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**“The issue of fairness in strategic interactions”**

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## Index

Thesis overview.....	4
CHAPTER 1: Theoretical bases.....	7
1. Social decision-making and strategic interactions	
2. Ultimatum Game and Dictator Game.....	8
3. About fairness.....	10
4. Contextual factors influencing social decision-making.....	14
4.1 Competition.....	16
4.2 Emotions.....	17
5. The studies presented in this thesis.....	19
CHAPTER 2: Study 1.....	22
1. Introduction.	
2. Aims of the study.....	25
3. Method.....	26
3.1 Experimental design	
3.2 Participants	
4. Materials and procedure.....	27
5. Results.....	29
6. Discussion.....	37
CHAPTER 3: Study 2.....	40
1. Introduction	
2. Aims of the study.....	44
3. Method.....	45
3.1 Experimental design	
3.2 Participants	
4. Materials and procedure.....	46
5. Results.....	49
6. Discussion.....	55
Study 3.....	58
1. Aims of the study	
2. Method.....	60
2.1 Experimental design	
2.2 Participants	
3. Materials and procedure.....	61
4. Results.....	63

5. Discussion.....	70
Study 4.....	72
1. Aims of the study	
2. Method.....	73
2.1 Experimental design	
2.2 Participants	
3. Materials and procedure.....	74
4. Results	
5. Discussion.....	80
General discussion.....	82
<i>References</i> .....	85

# The issue of fairness in strategic interactions

## Thesis overview

The main aim of this doctoral thesis is to examine the issue of fairness in strategic interactions. More specifically, the research here presented investigated, through three main experimental studies and the replication of one of them at the University of Leiden, whether previous “experiences” could affect decisions in strategic games, such as the Ultimatum Game (UG, Guth et al., 1982) and the Dictator Game (DG, Kahneman et al., 1986). Furthermore, it was investigated whether this hypothesized effect was mediated by the emotional reaction elicited by these previous experiences and/or by emotions and beliefs strictly related to the decisions.

The UG and the DG are two economic tasks widely used in the social decision-making literature, since their simple and versatile structure allows to introduce numerous readjustments and to test different theoretical hypotheses (see for a review Camerer, 2003, and Guth and Kocher, 2014). In both games a participant (the *proposer*) is called to decide how to divide a sum of money given by the experimenter between herself and the other participant (the *receiver*), who has the power to refuse division (if he/she does not agree with it) in the UG, but who can do nothing in the DG. In the UG, if the receiver refuses the offer, both players receive nothing. According to the perspective of the rational choice theory (von Neumann and Morgenstern, 1944, 1979), in the UG the proposer should offer 1 unit to the receiver, who should accept any proposal, since any offered sum is better than zero. In the DG proposers, who have the possibility to keep the entire budget for themselves without backwash, should offer nothing. Actually, in numerous studies (see for a review Camerer, 2003; Guth and Kocher, 2014)

participants' behaviour differs from theoretical predictions. In the UG, proposers generally offer around half of the initial amount, whereas receivers reject, in at least half of cases, very low offers. In the DG, proposers give around 20% of the total amount to the receivers (Forsythe and co., 1994; Kagel and Roth, 1997). Thus people in this kind of tasks do not behave selfishly, as classical economic theories predicted, but rather show a general tendency towards fairness. Especially in the subsequent literature (Fehr and Schmidt, 1999; Charness and Rabin, 2002; Pillutla and Murnighan, 1995, 2003; Kahneman, 2003; van Damme et al., 2014; Sanfey, 2017), many psychological factors have been called into question to explain this fair behaviour.

The structure of the thesis is the following. First of all, the theoretical framework, within which the three experimental studies (and the replication of the last one) have been conceived, will be examined and the most important theories about fairness in social decision-making will be presented. Afterwards, the studies will be described. The UG and the DG have been included in a wider framework of interaction between two players and a two-stage paradigm was used. It was investigated only the role of proposer, since the thesis focused on the factors leading people to make fair vs. selfish choices.

In study 1, the experience lived in the first stage was represented by a luck game, played by both participants individually. They started the experiment with a certain number of tokens, that could increase or decrease through a series of draw at the luck game (whose results were actually manipulated). The tokens held at the end of the luck game had to be divided afterwards in the UG or the DG. This division was done without knowing the other budget.

In studies 2 and 3, previous experiences were represented by cognitive tasks, through which participants had to accumulate the score needed to play the second stage of the experiment (actually never played). The results of these tasks were manipulated in conformity with the experimental conditions of each study. In both studies participants were told that they were playing with another player with whom they were connected

via Internet (actually there was no other player). The UG or the DG was presented as the last game of the first stage. In fact, the experiment ended after this game.

In the studies 2 and 3 it was introduced an ever-increasing competitiveness between the two players, by making victory at the whole game more and more important. Competitiveness was absent in the first study.

In the end, a replication of study 3 with a students' sample of the University of Leiden will be described. This replication was conducted during my visiting period in this University, under the supervision of Prof. Eric van Dijk, professor of psychology and social decision-making.

In conclusion, I will discuss theoretical and practical aspects of the results obtained in the four experimental studies.

# Chapter 1: Theoretical bases

## 1. Social decision-making and strategic interactions

**Decision-making** is the cognitive process that, based on the evaluation of the aspects or potential outcomes concerning the available options, leads to the choice of one of them. Most decisions in daily life are taken in uncertain conditions (Schermerhorn et al., 2005) since people often do not have - or are unable to process adequately - all the needed information about available alternatives and their outcomes. The uncertainty is also due to the interaction with at least one other person that implies for decision-makers to taking into account reactions, expectations and preferences of other actors that are uncertain by nature (Fehr and Camerer, 2007; Sanfey, 2007). Such decisions, made in a social interaction context, are defined as **strategic interactions** and are formalized in the concept of **game**.

Game Theory is the mathematical discipline that deals with this type of decisions. The birth of this discipline is traced back to 1944 with the release of the book "*Theory of Games and Economic Behaviour*" by the mathematician John von Neumann and the economist Oskar Morgenstern. According to the authors, in an uncertain decision situation, players choose the combination to which the highest *expected utility* is associated, namely the alternative that offers the highest gains and/or the lowest losses.

In 1950, the mathematician John Nash formalized a sophisticated "solution" for the problem of how rational players should play in these types of interactions, then called *Nash equilibrium*. The Nash equilibrium in a game situation is reached when all players choose a strategy, which, if changed, would give no advantage to any players. This is equivalent to say that from such a situation everyone gets the maximum expected utility possible. A behaviour that violates these predictions would be considered an exception rather than a rule.

However, the results of numerous experimental studies conducted in the fields of experimental economic and psychology in the last 70 years (see for a review Camerer, 2003; Guth and Kocher, 2014) have shown instead that players, far from be completely self-interested, seem to behave in a fair manner and to have concerns for the others' wellness.

## 2. Ultimatum Game and Dictator Game

The Ultimatum Game (UG, Guth, Schmittberger and Schwarze, 1982) and the Dictator Game (DG, Kahneman et al., 1986; Forsythe et al., 1994) are two of the most used games to study strategic interactions.

The UG is an economic task in which two participants (a “*proposer*” and a “*receiver*”) must decide how to divide a sum of money given by the experimenter. The rules of this game are very easy. The proposer can offer a part of the total amount to the receiver. The receiver can, in turn, either accept or reject it. Both players are informed that if the receiver will accept the proposer's offer, the amount of money will be divided according to this decision. However, if the receiver, for some reason, decides to reject the offer, then neither player will receive anything. This game is called "Ultimatum Game" just because the choice of the proposer is placed to the receiver as an ultimatum to “take it or leave it”.

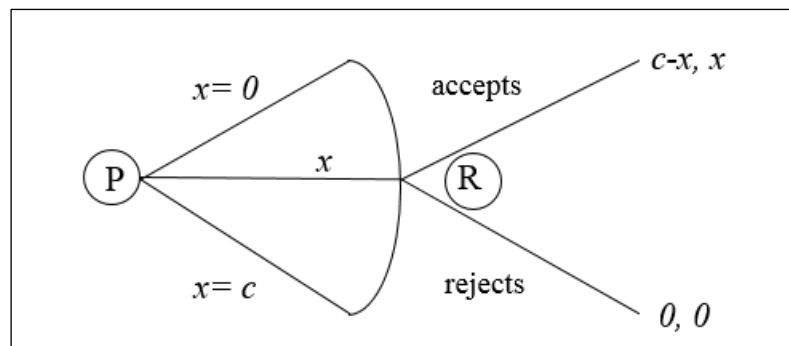


Image 1. Diagram of the UG. P = proposer; R = receiver;  $x$  = offer;  $c$  = initial amount of money. The present image was inspired by image traceable to the following internet address: <https://tex.stackexchange.com/questions/292575/improve-tree-aspect-forest>.



From the perspective of the rational choice theories, the perfect proposer should offer as little as possible to the other participant, keeping for herself most of the sum received. In the same way, the rational receiver should accept any proposal, since any offered sum is better than having nothing (in case of rejecting offer). Therefore, the Nash equilibrium in this game is reached when proposer offers 1 unit to the receiver, who accepts.

Nevertheless, numerous studies (Guth et al., 1982; Camerer, 2003; van't Wout, 2006; Guth and Kocher, 2014) have shown that people actually play in what appears as a fair manner: proposers offer generally around 40-50% of the initial amount; receivers reject, in at least half of cases, offers lower than 20-30% of the total amount. Since the fair proposals could be explained by a general disposition towards fairness, but also by an expectation of other's rejection of too low offers, a game (with a very similar structure of the UG), in which the receiver has no possibility of rejecting, was created: the Dictator Game (DG, Kahneman et al., 1986; Forsythe et al., 1994). Kahneman and colleagues (1986) were the firsts to remove the receiver's possibility to reject the offers. Moreover they gave to proposers the opportunity to choose between two alternative distributions of 20 \$: 10\$ for proposer/10\$ for receiver or 18\$ for proposer/2\$ for receiver. The 75% of the proposers chose the fair option (the first one), even if the receiver had no possibility of revenge. Therefore, players in the role of proposers decided to lose 8\$ by giving them to receivers. Was this choice motivated by a genuine sense of fairness or by a too strong unfairness of the second option? Forsythe and colleagues (1994) tried to answer to this question by giving full freedom of choice to the proposers: they could decide freely how much to donate to receivers, who in any case cannot do anything. Also in this condition, almost 60% of proposers offered around 20% of the total amount (Forsythe and co., 1994; Kagel and Roth, 1997).

Since the other participant has no decisional power in the DG, this game is often used as an altruism measure, namely a measure of how much someone is willing to donate to someone else at a personal cost for her.

The results obtained with this game (Forsythe et al., 1994; Fehr and Schmidt, 1999; Charness and Rabin, 2002; Engelmann and Strobel, 2004), but also those obtained with other games (as for example the Prisoner's dilemma, Tucker, 1950 or the Trust Game, Berg et al., 1995) represent a strong experimental evidence of a general tendency towards fairness.

### 3. About fairness

Regarding the motivations underlying fair behaviour, there are two main theoretical positions: one represented by “social preferences models”, according to which positive offers at both UG and DG are essentially driven by a honest concern towards others (*pro-social motivations*); the other represented by the authors that instead consider fair offers as strategic means to avoid the offer rejection and thus to earn more (*pro-self motivations*).

**Social preferences models** mainly take into account three types of social preferences: the inequity aversion (Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000); reciprocity (Fehr and Gächter, 2000; Fishbacher, Gächter and Fehr, 2001); social-welfare (Charness and Rabin, 2002; Engelmann and Strobel, 2004, 2006). The common idea behind social preferences models is that human beings are driven not only by self-centered motives but also by high social values (like honesty, justice and aversion to inequity). In the name of these values people would be willing to renounce to personal reward if it is obtained at the expense of other individuals. In other words, people take care of others' welfare as well as of their own. According to this perspective, in a bargaining situation, decision-makers tend not only to maximize their own payoffs, but

also to reduce the gap between their and others' payoffs: they do not like to have less than others, since it could provoke envy, but neither having much more than them, since it could induce guilt. They are "**inequity averse**" (Fehr and Schmidt, 1999, 2006; Bolton and Ockenfels, 2000). An important suggestion coming from these theories is that, in strategic games such as the UG, decision-makers take into account not only the material consequences of the resources' distribution but also the intention transmitted by the proposal itself. The same low offer is more likely to be rejected when it is the most unfair of the available options, compared to when it is not the worst. In the former case, the proposer had the possibility to behave more fairly and did not do so, whereas in the latter case the proposer is perceived to be willing to treat the receiver as fairly as possible (Falk, Fehr and Fischbacher, 1999). Behaving in conformity to the perceived behaviour of the proposer corresponds to the social norm of **reciprocity** (Fehr and Gächter, 2000; Fishbacher, Gächter and Fehr, 2001; Fehr and Fishbacher, 2006), in accordance with which everyone deserves to be treated how she treats others. In response to an action with a positive or negative effect on them, people will respond very probably with an action that has the same (or almost the same) positive or negative value (Fehr and Gächter, 2000; Fishbacher, Goether and Fehr, 2001; Fehr and Fishbacher, 2006). Very close to these theories is the Rabin's concept of "**fairness equilibrium**" (1993), or "**reciprocal fairness equilibrium**" (Charness and Rabin, 2002). According to these authors, and contrarily to the Nash equilibrium, what people actually try to maximize is the "social utility". In this view, players are concerned in improving "**social surplus**" (i.e. the sum of their payoffs plus the others' payoffs) and are willing to renounce even to personal incomes if this allows augmenting the profits of those with low earnings (Rabin, 1993; Charness and Rabin, 2002). Moreover, in this view, positive offers in the DG, where receivers have no decisional power and no possibility to take revenge, are the strongest evidences in favor of people's altruism.

An opposed view is that of the second line of scholars, which assert that fair offers in the UG actually are based on instrumental self-interested motives: to avoid low-offer rejection and to earn more (Straub and Murnighan, 1995; Pillutla and Murnighan,

1995, 2003; van Dijk, De Cremer and Handgraaf, 2004; Ding et al., 2014; Chen et al., 2017). In Greenberg's words (1990), proposing a fair distribution to a receiver who has the power to reject the offer is the result of an *apparent* rather than a *real* fairness. Empirical evidence in favor of this hypothesis is represented by the results obtained in studies (Straub and Murnighan, 1995; Pillutla and Murnighan, 1995) that used a symmetric/asymmetric information paradigm, in which only half of the receivers were informed about the proposers' initial amount (symmetric condition). The other half did not know it (asymmetric condition). It was found that the majority of proposers made fair offers only in the symmetric condition. The receivers in the asymmetric condition had no reference points to evaluate the offer, and thus more unequal offers were made to them. In a similar way, Kagel, Kim and Moser (1996) conducted a study in which the tokens to divide were worth more for the proposers than to the receivers (each token was worth 0.10 for the receivers and 0.30 for the proposers). In an experimental condition both proposers and receivers were informed about the tokens' real value; in the other experimental condition, only proposers knew it, whereas the receivers were told that tokens had the same value for both players. Results showed that in the former condition, proposers skillfully divided the initial amount (i.e. 100 tokens) so that both players would earn the same payoff (i.e. 25-75, where  $25 \cdot 0,30 = 7,5$  and  $75 \cdot 0,10 = 7,5$ ). On the contrary, in the other condition, most of proposers offered around half of the amount to the ignorant receivers, so that they could earn more (i.e. 50-50, where  $50 \cdot 0,30 = 15$  and  $50 \cdot 0,10 = 5$ ).

By using the MAO (Minimum Acceptable Offer) paradigm, Ding and colleagues (2014) found that the majority of proposers offered around 30% of the total amount, corresponding to the minimum acceptance threshold declared by receivers. Thus, proposers decide to offer the bare minimum to the receivers, revealing, according to the authors, only concern in avoiding rejections. In a more recent study, Chen and colleagues (2017) asked proposers at UG to choose between two types of proposals: a fair offer vs. a very unfair one in a condition, and a fair vs. slightly unfair offer in another condition. The results showed that in the first condition people prefer to make

fair offers compared to the very unfair ones, but in the second condition, most of the proposers choose the slightly unfair offer rather than the fair one. According to the authors, from a strategic point of view, fair offers are more effective than the clearly unfair ones because they guarantee an almost certain gain, since for the receiver it would be very disadvantageous to reject them. However, if the risk of rejection is low, as it is supposed to be in front of a slightly unfair offer, participants prefer to propose the latter rather than an equitable subdivision. Therefore proposers in the UG seem to behave like “sophisticated profit maximizers” (Camerer and Thaler, 1995). In this perspective, in the DG, where the receiver is completely powerless, positive offers would be ascribed to a feelings of social responsibility towards receivers’ powerlessness (Greenberg, 1978) rather than an endogenous sense of fairness, leading proposer to be a “benevolent dictator” (van Dijk and Vermunt, 1999). The results found by van Dijk and Vermunt (1999) represent an empirical evidence of this idea. The authors conducted a study with the same paradigm used by Kagel and colleagues (1996), but testing proposers’ behaviour in both the UG and the DG. They found that, in the UG the proposers’ behaviour depended effectively on whether either players or only proposer knew the chips’ real value. On the contrary, proposers in the DG were not influenced by receivers’ ignorance about chips’ real value. They in fact gave always a certain number of chips such that both players’ payoffs were fairly shared. In this way they acted as a “benevolent dictator”, even if the receivers could not have judged their unfair offers negatively.

In the UG the proposers’ power seems to act in a different way. Ciampaglia and colleagues (2014) by using a not-economic version of the UG, in which participants had to share a workload, assigned less or more power to one of the two players. They found that proposers with more power, rather than acting with “benevolence”, took advantage from the situation and gave about 20 % less to the weakest recipients compared to the offers made in a situation of balanced power.

These results suggest that sometimes people adjust their behaviour based on contextual cues. The sense of fairness seems to be influenced by contextual factors (Frey and Bohnet, 1995).

#### **4. Contextual factors influencing social decision-making**

Different contextual factors have been taken into account in several studies in order to show how they affect decision behaviour.

For example, differences in **one-shot versus repeated** UG are reported in several studies (Slembeck, 1999; Boles, Croson and Murnighan, 2000). Repetition gives to players the opportunity to build a reputation, be it positive or negative. Therefore, subjects playing the UG could behave fairly to show to the other participant that they are fair and upright persons and, thus, entitled to request the same treatment from the other, in a way consistent with the reciprocity theory (Fehr and Gächter, 2000; Fishbacher, Goether and Fehr, 2001; Fehr and Fishbacher, 2006). This could lead both proposers and receivers closer to the fairness equilibrium (Boles, Croson and Murnighan, 2000). However, in an opposite way, repetition could also be used by some kinds of “tough proposers” as a possibility to communicate to the receivers that they want to earn as much as possible and that they will never offer more (Slembeck, 1999).

Another important factor that seems to have a relevant effect on the offer is the **identity of the opponent**. For example, knowing something about the kindness of the other participant could arise a liking in the dictators and lead to higher offers (Bohnet and Frey, 1999). The important role of the "personification" of the opponent in a bargaining interaction has also been shown by studies that compared offers made by a real person vs. a computer (Sanfey et al., 2003; van't Wout et al., 2006). These studies reported higher levels of anger and rejection in response to unfair offers made by real persons rather than by a computer. On the opposite side, by increasing the **anonymity** between players, and therefore by increasing social distance between them (in the meaning of

“degree of reciprocity that subjects believe exist within a social interaction”, Hoffman et al., 1996, pp. 654), Hoffman and colleagues (1996) have shown that offers systematically decrease.

**Personal value**, in terms of self-affirmation, also seems to influence behaviour in the UG and the DG. Regarding receivers, in the UG, several authors argue that rejecting unfair offers, considered "psychologically offensive", calls into question personal dignity (Thaler, 1988; Zhang, 2008, 2009; Athanasiou et al., 2015). Evidences in favor of this hypothesis would be the higher rejection rates when the offers are associated with outrageous sentences (Kravitz and Guntto, 1992), when they are made by a person rather than by a computer (Blount, 1995; van't Wout et al., 2006), and when receivers' sense of self-affirmation is high (Gu et al., 2016). Regarding proposers (in both UG and DG), it has been shown that the thought of having more rights on the budget to be shared leads participants to make more unfair offers. In the DG around 80% of the proposers randomly assigned to the "more right" status gave less than 40% of the total sum to the receivers (Hoffman et al., 1992).

Having more “rights” on the budget to divide is a factor that, beyond the personal value, calls into question also other issues strictly related to experiences lived before the UG and the DG, through which people can “create” the amount to divide. In the classical versions of the UG and the DG, the amount to share between the two players was a “free gift” made by the experimenter (Guth et al., 1982; Kahneman et al., 1986; Forsythe et al., 1994) and thus no **sense of entitlement** about it was induced. However, some studies induced a sense of the entitlement in participants by using a two-stage paradigm, in which the amount to split in the second stage was earned by participants in the first stage through different tasks that involved personal skills (Hoffman et al., 1994; Cherry et al., 2002; Cappelen et al., 2007, 2010; Ciampaglia, 2014). These studies revealed that the participants who believe to have been most capable than the other player behave in a more selfish way, offering less to her compared to the participants in which no sense of entitlement was induced. Cappelen and colleagues (2007, 2010) argued that what happens in the “production phase” (i.e. in the first stage)

affects behaviour in the “distribution phase” (i.e. in the second stage) based on what *ideals of fairness* people consider more important for them. They identified three ideals of fairness that could guide distributional behaviour: i) first, a strict egalitarianism, according to which it is needed to equalize the inequalities, regardless of how these inequalities were reached; ii) second, a libertarianism that entails giving to someone only what she produced; iii) third, a liberal egalitarianism that justifies only the inequalities produced by factors under own control, namely the results of deliberate choices and/or personal abilities. In the study presented in 2007 they found that most of participants in the DG behave following the *liberal egalitarian* and *libertarian* ideals, taking into account others’ choice in the first stage (i.e. how much the other decided to invest of a sum) when they decided how much to offer.

#### **4.1 Competition**

Competition is one of the factors, raised by a two-stage paradigm, which can affect offers in the UG and the DG. To the best of my knowledge, Schotter, Weiss and Zapater (1996) were the only authors who have so far investigated the role of competition in economical UG and DG. They used a “*survival pressure*” procedure, by embedding the two games in a competitive framework, where the decisions made at these games had a consequence on the following task. In detail, they built a study with 4 experimental conditions: 2 conditions entailed the classical version of the one-shot UG or DG; in the other 2 conditions, the UG or the DG was inserted in a two-stage competition and only the proposers who earned more points in the first stage could pass to the second stage. The authors hypothesized that in the two-stage conditions, given the “*survival pressure*”, low offers in the first stage would be perceived as more justified by proposers and more acceptable by receivers, compared to conditions in which one-stage UG or DG was played. They actually found that only in the DG the survival pressure affected the offers in the first stage. Indeed, dictators engaged in a two-stage game made lower offer in the first stage, compared to dictators engaged in



one-stage DG. On the contrary, in the UG this effect did not reach statistical significance, maybe because of the possibility of a rejection. To the authors these results were enough to posit that “equity is not an absolute ideal but rather one that is defined conditional on the institutional structure in which the agents are placed” (Schotter, Weiss and Zapater, 1996, pp. 51).

## 4.2 Emotions

Emotions are among the most important factors that could affect the decisions in the UG and the DG. Many scholars have considered them to explain why the choices made in the UG and the DG are very different from the ones predicted by classical theories.

When we talk about emotions related to decision-making, we usually refer to a classification proposed by Loewenstein and Lerner (2003). Based on which phases of the decision-making process they arise, the authors divided emotions in two main group: *expected* and *immediate* emotions. The former are essentially mental anticipations of emotional consequences of decision-making. The latter are instead felt at the decision time. Immediate emotions are divided then in *incidental* or *integral*, based on their origin. The incidental emotions are elicited by events preceding the decision and are unrelated to its object. The integral emotions instead are elicited by the object of the decision itself and are related to it.

Both kind of immediate emotions could affect decisions in the UG and the DG. Among integral emotions, *fear* of rejection is a factor that explains at least part of fair offers in the UG (Fellner and Guth, 2003; van Dijk, De Cremer and Handgraaf, 2004; Ding et al., 2004). To the best of my knowledge no studies have directly measured fear of rejection: it was instead inferred from different factors. For example, Fellner and Guth (2003) and van Dijk, De Cremer and Handgraaf (2004) showed that offers increased in function of the receiver’s power (null in the DG and high in the UG), entailing the

increase of negative consequences for proposers. Ding and colleagues (2004), as already said, came to similar results by using MAO (Minimum Acceptable Offer) paradigm.

On the other hand, it was demonstrated that receivers reject unfair offers mainly because of *anger* towards proposers (Pillutla and Murnighan, 1996; Sanfey et al., 2003; van't Wout et al., 2006). They seem to be willing to renounce to personal payoffs just to punish an unjust proposer. Pillutla and Murnighan (1996) showed that, the more the receivers perceived proposers' offers as unfair, the more anger's levels increased and, by consequence, rejection rates increased. Similar results were found by the study of Sanfey and colleagues (2003), investigating, at behavioural and cerebral level, receivers' reactions to unfair proposals made by real participants and by the computer in the UG. On a behavioural level, the results showed that the more perceived anger increased, the more participants were inclined to reject unfair proposals, especially when real people made the offers. At the neural level, fMRI showed increased activity of the anterior bilateral insula, an area usually associated with negative emotional states, such as anger, pain, physical and moral disgust. Also the results obtained by Van't Wout and colleagues (2006) go in the same direction. They found that the intensity of anger elicited by unfair offers was associated with a high physiological activation of the receivers, especially if these offers were made by real proposers, rather than by the computer.

The studies investigating the role of incidental emotions in the UG also seem to show that they could influence decisions made by the participants. For example, Harlé and Sanfey (2007) have shown that participants, placed in a condition of induced sadness, tend to reject more unfair proposals. In the view of the authors, sad participants became more pessimistic and, consequently, they tended to focus more on the negative aspects of the unfair offers. Andrade and Ariely (2009) also demonstrated that inducing incidental anger in receivers lead higher rejection rates and that this effect is enduring in time. Moretti and Di Pellegrino (2010) obtained also higher rejection rates in receivers to which disgust was caused (through showing pictures), compared to

receivers to whom sad and neutral emotions was induced. On the contrary, Bonini et al. (2011), by inducing a disgusting smell in a sample of receivers and a neutral smell in another sample, found that receivers were more willing to accept unfair offers in the former case, compared to the latter. According to the authors, receivers in the “disgust condition”, mis-attribute the disgust felt for the unfair offers to the disgusting smell.

What do not appear very clear yet is how incidental emotions act on decision-making. According to the Accommodation/assimilation theory (Forgas, 1995), a positive mood makes people more "assimilative" and selfish, that is more focused on personal rewards, while a negative mood makes them more oriented towards the surrounding environment (more "accommodative") , and therefore more other-regarded. Indeed, through four experimental studies conducted with UG and DG, Forgas (2013) showed that proposers with a negative mood (induced by using video clip and manipulated feedback at a cognitive-spatial task) offered more resources than those with a positive mood. Completely opposite are the previsions made by the Mood-maintenance hypothesis of Isen (1987, 2008). According to this theory, people with a positive mood try to preserve it by making decisions that are consistent with their emotional state, and therefore more equitable and socially acceptable, that is fairer offers in the UG, as would demonstrate the results obtained by Mellers (2010).

## **5. The studies presented in this thesis**

In order to investigate whether previous experiences, lived before to play the UG and the DG, could affect proposers' decisions made at both these games, in the studies presented in this thesis a two-stage paradigm was used. Several studies (Hoffman et al., 1994; Schotter, Weiss and Zapater, 1996; Cherry et al., 2002; Cappelen et al., 2007, 2010; Bland et al., 2017; Matarazzo et al., 2017) have shown the effectiveness of this paradigm to investigate the contextual factors passible to affect participants' decision-

making. In detail, in these studies, it was used to test two main questions simultaneously: whether particular types of previous experiences can affect offers done in the UG and the DG; whether the emotional reaction raised by previous experiences can mediate these putative effects.

Two different kinds of previous experiences were created by means of the games presented before the UG or DG: *luck games* and *skill games*. In study 1, participants in the first stage played a game of *luck*, through which the initial number of tokens provided by the experimenters could be modified. The final amount of tokens had to be shared, in the second stage, in the UG or in the DG. In this study, the two stage were completely unrelated between them and no explicit final goal was stated.

In studies 2 and 3, the first stage was composed by three games: two *ability* tasks and a session of the UG or the DG. Through these games participants had to earn the score needed to pass to the second stage, for which there was a minimum threshold to reach. Participants were falsely informed that they were playing with another player and that both of them, one of them or none of them could pass to second stage, the most important of the whole experiment. The second stage was actually never played. It was only mentioned in order to link the decisions made in the first stage with the second stage. The results of the ability tasks were manipulated in conformity with the experimental conditions of each study. Namely, in study 2 participants were ahead or at disadvantage compared to the other player, or were not informed about their score. In the first two conditions the proposer's power was manipulated, while in the third condition the offer was made under uncertainty. In the mock second stage participants should have increased their score but would have played alone. In this way, competitiveness concerned only the first stage.

In study 3 participants were always ahead compared to the other player (except than in the uncertainty condition, in which no result was communicated) but in one condition the other player had reached the threshold for the second stage while in the other condition she did not. In this way the receiver's power in the UG was manipulated. However, in order to increase competitiveness, the instructions specified that if a player

did not pass to second stage, her score would have been devolved to the other player and that if both players reached the second stage, they would have played against each other in a zero-sum game.

In all studies here presented, two groups of emotions were taken into account. They are not strictly classifiable as incidental or integral emotions, in the meaning given to the terms by Lowenstein and Lerner (2003). Indeed, the first group was only partially unrelated to the decisions taken in the UG or the DG. In fact, the experiences that should elicit them were separate from the two games, even if the general gaming context was the same. Positive and negative emotions were employed to investigate whether they were affected by the manipulation of games results and whether they mediated the putative effect of such manipulation on the choices in the UG and the DG. The second group instead included emotions and beliefs that in literature have been associated with the choice made in both games.

Furthermore, in these, studies, versions of the UG and the DG without money allocation were built. Participants were indeed asked to divide tokens (in study 1) and points (in studies 2 and 3). To the best of my knowledge, only few studies have investigated proposers' behaviour in non-economic versions of the UG and the DG. Ciampaglia and colleagues (2014) and Matarazzo and colleagues (2016) are two of these, and their results suggest that proposers' decisions in these conditions are similar to those found in the economic literature.

Lastly, in the three studies conducted in Italy participants were unpaid volunteers. On the contrary, in the replication of the third study, conducted at the Leiden University, participants were paid. Possible differences found in results of study 3 and of its replication will be considered.

# CHAPTER 2

## STUDY 1

### 1. Introduction

As stated before, the sense of fairness, measured through the offers in both the Ultimatum Game (UG, Guth et al., 1982) and the Dictator game (DG, Kahneman et al., 1986; Forsythe et al., 1994), is sensitive to many contextual factors (Frey and Bohnet, 1995). Some studies have shown that offers in both games can change based on previous experiences made in the experimental setting before to play the games. Moreover, such experiences can also influence the emotional state in which participants arrive to play the UG and the DG, affecting decision-making of both proposers and receivers (Harlé and Sanfey, 2007; Andrade and Ariely, 2009; Moretti and Di Pellegrino, 2010; Bonini et al., 2011).

In the classical versions of the UG and the DG, the amount to share between the two players was a “free gift” made by the experimenter (Guth et al., 1982; Kahneman et al., 1986; Forsythe et al., 1994). In this study, instead, the amount to be divided consisted in the number of tokens resulting from a game of luck, through which the initial number of tokens provided by the experimenter had increased, decreased or remained unchanged, depending on the experimental conditions. Does the result of such a game affect the choices in the UG and/or the DG?

To my knowledge, only few studies have investigated this topic. Van Swol and Braun (2014) created an experimental design with two condition named “Bonus” and “Not-bonus”. In the “Not-bonus” condition, participants picked a card from a deck (in which all the cards were actually always “8”) and they were told that the equivalent amount in dollars would have been the sum to share in a UG session (i.e. always 8\$). In the “Bonus” condition, after picked a card from a deck (in this condition always “7”), participants had to play a single manipulated session of “heads or tails” game, through

which they earned always 1\$ more. In other words, all participants played the UG with 8\$, but in the “Bonus” condition participants were led to believe they were lucky to earn 1\$ of that sum. This was enough to make proposers more selfish: indeed they offered fewer dollars to receivers (around 5% less) compared to the proposers in the “Not-bonus” condition. According to the authors, participants in the “Bonus” condition viewed the extra dollar won as resulting from the right choice they had made in the coin toss game: consequently, they felt entitled to separate this dollar from the others and to keep it for themselves.

Bland and colleagues (2017) found similar results. In their study, participants were paired with an anonymous opponent. They were told that at first both of them had to play a simple game, where they had to choose three out of nine yellow ovals presented on the screen and to uncover them. If they found a black colour on the uncover side, then they earned 3£. On the contrary, if they found a red colour on the uncover side, then they earned nothing. Therefore, participants could hypothetically earn from 3£ to 9£, but actually the outcome was manipulated. Three experimental conditions were created: a) the participant earned more than the opponent; b) the opponent earned more than the participant; c) both players earned the same. Then the outcomes of both participants were added up and this amount became the budget to share in the UG, at the second stage. This means that each participant contributed in a different way to the sum accumulation. At the second stage, the roles of proposer and receiver were randomly assigned. Results showed that the participants who believed to have contributed more to the accumulated amount, by earning more in the first stage, were less willing to share the sum with the other players, by offering to them between 30% and 40% of the total, compared to the 50% proposed in the conditions in which participants had contributed less or in the same way. Although in this study explicit references to luck were not made, participants were told that they had “won” and not “earned” the amount, thus they should not have felt any right on it. Moreover, the task used did not entail personal skills and no cognitive effort was done.

Taken together, the results of the two studies seem to show that people in a context of strategic interactions are willing to accept inequalities in resources' distribution if these inequalities are due to their previous good/bad luck.

Whether the effect that the previous good/bad luck has on the offers done at both UG and DG is mediated by the emotion raised by the previous experience is another important issue to disentangle. Several studies have shown that emotional states affect decision-making in both games (Pillutla and Murnighan, 1996; Sanfey et al., 2003; van't Wout et al., 2006; Harlé and Sanfey, 2007; Mellers, 2010; Moretti and Di Pellegrino, 2010; Forgas, 2010, 2013). However, it has been scarcely investigated whether emotions can mediate the effect of experimental manipulation on the choices in the UG and the DG.

To the best of my knowledge, only Matarazzo and colleagues (2017) have examined this subject. They built a non-economic version of the UG, where proposers have to divide no money but tokens. Through a luck game, their number could increase, decrease or remain unchanged, compared to the amount received at the beginning of the experiment. The emotional reaction following the experimental manipulation and the emotions and beliefs felt during decision-making were self-assessed by participants (all proposers) and were considered as potential mediators of the effects exerted by experimental conditions. It was found that in the negative outcome condition, proposers offered significantly less tokens to their opponent, compared to proposers in the unvaried outcome condition (35% vs. 43% of the total amount). No significant differences between negative and positive conditions were found, thus suggesting that a good luck do not increase generosity. This effect was mediated by the emotions and beliefs experienced during decision-making, whereas the emotions felt after the luck game exerted a suppression rather than a mediation effect: so, the role of emotion has been unclear and needed to be further investigated.



## 2. Aims of the study

This study further investigated the topic discussed in the paper of Matarazzo et al. (2017) by using a similar experimental design. Therefore it examined whether:

- a manipulated result obtained in a card game influenced the decisions of proposers in the UG and at the DG, in a similar or different way depending on the game;
- this effect was mediated by emotions related to the card game and/or by emotions and beliefs about the choice.

The following results were expected:

1. Regarding the experimental conditions: if participants were willing to share their good luck with the opponent, the offers should increase with the positive outcome at the card game and decrease with the negative one, compared to the condition in which the number of tokens at start and end of the card game was the same. If instead the good luck at the card game was experienced as own merit and thus participants were not willing to share it, the offers should decrease with a positive outcome. If previous game did not affect the offers, no differences between the experimental conditions should occur.
2. Regarding the emotions related to the card game and the emotions and beliefs related to decision-making in the UG and the DG: both types of emotional response should change in function of manipulated outcome and should mediate the putative effects of the card game on choices in the UG and the DG.
3. About the games, and therefore regardless of the experimental conditions, the offers in the UG, compared to those in the DG, should be higher if participants were sensitive to the bargaining power of the other player (Straub and Murnighan, 1995; Pillutla and Murnighan, 1995). If instead the DG evoked feelings of social responsibility (Greenberg, 1978; van Dijk

and Vermunt, 2009), the offers in this game should be higher or similar compared to the offers done in the UG.

### **3. Method**

#### **3.1. Experimental design**

A 2 (game: UG vs. DG) x 3 (outcome: positive, negative or unchanged outcome in a luck game) between-subject design was created. The different outcomes were created by manipulating the results obtained in a luck game (i.e. a card game) played in the first part of the experiment before playing the UG or the DG. To play the card game participants received a certain number of tokens at the beginning of the experiment, whose amount varied based on conditions. After playing the card game such number increased, decreased or remained unchanged. Since the initial number of tokens varied in accordance to the conditions, at the end of the card game all participants had the same budget to play the UG or the DG.

#### **3.2. Participants**

A total of 300 participants (M=152) took part in the study: 150 participants played the Ultimatum Game and 150 played the Dictator Game. They were unpaid volunteers students from different Universities of Campania, aged between 18 and 42 years (M=22.20; S.D.=3.029). For each game (UG and DG), participants were randomly assigned to one of the 6 experimental conditions: positive, negative or unchanged outcome at the card game played before the UG or the DG.

The participants were recruited two at a time, by paying attention on avoiding any contact between them, in order to make as anonymous as possible the interaction. After

recruited, they were settled in two near but separate rooms and were told that they would interact via Internet. Actually, there was no real interaction between them.

#### **4. Materials and procedure**

The experiment was implemented on “E-Prime 2.0” software and was carried out with a laptop. Before starting the experiment, participants were asked to read and sign the informed consent.

In the general instructions, participants were informed that the experiment was divided into two parts. In the first part, they would have to play a simple card game. In the second part, they would have to make a decision, “*by interacting with the other participant*” in the case of the UG, or “*that would affect also the other participant*” in the case of the DG.

All participants then played the card game with the initial amount of tokens provided by the experimenter. It consisted in eight draws from a deck of 40 cards, through which they could win or lose a certain amount of tokens. The experimenter actually manipulated what appeared like a randomly drawing, in order to build the three different outcomes. In “positive outcome”, participants received 10 tokens as initial budget and ended the game with 19 tokens. In “negative outcome”, they started with 40 tokens, and ended the game with 19 tokens. In “unchanged outcome”, the initial and final amount was 19 tokens (see table 1).

Table 1. Experimental conditions and their related initial and final budget.

<b>OUTCOMES</b>	<b>INITIAL BUDGET</b>		<b>FINAL BUDGET</b>
Unchanged	19 tokens	} Card game →	19 tokens
Negative	40 tokens		
Positive	10 tokens		

Therefore, in all conditions participants ended the card game with 19 tokens. They represented the initial budget for the second part of the experiment where participants played the UG or the DG.

In order to investigate whether the experimental manipulation of the outcome in the card game affected the emotional state of the participants, they were asked to assess the intensity of six emotions (happiness, satisfaction, feeling lucky, sadness, irritation, disappointment), before and after playing the card game. Emotions were randomly presented on the screen, and participants had to assess them on a 9-point Likert Scale (1 = not at all; 9 = extremely).

Then, half of the sample played a single session of the UG, and the other half played a single session of the DG. The role of proposer was seemingly drawn in a random way. Actually, all participants played the UG or the DG in this role. All proposers were instructed that they had to decide whether and how to divide their available budget (19 tokens) with the other participant. Proposers were also told that receivers had previously executed the same card game even if the outcome was not communicated. Then, the specific rules for each game (UG or DG) were given. In detail, participants in the UG conditions were told that their opponent could decide to accept or reject their offer, and that, in case of rejection, neither player would receive anything. On the contrary, the participants in the DG conditions were told that the other participant could only accept their offer. Reaction times employed by the participants to make their offer were registered.

After made their offer, all participants were asked to assess, on a 9-point scale (1 = not at all; 9 = extremely), the intensity with which they had experienced a set of emotions

and beliefs, which in literature were assumed to underlie decision-making about the offer. They differed depending on the principal game. In the UG, they were the following: *sense of fairness, empathy, thinking that it was convenient for the responders to accept also poor offers, desire to keep as much as possible of the total budget for themselves, fear that a too low offer would be rejected*. In the DG emotions and beliefs about the choice were: *sense of fairness, empathy, desire to keep as much as possible of the total budget for themselves, thinking that the responder could only be able to accept one's offer*. All items were presented in a random order. After that, the experiment ended and participants were debriefed about the real aims of the study and thanked.

In order to test the reliability of the fictional interaction procedure, a pilot study with 40 participants had been conducted. Participants were specifically asked, after the experiment, to evaluate the credibility of the interaction with the other participant. No participant doubted about it.

## **5. Results**

### *Manipulation check*

In order to check whether the manipulated outcome given to the card game influenced the intensity of emotions self-assessed before and after the card game, a 2 (game: Ultimatum/Dictator) x 3 (outcome: unchanged/positive/negative) x 6 (emotions: sadness/satisfaction/feeling lucky/joy/disappointment/irritation) x 2 (time: pre/post card game) mixed ANCOVA was carried out. Game and outcome were inserted as between-subjects variables, whereas emotions and time were settled as within-subject variables. Gender was settled as covariate.

Results revealed a significant three-way interaction between outcome, emotions and time ( $F=8.435$ ;  $df= 10,1465$ ;  $p<.001$ ;  $\eta^2=.054$ ), whereas the four way interaction, including the game, was not significant. Thus, emotions had a similar trend in time in both games. Gender had no effect.

The simple effect analysis about the three-way interaction revealed that:

- with the unchanged outcome no emotions changed in a significant way, except for irritation that decreased after the card game ( $p<.01$ ) ;
- with the positive outcome all emotions differed in a significant way, except for sadness. In detail, emotions with a positive valence, i.e. joy ( $p<.001$ ), satisfaction ( $p<.001$ ), and feeling lucky ( $p<.001$ ) increased. On the contrary, emotions with a negative valence, i.e. irritation ( $p<.001$ ) and disappointment ( $p<.01$ ) decreased;
- with the negative outcome only joy ( $p<.001$ ) and satisfaction ( $p<.001$ ) decreased significantly.

In table 2 means (and standard deviations) of the emotions assessed before and after the card game were reported.

Table 2. Means (and standard deviations) of emotions self-assessed before and after card game.

Emotions	Unchanged outcome		Positive Outcome		Negative Outcome	
	Before	After	Before	After	Before	After
Disappointment	3.541 (.231)	3.193 (.219)	3.871 (.232)	3.264 (.219)	3.558 (.232)	3.813 (.220)
Joy	5.511 (.189)	5.553 (.193)	5.002 (.189)	5.608 (.193)	5.417 (.189)	4.839 (.193)
Irritation	3.165 (.232)	2.617 (.213)	3.478 (.232)	3.022 (.213)	3.257 (.233)	3.191 (.214)
Feeling lucky	4.593 (.229)	4.912 (.222)	4.245 (.229)	5.628 (.222)	4.071 (.229)	3.950 (.222)
Satisfaction	5.445 (.199)	5.433 (.192)	4.998 (.199)	5.709 (.192)	5.227 (.199)	4.558 (.192)
Sadness	3.241 (.206)	2.952 (.215)	3.352 (.206)	3.163 (.215)	3.647 (.206)	3.445 (.215)

Since joy and satisfaction were the only two emotions that changed in both positive and negative outcome, they were the only taken into account in the further mediation analyses. To this end, the  $\Delta$  value (i.e. the difference between post and pre values) of the two emotions ( $\Delta$  joy and  $\Delta$  satisfaction) was calculated. The other emotions were no longer considered.

*Effect of experimental conditions on Offers*

In the purpose to investigate whether the card-game outcome affected the offers and whether this supposed effect was different in the two games (Ultimatum and Dictator), a 3 (outcome: unchanged/positive/negative) x 2 (game: Ultimatum/Dictator) between-subject ANCOVA was conducted, with gender included as covariate, and the offer amount settled as dependent variable.

The results showed no significant main effects but revealed a significant interaction between game (UG vs. DG) and outcome (unchanged/positive/negative),  $F= 13.311$ ;  $df= 2,293$ ;  $p<.001$ ;  $\eta^2=.083$ . The interaction was examined through a simple effects analysis with Bonferroni adjustment for pairwise comparisons.

In table 3 means of tokens offered for each condition are reported.

Table 3. Means (and s.d.) of tokens offered to the other participant.

	<b>Unchanged outcome</b>	<b>Positive outcome</b>	<b>Negative outcome</b>	<b>Tot.</b>
<b>Ultimatum game</b>	5.96 (3.213)	4.30 (3.012)	7.44 (3.748)	<b>5.90 (3.557)</b>
<b>Dictator game</b>	5.22 (3.661)	7.06 (3.678)	5.12 (3.805)	<b>5.80 (3.797)</b>
<b>Tot.</b>	<b>5.59 (3.447)</b>	<b>5.68 (3.621)</b>	<b>6.28 (3.934)</b>	<b>5.85 (3.673)</b>

Pairwise comparisons of the games (UG and DG) in function of the outcome (unchanged/positive/negative) revealed that:

- in the conditions with unchanged outcome, there was no significant difference between the two games (UG and DG) in terms of tokens offered to the other participants ( $p=.290$ );
- with a positive outcome, in the DG, proposers gave significantly more tokens to the other participant, compared to the UG offers ( $p<.001$ );
- with a negative outcome, in the UG, proposers gave significantly more tokens to the receivers, compared to the DG ( $p<.01$ ).

If we consider the interaction from another perspective, i.e. comparing the outcomes in function of the game, the results show that:

- in the UG, participants who received a positive outcome offered significantly less tokens to the other player, compared to those receiving a negative outcome ( $p<.001$ ). No differences between the unchanged outcome and the other two types of outcome were found;
- in the DG, participants who obtained a positive outcome gave significantly more tokens to the receivers, compared to participants obtaining negative or unchanged outcomes (both  $ps<.05$ ), who gave a similar number of tokens.

#### *Effect of Experimental conditions on reaction times during decision-making*

In order to investigate whether the reaction times employed to decide the offer differed depending on experimental conditions, it was conducted a 3 (outcome: unchanged/positive/negative) x 2 (game: Ultimatum/Dictator) between-subject ANCOVA, with gender included as covariate. The dependent variable was the offers' reaction time.

Results revealed only a main effect of the game ( $F= 5.967$ ;  $df=1,293$ ;  $p<.05$ ;  $\eta^2= .020$ ), although the  $\eta^2$  value was low. In the UG participants taken a little more time to made a choice (mean= 38786.6200 sec.; s.d.= 1245.726), compared to the DG (mean= 34448.8933 sec.; s.d.= 1245.726).



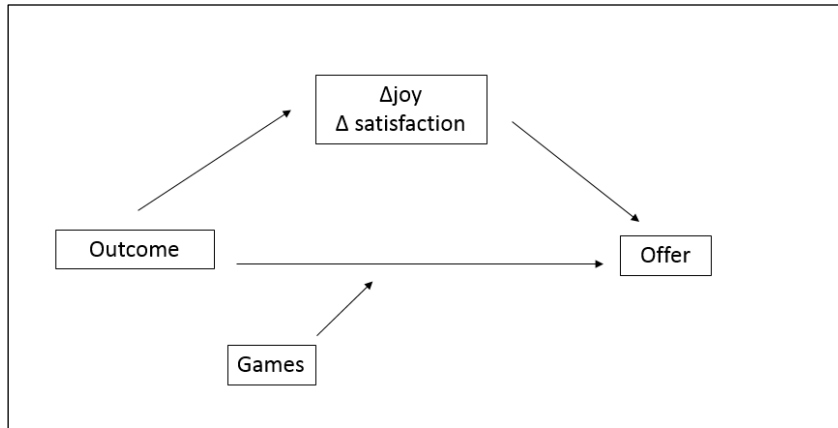
### *Mediation-moderation analysis*

Results of manipulation check showed that the card-game outcome affected only joy and satisfaction, whereas no (casual) effect was due to the random assignation of the participants to the UG or the DG. Results of ANCOVA showed that offers were affected by the interaction between card-game outcome (positive/negative/ unchanged) and main game (UG vs. DG), without any main effect of the two independent variables. In order to investigate whether the effect of the outcome on offers, which was moderated by the type of game, was mediated by changes in joy and satisfaction (i.e.  $\Delta$  joy and  $\Delta$  satisfaction), a mediation-moderation analysis using the PROCESS 3.1 macro for SPSS (Hayes, 2018) was performed. The macro uses bootstrapping method for estimating indirect effects (i.e. the effect of mediating variables); 95% bias-corrected confidence intervals were calculated through 5000 bootstrap samples. It has been tested a model (model 5) in which the card-game outcome was included as independent variable (IV),  $\Delta$  joy and  $\Delta$  satisfaction were included as Mediators (Med) and the type of game (UG vs. DG) was included as moderator (Mod). Offers in the UG and DG were the dependent variable (DV).

In figure 1 the model is depicted.

The multicategorical IV was coded as two dummy variables (Positive outcome = 1; other outcomes = 0; Negative outcome = 1; other outcomes = 0) with the unchanged outcome acting as reference category. The moderator was coded as one dummy variable (1= DG, 0 = UG). Gender was settled as covariate (0=F; 1=M).

Figure 1. Conceptual model of mediation-moderation analysis conducted.



In order to avoid repetitions, I will not report in detail the results similar to those already highlighted by the two ANCOVAs, such as effects exerted by outcome on the two mediators ( $\Delta$  joy and  $\Delta$  satisfaction): compared to unchanged outcome, both increased with positive outcome and decreased with negative outcome.

When all variables (IV, Mod, IVxMod Interaction, Med and covariate) were inserted in the regression model to test their direct effect on offers, the significant results were the following: compared to unchanged outcome, positive outcome ( $B=-1.5579$ ;  $SE=.7154$ ;  $t=-2.1776$ ;  $p<.05$ ) decreased offers, whereas the interaction positive outcome x DG increased them ( $B=3.4580$ ;  $SE=.9967$ ;  $t=3.4693$ ;  $p<.001$ ).  $\Delta$  joy ( $B=-.3027$ ;  $SE=.1435$ ;  $t=-2.1093$ ;  $p<.05$ ) decreased offers. The remaining variables did not exert any significant effect. The conditional direct effects of IV on DV, i.e. the effects of outcome moderated by the type of main game (UG vs. DG), were similar to those revealed by the second ANCOVA: compared to unchanged outcome, with a positive outcome, in the UG offers decreased ( $B=-1.5579$ ;  $SE=.7154$ ;  $t=-2.1776$ ;  $p<.05$ ), whereas in the DG increased ( $B=1.9001$ ;  $SE=.7083$ ;  $t=2.6828$ ;  $p<.01$ ). The effect of negative outcome did not reach the level of significance. However, negative outcome exerted an indirect effect on offers through  $\Delta$  joy ( $B=.1877$ ;  $BootSE=.1172$ ;  $BootLLCI=.0029$ ;  $BootULCI=.4576$ ), which thus exerted a mediation effect. More specifically, negative

outcome decreased  $\Delta$  joy, which in turn decreased offers: so the indirect effect was positive.

Since the “emotions and beliefs about the choice” were different in the two games, two different mediation analyses were conducted (one for each game).

#### *Mediation analysis for the UG*

The mediation analysis was conducted by using the PROCESS 3.1 macro for SPSS (Hayes, 2018). For this analysis only the data concerning the UG were considered: consequently, the selected model (model 4) tested whether outcome (IV) affected offers in the UG (DV) and whether this effect was mediated by emotions and beliefs about the choice, self-assessed by participants after offer (Med). Gender was introduced in the model as covariate (M=1; F=0). The multicategorical independent variable (outcome) was coded as two dummy variables (Positive outcome = 1; negative condition = 0 / Negative outcome = 1; positive condition = 0) with unchanged outcome as reference category. Putative mediators were: *Desire to keep available budget as much as possible*; *Empathy*; *Thinking that it would have been convenient to the other participant to accept any offer*; *Sense of justice*; *Fear that an offer too advantageous for his/herself would have been rejected by the other participant*.

Regarding the effect of IV on the putative mediators, results revealed that, compared to unchanged outcome, in positive outcome the self-assessed intensity of “Empathy” was lower (B= -.9200; SE= .4411; t= -2.0856; p=.0388), while in negative outcome “Desire to keep available budget as much as possible” (B= -1.0946; SE= .5134; t= -2.1318; p<.05) and “Thinking that it would have been convenient to the other participant to accept any offer” (B= -1.6506; SE= .5405; t= -3.0539; p<.05) were lower. “Sense of justice” and “Fear that an offer too advantageous for his/herself would have been rejected by the other participant” were not affected by the outcome manipulation. No effect was exerted by gender.

The total effect (i.e. the overall effect exerted by IV on DV both directly and through Med) of outcome manipulation was the following: compared to unchanged outcome,

positive outcome decreased offers ( $B=-1.660; SE=.6700; t=-2.4778; p<.05$ ), while negative outcome increased them ( $B=1.4823; SE=.6700; t=2.2122; p<.05$ ). Gender did not exert any effect.

When outcome, mediators and covariate were all inserted in the model, in order to test their direct effect on offers, results were the following: “Desire to keep available budget as much as possible” decreased offers ( $B= -.5997; SE= .1051; t= -5.7049; p<.001$ ); on the contrary, “Sense of justice” ( $B= .2854; SE= .1144; t= 2.4951; p<.05$ ) and “Fear that an offer too advantageous for his/herself would have been rejected by the other participant” ( $B= .2381; SE= .1065; t= 2.2350; p<.05$ ) increased offers. The effect of both positive and negative outcomes was no longer significant. However, only negative outcome exerted a positive indirect effect on offers through “Desire to keep available budget as much as possible” ( $B= .6564; BootSE= .3427; BootLLCI = .0569; BootULCI=1.4061$ ). In detail, negative outcome diminished the intensity of this mediator, which in turn exerted a negative effect on offers by diminishing them. The multiplication of these double negative effects resulted in a positive effect. In other words, receiving a negative outcome in the card game increased offers in the UG because decreased the selfish desire for appropriation. Sense of justice and fear of rejection increased offers but this effect did not depend on manipulated outcome.

#### *Mediation analysis for the DG*

Also this analysis was conducted by means of PROCESS 3.1 macro for SPSS (Hayes, 2018). In this case only the data concerning the DG were considered. The procedure was the same previously described but the putative mediators were slightly different:

*Desire to keep available budget as much as possible; Empathy; Sense of justice; Thinking that the responder could only be able to accept one's offer.*

Results showed that negative outcome made to increase “Sense of justice” ( $B= 1.0419; SE= .5019; t= 2.0759; p<.05$ ) and “Empathy” ( $B=.9370; SE= .4563; t= 2.0534; p<.05$ ).

No other mediators were influenced by the experimental manipulation. The analysis of the total effects of experimental conditions on offers revealed that only positive outcome had a significant effect on offers ( $B= 1.8308$ ;  $SE=.7442$ ;  $t= 2.4601$ ;  $p<.05$ ) by increasing them. When the direct effects of both IV and mediators were calculated, the effect of positive outcome was still significant ( $B= 2.0816$ ;  $SE=.7181$ ;  $t= 2.8987$ ;  $p<.05$ ), whereas, among the putative mediators, only “Desire to keep available budget as much as possible” affected offers by decreasing them ( $B= -.5296$ ;  $SE= .1299$ ;  $t= -4.0769$ ;  $p<.001$ ). So, there was no indirect effect. The emotions and beliefs taken into account did not mediate the effect of positive outcome on offers. Those affected by the experimental manipulation (empathy and sense of justice) did not affect offers, while the desire for appropriateness affected offers independently from the experimental manipulation. Gender never affected results.

## **6. Discussion**

The study presented here has investigated whether a previous experience (a card game whose outcomes were manipulated) affected the offers in the UG and in the DG and whether this effect was mediated by emotions related to the card game and/or emotions and beliefs about the choice.

First of all, results revealed that a manipulated outcome given to a simple card game was able to affect the emotional state of participants in an intuitive way. This effect was stronger with positive outcome condition where the emotions with a positive valence increased and those with a negative valence decreased. Instead, in negative outcome condition, the effect was weaker: only joy and satisfaction decreased. With unchanged outcome, also emotions tend to remain unchanged: only irritation decreased, maybe because the card game was quite relaxing.

Regarding the effect of experimental conditions on offers, results revealed that the manipulated outcome of the card game affected the offers both in the UG and the DG,

but in an opposite way in the two games as a function of the bargaining power of the receiver. Namely, with a positive outcome, in the DG, proposers gave significantly more tokens to the other participant, compared to offers in the UG (37% vs. 22% of total budget, respectively). The opposite effect was found with a negative outcome: in the UG proposers made higher offers, compared to those made in the DG (about 40% vs. 27% of total budget, respectively). In other words, when participants were lucky and receivers had no possibility to oppose to their choices (i.e. in the DG), they made more generous offers, compared to a situation in which receivers had a decision power (the UG). On the contrary, when the other has a strategic power (i.e. in the UG), thinking of having been unlucky leads proposers to make higher offers, perhaps in order to avoid other losses (such as in case of a rejection). In the unchanged outcome condition, no differences between offers done in the two games were found: they were around 30% of total budget.

It is noteworthy that receivers were supposed to have already a number of tokens, because they too had played the card game.

These findings suggest a general tendency to fairness, which becomes particularly relevant in the DG, where the offer corresponds to a gift. This result appears even stronger if we consider that the dictators had no information about the receivers' outcome in the card game.

As already said, Matarazzo and colleagues (2017) conducted a study with a procedure very similar to the one used in the present study, even if the DG was not included in the design. Moreover, in their study, participants were told that receivers had performed a cognitive task before the UG, and that, consequently, they did not have any personal budget. They found that, after receiving a negative outcome in the card game, proposers in the UG offered significantly less tokens to their opponent. On the contrary, in this study, higher offers in the UG were observed. Since the main difference between the procedures used in the two studies was about the opponent's budget, the different results were probably due to this factor. It could be hypothesized indeed that proposers in the Matarazzo's study thought that the receivers, not having a personal budget, were

more willing to accept low offers in order to earn at least something. On the contrary, in the present study proposers probably were more scared about the possibility of a rejection that they considered more likely, since receivers had already a personal budget.

Regarding the second main aim of the study, namely investigating whether the effect of the experimental conditions was mediated by the emotions related to the card-game and by the emotions and beliefs related to decision-making in the UG and the DG, results showed that this happened only partially. Regarding the emotions related to the card-game, only  $\Delta$  joy mediated the effect of the negative outcome condition. However, the finding that the increase of joy produces a decrease of offers is congruent with the predictions of the Accommodation/assimilation theory (Forgas, 1995) according to which people in a positive mood make more selfish choices. Among emotions and beliefs related to the decision-making only the “Desire to keep as much as possible of the total budget for themselves” mediated the effect of negative outcome in the UG, whereas no effect were found for the DG.

Lastly, the analysis on the reaction times employed by the participants to make their offer revealed that these were higher in the UG, compared to the DG. Although this effect was very low, it was probably due to the strategic component present in the UG, which involved a greater reflection on the sum to offer to the receivers.

# CHAPTER 3

## Study 2

### 1. Introduction

In the first study, it was shown that the results obtained in a simple luck game affected the offers done at both the UG and the DG. In this study a two-stage paradigm was used: in the first stage, there was a game of luck, while in the second stage participants played the UG or the DG.

In the studies 2 and 3, and in the replication of the third study, described in this chapter, also a two-stage paradigm was used, but the following modifications were introduced: the luck game was substituted by two cognitive tasks; in the first stage participants had to obtain the score needed for reaching the second stage, by performing the cognitive tasks and the UG or the DG; the second stage was fictitious but was presented as the most important of the entire experiment. Finally, all the tasks of the first stage were placed in a general competitive framework, absent in the first study. Study 2 and 3 differed each other for the level of competitiveness, higher in study 3.

In the literature, numerous studies showed that proposers who believed to have been more deserving in ability tasks compared to their opponent, thus earning the role of proposer, behave in a more selfish way (Hoffman et al., 1994; Cherry et al., 2002; Cappelen et al., 2007, 2010).

Hoffman and colleagues (1994) demonstrated that when participants earned the right to be in the role of proposers lower offers were observed, compared to when the role of proposer was randomly assigned. In detail, in their study there were two ways to assign the role of proposer: a “*contest assignment treatment*” and a “*random assignment treatment*”. In the “*contest assignment treatment*”, 12



participants had to answer to a current events questionnaire. For each correct answer, participants earned money and the firsts six participants who earned more money earned the right to become proposers in the UG or in the DG. In the “random assignment treatment”, the role of proposer was casually assigned. Results revealed that in the UG, less than 45% of the participants who earned the role of proposers offered 4\$ out of 10\$ to the receivers, whereas in the “random assignment treatment” more than 85% gave 4\$ or more. Moreover, in the “contest assignment treatment” only 4% of proposers in the DG offered 4\$ to the other participant, and nobody offered 5\$. The authors attributed these differences to an increased sense of right felt by the proposers who earned the role through their ability.

In the study of Cherry and colleagues (2002), dictators earned through a quiz the amount to divide with the receiver, who did not do the quiz and thus had not any personal budget. The experiment entailed two stages. In the first stage, named *money-earning session*, dictators had to do a quiz composed of 17 questions taken from the GMAT (Graduate Management Admission Test), through which they could earn 40\$ (if they correctly answered at least 10 questions out of 17) or 10 \$ (if they correctly answered less than 10 questions). In the second stage, named *bargaining session*, proposers were randomly paired with anonymous receivers, with whom they had to play the DG. The authors compared the results obtained in three different experimental conditions: a) the “baseline” treatment, in which no “money-earning session” was entailed, such as in the classical version of the DG; b) the “earnings” treatment, in which proposers had to do the quiz, while receivers did nothing, and then both played the DG; c) the “double-blind with earnings”, identical to the “earnings” treatment, except for the fact that offers were completely anonymous: indeed they were written on a paper, inserted in a box and then randomly draw by the receivers. Results revealed that the percentages of dictators who offered zero were: - 15-19% in the “baseline” treatment; - 70-79% in the “earnings” treatment; - 95-97% in the “double-blind with earnings” treatment.

Therefore, according to the authors, legitimizing wealth with effort makes altruism an exception and the self-interest a rule.

Always by using a two-stages paradigm, Cappelen and colleagues (2007, 2010) created two experiments in which the first stage consisted in a “*production phase*” and the second stage in a “*distribution phase*” (namely a session of the DG). In the 2007 study the production phase consisted in deciding how much to invest of a given sum of money (0, 100 or 200 out of 300 NOK, Norwegian crown) by knowing that such investment could allow doubling or quadrupling the initial amount. Instead, in the 2010 study in the production phase participants had to perform a task (i.e. to type a text on the computer). The “value of production” (i.e. how much it was earned in this phase) for each participant depended on three factors: working time, productivity (how many correct words they typed in 1 minute), and price (the amount of money for each correct word, which was randomly assigned between two possible amounts). In the consequent distribution phase, participants had to play the DG, in the role of both proposers of receivers. Before playing the DG, proposers were informed about the amount earned by the other participants in the production phase. According to the authors, results of both studies demonstrated that, in deciding how much to give to receivers, a crucial role was played by the distinction between the factors that *were or not* under the receivers' control. Results of the first experiment indeed showed that, apart from those who offered nothing or half of the amount regardless of the situation, the majority of dictators cared about the others' type of investment in deciding how much to offer them. Indeed, most of participants offered a sum in line with what receivers had produced on the basis of their skills (factor under personal control) or a sum able to decrease the inequalities due to bad luck (factor not under personal control). Moreover, in the 2010 study, the authors found that dictators modulated their offers based on working time and productivity (i.e. factors under personal control) and not on the price (randomly assigned).

Therefore, in all the studies reported so far it was demonstrated that the more the participants felt that they were more deserving than the other player, the more they were reluctant to share their amount with him/her. However, in all these studies, the experiment ended after the decision made in the UG or the DG. To the best of my knowledge, Schotter, Weiss and Zapater (1996) were the only scholars who embedded the UG and the DG in a competitive framework. As I wrote in the first chapter, they created a “*survival pressure*” procedure, where the decisions made in the UG and DG had consequences on the following task. They found that only in the DG the survival pressure affected the offers in the first stage. Indeed, dictators engaged in a two-stage game made lower offer in the first stage, compared to dictators engaged in one-stage DG.

In the studies reported in this chapter, a two-stage paradigm was used in which worthiness and competitiveness were inserted. The goods to be divided in the UG and DG were not of economic nature, but consisted in points to be earned through ability tasks. The worthiness was manipulated through fake feedbacks (positive or negative) given to these tasks. In all these studies a similar basic procedure was used. In the first stage participants had to play three games: two cognitive skill games and the UG or the DG. Through these games, they could accumulate points to pass to the second stage, for reaching which a minimum threshold had to be achieved. Actually the second stage did not exist, since its only function was to generate a competitive context in the first stage, where the UG and the DG were played.

The differences between the specific procedures will be reported in the description of each study.

## **2. Aims of the study**

In the present study it was investigated whether:

- being in an advantageous or disadvantageous position compared to the other participant (by having gained more or less points than his/her, in cognitive-ability tasks whose results had been manipulated) affected the offers in the UG and in the DG, in a competitive context;
- this putative effect was mediated by emotions related to the ability tasks and/or by emotions and beliefs about the choice.

The following results were expected:

1. Regarding the manipulation of the results in cognitive-ability tasks: if more deserving participants behaved more selfishly, the participants who received a positive manipulated feedback in the two ability tasks (and thus were in ahead compared their opponent) should offer fewer points to the receiver, compared to the remaining participants (i.e. those with a negative feedback and those without feedback). If instead participants with a higher score were more willing to help the needy, those receiving a positive feedback should make higher offers. On the contrary, if the results to previous tasks did not affect decision-making, similar offers in the three experimental conditions should be observed;
2. Regarding the games (UG and DG): if participants were sensitive to the bargaining power of the other player (Straub and Murnighan, 1995; Pillutla and Murnighan, 1995), the offers in the UG should be higher, compared to those in the DG. If on the contrary the receivers' powerlessness in the DG evoked feelings of social responsibility (Greenberg, 1978; van Dijk and Vermunt, 2009), the offers in this game should be higher, compared to the offers done in the UG.
3. About the emotions related to the cognitive-ability tasks and the emotions and beliefs related to decision-making in the UG and the DG: both types of

emotional response should change in function of manipulated outcome and should mediate the putative effects of the ability tasks on choices in the UG and the DG.

### **3. Method**

#### **3.1. Experimental design**

A 2 (main game: UG/DG) x 3 (feedback: positive /negative /absent) between-subject design was created. The different feedbacks were created by manipulating the results obtained by both participants in two cognitive-ability tasks played before playing the UG or the DG. Therefore, participants could play the UG or the DG: by being in an advantageous position compared to the opponent; by being in a disadvantageous position compared to the opponent; by knowing neither their own results, nor those of the opponent.

#### **3.2. Participants**

A total of 333 participants (M=148) took part in the study: 168 participants played the Ultimatum Game (56 for each of the three experimental conditions) and 165 played the Dictator Game (56 for each of the three experimental conditions, less 3 participants in the positive condition since they did not finish the experiment). They were students from different Universities of Campania, unpaid volunteers, aged between 18 and 30 years (M= 22,11; S.D.=2,715). Each participant was randomly assigned to one of the 6 experimental conditions: positive, negative and absent feedback for the UG and positive, negative and absent feedback for the DG. However, they were paired by gender.

The participants were recruited two at a time, by paying attention on avoiding the contact between them, in order to make as anonymous as possible the interaction. After recruited, they were settled in two near but separate rooms and they were told that they would interact via Internet. Actually, there was no real interaction between them.

#### **4. Materials and procedure**

The experiment was implemented on “E-Prime 2.0” software and was carried out with a laptop. Before starting the experiment, participants were asked to read and sign the informed consent.

General instructions informed participants that the main aim of the experiment was to investigate how people behave when they have to pursue a goal and that the experiment was divided into two stages, in both of them the two participants would be connected each other via Internet. In the first stage, they had to play three games, two decision tasks, and one cognitive task, through which they had to reach at least 8 point in order to pass to second stage. Participants were also informed that in the second stage they would play alone, and that they should increase their score as much as possible through a series of cognitive tasks. Actually, the second stage was never really played and the experiment ended after the third task of the first stage (i.e. after the UG or the DG). Finally, instructions told participants that during the experiment they should assess the intensity of a number of emotional states because one of the aims of the study was to investigate whether they would change during the experiment.

The experiment started by asking participants to assess, on a 9-point Likert Scale (1 = not at all; 9 = extremely), the intensity of six emotions (contentment, satisfaction, self-confidence, frustration, irritation, sorrow), randomly presented.

Emotions were again assessed after the two tasks of cognitive ability, in order to evaluate whether they were affected by the manipulated result to such tasks.

After that, participants were asked to perform a decision task, with a single item, for which 4 points were available according to this rule: if only one player answered correctly, she would earn 4 points; if both players answered correctly, they both would earn 2 points; if no player answered correctly, nobody would earn anything. Results were manipulated and both players, regardless of their answer, earned 2 points.

Then, participants were told that, for the second game, the program would randomly draw one between two types of tasks: a cognitive and a perceptive task. Actually, participants received always the cognitive task, whereas the mock opponent received the fictitious perceptive task. The task consisted in 8 items drew from the SCAT (Short Cognitive Ability Task), created *ad hoc* by Matarazzo and colleagues (2015) with the aim to make the feedback manipulation believable. Indeed, the task was quite demanding and it was hard for participants to guess if their answers were right or wrong. For each item, participants had 30 seconds to answer and they were told that if they did not answer a question in time, the program would register a random response. This allowed avoiding that participants assigned to the positive feedback condition had a high score although they did not answer every question. For this task, two points for each correct answer were given. Therefore, participants could hypothetically earn 16 points: actually, those receiving a positive feedback were told that they had answered correctly 7 trials up 8 (thus gaining 14 points), whereas those receiving a negative feedback were told that they had answered correctly 1 trial up 8 (thus gaining 2 points).

After receiving their results, participants were also informed about those of their opponent: participants assigned to the positive feedback condition were informed that the opponent had earned 4 points, whereas those assigned to the negative feedback condition were informed that the opponent had earned 12 points.

In the absent feedback condition no results were communicated after the two tasks. In table 1 the scores obtained by participants in all experimental conditions are reported.

Table 1. Manipulated results obtained by participants in the two first game of the first stage. Participants played all in the role of Participant A.

	ABSENT FEEDBACK		POSITIVE FEEDBACK		NEGATIVE FEEDBACK	
	PARTICIPANT A	PARTICIPANT B	PARTICIPANT A	PARTICIPANT B	PARTICIPANT A	PARTICIPANT B
<b>DECISIONAL ITEM</b>	Not communicated	Not communicated	2	2	2	2
<b>SCAT</b>	Not communicated	Not communicated	14	4	2	12
<b>TOTAL SCORE</b>	<b>Not communicated</b>	<b>Not communicated</b>	<b>16</b>	<b>6</b>	<b>4</b>	<b>14</b>

After played the first two games of the first stage, participants self-assessed the same six emotions assessed at the beginning of the experiment. Then, half of participants played the UG and the other half played the DG. All participants played in the role of proposers. Both games were presented as a decision task in which one player, named proposer, had to decide how to divide 10 further points with the receiver, who had the power to refuse in the UG (by leaving in this way the scores unvaried), while had no power in the DG. It is worthy to note that, since 8 points was the minimum threshold to pass to the second stage, in the positive feedback condition participants had 8 points more than the threshold, whereas the opponent needed two points to reach it; on the contrary, in the negative feedback condition participants needed 4 points for reaching the threshold, whereas the opponent had obtained 6 points more than the threshold.

Finally, after making their offer in the UG or the DG, all participants were asked to assess, on a 9-point scale (1 = not at all; 9 = extremely), the intensity with which they had experienced a set of emotions and beliefs that in literature were assumed



to underlie decision-making about the offer. They differed depending on the principal game. In the UG they were the following: *sense of fairness, empathy, thinking that it was convenient for the responders to accept also poor offers, desire to keep as many points as possible, Fear that an offer too advantageous for his/herself would have been rejected by the other participant*. In the DG emotions and beliefs about the choice were: *sense of fairness, empathy, desire to keep as many points as possible, thinking that the responder could only be able to accept one's offer*. They were all presented in a random order. After that, the experiment ended and participants were debriefed about the real aims of the study and thanked.

## 5. Results

### *Manipulation check*

In order to check whether the manipulated outcome given to the ability tasks influenced the intensity of emotions self-assessed before and after the two ability tasks, a 2 (game: Ultimatum/Dictator) x 3 (feedback: absent/positive/negative) x 6 (emotions: contentment /sorrow /self-confidence /frustration /irritation /satisfaction) x 2 (time: pre/post ability tasks) mixed ANCOVA was carried out. Game and conditions were inserted as between-subjects variables, whereas emotions and time were settled as within-subject variables. Gender was settled as covariate.

Results revealed a significant three-way interaction between feedback, emotions and time,  $F=16.482$ ;  $df=10,1630$ ;  $p<.001$ ;  $\eta^2=.203$ . On the contrary, the four-way interaction, including the game, was not significant. Thus, emotions had a similar trend in time in both games. Gender had no effect.

The interaction was examined through a simple effects analysis with Bonferroni adjustment for multiple comparisons. Results revealed that:

- with absent feedback, contentment ( $p<.01$ ), self-confidence ( $p<.001$ ) and satisfaction ( $p<.001$ ) decreased after the two ability tasks, whereas sorrow ( $p<.05$ ), frustration ( $p<.001$ ) and irritation ( $p<.001$ ) increased;

- with positive feedback emotions with a positive valence, i.e. contentment ( $p<.001$ ), satisfaction ( $p<.001$ ) and self-confidence ( $p<.001$ ), increased. On the contrary, emotions with a negative valence, i.e. irritation ( $p<.01$ ), sorrow ( $p<.01$ ) and frustration ( $p<.05$ ), decreased;

- with negative feedback all the emotions changed in a significant way, except for frustration. Contentment ( $p<.001$ ), self-confidence ( $p<.001$ ) and satisfaction ( $p<.001$ ) decreased. Sorrow ( $p<.001$ ) and irritation ( $p<.05$ ) increased.

In table 2 means (and standard deviations) of the emotions self-assessed before and after the ability tasks are reported.

Table 2. Means (and s.d.) of emotions self-assessed before and after the ability tasks

Emotions	Absent feedback		Positive feedback		Negative feedback	
	Before	After	Before	After	Before	After
<b>Contentement</b>	5.270 (.165)	4.833 (.170)	5.660 (.167)	6.418 (.173)	5.789 (.165)	4.464 (.170)
<b>Sorrow</b>	2.694 (.212)	3.270 (.191)	3.060 (.215)	2.328 (.194)	3.066 (.212)	4.365 (.191)
<b>Self-Confidence</b>	6.258 (.168)	5.386 (.178)	6.246 (.170)	6.768 (.181)	6.059 (.168)	5.342 (.178)
<b>Frustration</b>	2.592 (.207)	3.375 (.201)	2.944 (.209)	2.462 (.204)	3.569 (.207)	3.791 (.201)
<b>Irritation</b>	2.597 (.216)	3.392 (.212)	3.174 (.219)	2.508 (.215)	3.310 (.216)	3.836 (.212)
<b>Satisfaction</b>	5.184 (.183)	4.521 (.170)	5.470 (.186)	6.818 (.172)	5.665 (.183)	4.104 (.170)

Since all emotions changed in a significant way in all the experimental conditions, except for frustration that did not change with negative feedback, the  $\Delta$  value (i.e. the difference between post and pre values) of the remaining 5 emotions was calculated. These values were the only taken into account in the further mediation analyses.

*Effect of experimental conditions on Offers*

In Table 3 means of points offered for each experimental condition are reported. With the purpose of investigating whether the experimental conditions affected the offers, a 2 (game: Ultimatum/Dictator) x 3 (feedback: absent/positive/negative) ANCOVA was carried out, with gender included as covariate, and the offer amount settled as dependent variable.

A main effect of each independent variable was found, whereas their interaction was not significant. Gender had no effect.

Table 3. Means of points (and standard deviations) offered by proposers in each experimental conditions.

	<b>Absent feedback</b>	<b>Positive feedback</b>	<b>Negative feedback</b>	<b>Tot.</b>
<b>Ultimatum game</b>	4.88(0.470)	4.36(1.901)	4.05(1.773)	<b>4.43(1.554)</b>
<b>Dictator game</b>	4.25(1.405)	3.83(2.054)	2.84(2.543)	<b>3.64(2.127)</b>
<b>Tot.</b>	<b>4.56(1.089)</b>	<b>4.10(1.986)</b>	<b>3.45(2.265)</b>	<b>4.04(1.899)</b>

The main effect of game ( $F=16.330$ ;  $df = 1,326$ ;  $p<.001$ ;  $p\eta^2=.048$ ) revealed that in the UG proposers offered more points to the receiver than in the DG. The main effect of feedback ( $F=10.553$ ;  $df = 2,326$ ;  $p<.001$ ;  $p\eta^2=.061$ ), examined through pairwise comparisons with Bonferroni adjustment, revealed that with negative feedback proposers offered significantly less points compared to absent feedback ( $p<.001$ ) and to positive feedback ( $p<.05$ ), which did not differ each other.

*Effect of experimental conditions on reaction times during decision-making*

A 3 (conditions: absent/positive/negative outcomes) X 2 (game: Ultimatum/Dictator) ANCOVA was conducted, in order to investigate whether the

reaction times employed to decide the offer were different depending on experimental conditions, with gender included as covariate. Results revealed no significant effects of the IV on reaction times.

#### *Mediation analysis*

Results of manipulation check showed that the task feedback affected almost all emotions (except frustration), and that no (casual) effect was due to the random assignment of the participants to the UG or the DG. Results of ANCOVA on offers showed that feedback and game affected offers independently of each other. Thus, a mediation analysis was performed to investigate whether the effect of the feedback on offers was mediated by the change in emotions, by using the PROCESS 3.1 macro for SPSS (Hayes, 2018). The macro uses bootstrapping method for estimating indirect effects (i.e. the effect of mediating variables); 95% bias-corrected confidence intervals were calculated through 5000 bootstrap samples. It has been tested the model 4 in which the card-game outcome was included as independent variable (IV), and  $\Delta$  contentment,  $\Delta$  sorrow,  $\Delta$  self-confidence,  $\Delta$  irritation,  $\Delta$  satisfaction were included as Mediators (Med). Offers in the UG and DG were the dependent variable (DV). The multicategorical IV was coded as two dummy variables (Positive feedback = 1; other feedbacks = 0; Negative feedback = 1; other feedbacks = 0) with the absent feedback acting as reference category. Gender was settled as covariate (M=1; F=0).

Regarding the effects that feedback exerted on putative mediators, results were similar to those found in the manipulation check and are not reported here. Also the total effect of the IV on the DV was the same as the ANCOVA: compared to the reference category, with negative feedback offers decreased, where there was no significant difference between the reference category and positive feedback. However, when all variables were introduced in the model to test their direct effect on the DV, no effect of the putative mediators and no indirect effect of the IV through mediators were found.

Since the “emotions and beliefs about the choice” were different in the two games, two different mediation analyses were conducted (one for each game).

#### *Mediation analysis for the UG*

Also this analysis was conducted by using the PROCESS 3.1 macro (model 4) for SPSS (Hayes, 2018). However, only the data concerning the UG were considered: thus the model tested whether feedback (IV) affected offers in the UG (DV) and whether this effect was mediated by emotions and beliefs about the choice, self-assessed by participants after offer (Med). Gender was introduced in the model as covariate. The five putative mediators were: *Fear that an offer too advantageous for his/herself would have been rejected by the other participant*; *desire to keep as many points as possible*; *Empathy*; *Thinking that it would have been convenient to the other participant to accept any offer*; *Sense of justice*.

Regarding the effect of the IV on putative mediators, results revealed that, compared the reference category, *desire to keep as many points as possible* increased in both positive ( $B=1.2447$ ;  $SE=.4938$ ;  $t=2.5206$ ;  $p<.05$ ) and negative ( $B=1.2125$ ;  $SE=.4944$ ;  $t=2.4523$ ;  $p<.05$ ) feedbacks, as well as *Thinking that it would have been convenient to the other participant to accept any offer* ( $B=1.3587$ ;  $SE=.5149$ ;  $t=2.6387$ ;  $p<.01$  for positive feedback;  $B=1.5656$ ;  $SE=.5156$ ;  $t=3.0366$ ;  $p<.01$  for negative feedback). On the contrary, *Sense of justice* decreased in both positive ( $B= -.9024$ ;  $SE= .4208$ ;  $t= -2.1443$ ;  $p<.05$ ) and negative ( $B= -1.6441$ ;  $SE= .4214$ ;  $t= -3.9015$ ;  $p<.01$ ) feedbacks. The remaining two putative mediators were not affected by feedback.

The total effect of feedback manipulation was the following: compared to absent feedback, negative outcome decreased offers ( $B=-.8253$ ;  $SE=.2896$ ;  $t=-2.8502$ ;  $p<.01$ ), while positive outcome did not differ significantly. Gender did not exert any effect.

When all variables (IV, Med and covariate) were inserted in the regression model to test their direct effect on offers, results revealed that the effect of negative

feedback was no longer significant. Among the putative mediators, *Fear that an offer too advantageous for his/herself would have been rejected by the other participant* increased offers ( $B = .1222$ ;  $SE = .0453$ ;  $t = 2.6962$ ;  $p < .01$ ) whereas *desire to keep as many points as possible* decreased them. ( $B = -.2216$ ;  $SE = .0461$ ;  $t = -4.8076$ ;  $p < .001$ ).

The effect of negative feedback on offers in UG was therefore mediated by *desire to keep as many points as possible* ( $B = -.2687$ ;  $BootSE = .1312$ ;  $BootLLCI = -.5678$ ;  $BootULCI = -.0544$ ). In detail, negative feedback increased the intensity of this mediator, which in turn exerted a negative effect on offers by diminishing them. The multiplication of these effects resulted in a negative effect. In other words, receiving a negative feedback after the two ability tasks decreased offers in the UG because increased the desire to preserve as many points as possible.

#### *Mediation analysis for the DG*

Also this analysis was conducted by using the PROCESS 3.1 macro (model 4) for SPSS (Hayes, 2018). Only the data concerning the DG were considered: the model tested whether feedback (IV) affected offers in the DG (DV) and whether this effect was mediated by emotions and beliefs about the choice (Med.). Gender was introduced in the model as covariate. The four putative mediators were: *desire to keep as many points as possible*; *Empathy*; *Sense of justice*; *Thinking that the responder could only be able to accept one's offer*.

Regarding the effect of the IV on putative mediators, results showed that, compared to the reference category, only *desire to keep as many points as possible* increased in both the positive ( $B = 1.0763$ ;  $SE = .5295$ ;  $t = 2.0329$ ;  $p < .05$ ) and the negative ( $B = 1.2770$ ;  $SE = .5222$ ;  $t = 2.4454$ ;  $p < .05$ ) feedbacks. The other three putative mediators were not affected by feedback.

The analysis of the total effects of the IV on the offers revealed that only negative feedback decreased the offers ( $B = -1.3947$ ;  $SE = .3872$ ;  $t = -3.6021$ ;  $p < .001$ ), while

positive feedback did not differ significantly from the reference category. Gender did not exert any effect.

When all variables (IV, Med and covariate) were inserted in the regression model to test their direct effect on offers, the effect of negative feedback was still but less significant ( $B=-.8864$ ;  $SE=.3408$ ;  $t= 2.6005$ ;  $p<.05$ ). Among the putative mediators *desire to keep as many points as possible* ( $B= -.3247$ ;  $SE= .0589$ ;  $t= -5.5142$ ;  $p<.001$ ) decreased offers.

The effect of negative feedback on offers in DG was therefore partially mediated by *desire to keep as many points as possible* ( $B=-.4147$ ;  $BootSE=.1861$ ;  $BootLLCI=.8065$ ;  $BootULCI=-.0768$ ). In detail, negative feedback increased the intensity of this mediator, which in turn exerted a negative effect on offers by diminishing them. The multiplication of these effects resulted in a negative effect. In other words, receiving a negative feedback after the two ability tasks decreased offers in the DG because increased the desire to preserve as many points as possible.

## **6. Discussion**

The study presented here had the main aims to investigate whether being in an advantageous or disadvantageous position compared to their opponent, in a competitive context, affected the offers in the UG and the DG and whether this effect was mediated by emotions related to the ability tasks and/or by emotions and beliefs about the choice.

Results revealed that the two experimental conditions affected the offers independently of each other. In detail, regarding the game, in the UG proposers gave significantly more points to the receivers compared to the DG. Thus, proposers seemed to be sensitive to the bargaining power of the other participant (Straub and Murnighan, 1995; Pillutla and Murnighan, 1995). However, also in this study,

proposers in the DG offered more than the 30% of the total amount to the powerless receiver, by confirming other-regarding concerns highlighted in literature (Forsythe et al., 1994; Fehr and Schmidt, 1999; Charness and Rabin, 2002; Engelmann and Strobel, 2004; Holt and Laury, 2008).

Regarding the conditions, negative feedback led participants to offer less points to their opponent compared to the positive and absent feedback. In fact, proposers who received a negative feedback believed they had earned only 4 points at the ability tasks and they knew that the minimum threshold to pass to the second stage was 8 points. Therefore, they kept enough points to pass to the second part of the experiment. On the contrary, in the positive feedback condition, even if proposers had the power to offer nothing (or very few, if they made a strategic choice in the UG) to the other, thus increasing their advantage, they decided to be benevolent and to help the needy receivers sharing almost fairly with them the amount of points. In the absent feedback condition then, where participants do not have any reference point about their position in the game, their offers did not differ from those of the participants with positive feedback. Overall, these results were very similar to those found in literature (see Camerer, 2003 or Güth and Kocher, 2014 for a review) by confirming a general tendency to fairness where no other factors were taken into account. On the contrary, these results are not in line with those studies (Hoffman et al., 1994; Cherry et al., 2002; Cappelen et al., 2007, 2010) in which more worthy proposers made more selfish offers.

Regarding the second main aim of the study, namely investigating whether the effect of the experimental conditions was mediated by the emotions related to the ability tasks and the emotions and beliefs related to decision-making in the UG and the DG, results showed that this happened only partially. Although the emotions related to the ability tasks were affected by the experimental conditions, they did not exert any mediation effect on the offers. Regarding the emotions and beliefs about the choice, only “*desire to keep as many points as possible*” mediated the effect of the negative feedback condition, completely in the UG and only partially



in the DG. However, in both games, negative feedback led participants to feel more “*desire to keep as many points as possible*” that in turn led the offers to decrease. In other words, more “*desire to keep as many points as possible*” is felt with negative feedback, more offers decrease.

## Study 3

### 1. Aims of the study

As already said, in study 3, compared to study 2, two main factors have been changed, although the general structure of the experiment was the same: the degree of competitiveness and the position in the game of participants compared to their opponents. The competitiveness was increased introducing a new rule in the two-stage paradigm, according to which if only one participant reached the stage 2, then she would obtain all the points of the other participant, who instead would finish the experiment at the end of the stage 1. Furthermore, the manipulation of the game position of the two participants, through false feedback to cognitive-ability tasks, was the following: our participants were always ahead compared to opponents (except for the uncertainty condition, in which the results were not communicated). However, the score of opponents varied as a function of experimental manipulation. In detail, in a type of condition, they had already reached the minimum threshold needed to pass to the second stage; in another condition, they had not reached the threshold yet. In the third condition, as already said, the results were not communicated.

Therefore, in the present study it was investigated whether:

- in a competitive two-stage paradigm, the offers in the UG and in the DG were affected by the possibility (present, absent or uncertain, according with the manipulated scores of players) to obtain the points of the other player if the latter failed to reach the minimum threshold needed to pass to the second stage
- in such paradigm the difference between the UG and the DG in terms of bargaining power of receivers was effaced when in the UG receivers had failed to reach the threshold and could reach it only if proposers would donate them the needed points;

- these putative effects were mediated by emotions related to the ability tasks and/or by emotions and beliefs about the choice.

The following results were expected:

- Regarding the manipulation of the results in cognitive-ability tasks and thus the position in the game of the players: since our participants were always in a position of clear advantage compared to opponents (except for the uncertainty condition), it was supposed that the receivers' position was the relevant factor driving the offers. More specifically, in the UG it has been created a condition in which receivers had no bargaining power, analogously to what happens in all DG conditions. Namely, when the threshold had not been reached yet, receivers had no decisional power, for two reasons: any offer could help them to pass to the second stage (except for offer=1); if they rejected the offer, and thus did not pass to the second stage, all their points would be given to proposers. On the contrary, when the threshold had been reached, receivers had power to decide whether accept or not the offers. Consequently, in the UG, it was expected the following findings: if proposers would take gain from the receivers' powerlessness when the threshold had not reached, lower offers in this condition should be observed, compared to offers made in threshold reached and uncertainty conditions (where receivers had bargaining power). If instead the powerless position of the opponent evoked feelings of social responsibility, higher offers in this condition should be observed. Finally, if the results to previous tasks did not affect decision-making, similar offers in the three experimental conditions should be observed. Regarding the DG, where receivers are always powerless, in accordance with some studies reported in literature (Greenberg, 1978; van Dijk and Vermunt, 2009) highlighting that receivers' powerlessness evoked feelings of social responsibility, it was expected that offers would be higher in the case in which receivers were needier, i.e. when they had not reached the threshold yet.

- About the emotions elicited by the ability tasks and the emotions and beliefs about the choice: both type of emotional reactions should be affected by experimental conditions and should mediate their putative effect on choices in the UG and the DG.

## 2. Method

### 2.1 Experimental design

A 2 (main game: UG/DG) x 3 (receiver's position: uncertain/threshold reached /threshold not reached) between-subject design was created. The different conditions were created by manipulating the scores obtained by both participants in two cognitive-ability tasks played before playing the UG or the DG. Therefore, participants could play the UG or the DG: by being in an advantageous position compared to the opponent who already had reached the minimum threshold needed to pass to the second stage (*threshold reached*); by being in an advantageous position compared to the opponent who had not reached yet the minimum threshold needed to pass to the second stage (*threshold not reached*); by knowing neither their own results, nor those of the opponent (*uncertain position*). For the sake of brevity, I have named "receiver's position" this variable, but it should be specified that our participants were always in ahead, compared to the opponents, and that the condition of uncertainty concerned both proposers and receivers.

### 2.2 Participants

A total of 240 unpaid volunteers participated (M=110) in the study: 120 participants played the Ultimatum Game (40 for each of the three experimental conditions) and 120 played the Dictator Game (40 for each of the three experimental conditions).

They were students from different Universities of Campania, aged between 18 and 44 years ( $M= 22,25$ ;  $S.D.=3,000$ ). The recruitment procedure was the same used in study 2. Also in the present study, each participant was randomly assigned to one of the six experimental conditions.

### **3. Materials and procedure**

Materials and procedure were almost the same employed in study 2. Therefore, in order to avoid repetitions, only the modifications made will be illustrated. Once again, the experiment was implemented on “E-Prime 2.0” software and was carried out with a laptop.

General instructions informed participants that the main aim of the experiment was to investigate how people behave when they have to pursue a goal and that the experiment was divided into two stages, in both of them the two participants would be connected each other via Internet. In the first stage, they had to play three games, two decision tasks, and one cognitive task, through which they had to reach at least 17 points in a condition or 19 points in the other condition, in order to pass to the second stage. In the second stage, contrary to study 2, they should play a zero-sum game against the other participant, but only if both participants reached the minimum threshold. Otherwise, if only one participant reached the second stage, she would obtain all points of the other. If no participant reached the second stage, the experiment would end after the first stage. The second stage was actually never played and the experiment ended after the third task of the first stage (i.e. UG or DG). Finally, instructions told participants that during the experiment they should assess the intensity of a number of emotional states because one of the aims of the study was to investigate whether they would change during the experiment.

The experiment started by asking participants to assess, on a 9-point Likert Scale (1 = not at all; 9 = extremely), the intensity of six emotions (contentment, satisfaction, self-confidence, frustration, irritation, sorrow), randomly presented. Emotions were again assessed after the two tasks of cognitive ability, in order to evaluate whether they were affected by the manipulated result to such tasks.

After that, participants were asked to perform a decision task, similar to that used in study 2. Results were manipulated and both players, regardless of their answer, earned 2 points.

Then, participants were told that, for the second game a cognitive task consisting of both cognitive and perceptive trials had to be played. The cognitive trials were extracted by the SCAT (already described in previous study), with the exception that in this study, 3 points for each correct answer were given. The perceptive trials consisted in 4 items of the “Find the differences” game. Also for this game, 3 points for each correct answer were given. Therefore, participants in this second game could hypothetically earn 24 points. In both “threshold reached” and “threshold not reached” conditions, through manipulation of the results, our participants earned the maximum (by answering correctly to 8 trials up to 8), while their opponents earned only 15 points (by answering correctly to 5 trials up to 8). Participants were also informed about their opponent’s results. Therefore participants’ scores after the two games were: 26 points for our participants vs. 17 points accumulated by the opponents. Consequently, in the condition in which the threshold had been fixed to 17 points, opponents reached it; in the condition in which the threshold had been fixed to 19 points, opponents did not reach it yet. In the uncertainty condition, no results were communicated.

In table 1 the scores obtained by participants in the three conditions are reported.

Table 1. Manipulated results obtained by participants in the three conditions. Participants played all in the role of Participant A.

	THRESHOLD REACHED/THRESHOLD NOT REACHED CONDITIONS		UNCERTAINTY CONDITION	
	PARTICIPANT A	PARTICIPANT B	PARTICIPANT A	PARTICIPANT B
DECISIONAL TASK	2	2	Not communicated	Not communicated
SCAT & PERCEPTIVE TRIALS	24	15	Not communicated	Not communicated
<b>TOTAL SCORE</b>	<b>26</b>	<b>17</b>	<b>Not communicated</b>	<b>Not communicated</b>

After playing the first two games, participants self-assessed the same six emotions assessed at the beginning of the experiment. Then, half of participants played the UG and the other half played the DG. All participants played in the role of proposers. Both games were presented as a decision task in which one player, named proposer, had to decide whether and how to divide 13 further points with the other player, named receiver, who had the power to refuse in the UG (by leaving in this way the scores unvaried), while had no power in the DG.

Finally, after making their offer in the UG or the DG, all participants were asked to assess, on a 9-point scale (1 = not at all; 9 = extremely), the intensity of the same emotions and beliefs already used in study 2. After that, the experiment ended and participants were debriefed about the real aims of the study and thanked.

## 4. Results

### *Manipulation check*

In order to check whether the manipulated feedback given to the ability tasks influenced the intensity of emotions self-assessed before and after the tasks, a 2 (game: Ultimatum/Dictator) x 3 (receiver's position: uncertain/threshold reached /threshold not reached) x 6 (emotions: contentment /sorrow /self-confidence

/frustration /irritation /satisfaction) x 2 (time: pre/post ability tasks) mixed ANCOVA was carried out. Game and conditions were inserted as between-subjects variables, whereas emotions and time were settled as within-subject variables. Gender was settled as covariate.

Results revealed a significant three-way interaction between conditions, emotions and time,  $F=5.361$ ;  $df=2,233$ ;  $p<.001$ ;  $\eta^2=.104$ . Instead, the four-way interaction, including the game, was not significant. Thus, emotions had a similar trend in time in both games. Gender had no effect.

The interaction was examined through a simple effects analysis with Bonferroni adjustment for multiple comparisons. Results revealed that:

- in the uncertainty condition, contentment ( $p<.001$ ) and self-confidence ( $p<.05$ ) decreased after the two ability tasks, whereas frustration ( $p<.01$ ) and irritation ( $p<.01$ ) increased. Satisfaction and sorrow did not differ in a significant way;
- in the threshold reached condition, only satisfaction ( $p<.01$ ) increased in a significant way. No other change was found.
- in the threshold not reached condition, all emotions changed in a significant way. Namely, emotions with a positive valence, i.e. contentment ( $p<.001$ ), self-confidence ( $p<.001$ ) and satisfaction ( $p<.001$ ), increased. Sorrow ( $p<.05$ ), frustration ( $p<.01$ ) and irritation ( $p<.05$ ) decreased.

In table 2 means (and standard deviations) of the emotions self-assessed before and after the ability tasks are reported.



Table 2. Means (*and standard deviation*) of emotions self-assessed before and after the ability tasks.

Emotions	Uncertainty		Threshold reached		Threshold not reached	
	Before	After	Before	After	Before	After
<b>Contentement</b>	5.558 (.192)	4.933 (.175)	5.902 (.191)	6.202 (.175)	5.965 (.192)	6.864 (.175)
<b>Sorrow</b>	2.361 (.228)	2.746 (.223)	2.893 (.227)	2.921 (.223)	2.646 (.228)	2.046 (.223)
<b>Self-Confidence</b>	6.093 (.178)	5.693 (.182)	6.189 (.178)	6.414 (.182)	6.543 (.178)	7.131 (.182)
<b>Frustration</b>	2.625 (.234)	3.200 (.221)	2.909 (.234)	2.622 (.221)	2.791 (.234)	2.128 (.221)
<b>Irritation</b>	2.645 (.236)	3.352 (.229)	2.724 (.236)	2.550 (.229)	2.706 (.236)	2.160 (.229)
<b>Satisfaction</b>	5.195 (.198)	5.193 (.179)	5.864 (.198)	6.480 (.179)	5.528 (.198)	7.190 (.179)

Since only satisfaction changed in a significant way in all experimental conditions, the  $\Delta$  value (i.e. the difference between post and pre values) of this emotion was calculated and this value was the only taken into account in the further mediation analyses.

#### *Effect of experimental conditions on Offers*

With the aim to investigate whether the experimental conditions affected the offers, a 2 (game: Ultimatum/Dictator) x 3 (receiver's position: uncertain/ threshold reached /threshold not reached) ANCOVA was carried out, with gender included as covariate, and the offer amount settled as dependent variable.

The results showed no significant main effects but revealed a significant interaction between game and receiver's position,  $F= 7.017$ ;  $df= 2,233$ ;  $p<.01$ ;  $\eta^2=.057$ . The interaction was examined through a simple effects analysis with Bonferroni adjustment for multiple comparisons. Gender had no effect.

In the table 3 means and standard deviations of points offered by participants are reported.

Table 3. Mean of points (and standard deviations) offered by proposers in each experimental conditions.

	Uncertainty	Threshold reached	Threshold not reached	Tot.
<b>Ultimatum game</b>	4.85(2.095)	4.98(2.213)	3.22(2.636)	<b>4.35(2.441)</b>
<b>Dictator game</b>	4.90(2.426)	3.63(2.696)	4.80(2.775)	<b>4.44(2.678)</b>
<b>Tot.</b>	<b>4.88(2.252)</b>	<b>4.30(2.543)</b>	<b>4.01(2.804)</b>	<b>4.40(2.558)</b>

Pairwise comparison of the game in function of the receiver's position revealed that:

- regarding the uncertainty condition, there was no significant difference between the two games (UG and DG) in terms of points offered to the other participants ( $p=.894$ );
- when receivers had reached the threshold, in the UG proposers offered significantly more points to them, compared to the DG offers ( $p<.05$ );
- when receivers had not reached the threshold, in the UG proposers offered significantly less points to them, compared to DG ( $p<.01$ ).

If we consider the interaction from another perspective, i.e. comparing the conditions in function of the game, the results showed that:

- in the UG, when receivers had not reached the threshold, proposers offered significantly less points to them, compared to those offered when receivers had reached the threshold ( $p<.05$ ) and in the uncertainty condition ( $p<.01$ );
- on the contrary in the DG no differences in terms of offers in the different conditions were found.

### *Effect of experimental conditions on reaction times during decision-making*

In order to investigate whether the reaction times employed to decide offer were different depending on experimental conditions, a 2 (game: Ultimatum/Dictator) x 3 (receivers' position: uncertain/ threshold reached/ not reached/) ANCOVA was conducted, with gender included as covariate. The dependent variable was the offers' reaction time.

Results revealed no significant effects of the IV on the reaction times.

### *Mediation-moderation analysis*

Results of manipulation check showed that after the manipulated results to the two cognitive-ability tasks, only satisfaction changed in all experimental conditions and that no (casual) effect was due to the random assignation of the participants to the UG or the DG. Results of ANCOVA showed that offers were affected by the interaction between receiver's position (uncertain/threshold reached/threshold not reached) and main game (UG vs. DG), without any main effect of the two independent variables. In order to investigate whether the effect of the experimental manipulation on offers, which was moderated by the type of game, was mediated by changes in satisfaction (i.e.  $\Delta$  satisfaction), a mediation-moderation analysis using the PROCESS 3.1 macro for SPSS (Hayes, 2018) was performed. It has been tested the model 5, following the same procedure used in the first study. However, results showed that  $\Delta$  satisfaction exerted no direct or mediation effect on offers.

Since the "emotions and beliefs about the choice" were different in the two games, two different mediation analyses were conducted (one for each game).

### *Mediation analysis for the UG*

In order to investigate whether the effect exerted by the experimental manipulation on the offer in the UG was mediated by emotions and beliefs about the choice, a mediation analysis was conducted by using the PROCESS 3.1 macro (model 4) for SPSS (Hayes, 2018). The receiver's position, coded as two dummy variables (Threshold reached = 1; threshold not reached = 0 / Threshold not reached = 1; threshold reached = 0) with the uncertainty condition as reference category, was included as IV. The offer made in the UG was the dependent variable (DV). The five emotions and beliefs about the choice (*Fear that an offer too advantageous for his/herself would have been rejected by the other participant; desire to keep as many points as possible; Empathy; Thinking that it would have been convenient to the other participant to accept any offer; Sense of justice*) were inserted in the model as putative mediators. Gender was included as covariate.

Regarding the effect of the IV on the putative mediators, results revealed that the only putative mediator affected by experimental manipulation was *desire to keep as many points as possible*, which increased when the other participant had not reached the threshold yet (B=1.9547; SE=.5938; t=3.2918; p<.01).

The total effect of experimental manipulation was the following: compared to reference category, the condition in which receiver had not reached the threshold yet decreased offers (B=-1.6558; SE=.5230; t=-3.1662; p<.05), whereas the condition in which the threshold had been reached did not differ from reference category. Gender did not exert any effect.

When all variables (IV, Med and covariate) were inserted in the regression model to test their direct effect on offers, results revealed that the total effect of "threshold not reached" was no longer significant (B=-.7812; SE=.4794; t=-1.6295; p>.05), whereas *desire to keep as many points as possible* had a negative direct effect on offers (B= -.3472; SE= .0775; t= -4.4771; p<.01) by decreasing them, and thus suggesting a mediation effect. Indeed, "threshold not reached" exerted a negative

indirect effect on offers through such mediator (B= -.6786; BootSE= .2630; BootLLCI = -1.2417; BootULCI= -.2115). In detail, “threshold not reached” increased the intensity of the desire for appropriation, which in turn diminished offers. The multiplication of these opposite effects resulted in a negative effect.

#### *Mediation analysis for the DG*

Also this analysis was conducted by means of PROCESS 3.1 (model 4) macro for SPSS (Hayes, 2018). In this case only the data concerning the DG were considered. The procedure was the same previously described but the putative mediators were slightly different: *desire to keep as many points as possible*; *Empathy*; *Sense of justice*; *Thinking that the responder could only be able to accept one's offer*.

No conditions affected the putative mediators.

The total effect of experimental manipulation was the following: compared to reference category, the condition in which receiver had already reached the threshold decreased offers (B=-1.2481;SE=.5923;t=-2.1681;p<.05), whereas the condition in which the threshold had not been reached yet did not differ from reference category. Gender did not exert any effect.

When all variables (IV, Med and covariate) were inserted in the regression model to test their direct effect on offers, results revealed that the effect of “threshold reached” was still significant (B=-1.2669;SE=.5015;t=-2.5263;p<.05). Moreover *desire to keep as many points as possible* decreased offers (B=-.3933;SE=.0809;t=-4.8588;p<.0001), whereas *Empathy* increased them (B=.1957; SE=.0946; t=2.0683; p<.05). However, these effects were exerted regardless of experimental manipulation. Indeed, no indirect effect was found.

## 5. Discussion

The second study presented in this chapter had two main aims: (i) to investigate whether, in a competitive two-stage paradigm, the offers in the UG and in the DG were affected by the possibility to obtain the points of the other player if the latter failed to reach the minimum threshold needed to pass to the second stage; (ii) to investigate whether in such paradigm the difference between the UG and the DG in terms of bargaining power of receivers was effaced when in the UG receivers had failed to reach the threshold and could reach it only if proposers would donate them the needed points.

Moreover, it was investigated whether these supposed effects were mediated by emotions related to the ability tasks and/or by emotions and beliefs about the choice.

Results revealed an interaction between receivers' position and main games (i.e. UG and DG). In detail, in the uncertainty conditions, no differences between the UG and the DG were found. In these conditions, proposers offered around 40% of the amount to the receivers, regardless their bargaining power, showing that when no reference point about their position in the game was given, a general tendency towards fairness was revealed (see Camerer, 2003 or Güth and Kocher, 2014 for a review). Moreover, these results were also in line with the results obtained in the absent feedback condition in the second study of this thesis.

Regarding the condition in which receivers had reached the threshold to pass to the second stage of the experiment, proposers offered significantly more points in the UG compared to the DG. On the contrary, when the threshold had not reached yet, the games had an opposite effect: the UG decreased the offers compared to the DG. Thus, if the other participant had a bargaining power (i.e. in the threshold reached condition at the UG) higher offers were observed. Probably this effect was due to by the proposers' anticipation of the possibility that receiver, having already reached the second stage, could be more willing to reject unfair offers.

On the contrary, when the other participant did not reach yet the threshold, the two games had an opposite effect. In the UG proposers were more selfish by offering fewer points to receivers: probably they relied on the receivers' necessity to obtain at least two points to pass to the second stage. However, although giving less, proposers allowed their opponents to pass to the second stage. These results in fact seem to confirm the view according to which the UG evoked strategic concerns (Straub and Murnighan, 1995; Pillutla and Murnighan, 1995, 2003; van Dijk, De Cremer and Handgraaf, 2004; Ding et al., 2014; Chen et al., 2017). This is also evident by the mediation effect exerted by "threshold not reached" on offers through "desire to keep as many points as possible". Namely, more desire to keep points was felt in this condition, lower offers were observed.

In the DG, the powerlessness of the needy receivers evoked feelings of social responsibility in the proposers (Greenberg, 1978; van Dijk and Vermunt, 2009), who made generous offers. This effect represents a strong evidence in favour of the altruism elicited by the other powerlessness. In a context of competitiveness the dictators could take advantage by the other powerlessness by not allowing her to pass to the second stage in order to keep all her points and did not do so, acting as a "benevolent dictator" (van Dijk and Vermunt, 2009). These results were thus not in line with the results obtained by Schotter, Weiss and Zapater (1996), where dictators in the first stage made lower offers to the powerless receivers, keeping more for themselves in order to pass to the second stage.

## **Study 4**

### **Replication of study 3 at the Leiden University**

#### **1. Aims of the study**

In this session, the replication of the study 3 carried out at the Leiden University, under the supervision of Prof. Eric van Dijk, was described. The present study was identical to study 3 conducted in Italy and described in the previous session, with only the following differences: in this study, participants, before to take part in our experiment, were involved in another study, executed in the same laboratory; - participants were paid volunteers, whereas in Italy they were unpaid volunteers.

The first reason driving this replication was to further investigate the result, observed in Study 3, for which in the DG higher offers were observed when the other participant was needy. This result echoes those of Study 1, in which luckier proposers in the DG gave more tokens to the other participant, while in the UG the opposite result was observed. Although the “benevolent dictator” is a well-documented phenomenon in literature (see for example van Dijk and Vermunt, 1999), with the Italian sample this result was particularly evident. Therefore, the replication of Study 3 conducted in Holland, by using the same experimental design used in Italy (except for the reimbursement for participation, not entailed in Italy), was carried out in order to examine whether the generosity of Italian “dictators” was due to specific experimental manipulation or was a specific feature of Italian sample.

The other goals underlying this study were the same of study 3. Therefore, it aimed at investigating whether:



- in a competitive two-stage paradigm, the offers in the UG and in the DG were affected by the possibility (present, absent or uncertain, according with the manipulated scores of players) to obtain the points of the other player if the latter failed to reach the minimum threshold needed to pass to the second stage
- in such paradigm the difference between the UG and the DG in terms of bargaining power of receivers was effaced when in the UG receivers had failed to reach the threshold and could reach it only if proposers would donate them the needed points;
- these putative effects were mediated by emotions related to the ability tasks and/or by emotions and beliefs about the choice.

## **2. Method**

### **2.1 Experimental design**

The experimental design and the hypotheses were the same of study 3, described in the previous session of the work.

### **2.2 Participants**

A total of 240 participants (F=174) took part in the study, but only 219 were taken into account for the analyses, since twenty-one participants did not correctly complete the experiment, by giving partial or unintelligible answers. 117 participants were in the UG sample (39 for the uncertainty condition; 38 for the threshold reached condition; 40 for the threshold not reached condition) and 102 were in the DG sample (33 for the uncertainty condition; 35 for the threshold reached condition; 34 for the threshold not reached condition). They were students from the Leiden university, aged between 17 and 60 years ( $M= 21.81$ ;  $S.D.=4.115$ ). Participants were recruited by the experimenter in several faculties of Leiden. They were informed about the research topic and about main features of the experiment. If they accepted to take part in the study, an appointment was defined.

### 3. Materials and procedure

Materials and procedures used were the same employed in study 3. Also for this study, the experiment was implemented on “E-Prime 2.0” software and was carried out on a desktop computer in private rooms designed for the experiment.

### 4. Results

#### *Manipulation check*

With the aim to test whether the manipulated feedback given to the ability tasks influenced the intensity of emotions self-assessed before and after the tasks, a 2 (game: Ultimatum/Dictator) x 3 (receivers' position: uncertain/ threshold reached/ not reached/) x 6 (emotions: contentment /sorrow /self-confidence /frustration /irritation/ satisfaction) x 2 (time: pre/post ability tasks) mixed ANCOVA was carried out. Game and conditions were inserted as between-subjects variables, whereas emotions and time were settled as within-subject variables. Gender was settled as covariate.

Results revealed a significant three-way interaction between conditions, emotions and time,  $F=7.092$ ;  $df=10,1060$ ;  $p<.001$ ;  $\eta^2=.145$ . On the contrary, the four-way interaction, including the game, was not significant. Thus, emotions had a similar trend in time in both games. Gender had no effect.

The interaction was examined through a simple effects analysis with Bonferroni adjustment for pairwise comparisons. Results revealed that:

- in the uncertainty condition, contentment ( $p < .001$ ), satisfaction ( $p < .01$ ) and self-confidence ( $p < .001$ ) decreased after the two ability tasks, whereas frustration ( $p < .001$ ) and irritation ( $p < .001$ ) increased. Sorrow did not differ in a significant way;

- in the threshold reached condition, only frustration ( $p < .01$ ) and satisfaction ( $p < .001$ ) increased in a significant way. All the other emotions did not differ in a significant way;

- in the threshold not reached condition, the emotions with a positive valence, i.e. contentment ( $p < .01$ ), self-confidence ( $p < .001$ ) and satisfaction ( $p < .001$ ), increased. On the contrary, emotions with a negative valence did not differ in a significant way.

In table 1 means (and standard deviations) of the emotions self-assessed before and after the ability tasks are reported.

Table 1. Means (and s.d.) of emotions self-assessed before and after the cognitive-ability tasks.

Emotions	Uncertainty		Threshold reached		Threshold not reached	
	Before	After	Before	After	Before	After
<b>Contentement</b>	6.070 (.188)	4.973 (.199)	6.069 (.186)	6.325 (.197)	6.114 (.186)	6.668 (.197)
<b>Frustration</b>	2.454 (.200)	3.951 (.236)	2.166 (.198)	2.783 (.234)	2.607 (.198)	2.690 (.234)
<b>Irritation</b>	2.660 (.207)	3.909 (.234)	2.480 (.205)	2.576 (.232)	2.756 (.205)	2.711 (.232)
<b>Satisfaction</b>	5.191 (.232)	4.535 (.220)	5.209 (.230)	6.459 (.217)	5.315 (.230)	6.815 (.218)
<b>Self-Confidence</b>	6.527 (.178)	5.179 (.199)	6.537 (.176)	6.522 (.197)	6.268 (.176)	6.876 (.197)
<b>Sorrow</b>	2.699 (.210)	2.643 (.198)	2.434 (.208)	2.115 (.196)	2.684 (.208)	2.368 (.197)

Since only satisfaction changed in a significant way in all the experimental conditions, the  $\Delta$  value of this emotion was calculated and was the only taken into account in the further analyses.

*Effect of experimental conditions on Offers*

In Table 2 means of points offered for each experimental condition are reported. In order to investigate whether the experimental conditions affected offers, a 2 (game: Ultimatum/Dictator) x 3 (receivers' position: uncertain/ threshold reached/ threshold not reached) ANCOVA was conducted, with the offer amount settled as dependent variable. Gender was included as covariate.

Two main effects of both independent variables were found. On the contrary, the interaction effect was not significant. Gender had no effect.

Table 2. Means of points (and s.d.) offered by proposers in each experimental condition.

	<b>Uncertainty</b>	<b>Threshold reached</b>	<b>Threshold not reached</b>	<b>Tot.</b>
<b>Ultimatum game</b>	5.87 (1.128)	5.61 (2.007)	4.30 (2.747)	<b>5.25 (2.173)</b>
<b>Dictator game</b>	4.48 (3.104)	4.86 (2.545)	3.06 (3.054)	<b>4.14 (2.982)</b>
<b>Tot.</b>	<b>5.24 (2.347)</b>	<b>5.25 (2.296)</b>	<b>3.73 (2.939)</b>	<b>4.73 (2.635)</b>

The main effect of game ( $F=10.998$ ;  $df=1,212$ ;  $p<.01$ ;  $\eta^2=.049$ ) revealed that in the UG, proposers offered significantly more points ( $p<.01$ ) compared to the DG. The main effect of condition ( $F=8.836$ ;  $df=2,212$ ;  $p<.001$ ;  $\eta^2=.077$ ), examined through pairwise comparisons with Bonferroni correction, showed that in threshold not reached condition, proposers offered significantly less points compared to the threshold reached condition and to the uncertainty condition (both  $ps<.001$ ).

### *Effect of experimental conditions on reaction times during decision-making*

A 2 (game: Ultimatum/Dictator) x 3 (receivers' position: uncertain/ threshold reached/ not reached) ANCOVA was conducted, in order to investigate whether the reaction times employed to decide offer were different depending on experimental conditions, with gender included as covariate.

Results revealed a main effect of game ( $F=8.239$ ;  $df= 1,212$ ;  $p<.01$ ;  $\eta^2=.037$ ): in the UG, participants employed more time to decide compared to the DG ( $p<.05$ ).

### *Mediation analyses*

Results of manipulation check showed that the experimental manipulation of the results obtained by participants at the ability tasks affected only satisfaction, and that no (casual) effect was due to the random assignation of the participants to the UG or the DG. Results of ANCOVA on offers showed that receivers' position (uncertain/ threshold reached/ not reached) and game affected offers independently of each other. Thus, a mediation analysis was performed to investigate whether the effect of receiver's position on offers was mediated by the change in satisfaction, by using the PROCESS 3.1 macro for SPSS (Hayes, 2018). It has been tested the model 4 in which receiver's position was included as independent variable (IV),  $\Delta$  satisfaction was included as Mediator (Med), and Offer in the UG and DG was the dependent variable (DV). The multicategorical IV was coded as two dummy variables (Threshold reached = 1; threshold not reached = 0; Threshold not reached = 1; threshold reached = 0) with the uncertainty condition acting as reference category. Gender was settled as covariate ( $M=1$ ;  $F=0$ ).

Regarding the effects that conditions exerted on  $\Delta$  satisfaction, results were similar to those found in the manipulation check: compared to the uncertainty condition,  $\Delta$

satisfaction increased in both remaining conditions. Also the total effect of the IV on the DV was the same as the ANCOVA: compared to the reference category, in “threshold not reached” offers decreased, where there was no significant difference between the reference category and “threshold reached”. However, when all variables were introduced in the model to test their direct effect on the DV, no effect of  $\Delta$  satisfaction and no indirect effect of the IV through  $\Delta$  satisfaction were found. Since the “emotions and beliefs about the choice” were different in the two games, two different mediation analyses were conducted (one for each game).

#### *Mediation analysis for the UG*

Also this analysis was conducted by using the PROCESS 3.1 macro (model 4) for SPSS (Hayes, 2018). However, only the data concerning the UG were considered: thus the model tested whether condition (IV) affected offers in the UG (DV) and whether this effect was mediated by emotions and beliefs about the choice, self-assessed by participants after offer (Med). Gender was introduced in the model as covariate. The five putative mediators were: *Fear that an offer too advantageous for his/herself would have been rejected by the other participant; desire to keep as many points as possible; Empathy; Thinking that it would have been convenient to the other participant to accept any offer; Sense of justice.*

Regarding the effect of the IV on the putative mediators, results revealed that only *Fear that an offer too advantageous for his/herself would have been rejected by the other participant* decreased when the threshold had not been reached ( $B=-2.1775$ ;  $SE=.5971$ ;  $t=-3.6468$ ;  $p<.01$ ). No other putative mediators were affected by conditions.

The total effect of receiver’s position was the following: compared to uncertainty condition, “threshold not reached” decreased offers ( $B=-1.5843$ ;  $SE=.4720$ ;  $t=-3.3568$ ;  $p<.01$ ). On the contrary, “threshold reached” did not differ from the uncertainty condition. Gender did not exert any effect.

When all variables (IV, Med and covariate) were inserted in the regression model to test their direct effect on offers, results revealed that the total effect of “threshold not reached” was still but less significant ( $B=-.9144$ ;  $SE=.3954$ ;  $t=-2.3128$ ;  $p<.05$ ). The *desire to keep as many points as possible* had a negative direct effect on the offers ( $B= -.2535$ ;  $SE=.0618$ ;  $t= -4.1035$ ;  $p<.001$ ) by decreasing them. On the contrary, *Fear that an offer too advantageous for his/herself would have been rejected by the other participant* ( $B= .2033$ ;  $SE=.0596$ ;  $t= 3.4114$ ;  $p<.001$ ), *Empathy* ( $B=.1506$ ;  $SE=.0722$ ;  $t= 2.0863$ ;  $p<.05$ ) and *Sense of justice* ( $B=.1751$ ;  $SE=.0656$ ;  $t= 2.6706$ ;  $p<.01$ ) led offers to increase.

The effect of “threshold not reached” in the UG was therefore partially mediated by *Fear that an offer too advantageous for his/herself would have been rejected by the other participant* ( $B= -.4426$ ;  $BootSE= .2175$ ;  $BootLLCI = -.9286$ ;  $BootULCI=-.0949$ ). In detail, this mediator, which decreased when receivers had not reached the threshold, exerted a positive effect on offers by increasing them. The multiplication of these effects resulted in a negative effect. In other words, the condition in which receivers failed to reach the threshold decreased offers in the UG because decreased the fear of a rejection.

#### *Mediation analysis for the DG*

The same mediation analysis was conducted for the DG, by inserting the specific emotions and beliefs about the choice used for this game (*desire to keep as many points as possible*; *Empathy*; *Sense of justice*; *Thinking that the responder could only be able to accept one's offer*).

Only “threshold reached” affected *Thinking that the responder could only be able to accept one's offer* ( $B=-1.9328$ ;  $SE=.5770$ ;  $t=-3.3498$ ;  $p<.01$ ), by decreasing it. All the other mediators were not affected by receiver's position.

No total effects of the IV were found.

When all variables (IV, Med and covariate) were inserted in the regression model to test their direct effect on offers *desire to keep as many points as possible* decreased offers ( $B=-.3567$ ;  $SE=.0997$ ;  $t=-3.5794$ ;  $p<.001$ ) and *Sense of justice* increased them ( $B=.2976$ ;  $SE=.1081$ ;  $t=2.7518$ ;  $p<.01$ ). However, these effects were exerted regardless of experimental manipulation. Indeed, no indirect effect was found.

## 5. Discussion

In the replication of the third study conducted at the Leiden University, the main aim was to further investigate whether the generosity of the dictators' offers when receivers were needy was due to the specific experimental manipulation or to a peculiar feature of our sample.

Results revealed that, compared to the results obtained in Study 3, no interaction effect between the two IV (i.e. games and receivers' position) was found. On the contrary, two main effects were revealed. Regarding the game, proposers in the UG offered significantly more points to the receivers compared to the dictators. However, also in this study, dictators offered more than the 30% of the total amount to powerless receivers, by showing once again other-regarding concerns found in literature (Forsythe et al., 1994; Fehr and Schmidt, 1999; Charness and Rabin, 2002; Engelmann and Strobel, 2004; Holt and Laury, 2008).

About the receivers' position, results revealed that when receivers had not reached the threshold to pass to second stage, proposers offered them fewer points compared to the two other experimental conditions, both in the UG and in the DG. Furthermore, "dictators" in this condition gave the fewest points than all other participants, although this value did not reach the significance level. Thus, the peculiar result found with the Italian sample was not replicated with the Dutch sample.



Indeed, in the UG, both Dutch and Italian sample seem to be sensible to bargaining power of receiver, by offering fewer points when such power is lower or absent. On the contrary, in the DG, where structurally receivers are always powerless, the two samples seem to have decided based on two opposite criteria: merit and need. Dutch participants have perhaps given less because they believed that receivers were responsible for the low score obtained; Italian participants have maybe given more because they perceived the receivers as being clearly at a disadvantage compared to them and more in need of being helped.

## **General discussion**

The main aim of this thesis was to examine the issue of fairness in strategic interactions. More specifically, the research here presented investigated whether previous “experiences” could affect decisions in strategic games, such as the UG and the DG, built in not economical versions. To this aim, the UG and the DG were inserted in a two-stage paradigm in which previous “experiences”, lived in the first stage, entailed luck game or cognitive ability tasks. Moreover, in studies 2 and 3 it was introduced an ever-increasing competitiveness between the two players, by making victory at the whole game more and more important. Furthermore, it was investigated whether the hypothesized effect of the previous experiences was mediated by the emotional reaction elicited by such experiences and/or by emotions and beliefs strictly related to decisions.

First of all, results showed that the not economical versions of the UG and the DG were effective. Indeed, in all studies, participants were steeped in the experimental context, displaying an intrinsic motivation to participate in, even if money was not involved. Moreover, the experimental manipulation has always produced effects on offers in both the UG and the DG, in ways consistent with the expected results. In addition, participants in the debriefing session always declared a subjective involvement. As already said, to the best of my knowledge, only a few studies have previously investigated proposers’ behaviour in not economical version of the UG (Ciampaglia et al., 2014; Matarazzo et al., 2016). In the study of Ciampaglia and colleagues (2014), proposers had to divide a workload with their opponent, while in the study of Matarazzo and colleagues (2016) the object of division consisted of symbolic tokens. In all studies presented here, tokens or points had to be divided and, when the UG was played, similar offers were observed. Taken together, these studies showed results similar to those found with the economic versions of the UG (see Camerer, 2003 or Güth and Kocher, 2014 for a review). To the best of my knowledge, no studies

investigated proposers' behaviour in not economic versions of the DG. In the studies presented in this thesis, also the results obtained with this game were in line with the results obtained in the economic version of the DG (see Camerer, 2003 or Güth and Kocher, 2014 for a review).

From a theoretical point of view, the general tendency of people towards fairness, documented in the literature (Forsythe et al., 1994; Fehr and Schmidt, 1999; Charness and Rabin, 2002; Engelmann and Strobel, 2004; Holt and Laury, 2008) was found also in the studies presented here. Proposers indeed always offered something, in both the UG and the DG, even if in some experimental conditions keeping all tokens or points for themselves would have represented a huge personal advantage without entailing any negative consequences for themselves (see for example the results obtained in the condition in which the other participant was needier in Study 3). Nevertheless, the two-stage paradigm (Schotter, Weiss and Zapater, 1996; Matarazzo et al., 2016; Bland et al., 2017) has revealed that both types of previous “experiences” lived in the first stage (i.e. luck game or ability tasks), whose results were manipulated, have been effective in influencing proposers' behaviour. Thus, despite a general tendency towards fairness, people adjust their behaviour in function of contextual factors, such as luck, worthiness or personal position in the played game (Frey and Bohnet, 1995).

The role of both types of emotional reactions (i.e. the emotions related to the games/tasks performed in the first-stage and the emotions and beliefs related to the decisions made in the UG or the DG) has been less influential than expected. The former emotions, although influenced by the experimental conditions, scarcely affected offers and rarely mediated the effect of the experimental conditions on offers. Indeed, only in study 1, changes in joy mediated the effect of a negative outcome on the offers. Regarding the emotions and beliefs about the decisions made in the UG or the DG, the desire to keep as much as possible for themselves was the most frequent mediator. Namely, in almost all the studies (except for the replication of the third study), such desire mediated, especially in the UG, the effect of the experimental conditions on offers. Other emotions and beliefs about the decisions, such as sense of justice and

empathy and, only for the UG, the fear of a rejection, tended to increase the offers. However, they did not work as mediators since they were not affected by the experimental conditions. Indeed, they are quite stable traits hardly influenced by situations.

Finally, although no statistical comparison between Study 3 and its replication (study 4) can be done, some similarities and differences in the respective results are noteworthy. Regarding the experimental procedure, the two studies were identical, with the only differences that in study 4, participants before to take part in our experiment were involved in another study and that they were paid volunteers, whereas in Italy they were unpaid volunteers and participated only in one experiment. Results obtained with the Italian sample showed a particular phenomenon for which: when the UG was played, the condition in which the opponent was needier elicited the lowest offers compared to the other experimental conditions; on the contrary, when the DG was played the same condition elicited the highest offers. With the Dutch sample instead, we found that in both games (UG and DG) the condition in which the other participant was needier elicited lowest offers compared to the other conditions. Indeed, in the UG, both Dutch and Italian samples seem to be sensible to bargaining power of receivers, they offering fewer points when such power is lower or absent. On the contrary, in the DG, where structurally receivers are always powerless, the two samples seem to have decided based on two opposite criteria: merit and need. Dutch participants have perhaps given less because they believed that receivers were responsible for the low score obtained; Italian participants have maybe given more because they perceived the receivers as being clearly at a disadvantage compared to them and more in need of being helped.

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