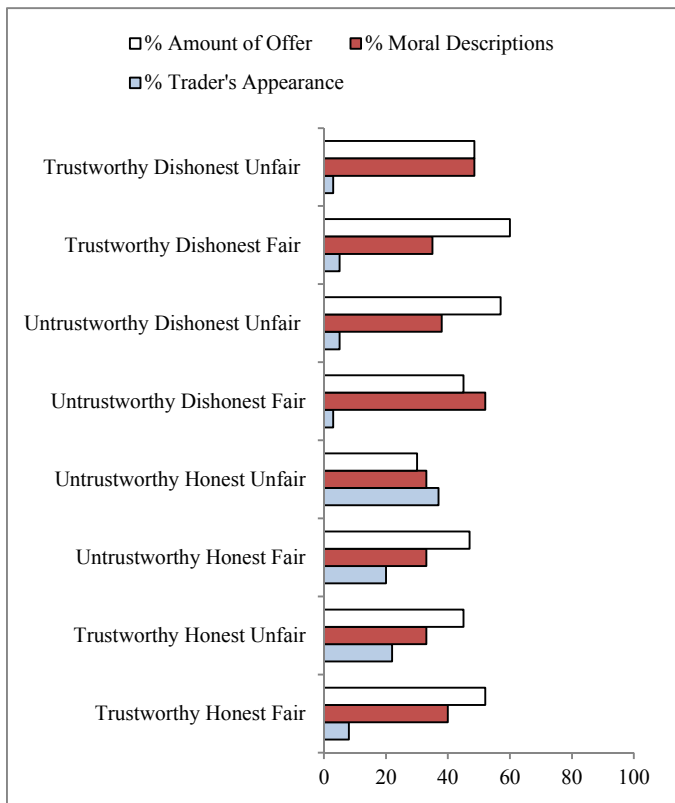


Fig. 2. Percentages of receivers' preferences expressed in favor of alternative answers offered by question 2 (see Table III) for conditions 1-8 listed in Table II.

The chi square analyses of the receivers' motivations to alternative answers offered by question 2 indicate significant differences among the three alternative options (moral description, trader's appearance, and amount of offer) for conditions 1-8 (chi square=95.55, $p < 0.001$).

A univariate ANOVA on the distributions of receivers' motivations revealed significant differences among conditions ($F(7, 479)=5.302, p < 0.001$). Bonferroni post hoc tests indicate that these differences are due to the *untrustworthy honest unfair* condition (where motivations are equally balanced among the three alternatives), that significantly differ with respect to the *trustworthy honest fair* ($p=0.002$), *untrustworthy dishonest fair* ($p=0.003$), *trustworthy dishonest unfair* ($p=0.001$), *untrustworthy dishonest unfair* ($p < 0.001$) and *trustworthy dishonest fair* ($p < 0.001$) since for these conditions motivations in favor of moral descriptions or offer amounts or both, were significantly higher than those offered for trader's appearances.

Fig. 3 reports percentages of receivers' preferences expressed in favor of alternative answers offered by question 2 (see Table III) to conditions 9-12 listed in Table II. For these four conditions, the trader's appearance is not shown. The chi square analyses does not find significant differences (chi

square=0.713, $p=0.398$) among motivations provided by receivers to explain their decision to accept or refuse the offer.

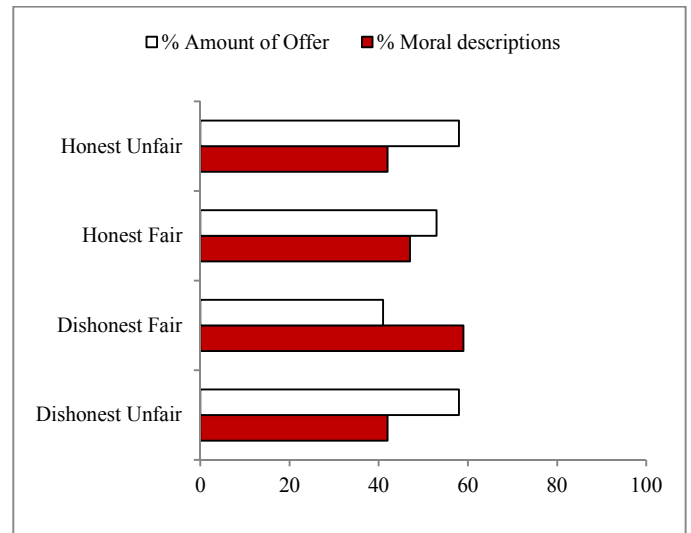


Fig. 3. Percentages of receivers' preferences expressed in favor of alternative answers offered by question 2 (see Table III) to conditions 9-12 listed in Table II. No significant differences among the proposed alternatives are observed.

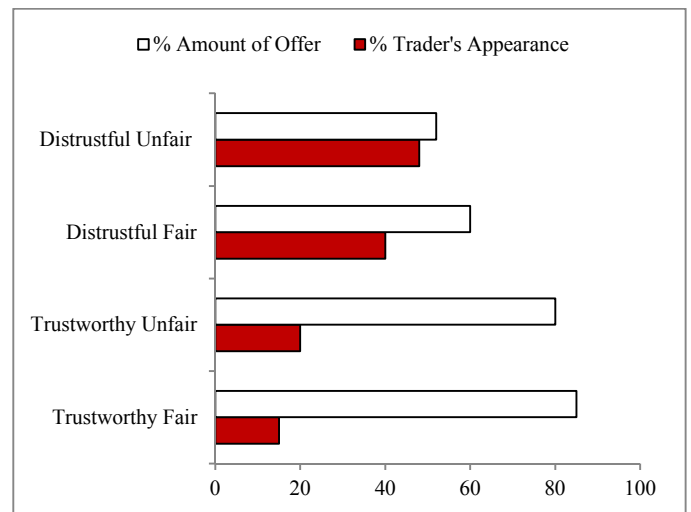


Fig. 4. Percentages of receivers' preferences expressed in favor of alternative answers offered by question 2 (see Table III) to conditions 13-16 listed in Table II.

The univariate ANOVA does not find significant differences among conditions 9-12 ($F(3, 236)=1.445, p=0.230$). The motivations were equally distributed between the two offered alternatives (the amount of the offer and trader's moral description). This result is very interesting. It must be noticed (see also Fig. 1) that differences among acceptance and rejection rates were significant for conditions *honest fair* (in favor of accept), and *dishonest fair*, *dishonest unfair* (in favor of reject). However, when receivers are asked to motivate their choice to accept or reject the offer, it seems that neither the trader's moral description nor the amount of offer strongly motivate their decisional behavior. It is more likely they choose by chance one of the two motivations, being both "emotionally reasonable" no matter the fairness or unfairness of the offer. In addition, the *honest fair* condition received only 63% against

90% of acceptance for the plain Ultimatum Game (see [16], Figure 1) where no moral description is provided, suggesting that receivers irrationally considered this added feature something to handle suspiciously. Instead, the *dishonest unfair* condition received 82% against 73% of rejection for the plain Ultimatum Game (see [16], Figure 1), suggesting that a negative moral description reinforces rejection rates while a positive moral description weakens acceptance rates.

Fig. 4 reports percentages of receivers' preferences expressed in favor of alternative motivations offered by question 2 (see Table III) to conditions 13-16 listed in Table II. For these four conditions, the trader's moral description is not provided. The chi square analyses showed that there were significant differences (chi square=34.615, $p < 0.001$) among receivers' provided motivations (trader's appearance, amount of offer) for accepting or refusing the offer.

A univariate ANOVA revealed significant differences among receivers provided motivations for conditions 13-16. Bonferroni post hoc tests indicate that receivers' preferences were significantly different for conditions: a) *trustworthy fair* - where motivations in favor of offer amounts are significantly higher than those for trader's appearances - with respect to the *untrustworthy unfair* ($p < 0.001$) - where no significant differences between trader's appearances and offer amounts are observed; b) *trustworthy unfair* - where receivers' preferences in favor of offer amounts are significantly higher than those for trader's appearances - with respect to the *untrustworthy unfair* ($p = 0.004$) - where no significant differences between the two alternatives are observed. Differences among acceptance and rejection rates (see Fig. 1) were significant for *trustworthy fair* (favoring to accept), and *trustworthy unfair*, *untrustworthy unfair* (favoring to reject). Receivers' divided opinion is observed only for the *untrustworthy fair* condition where no significant differences are observed between acceptance and rejection rates. However, when asked to motivate their decisional behavior, a trader's untrustworthy or trustworthy appearance seems not to be a good motivation for rejecting or accepting a fair offer, suggesting a desirability bias at play: "I am rational, I don't care of appearance. I made my decision because of the unfair amount of offer".

C. Emotional feelings

One of the experiment's assumptions was that when provided with trader's appearances, or moral descriptions, or both, receivers must be aroused by contradictory or consistent feelings when making their decisions, or otherwise rationally consider their choice expressing no particular feelings.

Question 3 (see Table III) was formulated to assess this assumption in terms of emotional valence values expressed in as either positive, or negative, or mixed, or no particular feelings. For sake of clarity, the receivers' feeling distributions (in percentages) are reported in Fig. 5. Tables IV reports the corresponding preferences (in percentages) expressed in favor of the four alternative options offered by question 3 for each of the 16 conditions under consideration.

The chi square analyses on conditions 1-16 indicate significant differences among receivers' preferences to the four alternative feelings (chi square=49.908, $p < 0.001$). The univariate ANOVA

revealed significant difference among conditions on the distributions of the four categories of emotional feelings ($F(15, 959) = 5.077$, $p < 0.001$).

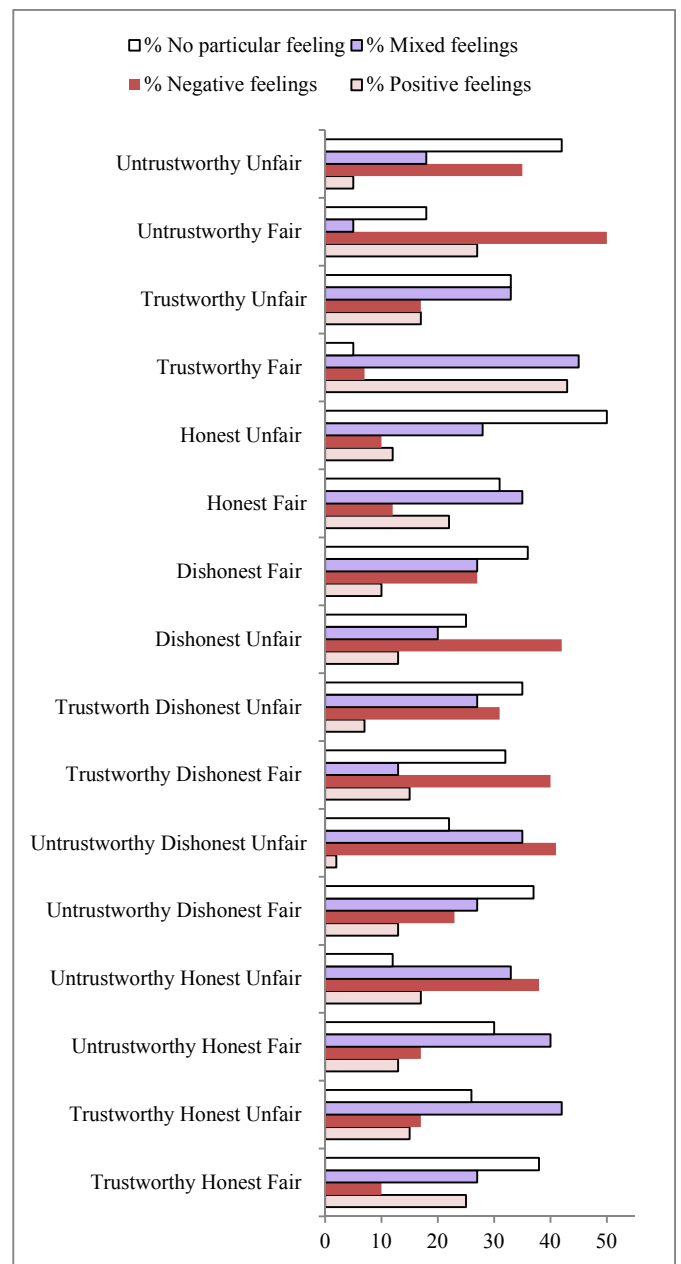


Fig. 5. Receivers' preferences expressed to alternative answers offered by question 3 (see Table III) for the 16 conditions (see Table II).

Bonferroni post hoc tests indicate that: a) the *untrustworthy honest unfair* condition significantly differ from the *honest unfair* ($p = 0.005$) condition; b) the *trustworthy fair* condition significantly differ from the *untrustworthy honest fair* ($p = 0.007$), *untrustworthy dishonest fair* ($p < 0.001$), *trustworthy dishonest unfair* ($p = 0.003$), *dishonest fair* ($p = 0.003$), *honest unfair* ($p < 0.001$) *untrustworthy unfair* ($p = 0.001$); c) the *untrustworthy fair* condition significantly differ from conditions: *untrustworthy unfair* ($p = 0.002$), *untrustworthy dishonest fair* ($p < 0.001$), *trustworthy dishonest unfair*

($p=0.007$), *honest unfair* ($p<0.001$) and *dishonest fair* ($p=0.007$). In addition, the chi square analysis shows that feeling distributions significantly differ in each of the following 8 conditions: *untrustworthy honest fair* (chi square=11.87, $p=0.008$), *untrustworthy honest unfair* (chi square=16.27, $p=0.001$), *trustworthy dishonest fair* (chi square=12.33, $p=0.007$), *trustworthy dishonest unfair* (chi square=11.6, $p=0.009$), *honest unfair* (chi square=24.9, $p<0.001$), *trustworthy fair* (chi square=35.3, $p<0.001$), *untrustworthy fair* (chi square=25.73, $p<0.001$), *untrustworthy unfair* (chi square=19.73, $p<0.001$). Fig. 5 illustrates receivers' choices among alternative feelings supposed to be aroused when accepting or refusing either a fair or unfair offer. As it can be seen from Fig. 5 positive and mixed feelings guide receivers' preferences only for the *trustworthy fair* condition, motivating its significant differences among the feeling distributions for the 8 abovementioned conditions.

TABLE IV

Receivers' feeling distributions for the 16 conditions listed in Table II.				
	% Positive feeling	% Negative feeling	% Mixed feeling	% No particular feeling
Trustworthy Honest Fair	25	10	27	38
Trustworthy Honest Unfair	15	17	42	26
Untrustworthy Honest Fair	13	17	40	30
Untrustworthy Honest Unfair	17	38	33	12
Untrustworthy Dishonest Fair	13	23	27	37
Untrustworthy Dishonest Unfair	2	41	35	22
Trustworthy Dishonest Fair	15	40	13	32
Trustworthy Dishonest Unfair	7	31	27	35
Honest Fair	12	10	28	50
Honest Unfair	22	12	35	31
Dishonest Fair	10	27	27	36
Dishonest Unfair	13	42	20	25
Trustworthy Fair	43	7	45	5
Trustworthy Unfair	17	17	33	33
Untrustworthy Fair	27	50	5	18
Untrustworthy Unfair	5	35	18	42
Frequencies over all the conditions	256	417	455	472

The untrustworthy fair condition shows the higher percentage of negative feelings, even though, negative feelings guide receivers' preferences also in the untrustworthy honest unfair, untrustworthy dishonest unfair, trustworthy dishonest fair, and dishonest unfair conditions, together with either mixed or no particular feelings, or both. Mixed feelings lead receivers' preferences for the trustworthy honest unfair, untrustworthy honest fair, honest fair, and trustworthy unfair conditions. No particular feelings lead receivers' preferences for the untrustworthy unfair, honest unfair, dishonest fair, trustworthy dishonest unfair, untrustworthy dishonest fair, and trustworthy honest fair conditions. Table IV shows that frequencies of positive feelings over all conditions are lower than negative, mixed, and neutral ones. Positive feelings are

higher, together with mixed feelings, only for the trustworthy fair condition.

It seems that the game does not arouse positive feelings even in positive situations, i.e., when the trader is trustworthy, and honest, or trustworthy, or honest and always making a fair offer. On the contrary, the game seems to arouse more negative and mixed or negative and neutral, or mixed and neutral feelings. The receivers' lack of consensus in expressing a strong preference toward a unique feeling, but stronger responses of mixed or no feelings, suggests unawareness and emotional involvements in performing the task. In addition, untrustworthy appearances receive higher percentages of negative feelings with respect to trustworthy appearances even though feelings' distributions are far from denoting a clear emotional state with respect to the fairness/unfairness of the offer.

D. What Caused the Arousal of such Emotional Feelings?

The receivers' answers to question 4 (Table III) were analyzed separately for conditions 1-8 (Trader's appearances vs Moral descriptions vs Offer amounts), 9-12 (Moral descriptions vs Offer amounts), and 13-16 (Trader's Appearances vs. Offer amounts) through chi square and univariate ANOVA statistics analyses. Figures 6, 7, and 8 report percentages of receivers' choices among valid (according to conditions) alternative options provided by question 4 for conditions 1-8, 9-12, and 13-16, respectively. This analysis aims to show which of trader's features elicited the receivers' emotional involvement. The results are discussed separately for conditions 1-8, 9-12, and 13-16.

The chi square analyses on rationales causing the emotional involvement of receivers (the four alternatives offered by question 4) indicate significant differences among the four alternatives offered by question 4 for conditions 1-8 (chi square=51.45, $p<0.001$). Over the four trader's features that might have aroused the feelings listed by question 3, preferences are given in percentage as 34% to the moral description, 12% to the trader's appearance, 29% to the amount of offer, and 25% to "it is only a game" option.

A univariate ANOVA performed on conditions 1-8 do not show significant difference among them, suggesting that the distributions of receivers' preferences were similar for the four alternatives offered by question 4 in Table II ($F(7, 479)=2.042$, $p=0.048$). Fig. 6 illustrates this results. Receivers' preferences were undoubtedly not in favor of the trader's appearance, even though it was clear from the data in Fig. 1 that appearance played a significant role on the decision to accept the offer (the *trustworthy fair* condition received 87% of acceptance rate).

Fig. 7 reports percentages of receivers' preferences expressed in favor of alternative answers offered by question 4 (see Table III) to conditions 9-12 listed in Table II. For these four conditions, the trader's appearance is not shown. The chi square analyses does not revealed significant differences (chi square=0.034, $p=0.983$) among motivations provided by receivers to explain their feelings. Over all the four conditions, the preferences expressed by receivers towards the three alternative motivations causing emotional involvements, were

given in percentage as 33% to the moral description, 33% to the amount of offer, and 34% to the “it is only a game” option.

The univariate ANOVA found that the distributions of the chosen options selected among those provided by question 4 are significantly different among conditions 9-12 ($F(3, 235)=5.578, p=0.001$). Bonferroni post hoc tests revealed that these differences are caused by barely significant differences between the *honest fair* with respect to the *dishonest fair* ($p=0.019$) and *dishonest unfair* ($p=0.039$) conditions, as well as, between the *honest unfair* with respect to the *dishonest fair* ($p=0.017$) and *dishonest unfair* ($p=0.036$) conditions. These differences are illustrated in Fig. 7. It should be noticed that the *honest fair* condition received the highest acceptance rate after the *trustworthy fair* condition. However, receivers do not attribute the feelings driving their decisions to the trader’s moral description.

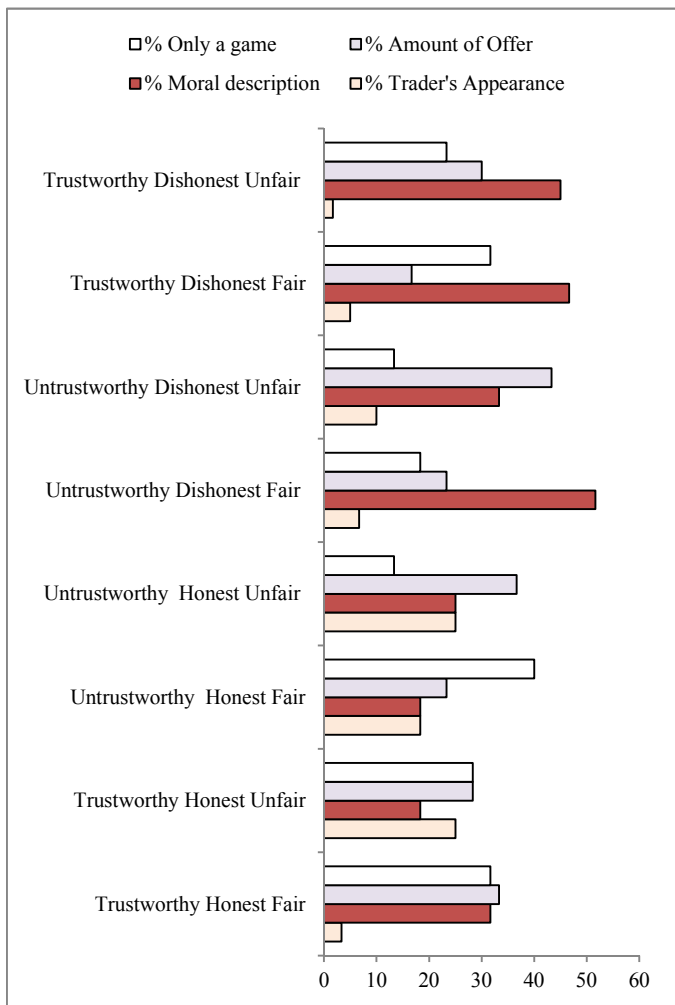


Fig. 6. Percentages of receivers' preferences expressed in favor of alternative answers offered by question 4 (see Table III) for conditions 1-8 listed in Table II.

Fig. 8 reports percentages of receivers' preferences expressed in favor of alternatives offered by question 4 (see Table III) to conditions 13-16. For these four conditions, the trader’s moral description is not shown. The chi square analyses found significant differences ($\chi^2=23.570, p<0.001$) among motivations provided by receivers to explain

their feelings. Over the four conditions, the preferences expressed by receivers towards the three motivations causing emotional involvements were given in percentage as 33% to the trader’s appearance, 46% to the amount of offer, 21% to the “it is only a game” option.

The univariate ANOVA revealed that the distributions of options provided by question 4 are barely significantly different among conditions 13-16 ($F(3, 237)=3.175, p=0.025$).

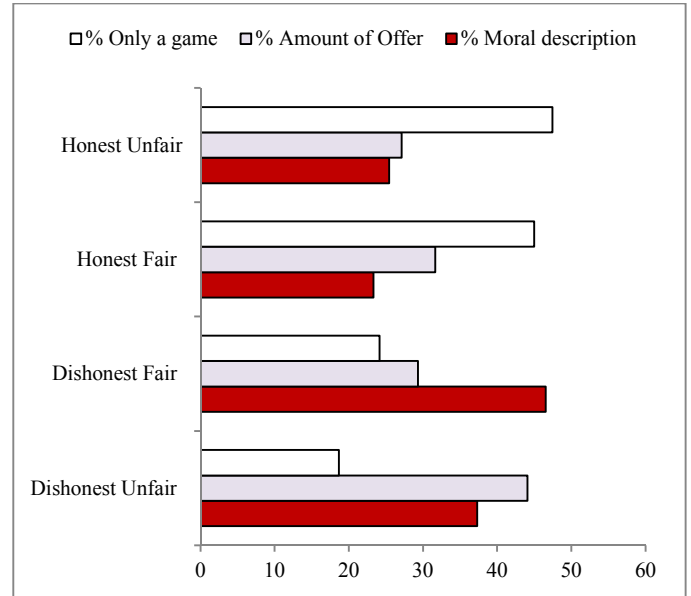


Fig. 7. Percentages of receivers' preferences expressed in favor of alternatives offered by question 4 (see Table III) to conditions 9-12 listed in Table II. No significant differences among the proposed alternatives are observed.

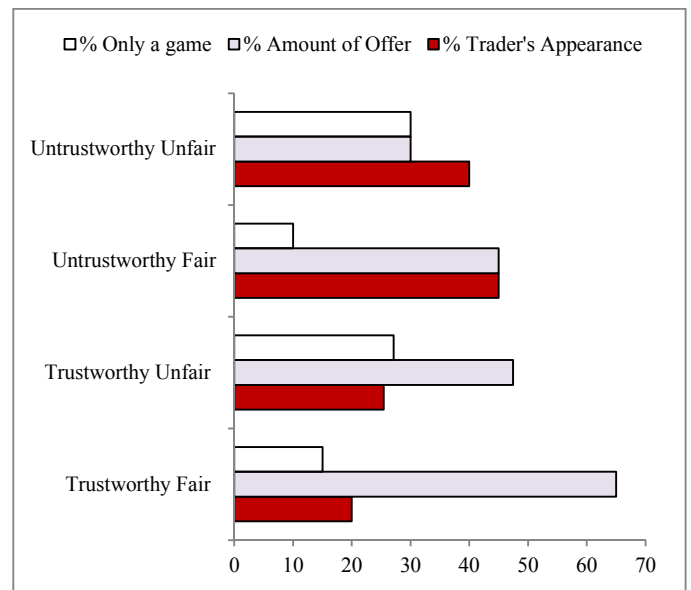


Fig. 8. Percentages of receivers' preferences expressed in favor of alternatives offered by question 4 (see Table III) to conditions 13-16 listed in Table II.

This was mostly due to the high percentage received by the “amount of offer” motivation in the condition *trustworthy fair*. Again here it is worth to notice the contradictory rationale offered by subjects about the trader’s features driving their

emotional feeling with respect to those driving their decision to accept or reject the offer.

IV. DISCUSSION AND CONCLUSION

The data reported in this paper show that decisional behaviors in the Ultimatum Game are strongly affected by intrinsic motivations, other-regarding preferences, and emotions, rather than rational assumptions of material opportunism, intended here as the possibility to gain an amount of money for free. The data shows that receivers are more persuaded by social appearances to accept fair offers. However, they do not feel the interference of social appearances in their decisions. Receivers feel that their decisions are equally affected by the amount of offers and traders' moral descriptions. Receivers are more persuaded to accept a fair offer when the trader is featured with positive moral judgments and trustworthy social appearances. Conversely, they are more persuaded to reject an unfair offer when the trader is featured with negative moral descriptions and untrustworthy social appearance. Non-converging emotions guiding the decision are observed both at intra and inter group level. Receivers are confused on the emotions guiding their decisions. Confusions arise because decisions seem to be driven by clashing contextual (social appearance, moral judgments, and offer amount) information in each condition. The complexity of the task (accounting of moral descriptions and appearances) may have produced a choice based more on individual, emotional and subjective beliefs rather than on the rational processing of the proposed experimental conditions.

As discussed in the review at the outset limited cultural differences have been identified in response to the underlying ultimatum game. It is as yet unknown whether the manipulation of appearance and moral description will vary along demographic dimensions such as gender, age-group, socioeconomic status or culture.

It appears that receivers' emotional behaviors involve the mutual influence of the physical environment and human conduct that unfold within it, suggesting that a change in the implementation of socially and emotionally believable cognitive systems must reflect on both deep investigations on relevant consequences occurring at users' cognitive and emotional states and efficient modeling of users' communicative signals, competencies, beliefs, and environmental information.

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