

Fairness: opportunity cost and priming effect.

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Introduction

The ideal of fairness played a very important part in our history as humans.

There are countless historical examples that show it: the Boston Tea party, the protests of the IRA during the 20th century, the French revolution, the episode of Rosa Parks, the Tiananmen Square protests, and several other examples could be made. These historical events were mainly driven by ideals and by beliefs about how a fair society should be.

Indeed, the concept of fairness affects our decision-making processes, either be it for cultural reasons or for biological ones. Biological reasons seem to be the most likely because there are reasons to believe that fairness played an important role also in our evolution. It has been widely proved that even the decision-making activity of monkeys is affected by the concept of fairness. De Waal and alia (2003) proved that Capuchin monkeys are susceptible to inequality: if monkeys witnessed a co-specific receiving a more attractive reward for an equal effort, they refused to participate to the experiment, and this effect was even amplified if the monkeys witnessed another monkey receiving a reward without any effort at all. Similarly, Takimoto and alia (2009) found monkeys to be averse to inequality. McAuliffe and Santos (2018) reached similar conclusions, and according to them we should derive two implications from the several observations about animals' aversion to inequity: that some elements of our reactions to distributional inequity are innate and strictly related to our evolutionary past, and that our sense of fairness is built upon general processes that animals use to navigate their social and ecological environment. Nonetheless, there are also scientists who do not support the claim that animals are naturally averse to inequality. For example, Brauer and al. (2006) found no support to the hypothesis that some primates are risk averse, and they argued that behaviors considered as 'fair' may not be necessarily due to inequality aversion but rather to the action of other cognitive mechanisms.

In case of human beings there are two possible arguments: either we have acquired a sense of fairness for biological reasons (as the animals did), or for cultural/strategic ones. With respect to the cultural acquisition of fairness, we may consider the experiment of Sommerville and Ziv (2018). They observed that infants start to develop an intuitive sense of distributive fairness

between the 6th and 12th months of their first year of life and they also observed that children of 13 months are able to express statements of praise or blame to those that violate or adhere to distributive fairness norms, although they are not able to translate these thoughts into actions to enforce those norms. The authors concluded by saying that such knowledge of distributive fairness may be due to acculturation.

Hence, be it cultural or biological, it is an evident fact the influence of fairness concerns in our decision-making processes. Fairness has a crucial influence on reciprocity, which is an important driver in many human interactions, and it is a key tenet of many ancient (e.g.: gift economies) and modern societies (e.g.: China and the Guanxi). Fairness concerns are also a key driver of welfare policies that are often not motivated by utilitarian arguments, and fairness and fairness belief (i.e.: what we think to be fair and what we think the others think to be fair) are something we can't help to consider when choosing a course of action.

Alas, fairness (and morals" imperative" more in general) are not included in traditional economic theory most of the time because of the assumption of selfishness stemming from the so called rational behavior.

Rational choice theory plays a central role in most of the theory conceived by the neo-classical economy. Featured by several assumptions it assumes that individuals are always capable to compute their own utility so to take decisions that maximize their own expected utility. Moreover, individuals are expected to be interested to maximize only their own payoff not being interested in someone else's payoff. These two assumptions turn out to be wrong on a regular basis in many economic situations.

Many scholars agree that sometimes the maximization process could be too cumbersome in cognitive regards and that individual decision making could be interpreted on the light of some 'bounded rationality' /satisfying process. People focus on what is satisfying for them and update this objective through revision of their aspiration targets (Simon, 1950). Moreover, with limited cognitive abilities they could adopt rules of thumbs. Although vis-à-vis perfect rationality bounded rationality loses in generality, it provides a more reliable description of the reality, and it is successfully able to explain deviations from the neoclassical paradigm (Dragan Miljkovic, 2003).

The notion of self-interest is lacking empirical support recently: there is widespread consensus among scholars concerning the role of fairness, altruism, and reciprocity as powerful motivator for many individuals, and that these ones should be considered when modeling the individual preferences (Fehr and al. 2006).

These incorrect assumptions about human's rationality and self-interest lead to theoretical predictions that are systematically contradicting empirical evidence, and this has been observed in many settings either strategic and non-strategic setting especially in lab experiments (Guth and Kocher, 2014).

A setting in which traditional game theory systematically failed to describe the individual behavior is the ultimatum game (Camerer, Behavioral game theory, 2003). The ultimatum game (Houser and McCabe, 2014) is a game in which are two players (respectively proposer and receiver) that have to divide a given pie of endowment. Even if some tweaks and variations of the original game exist, in its simpler form (i.e. a one-shot ultimatum game) the game works as follow. An initial endowment is given to the proposer, which chooses how much of this initial endowment he/she wants to give to the receiver. The receiver then, can either accept or reject the proposed division. If he/she rejects, the payoff of both players is 0, if he/she accepts, the payoff is divided according to the proposal of the proposer. Backward induction prescribes that the receiver should be indifferent between accepting a propose of 0 and rejecting a propose of 0. It also prescribes that the receiver would accept any proposal slightly superior to 0 (e.g. one cent of proposal where the endowment is 100\$). Since the utility of 1 cent is superior to the utility of 0. So that in the Nash Equilibrium of the game, the proposer offers 0 while the receiver is indifferent between accepting or rejecting the offer (Debove et al., 2016).

After decades of experimenting with the ultimatum game (Guth and Kocher, 2014), it has become clear that accepting a trifling offer is an extremely unlikely event. Quite often agents tend to divide money equally between them to increase the probability of being accepted assuming the other party to be concerned with fairness (or for other possible reasons better discussed later). Also, Bearden (2001) points out that predictions of game theory are not able to explain the behavior of the receiver and observes that the behavior of the proposer is mostly explicable if we consider that he/she may give a certain importance to a fair outcome.

Several theories have been proposed to explain such deviations from a rational conduct observed in the ultimatum game.

There are several papers, that explain the existence of fair offers in the ultimatum game by the means of reputation or repeated interactions: these models predict that reputation or repeated interaction outside the lab (cultural explanation) or either at the biological level, led to the development of a sense of fairness that functions automatically and such sense of fairness would be responsible for the behaviors we observe in the ultimatum game (even when reputation and repetition are absent) (Debove, 2015). These models argued that although fairness is sub-optimal in a one-shot anonymous ultimatum game, it is an optimal strategy in the real world, so that fairness has become a norm and/or it has become embedded in our cognitive processes.

But can indeed the ultimatum game provide relevant insights to understand how fairness affects our decisions? Several authors affirm that rejections in the ultimatum game are not due to fairness.

Camerer (2003) argues that the equal division is not due to fairness concerns, but it is due to the fear of the proposer's that his/her offer will be rejected; he points to the fact that the modal offer is much lower in settings where rejection is not allowed (e.g.: dictator game). Other scholars (Fehr and Gächter, 2002; Gintis et al., 2003) argued that punishment plays a central role in the development of fair and cooperative behaviors, so that the strategic possibility of punishing by rejection leads to a more egalitarian outcome. Other scholars instead (Baumard and Sperber, 2010) emphasized the crucial lack of information in the ultimatum game. More specifically: the fact that players don't know who is entitled to receive the money or the lack of awareness about the cooperative (or competitive) nature of the interactions may lead to the observed outcomes. Kirchsteiger (1994) even suggested that rejections are not due to fairness concerns, but rather they are due to envy.

Thus, there isn't a strong agreement about the causes of these deviations from the rational conduct: scholars don't know yet if these are caused by fairness concerns or not.

Anyhow, with respect to the just mentioned theories explaining deviations from the rational conduct, it is possible to affirm that:

- *fear of rejection* is not a per se sufficient explanation for the behavior of the proposer in the ultimatum game. It is sufficient to watch what happens in the dictator game to understand why. This is confirmed by individual behavior in the dictator game is a form of ultimatum game in which receivers are not allowed to reject offers and therefore any strategic concerns are eliminated. Engel (2011) in a meta study found that 13.298 subjects out of 20.813 playing as dictators made a positive contribution (i.e. rather than maximizing their income, they give a portion of their endowment to the other players). Being that rejection is not possible, there must be something else that causes the sharing. One may suppose that the fear of rejection in the ultimatum game corroborates the effect of fairness, but it's obvious that another cause is needed to explain the behavior of the proposer in the UG. Therefore, we can't consider fear of rejection as sufficient explanation for the irrational behavior of the proposer.
- Even the presence of punishment as a strategic option (not the fear of being punished, but the rational expectation that this may happen) is not sufficient per se to explain the behavior of the proposer in the ultimatum game. As it has been explained in the preceding point, in the dictator game most of the times the endowment is shared even if retaliation is not possible. Nonetheless, one may presume that the presence of punishment as a possible strategic outcome corroborates the effect of fairness. After all, one may consider punishment (especially when costly and not utility-maximizing) as a way of enforcing expectations of fairness during an interaction.
- The lack of information is instead a more delicate issue. As Engel (2011) pointed out, subjects in the dictator game are likely to give less if they feel entitled to their endowment (for example, if they have worked to obtain it); at the same time, he found that if the recipient is deserving, he/she gets more. Also, Carr and Mellizo (2013) found out that proposers are more incline to formulate higher offers if the receiver had to produce the endowment. On the other hand, Demiral and Mollerstrom (2020) found no empirical support for the existence of an entitlement effect. Therefore, there is not enough ground to say with certainty that the irrational behaviors observable in the ultimatum game are caused by the information ambiguity. This because in the papers where an entitlement effect is observed this appears to be marginal: it brings proposers to offer a smaller portion of their endowment if they are entitled to it (or a greater portion if the receiver is entitled) but even if proposers feel entitled, they usually do not offer 0; furthermore, there is no unanimous consensus on the existence of such effect. It is also worth noticing that

knowing who's entitled to the endowment is a relevant information only in relation to fairness concerns. If we are not concerned with fairness, being entitled to something is completely irrelevant: what matters is who has the faculty to obtain the endowment and who cannot do so. Talking about what one is entitled to is talking about fairness (e.g.: I'm entitled to X therefore it's just fair that I get X). So, if it was true that there is such thing as an entitlement effect, it would be reasonable to subsume it under the more general concept of fairness.

- Envy has the potential to be a good explanation to explain the behavior of the receiver. Isobe and al. (2018) carried out an experiment that was aimed to observe the behavior of patients afflicted by nervous anorexia during the ultimatum game. They did so because nervous anorexia is generally assumed to be featured by a high level of guilt and envy. Results showed that patients afflicted by nervous anorexia had a strong preference for fairness, with high guilt and high envy. It has been observed that such patients are more inclined to propose higher offers and show a higher rejection rate. Therefore, the authors concluded that envy and guilt entailed a heavier weight attributed to fairness. Hence, envy is likely to be a relevant factor to explain irrational behaviors of the receiver in the UG, but it would be reductive to consider just envy. As Bosman and al. (2001) pointed out, emotions play a very important role in the rejection of unfair offers in the UG. They discovered that unpleasant emotions (i.e.: anger, contempt, irritation, envy and sadness) tend to be more intense for the receiver when the proposed offer is lower. They also found that the intensity of the negative emotions significantly increases the probability of rejecting the offers. Bosman and al. (2001) concluded that such emotions should be considered along-side fairness and equity concerns to explain responder's behavior. This because the intensity of the emotions is determined by the individual expectations and such expectations depend upon social norms. In particular, these individual expectations depend upon fairness norms that concern distributional beliefs. To describe how the unpleasant emotions previously discussed are intimately related with moral views (and therefore with fairness), it may be a good idea to consider an ideal experiment. Let's consider price gouging. Price gouging is the practice of dramatically raising prices when demand rises substantially. Such surge in demand usually happens because a certain event takes place, for example a natural disaster. Most of the times, price surges have a dreadful impact on the price of staples and other essential goods. Price gouging can be considered as a close example of a real-life ultimatum game. If you're planning to

spend the next few days in a shelter, there are some things that you absolutely need to have (e.g.: water, food, etc...). If price gouging is not illegal (as it is in some state) and a natural disaster occurs, market prices are likely to be extremely high. Hence, many people will face 'ultimatums': either they renounce to something indispensable, or they accept to pay an unfair price. Of course, many people may feel anger, contempt and irritation, but this largely depends on their moral view about price gouging (i.e.: if it's subjectively considered fair or unfair). If one thinks of price gouging as the outcome of an efficient economic mechanism, as something almost natural, it is not to take for granted that he/she will experience the above-mentioned unpleasant emotions associated with an unfair 'ultimatum' in such a situation. Hence, it should be clear that the subjective nature of moral views (and hence of what's fair and what's not) is the main determinant of the emotional response.

This said, the purpose of this paper is not to prove if the deviations from the rational conduct in the ultimatum game are due to fairness concerns or to something else (like envy or fear of punishment). In this paper it is going to be assumed that deviations from the rational conduct in the ultimatum game are caused by fairness concerns because the main interest is to study in which circumstances/situations fairness loses salience, and if it is possible to increase/decrease its salience.

Assuming fairness as one of the most relevant drivers for individual behavior in UG games, I'm interested to understand the two following issues related to fairness.

- Is our preference for fairness put in second place when fairness is something we can't really afford? That is, fairness concerns somehow a "luxury good"?

Common sense and historical knowledge give us room to think that it is indeed so: all the arguments one makes in favor of fairness become idle chatting in critical conditions. A prime historical example of this is what happened in concentration camps during the second world war. Primo Levi, a prominent Italian writer, wrote a book called 'Se questo è un uomo' (If this is a man). The book is about his autobiographical experience in a Nazis' concentration camp dedicated to Jews. He provides a vivid description of what the life in Auschwitz was. The book was hastily written between 1945 and 1947, with the purpose of letting the world and the posterity know what

happened there. He only exposes the facts, and he never romanticizes or adds fictitious elements to his tale. What he describes is quite brutal. The extreme lack of food, the more general lack of any kind of resource, and the too long hours of consuming work changed the way in which prisoners related to each other. One would expect solidarity, but the exact opposite happened. Among prisoners every expectation of humanity ceased to be. Prisoners stole from each other with impunity and no remorse just to grant their own survival. It was not uncommon to have your shoes stolen while sleeping, to have your clothes stolen while you were washing your-self, or to have your food (or even the spoon) stolen if you got distracted for a moment. Prisoners are well aware that their action will lead other prisoners to starvation, to die in the cold, or to sickness. And yet they don't care because what's fair and what's not is not important anymore: survival is the only thing that matters. This historical reality gives us room to think that fairness concerns are something whose salience is relative: if the situation allows it, we may prefer a fair outcome, but if the price to act fairly is too high to pay, then fairness becomes simply irrelevant. It is therefore worth testing if fairness loses its relevance when certain conditions take place with a lab experiment, to give scientific support to what is an already reasonable claim. The hypothesis is that a sufficiently high opportunity cost leaves no room for consideration of fairness, so that people will behave selfishly. I'll test this hypothesis with an ultimatum game.

- Second, we aim to test the influence that the priming effect has on fairness. The priming effect occurs when the individual exposure to some stimulus sub-consciously affects the response to a following stimulus, with no awareness of such conditioning (source: the decision lab). The priming effect has been showed to affect our cognitive processes in multiple ways. For example, the priming effect can affect risk preferences. Erb and al. (2002) found out that by the means of the priming effect it was possible to induce risk-seeking or risk-averse preferences across a range of decision scenarios. Furthermore, they discovered two additional facts: the priming operated on a preconscious level, and such priming manipulation is overridden when decision makers consciously consider the priming event. Apparently, the priming effect can also condition allegedly rational decision-makers. Gilad and al. (2008) discovered with an experiment that it is possible to influence risk attitudes and investment decisions of financial professionals (i.e.: accountants and investment advisors) by the means of the priming effect. The priming effect can also be induced by the means of sheer recollection. Madan and al. (2015) performed an

experiment in which they proved that it is possible to induce the priming effect by the means of recollection: before performing a simple risky-choice task, subjects were reminded of a previous win (or of a previous loss). The task consisted in choosing between a fix lottery, and a lottery that 50/50 could give either a higher reward, or a lower reward. It turned out that subjects who were reminded with previous wins were more risk seeking, while subjects who were reminded with previous losses weren't affected. The authors concluded that it is possible to affect risk preferences by the means of a reminder of previous winning experiences. The priming effect is also able to affect time preferences, and it can be activated by the means of different media (e.g. images). Israel and al. (2014) performed an experiment in which they tried to influence subjects' risk preferences and time preferences by the means of a priming effect induced visually and by the means of a priming effect induced textually. The visual stimuli consisted in the picture of a vacation, or in the picture of old people. In parallel, the textual stimuli consisted in a text about a vacation, or in a text about elderliness. They found out that the visual stimuli have been effective in conditioning time preferences and risk preferences but priming with the textual stimuli had no effect. More specifically, the picture of a vacation increased preference for the present and risk aversion, while the picture of the elderly reduced preference for the present. The priming effect can also condition social interactions. Vohs and alia (2006), realized an interesting paper on money priming. The researchers observed that reminding subjects about money led to reduced requests for help and reduced helpfulness toward others. Money priming incentivized participants to play alone, to work alone, and caused participants to put more physical space among each other. Priming effect turned out even to be effective on a supraliminal level for advertising. Karreman's and al. (2005) carried out two experiments aimed to study the effect of subliminal priming of a brand name. The brands advertised were beverages. They found out that the subliminal prime is effective, and that this effect is moderated by individuals' feeling of thirst: for participants that were thirsty the intention to consume the primed drink increased and they were more likely to choose it. The priming effect could also be used to change preferences for generosity. Andersson and alia (2015) performed an experiment in which they showed words with positive connotations to prosocial values for 17ms. They observed that subjects exposed to the prime increased donations of the 10-17% vis-à-vis subjects that were not exposed. The priming effect has also turned out to be able to affect subjects' dishonesty. Welsh and al. (2013)

tested the effect of ethical and unethical priming on subjects' dishonesty: they observed that both types of priming reduced dishonesty, even when participants were unmonitored and even if they were performing a very demanding task (that in theory should incentivize cheating). The priming effect could also cause a harsher enforcement of fairness expectations. In an experiment performed by McCay and al (2010) a religious priming increased the costly punishment of unfair behaviors from a small subset of participants (the ones that previously donated to a religious organization). The increase in costly punishment implies a greater salience on fairness achieved by the means of the priming effect. For the scope of this paper, it is of particular interest to study how the priming effect can make fairness more/less salient and there will be an attempt to prime people to behave fairly.

In conclusion, in this paper we are going to study the effect of two elements on fairness:

- the effect of the opportunity cost on fairness' salience
- the effect of the priming effect on fairness' salience

This will be done through a survey administered to a group of MTurk workers. Mturk is an online platform that is widely used for crowdsourcing: each worker is paid a small fee to complete a task of the length of some minutes. Hence, the sample will be composed by MTurk workers located in the US. Then the results will be subject to statistical analysis to assess their significance.

Chapter 1 - Literature review

1.1: Literature review for hypothesis 1

There are several papers where it emerges that fairness' salience (or fairness preferences) can be affected by several contingencies/circumstances that determine the cost of acting fairly.

Buso et al. (2020) carried out an experiment to study the effects of the Covid 19 lockdown on fairness and cooperation. Participants played an ultimatum game and a linear public good game, and the results showed that participants' behavior in the UG and in the PG games were affected by the lockdown. First finding is that the self-reported length of the isolation is associated with lower cooperation and fairness: participants isolated for more than six weeks provided smaller contributions in the PG game and made smaller offers in the UG; such difference resulted to be statistically significant. Second finding is that proposers in households with at least three housemates shared a greater portion of their endowment in the UG, and this resulted to be statistically significant; this gave room to think that living in a more socially stimulating environment promotes fairness and increase awareness of strategic uncertainty. Third finding is that participants living away from their hometown on average contributed more in the PG game (such difference resulted statistically significant), but they also offered less in the UG game; this led the authors to conclude that being far from home makes more likely to cooperate with strangers, but it also makes people incline to more ambitious claims. In conclusion, in this paper it has been observed that fairness loses salience when the self-reported length of the isolation increases, when the number of housemates decreases, and when people are far from home. Instead, effects on cooperation were more ambiguous: cooperation increased if subjects were far from home, it did not change significantly with the number of housemates, and it decreased with the self-reported length of the isolation.

Another insightful paper is the one of Spiller and alia (2016). Spiller and al. (2016) carried out an experiment aimed at understanding if people's norms (I.e.: what the individual thinks to be fair), normative belief (I.e.: what the individual think to be considered fair by the others), beliefs about other people contribution (to the public good), and one's own contribution (to the public good)

are affected by one's own endowment. There are two stable findings in this experiment. First finding is that people's norm and normative belief have the same average; furthermore, norms and normative beliefs are significantly higher than the average belief about co-players contribution (more than 70% of the subjects think that other subjects will give less than what's fair). This led the researchers to conclude that a social norm (1) does not exist being that subjects do not believe the others will follow it. Researchers also investigated if subjects were more inclined to an absolute contribution fairness (i.e.: if the fair contribution is defined independently from the individual endowment) or to a relative contribution fairness (i.e.: if the fair contribution is defined relatively to the individual endowment). Subjects in the experiment were either rich (i.e.: with a greater endowment), poor (i.e.: with a smaller endowment), or clueless (i.e.: uninformed about their endowment). Rich players considered absolute contribution fairness as the right thing to do, and they also assumed other subjects to share this belief; nonetheless, their contribution behavior shows relative fairness (i.e.: they contribute the same share of endowment that they expect poor players to contribute). Poor players instead considered relative fairness as the right thing to do, they considered that other people do as well, and they also expected subjects to contribute according to absolute fairness; nonetheless, poor players contributed significantly more (both in relative and absolute terms) than they expect rich players to contribute. Clueless players formulate the same fairness considerations of poor players: they think relative contribution fairness is the right thing to do and they consider that others do as well; they also expect a relative-fairness contribution behavior from others. Furthermore, the researchers carried out a regression analysis to observe what variables influenced individual contribution behavior. They found out the following variables to be statistically significant: subjects are influenced by their own normative beliefs (i.e.: what the subject thinks to be the right contribution); subjects are influenced by contribution belief of their own player type (i.e.: what other players of my same type are contributing); subjects are affected by the type of player assigned to them (i.e.: rich players are likely to give 20% less of their endowment).

Hence, in the work of Spiller and al. (2016) it figures that considerations about fairness are not absolute. Contribution behavior results to be crucially affected by norms and normative beliefs which in turn are dependent upon the initial endowment. The real-life implications of this findings are worth noticing. By assuming these findings to hold outside the lab, it is possible to say that

being rich makes the individual more inclined to support a neutral taxation, while being poor increases the likelihood of supporting a progressive taxation.

It is also insightful to observe fairness preferences in a setting with no actual bargaining, like the dictator game.

Bohnet and al. (1999) carried out an experiment to check for the identification effect in the dictator game (i.e.: the authors tested the effect of different degrees of identification between the dictators and the recipients). The idea behind the experiment, is that people would have a stronger preference for fairness if they had more information on the counterparties (because it is easier to empathize with them). In the two-way identification treatment group, subjects were asked to stand up and look each other in the eyes for a few seconds. In the one-way identification treatment group, subjects had a number assigned to them that made it possible to be identified by the dictator. In such group subjects were asked to tell the audience their name, hobbies, planned major, and where they came from. The researchers observed that two-way identification causes fairness and reciprocity to acquire salience (i.e.: they observed convergence towards an egalitarian division of the pie). One-way identification instead did not lead to convergence towards a more egalitarian sharing of the pie, although it has been observed that providing information about the subjects (in the context of one-side identification) caused dictators to be more regardful of the dictated.

Hence, in this paper fairness preference (and reciprocity) resulted to be dependent upon the extent to which the dictator was able to identify the subjects.

Another paper whose findings are especially relevant is the one of Anderson and alia (2006).

Anderson and al. (2006) studied to what extent subjects tend to punish other subjects in a voluntary contribution mechanism. The researchers carried out several experiments in which they changed the cost of punishing another player. To eliminate the possibility of punishing other players for strategic concerns, after each round players were matched with new players, so that there were no strategic incentives to punish another player. The authors found a significant level of punishment, and it has emerged that the two main determinants of the level of punishment are the price (to be paid) to punish, and how much the contribution of the punished player is

below the average (i.e.: the demand for punishment substantially increased with the level of free riding). Furthermore, it has been observed that when the cost of punishment goes to zero, for the same contribution behaviors of the players the demand for punishment increases notably. Another interesting fact to observe, is that even when the cost of punishment is greater than the penalty imposed on the punished, demand for punishment is still greater than zero. It also been observed that high contributors are more likely to punish low contributors, and that low contributors are more likely to punish high contributors. The first fact (i.e.: high contributors punishing lower contributors) is in line with expectations and it can be easily explained: by observing price responsiveness of punishment, the authors concluded that punishment should be considered as a good for which there is a tradeoff between the satisfaction of punishing and its monetary cost. Subjects seemed to define the utility from punishing similarly to the utility derived from other goods, so fitting punishment in a rational utility maximizing calculation. Hence, it may be argued that high contributors have a relatively stronger (with respect to the other subjects) preference for fairness, therefore, they are more incline to punish unfair behaviors. For the behavior of low contributors punishing high contributors, the authors couldn't provide a satisfactory explanation. The authors do not explain why punishing generates utility. The most likely explanation is that obtaining justice (in this case, punishing free riders) entails some personal satisfaction (i.e.: it has a positive utility attached to it), and this personal satisfaction is even greater if the victim takes part in the process, as Edna Erez (1992) and Edna Erez and al. (1993) pointed out.

Hence, we can conclude from the work of Anderson and al. (2006) that people are willing to pay a price for a fair outcome (i.e.: to punish free riders), that the willingness to pay for punishing varies from individual to individual, and that as the opportunity cost to obtain a fair outcome increases, people are less incline to forgo a gain in order to obtain it. In short, fairness turned out to be sensible to the opportunity cost.

Another interesting paper in which demand for punishment was estimated is the one of Carpenter (2006). He designed an experiment to understand if individual preferences for punishment are compatible with a standard economic analysis. Similarly to many scholars, he discovered that people are willing to incur a personal cost to punish free riders that hamper the efficiency of the

group interaction. From this (and from observing that several authors are in line with his findings), he concluded that adding to standard selfish preferences a preference for punishing free riders is reasonable. Furthermore, by the means of economic analysis Carpenter has been able to show that people are responsive to changes in price and income when considering if to punish free riders, in analogy to what happens with the consumption of standard commodities. More exactly, demand for punishment is downward sloped and relatively inelastic with respect to price and income. The author provided an interesting interpretation of this fact: being that punishment takes place for social reasons and not economic ones, it should not be surprising that demand for punishment is inelastic with respect to price and income. Despite the relative inelasticity of the demand for punishment individuals resulted to be sensitive to the price of punishment but not sensitive to the changes in income (i.e.: it has been observed a substitution effect, but the income effect was not relevant). The author concluded by saying that punishers not reactive to the monetary consequences of their action (i.e.: an inelastic demand for punishment) is something in line with the real world. To sustain his claim, he brings the example 'the lobster gang of Maine'. This is a well-documented real-life case in which fishermen were monitoring each other on the Maine coast to prevent other fishermen to fish excessively. Of course, these fishermen resorted to punishment to stop free riders. Such fishermen were risking high monetary fines because of their unorthodox punishing methods (e.g.: blowing up the boat of the free riders). Hence, these fishermen were seemingly uninterested in the monetary consequences of the punishment and although the exact estimate of the price elasticity Carpenter carried out has no external validity, the fact that punishment is inelastic with respect to price and income seems to be economically significant.

Another interesting experiment in which it has been studied if we attach an absolute value to fairness is the one of Eckel and Gneezy. Eckel and al. (1995) conducted an experiment to understand people's price sensitivity to fairness. More specifically, they wanted to understand if there are any gender differences in the price we attach to fairness. They carried out an experiment (i.e.: punishment game) in which players had to split a pie with another of the players, and each player had to choose if he/she wanted to split a pie with an unfair player (i.e.: a player that in a previous game session chose to keep the 90% of the pie for himself) or with a fair player (i.e.: a player who wanted a 50/50 sharing of the pie). The pie to split with the unfair player was bigger. Then there

were a low relative price treatment group and a high relative price treatment group. In the low relative price treatment group, the pie for choosing the unfair player was 12 \$ (to be split evenly), while the pie for choosing the fair player was 10 \$ (to be split evenly). In the high relative price treatment group, the pie for choosing the unfair player was 12 \$ (to be split evenly), while the pie for choosing the fair player was 8 \$ (to be split evenly). After running the experiment, the authors found that women are significantly more inclined to punish unfair behaviors. According to their regression, the probability of choosing to split the pie with the unfair player is 25% higher for men (*ceteris paribus*). It has also emerged that male subjects are price insensitive: their tendency to choose the fair/unfair player is unchanged in the low-price treatment group or in the high price treatment group, and they tend to choose the unfair player independently. Instead, it turned out that female subjects are significantly more price sensitive: the probability of choosing the unfair player in the low relative price treatment group is the same as their male counterparts, but when we pass to the high relative price treatment group, the probability of choosing the unfair player increases by 31%. From these findings, the authors concluded that 'men are more likely to make decisions on principle' (i.e.: they are more likely to have an absolute conception of fairness), while women are more susceptible to changes to the variables of the decision-making environment (i.e.: they have a relative conception of fairness, and they consider the opportunity cost for acting fairly). Hence, for women a higher price for fairness would entail a lower importance of this latter on the outcome of the transaction.

Aharoni and al. (2018) carried out two experiments to understand the effect of cost-benefit salience on simulated criminal punishment judgments. From the first experiment, it has been demonstrated that when costs of the incarceration are not made salient, participants are more likely to assign judgments that are 20-53% more severe with respect to those formulated when costs were made salient. This implies that participants heavily discounted information on costs when those were implicit, but they were subsequently able to incorporate them in a rational calculation as soon as the information became explicit. Indeed, the authors observed that there is a relationship between cost and punishment: increasing the cost of punishment entails an incremental reduction in the sentences, and preference for punishment was particularly elastic at relatively low price points. It has also been observed that the pattern of indulgence tends toward a plateau above zero (when the price of punishment becomes very expensive), implying

that there is a qualitative change in the willingness to pay for punishment across cost levels (i.e.: people are willing to pay the price for punishment independently from the cost). This change would be motivated by a shift from a rational strategy that weights cost and benefit to a strategy that aims at protecting moral values. Furthermore, even if subjects were informed that a third party (i.e.: not the taxpayers) was going to pay for the incarceration, sentences were decreased the same. Hence, when cost conditions were made salient subjects resulted to have elastic preferences towards punishment, but people were relatively inelastic when considering if to punish the subject or not (i.e.: people were convinced that the criminal should be punished but they were not convinced about the severity of the punishment). Also, other facts have been proven. First: the decrease in willingness to pay is not due to subjects' ignorance about the funding of prison institutes, but it could be partially explained by a lack of awareness on the magnitude of the cost of incarceration (i.e.: being that people lack information about the cost, they attribute a cost with their imagination which might be lower than the real cost). The authors concluded that this behavior is consistent with a cost discounting bias that is effective if costs are not made explicit. It is also interesting that subjects were mostly unaware of their responsiveness to cost salience, as they declared that they would not have assigned a longer sentence if funds were unlimited. It has also emerged that a not-small minority of subjects were fully insensible to the cost of punishment, while the remaining ones showed to have (as we mentioned before) elastic preferences with different degrees.

Hence, from this paper we can conclude that some people established what would be a fair outcome in the framework of a cost benefit analysis (i.e.: they considered fairness something relative), while others established what would be a fair outcome ignoring prices of the punishment (i.e.: they considered fairness as something absolute).

Another paper in which are examined people's attitudes towards costly punishment (i.e.: costly in social terms) is the one of Aharoni et al. (2019). In this paper, subjects had to assign a judicial sentence for a hypothetical crime (it is similar to the previously mentioned paper). The authors studied the elasticity of punishment when subjects were provided with information about the material costs of the incarceration. There are three findings emerging from this paper. First, when costs are made salient punishments are less severe (i.e.: shorter sentences). Second, when

punishment costs were not made salient (in the costly punishment group) the level of punishment was comparable to the one in the cost-free group (i.e.: the group in which punishment entailed no social cost). Third, it emerged that the political stance is a good predictor of people's preferences with respect to costly punishment: people with a deontological, conservative stance were more likely to assign harsh punishments even with high costs; people with a deontological, liberal stance were more likely to assign relatively softer sentences with respect to conservatives, although their preferences for punishment were inelastic (similarly to the conservatives); people with a consequential, moderate political stance instead showed to be more sensible to punishment costs.

Therefore, in this paper fairness preferences resulted to be affected by the perceived opportunity cost (i.e.: if costs were made salient sentences were reduced), and it emerged a certain heterogeneity among individual fairness preferences, that could be possibly predicted by the political orientation. The authors therefore concluded that there is a conflict between the rational view and the idealistic view, and how people mediate between these two strategies depend in part on cost salience. Hence, fairness emerged to be sensible to the opportunity cost in this paper.

Again, Aharoni et al. (2021) carried out another experiment aimed at determining if information provided about cost salience could influence professional prosecutors' sentences: it has been shown that if prosecutors were insulated (i.e.: it was not emphasized the economical aspect of the incarceration) they were more likely to assign longer sentences (i.e.: nearly 1/3 longer). In the beginning of the experiment, subjects were presented with a criminal case summary describing a fictitious defendant convicted for selling illegal substances. Then some information was presented to subjects. To one group of participants, it was presented information about the cost of the incarceration. To another group of participants, incarceration was presented by highlighting its fiscal advantages (i.e.: savings due to reduced crimes). To the third group of participants, it was presented no information about the cost or economic benefit of the incarceration. Information about fiscal advantages did not impact length of the sentences, but information about costs did. Therefore, the authors concluded that prosecutors incorporate economic considerations in the decision-making activities but are likely to neglect the information if it is not made explicit.

Another interesting paper is the one of Masclet and alia (2008). Their experiment consisted of a public good game with three groups of subjects. A group with an equal cost treatment (i.e.: a group in which it was possible to punish, but punishment entailed the same cost for both the punished and the punisher), a group with unequal cost treatment (i.e.: the sanction to the punished is greater than the cost paid by the punisher), and a group with equal cost treatment and a partner matching protocol (in the other two group a stranger-matching protocol has been used). Two findings from their work are of particular interest. First, it has been observed that individuals in the equal cost treatment recur to punishment: this means that individuals punish even if punishment is not useful to reduce the inequality between the payoff of the punished and the one of the punisher. Second, it has been observed that the intensity of the punishment and the difference in earnings between punisher and punished are strongly correlated. This result together with the previous finding, suggests that individuals punish even if they can't affect payoff differences, because the behavior of the punished (i.e.: the free rider) led to a state of inequality that triggered emotions leading to a punishing behavior. To put it in simple terms, people punish for revenge. Moreover, it has been observed that individuals are less willing to punish in the equal cost treatment in comparison to the unequal cost treatment, independently from the level of punishment. In the equal cost treatment, punishment is inflicted in the 12% of the cases, while in the unequal cost treatment punishment is inflicted in the 16% of the cases. Furthermore, the contribution threshold that triggers punishment is higher in the equal cost treatment (3.70) and it is lower in the unequal cost treatment (1.33). Hence, from this paper it emerges that the punishment of free riders depends upon the cost for the punisher and that the opportunity cost for punishing influences judgments about the acceptability of the other players' conduct (i.e.: if the player's conduct triggers punishment or not).

Even Egas and al. (2008) obtained similar findings in a paper where they were trying to study the impact of punishment magnitude (i.e.: how big is the penalty inflicted to the punished) and cost of punishment on altruistic punishment (i.e.: punishment where the individual pays a personal cost). They observed that the magnitude of the punishment and its cost have a significant effect on the threshold deviation that triggers punishment of free riders. More in detail, they observed that when the cost of the punisher is low and the magnitude of the punishment is high, the threshold is 2.41; if the cost to the punisher is low and the magnitude of the punishment is low

too, then the threshold is 5.34; if the cost to the punisher is high and the magnitude is high, the threshold is 8.33; lastly, if the cost of punishing is high and the magnitude of punishing is low, then the threshold is 11.3. Therefore, from this paper one can easily conclude that the willingness to punish varies accordingly to the cost to the punisher and accordingly to the impact of the punishment, leading us to think that people do not punish on an absolute basis.

1.2: Literature review for hypothesis 2

There are several papers where the priming effect has been used in relation to fairness. Maxwell and al. (1999) carried out an interesting experiment in which a simulated negotiation took place. In their paper, it has been proven that by priming a consideration for fairness, it is possible to affect buyer's behavior/perception. Buyers primed with fairness exhibited a more cooperative behavior (i.e.: they made larger initial concessions than the non-primed buyers). Buyers primed with fairness concluded the negotiation in fewer rounds and in less time. Buyers primed with fairness showed to experience more often positive subjective disconfirmation (i.e.: a situation where the negotiated price is greater than the expected price prior to the negotiation). Buyers primed with fairness also experienced greater satisfaction for the outcome and lower perceived inequality. Lastly, fairness primed buyers were also more willing to negotiate again with the seller. In another experiment on justice priming of Maxwell and al. (2003), researchers showed that subjects primed with fairness tend to be more vindictive for reciprocity violations. In their negotiation experiment, they observed that if sellers do not reciprocate buyers' cooperative behavior, fairness primed buyers act by retaliation. They concluded that priming for fairness appears to make negotiators more sensible to social concerns. Buyers primed showed greater concerns for fairness, they acted more emotionally, and they expected a fair treatment in return for their behavior. Hence, buyers primed for fairness resulted to be more cooperative, or vindictive if the seller didn't reciprocate cooperation.

Another interesting paper is the one of Zdaniuk and alia (2013). The aim of the experiment they carried out was to see if the enactment of fair (or unfair behavior) can be influenced at a subliminal level. In their experiment, subjects' behaviors have been manipulated by the means of a priming effect: first subjects read a textual primer (a description of a fair leader and a description

of an unfair leader) where it was included a picture of the corresponding leader. Then participants were subliminally exposed (i.e.: a picture was showed to them, but the viewing time wasn't long enough to be aware of it) to the face of the fair leader, to the face of the unfair leader, or to a neutral face. Then the researchers declared to the subjects that for another unrelated experiment they had to act as managers to write a letter. The letter was about communicating dismissal to a subordinate. It turned out that subjects primed with the face of the unfair leader showed a lower and significant degree of interactional fairness with respect to subjects that were showed the picture of the fair or neutral leader. It is also quite interesting the fact that the priming effect was still significant even after controlling for participant's explicit attitudes towards the dismissal decision and their explicit emotions, leading the researchers to think that the effect of the prime is not mediated by these two variables. It is also interesting to observe that the difference between the fair and neutral prime was negligible while the difference between the unfair and neutral prime was significant. The authors motivated this by arguing that there may be some delicate interactions that naturally demand to be sensible and coherent with some minimal ethical standards. A dismissal decision is one of those delicate interactions. Hence, fair interactions in similar situation could be the norm, so that the positive prime (i.e.: the prime with the face of the fair leader) had a trifling impact. In conclusion, the authors of this article couldn't successfully influence people to behave fairly, but they have been able to influence people to behave unfairly.

In another paper instead, Schorn and al. (2009) have been successfully able to increase tips in a bathroom by priming subjects with the concept of honesty. The prime used by the researchers were 'mirrored words' (i.e.: words written in an inverse way), and the researchers put the stimuli in several locations (i.e.: on some sheets of paper, on the door as poster, and on the wall as a sticker). The author also primed another group of subjects with the same method, but with the word 'dishonesty'. It turned out that there is a statistically significant between the contribution of subjects primed with 'honesty' and the control group. The same can't be told for the group of subjects primed with 'dishonesty': their contributions behavior wasn't significantly different from the contribution behavior of the control group and of the group primed with honesty.

In conclusion, by the means of a supraliminal primer the authors have been successfully able to lead people to act more fairly.

Another interesting paper is the one of Tereza Tizkova (2019). In this paper the author used a priming manipulation to induce prosocial behaviors. To measure prosocial behavior, the researcher used some items from the GPS (global preference survey), and such questions are usually considered as a reliable indicator of prosocial behaviors. More specifically, the GPS is a set of questions that measure risk and time preferences, positive and negative reciprocity, altruism, and trust. The researchers only used the questions to measure reciprocity and altruism. The prime used was instead a verbal primer: that was either positive or negative depending upon the group of subjects (i.e.: a treatment group of participants was primed with positive concepts to incentivize prosocial behavior while another treatment group was primed with negative concepts to incentivize antisocial ones). In detail, the verbal primer consisted of a set of questions related to several concepts: generosity (e.g.: when was the last time you helped someone?), relatedness (e.g.: when was the last time you felt close to someone?), fairness (that was defined as considering the feelings of thy neighbor when making decisions), childhood memories, gratitude, affiliation, and money. Depending on the group, questions could be either a negative or a positive primer, except for childhood memories, gratitude (that were only used for positive priming), affiliation, and money (that were only used for negative priming). For what concerns the results, it emerged that positively primed subjects reported higher adjusted GPS scores, so there is evidence supporting the effectiveness of the verbal prime to induce prosocial behaviors; it has also emerged that negatively primed subjects did not report adjusted GPS scores that were significantly lower from the ones of the control group. Hence, there is no support for the hypothesis that negative prime could be used to incentivize antisocial behaviors, but the positive prime has been successfully able to condition people to behave fairly.

Another interesting experiment is the one of Kettle and alia (2017). In this field experiment the researchers primed several Guatemalan taxpayers immediately before they had to file a tax return (the prime was inserted in a CAPTCHA pop-up window). The aim of the researchers was to lead taxpayers to provide more honest declarations. The researchers tested the effectiveness of several primers: information about public goods, questions allowing the taxpayer to suggest on

which public good he/she thinks money should be spent, honesty declaration, information about penalties for dishonesty, or questions allowing the taxpayer to express an opinion on the penalty for false declarations. It turned out that all these primers had a trifling impact on the average amount of tax declared. To explain this result, the researchers brought several arguments that are mostly related to the experimental design: the primes could have been too distant from the form itself (i.e.: they weren't incorporated in the form); participants could have simply ignored the prime; in many online settings, honesty primes could be ineffective to prompt honest behaviors; Guatemalan citizens filing taxes declaration may be doing so already honestly because the probability of not filing and being prosecuted is very low in that country; lastly, the prime could have been simply ineffective in this experiment. Hence, in this experiment the priming effect resulted to be unable to elicit a fair behavior.

Another interesting paper for our analysis is the one of Narwal et alia (2019). In this paper it is studied how social norms affect consumer's behavior in the pay-what-you-want pricing (i.e.: a pricing mechanism where the consumer chooses the price he is willing to pay, that could be also 0) in an online retailer setting. Among the several hypotheses, the researchers tested the effect of norm priming when there is a violation of the primed norms. The violation consisted in an online seller suggesting to the same consumer two external reference prices (on two different accounts of that consumer) that were very distant from each other. The primed norm, was that the same retailer shouldn't discriminate across consumers (i.e.: he/she should charge the same price to everybody). From the experiment, it has emerged that an individual retailer charging two different prices is perceived as unfair. More importantly, it turned out that norm priming (i.e.: in this experiment the primed norm was a pricing norm) increases the intensity of consumer's reaction to the norm violation. More specifically, primed consumers had lower price fairness perception, lower willingness to pay, and more intention to spread negative word of mouth. Hence, from this paper we can conclude that norm priming can make consumers more susceptible to fairness, possibly leading to harsher retaliatory conducts in case of violation.

Another interesting paper is the one of Shariff et alia (2007). The main focus of this paper is the effect of religious prime on prosocial behaviors. They carried out two different studies to test the effectiveness of the religious prime. In the first study, half of the subjects were primed with the

concept of God by the means of the scramble-sentence paradigm of Srull and Wyer (1979) (2), while the other half of the subjects wasn't primed. More specifically, subjects had to unscramble 10 sentences of five words while eliminating the extraneous words to form a coherent sentence. After the task, subjects performed a one-shot version of the dictator game. All subjects played as dictators, and they were informed that they would have been playing with other players. To each player was granted anonymity. There are several findings emerging from the first study. It has been confirmed the general tendency to behave selfishly in one-shot anonymous games. A consistent number of people (36%) gave nothing in the control group (the one not primed), while in the treatment group the 16% left nothing. Similarly, in the control group only the 12% chose an egalitarian division of the pie, while in the treatment group subjects choosing an egalitarian division of the pie have been the 52%, so that the modal response rather than selfishness has been fairness. Interestingly, the primer has been effective both on atheist and on theist in a similar measure (3). The prime turned out to be more effective than explicit religious belief to drive people towards a fair sharing. Hence, from the first study it has emerged that religious priming (i.e.: priming subjects with the concept of God) leads people to behave fairly. The second study of the paper is similar to the first one but there are some differences: the sample (i.e.: in the first study all subjects were students, while in this one subjects are recruited in Vancouver), the no-prime control group became a neutral prime control group, an additional priming condition was introduced (i.e.: a secular prime) (4), and two further questions to assess subjects' awareness of the priming manipulation have been included at the end of the study. In this second experiment the religious prime had effects that are comparable to the ones of the previous experiment: the modal offer shifted from selfishness to fairness (i.e.: 44% of 50/50 offers in the religious priming group vs 28% in the neutral priming group) and while in the control group 40% of the subjects behaved selfishly (i.e.: made an offer of 0), in the religious priming group only 12% did. The secular prime instead, had an effect whose magnitude was near to the one of the religious prime. Differently from the previous study, the religious prime had no effect on the conduct of the atheist (5). For what concerns the awareness of the subjects, three subjects were to some extent aware of the manipulation, so they have been dropped from the study, the others were not aware of the manipulation. The explanations that the researchers provide to motivate the effectiveness of the religious prime are worth mentioning: they argued that the activation of

the concept of God serves as sufficient input condition to trigger agency detection (6), and this leads the brain to implicitly assume the presence of an intentional watcher, so undermining anonymity and resulting in more altruistic behaviors; or either it could be that the effect is due to the association of the concept of god with concepts such as charity and generosity. Hence, this study confirms that it is possible to lead people to the actuation of prosocial behaviors by priming them with religious concepts (or secular ones).

game, and prisoner Taking example from the work of Shariff et alia (2007), Tucker (2015) performed a similar experiment, but he substituted the dictated (that in the Shariff's paper was assumed to be a subject) with a charity. As for the previously mentioned paper, subjects were primed using the scramble sentence paradigm and the prime could have been either a neutral prime, a justice prime, or a religious prime. Furthermore, subjects were randomly assigned to one of the three possible charities: one of them was nameless, another was to help the agricultural industry in the Arkansas Delta and Appalachia, while the third was to help the agricultural industry in Haiti. One difference with the experiment of Shariff et al. (2007) is the fact that subjects were able to see how much the other participants allocated (the experiment took place in a classroom). Another difference is the attempt to measure the salience of the religion beliefs (i.e.: how much participants practiced the declared religion) and a classification for the kind of religions professed by the participants (nontheistic vs theistic). Another relevant difference is the amount given to the dictator (1 dollar in this experiment vs 10 dollar in the one of Shariff). The findings of Tucker go in the opposite direction with respect to the ones of Shariff et alia (2007): the religious and secular prime caused a notable decrease in the amount given (the secular prime had a more extreme effect), and such effects resulted to be statistically significant. Another finding that is unexpected is about the effect of the charity assigned: the nameless charity received significantly larger contributions, although researchers were expecting that participants would have donated more to an identifiable charity because of the decrease in social distance. In a similar fashion to the Shariff's paper, the self-reported religious identity did not have any significant effect on the amount of money donated. The researchers brought several reasons to motivate the ineffectiveness of the primer. It is stated that the ineffectiveness of the primer may be due to the nature of the recipient (the charity is not another player but an entity): although the charity is an entity that helps the others, people may perceive donating through a charity as different with

respect to helping someone directly. Being that the justice prime had a more extreme effect, another possible explanation could be related to the concept of justice: the prime may lead people to consider if the charity is donating money to the ones that deserve it (i.e.: because of the prime the charity is perceived as less worthy). Another possible explanation is the different sample used in the study (with respect to the sample used in the study of Shariff). Another possible explanation (and the most likely) is the reputational effect arising because participants could know how much each other donated and vice-versa. To explain the fact that people donated more to the nameless charity, the researcher argued that naming the charity could induce people to evaluate if the charity is worthy or not. This finding is particularly interesting because it is contrary to what normally happens in a dictator game (information about the dictators usually increase contributions).

Hence, in this paper it emerged that using a primer to condition people to behave fairly may be counterproductive.

Another interesting paper is the one of Winter and alia (2020). The researchers carried out an experiment to observe if priming subjects with the concept of money affects trust and fairness. The games played in the experiment were the ultimatum game, the trust game, and the dictator game. The researchers were expecting to observe a less egalitarian behavior in all the three games for subjects primed with money. More precisely, the researchers expected receivers primed with money to accept lower offers (i.e.: to have a lower threshold for rejection) and they expected proposers primed with money to make lower offers. It emerged that the difference between the offers and thresholds of the primed and not primed group are not statistically significant. In the trust game instead, the researchers hypothesized that subjects primed with money should be less willing to rely on the cooperative behavior of the other player, so being more inclined to choose the selfish behavior (defection). The difference of the tendency to defect of primed subjects and not primed subjects resulted not to be statistically significant. Even in the dictator game, there was no significant difference between the behavior of primed and not primed dictators (in terms of endowment shared with the dictators). Hence, in this experiment the money prime turned out to be ineffective to affect fairness, trust, and cooperation. Another interesting paper is the one of Galinsky and alia (2003). They carried out an experiment where subjects were primed with

power, to observe if such prime could lead to the enactment of prosocial or socially detrimental behaviors. The prime consisted in a recollection activity: before proceeding with the tasks, subjects had to write an essay about an incident they had in the past; participants in the low-power conditions had to remind an incident where they were powerless, while participants in the high-power condition had to remind a situation where they were powerful. Subjects in the neutral prime condition instead, had to write an essay about the day before the experiment. It resulted that priming subjects with power increased action in both cases: power-primed subjects were significantly more likely to deplete the common resource in a social dilemma game, and they were also more likely to contribute in a public good game. More in detail, subjects primed with high-power were significantly more likely to take actions, with respect to both the neutral primed subjects and the low-power primed subjects. The difference instead between the tendency to act of the low-power primed subjects and the neutral primed subjects didn't result to be statistically significant.

Hence, from this paper it results that it is possible to prime individuals with power to increase agency. Therefore, depending on the context this may result in a stronger (or weaker) preference for fairness.

Another interesting paper is the one of Jonas et alia (2013). In their paper they examined how mortality salience affects generosity and greed. In the third experiment of the paper (a dictator game), they combined mortality salience with a fairness prime. To manipulate mortality salience, a questionnaire of two questions was used, that to the subjects was presented as a personality test called 'Projective Life Attitudes Assessment'. The first question was about the emotions that thinking about death generates while the second question was about what will happen to you after death. In the control group instead, the questions were analogous, but they were about dental pain. After filling the questionnaire, subjects were primed with either a fairness prime or with a neutral norm prime. The prime consisted in a sentence unscrambling task. More specifically, subjects in the treatment group had to unscramble 14 sentences, and among those 9 were related to the concept of fairness. In the control group instead, subjects unscrambled 14 neutral sentences. It resulted that the effect of the fairness prime is significant, while the effect of mortality salience is only marginally significant. It is important to notice that these two effects

interacted between them significantly: only in the mortality salience condition the prime resulted effective, while it didn't in the dental pain condition; conversely, mortality salience resulted to be effective just when paired with the fairness prime (if paired with the neutral prime the effect wasn't significant). The effect was remarkable: on average people exposed to both morality salience and to the fairness prime gave more to the anonymous participant than what they kept for themselves (i.e.: on average, subjects kept for themselves 4.21\$ in the MS/fairness prime group, while subjects exposed to the MS condition and to the neutral prime kept for themselves 6.75\$). Hence, in this experiment it was demonstrated that mortality salience joined with a fairness prime causes people to behave more generously (even hyper fairly in this case).

Another interesting work is the one of Michailova and alia (2015). The researchers performed three experiments (i.e.: ultimatum game, dictator dilemma) to observe the effects of money priming (i.e.: a reminder about money) on the subjects. The researchers expected primed subjects to be more selfish in the dictator game, to be less generous in the ultimatum game (and to have a higher threshold for rejection), and to be less cooperative in the prisoner dilemma. Researchers found out that the money priming was not sufficient to induce a systematically different behavior.

Lastly, Lucas and al (2020) carried out an experiment to prime justice. First, they assessed participant's beliefs about distributive and procedural justice for self and others. Then participants were primed to think about distributive or procedural justice (for self or others). After that, general forgiveness attitudes and motivations to forgive a past transgression were measured. It resulted that participants with strong beliefs in distributive justice for others showed reduced forgiveness by thinking about distributive justice for others, but it was reinforced when thinking about distributive justice for self, or procedural justice for others. Among participants with strong beliefs in procedural justice for others, forgiveness was reinforced if the subjects thought to procedural justice for self or distributive justice for others. Hence, priming justice has been showed to have effects on forgiveness.

Chapter 2 - Theory and methodology for testing hypotheses

2.1: Models of fairness and definition

For the purpose of our analysis, it is also important to define fairness from a theoretical point of view.

Early research identified three dimensions of fairness:

1. Adams (1965) identified relative deprivation and distributive concerns as a source of injustice perception. When there isn't relative deprivation and when there is an egalitarian/meritocratic distribution of resources, the individual perceives to be treated fairly.
2. Thibaut and Walker (1975) identified procedural justice as another relevant dimension of fairness. That is, the nature of the decision-making process can condition judgment about the fairness of the outcome.
3. Bies and Moag (1986) identified instead the quality of the interpersonal treatment (i.e.: if someone is behaving politely/nicely) as another relevant dimension.

Nonetheless, pushed by the need to develop a unifying theory, Folger et Cropanzano (2001) starting from these several dimensions formulated a complete theory. According to them, for something to be perceived as unfair, there must be accountability. Accountability (in case of a tort) has three components: there is a harm done to someone, this harm is attributed to the intentional/wrongful action of another individual, and lastly, this action violates some ethical norm. These conditions are necessary to hold someone accountable for an unfair treatment/event.

With respect to the UG, it is possible to say that the three relevant dimensions of fairness are present:

1. The distribution of the endowment depends upon the will of the proposer. It follows that a proposal that would lead to an unbalanced distribution is object of fairness concerns.
2. Being that the offers in the UG are formulated in a quite arbitrary manner (i.e.: the proposer decides how much to offer), it is not possible to say that the process is per se

impartial/objective/unbiased, and hence fair. Hence it is possible to say, that procedural fairness is also a determinant of fairness perception in the UG.

3. The relevance of the quality of the interpersonal treatment in the UG depends upon the design of the experiment. Of course, this aspect is more relevant in experiments in which the subjects can talk to each other.

Therefore, it is possible to say that these three dimensions of fairness are present in the UG.

Furthermore, for what concerns accountability in the UG it is possible to say that:

1. If the proposer offers a small portion of the endowment, the receiver is indeed damaged because he/she will probably receive less money than he/she would like to get.
2. Of course, the receiver will consider the offer formulated by the proposer as intentional.
3. Lastly, since we are children, we are usually educated to an egalitarian sharing in situations where there is no clear-cut rule to assess property rights. This idea is very intuitive, ancient (e.g.: it is present in the bible in the parable of King Salomon), and it is indeed an ethical standard in many western societies. Hence, proposing a low offer (i.e.: an offer that is lower than 50/50) in the UG may result unethical.

Therefore, in this paper we adopt the definition of fairness of Folger and Cropanzano (2001) and although we didn't define what is fair, we have defined what is unfair. To recap, it is possible to say that something is considered unfair if there is a harm inflicted to someone, if this was intentional, and if it violates ethical standards, and a small offer in the UG fits all three categories (so that it can be deemed unfair).

To understand how fairness concerns affect us, it would be also appropriate to quickly review the several attempts to model fairness concerns in game theory.

As Fehr and Schmidt (2006) pointed out, there are several other theories that attempt to model other regarding preferences. It is possible to say that there are four classes of models.

First class are social preferences models.

Models of social preferences assume that the individual is not only concerned with his/her own payoff, but also with the general allocation of the resources. In more formal terms, by defining

the general allocation of resources $x = (x(1), x(2), \dots, x(N))$ where $N = (1, 2, \dots, N)$ is the set of individuals, it is possible to say that the utility of the player i is not only affected by $x(i)$ (i.e.: the resource allocated to player (i)), but it is also affected by variations in $x(j)$, where $j \neq i$.

Social preference models are three:

- Altruism.

Assuming altruism implies that once we define the utility function of the individual as $U(x(1), x(2), \dots, x(N))$, then the individual is altruistic if the partial derivative of the utility function with respect to each of the $x(i)$ is strictly positive, where $x(i)$ is the resource allocated to the (i) individual. In simple terms, it is possible to define an individual as altruistic if for every increase in someone else's payoff also his/her payoff increases. That said, according to the findings of Andreoni and Miller (2002) only a small portion of individuals can be defined altruistic by adopting this definition.

- Relative income and envy.

This theory assumes that subjects are not only concerned with the absolute value of their payoff, but they are also concerned with the value of their payoff with respect to the value of the other people's payoff. In formal terms, it is possible to say that in a two-player situation where the utility of the player (i) is defined as $U(x(i), x(i)/x(j))$, the partial derivative with respect to the first argument $x(i)$ is always strictly positive while the partial derivative with respect to the second argument $x(i)/x(j)$ is strictly positive for $x(i) < x(j)$ and it is equal to 0 for $x(i)$ equal or greater than $x(j)$. This implies that the partial derivative of the utility function with respect to $x(j)$ is equal or inferior to 0, so that this theory is the opposite of the above-described altruism. The problem with this theory is that it doesn't explain why altruistic behaviors take place (e.g.: donating in the DG).

- Inequality aversion.

According to Fehr and Schmidt (1999), inequality aversion implies that individuals are altruistic towards the other player if the material payoff of the other player is under a certain threshold, and that individuals are envious when the payoff of the other player exceeds this threshold. This

theory therefore implies that individuals will take decisions aimed at reducing inequalities. The utility function defined by Fehr and Schmidt is

$$U_i(x_1, x_2, \dots, x_N) = x_i - \frac{\alpha_i}{(N-1)} \sum_{j \neq i} \max(x_j - x_i, 0) - \frac{\beta_i}{(N-1)} \sum_{j \neq i} \max(x_i - x_j, 0)$$

Where $0 \leq \beta_i \leq \alpha_i$ and $\beta_i \leq 1$, so that the partial derivative of the utility function of player (i) with respect to $x(j)$ is superior or equal to zero iff $x(i) \geq x(j)$. This implies that as long as the payoff of player (i) is superior to the payoff of player (j), an increase in the payoff of player (j) also increases the utility of player (i). It is also worth noticing that the decrease in utility of player (i) for inequality is greater when another person has a greater payoff than player (i) rather than when another person has a lower payoff than player (i) because $\alpha_i \geq \beta_i$. This theory is actually able to explain several altruistic behaviors observed in many settings: donating in the DG, behaving kindly in trust games or exchange games, contributing/punishing free riders in voluntary contribution mechanisms, and rejecting low offers in the UG. Furthermore, in this model individuals are assumed to be heterogeneous with respect to their preference for fairness, and Fehr and Schmidt showed that the interaction between the types of players and the environment can lead to very egalitarian or very unfair outcomes.

Another model of inequality aversion that deserves attention is the one of Bolton and Ockenfels (2000). The utility function of this model is

$$U_i = U_i(x_i, \sigma_i)$$

where

$$\sigma_i = \begin{cases} \frac{x_i}{\sum_{j=1}^N x_j} = \text{if } \sum_{j=1}^N x_j \neq 0 \\ \frac{1}{N} \text{ if } \sum_{j=1}^N x_j = 0 \end{cases}$$

So that the utility function is assumed as concave and weakly increasing with respect to player (i)'s material payoff x_i for any value of σ_i .

Although this model with respect to the one of Fehr and Schmidt performs similarly, there is a crucial difference about how the income inequalities affect the individual behavior when there are more than two players. In the model of Fehr and Schmidt, it is assumed that the player makes an individual comparison between his/her payoff and the one of the other players. In the model of Bolton and Ockenfels instead, it is assumed that the player is comparing his/her payoff with the average payoff. So that in this model the partial derivative of the utility of player (i) with respect to the variable x_j (i.e.: the material payoff of player j) is not determined by the value of x_j relative to the value of x_i , but it is determined by the value of x_i with respect to the group average. This implies that even if both player (i) and player (j) had a payoff under the average, with the payoff of player (i) being greater than the payoff of player (j), the utility of player (i) would increase for a reduction in the payoff of player (j). Conversely, if both player (i) and player (j) had a payoff above the average with the payoff of player (j) being greater than the payoff of player (i), player (i)'s utility would increase if he/she gave some of his/her payoff to j.

This model proved to be successfully able to explain the outcome of several games (i.e.: the altruistic behaviors in the DG, the kind behaviors in the gift exchange and trust games, and the rejection in the ultimatum game).

Second class are interdependent preferences models.

These models assume that players can be of different types (e.g.: altruistic or selfish) and that the behavior of the player depends upon the belief about the type of the other player. Hence, the player is conditioned by the other player/s in two ways: his/her allocation is affected by the other players' actions and his/her allocation is conditioned by the information provided by the other player's actions. These models are called 'interdependent preference models' because the preference of a player depends upon the preference of another player and vice-versa. There are several of them, and because of the interdependent nature of the preferences these are more mathematically complex than the previously mentioned ones.

Levine (1998) developed a model of interdependent preferences. He assumed a utility function such that

$$U_i = x_i + \sum_{j \neq i} x_j (a_i + \gamma a_j) / (1 + \gamma)$$

Where $0 \leq \gamma \leq 1$ and $-1 < a_i < 1$ for every (i) belonging to $N = (1, 2, \dots, N)$. If one assumes $\gamma = 0$, then if $a_i > 0$ player (i)'s utility increases when the payoff of the other player increases (i.e.: the player is altruistic), while if $a_i < 0$ then player (i)'s utility decreases when the payoff of the other player increases (i.e.: the player is spiteful). Unless the value of a_i is assumed to be close to zero, or unless the value of a_j (i.e.: the value indicating if the other player is spiteful or altruistic) is assumed to strongly differs across scenarios, this model fares poorly when it is trying to explain the different behaviors (i.e.: sometimes altruistic, sometimes spiteful) of the same player across more games. If instead γ is assumed to be strictly greater than 0, then a player with $a_i > 0$ (i.e.: an altruistic player) feels more altruistic towards altruistic players. Moreover, if $-\gamma a_j > a_i$ player (i) may behave spitefully. With similar assumptions, the implication for a sequential game is that the optimal equilibria are determined by what the players signaled to each other, and this causes a plural number of equilibria. Although this model is able to explain the outcome of some games (i.e.: centipede games, public good games, and market games), it is not able to explain why people share their endowment in the DG.

Third class are models of intention-based reciprocity.

These models assume that not only the behavior of the other players is important, but also his/her intentions are. That is to say, the player is conditioned by two different beliefs: the belief about what the other players are going to do, and by the belief about why the other players are going to do that. So that when the other player chooses an action, it is relevant for the player to understand if he/she did so because he/she believed that the player was going to behave kindly, or if he/she believed that the player was going to behave selfishly. This kind of models usually do not fit well traditional game theory: game theory assumes that the player's strategy is determined by the beliefs about other players' strategy, and not by their intentions. Hence, the models of intention-based reciprocity apply to what the scholars call 'psychological game theory': a game theory that computes the payoff in function of player's beliefs about other players' intentions.

Last class of models are axiom-based models.

These models assume axioms that generate behaviors that are coherent with fairness and reciprocity. An important work in this field is the one of Segal and Sobel (2004). According to their model, player (i)'s preferred strategy is given by a preference relation $f_i \sigma_j$, where σ_j is the belief about player (j)'s strategy. It is possible to prove that if the preference relation $f_i \sigma_j$ satisfies the self interest axiom (i.e.: ceteris paribus, if player (i) has a higher material payoff he/she has a higher utility) and the independence of irrelevant alternative axiom (i.e.: an axiom according to which the utility attached to a certain outcome is independent from irrelevant alternatives), then it is possible to write a utility function as

$$u_i(\sigma_i, \sigma_j) = v_i(\sigma_i, \sigma_j) + a(i, \sigma_j) v_j(\sigma_i, \sigma_j)$$

where $v_i(\sigma_1, \sigma_2)$ indicates player's (i) utility function solely with respect to his/her own payoff and $a(i, \sigma_j)$ is positive if player (i) has altruistic preferences, while it is negative if the player (i) has spiteful preferences. Furthermore, this model considers only two players and the utility function $v_i(\sigma_1, \sigma_2)$ satisfies the von Neumann-Morgenstern axioms. It is worth noticing that many of the models we've just discussed (i.e.: relative income, altruism, inequity aversion, altruism and spitefulness) can be subsumed under the Sobel and Segal utility function.

This said, for the purpose of our analysis none of the above-mentioned models is going to be adopted. The aim of this paper is to understand if fairness concerns are affected by the opportunity cost and if they can be conditioned by the means of the priming effect, so that the modelling done in this paper will be aimed at testing the significance of the effects of these two aspects on the outcome of our experiments.

2.2: Hypotheses

In this paper I'm going to test two hypotheses.

Hypothesis 1: if the opportunity cost (i.e.: what you forgo in order to obtain a fair outcome) becomes higher, fairness loses salience.

Hypothesis 1a: if the opportunity cost (i.e.: the money that one would gain by renouncing to the fair outcome) becomes higher, then individuals are more likely to accept unfair offers.

Hypothesis 1b: if the opportunity cost (i.e.: the money that one would not lose by renouncing to the fair outcome) becomes higher, then individuals are more likely to accept unfair offers.

Hypothesis 2: the priming effect can make more/less influential fairness considerations in the decision-making process.

Hypothesis 2a: by the means of a fair textual prime it is possible to corroborate the effect of fairness in the decision-making process.

Hypothesis 2b: by the means of an unfair textual prime it is possible to weaken the effect of fairness in the decision-making process.

2.3: Methodology for testing hypothesis 1

To test the hypothesis 1, I will perform an experiment consisting in the ultimatum game: the first part of the experiment is aimed to test hypothesis 1a, while the second one to test hypothesis 1b.

In both parts of the experiment subjects will be playing the ultimatum game as the receiver. Technically, it's improper to say that subjects will play the ultimatum game: they will fill a survey providing information about what would be their strategy if they were playing the ultimatum game. In both groups, subjects will be presented with a hypothetical situation, and they will have to decide if to accept or reject an offer. The survey is divided in two parts: in the first part hypothesis 1a is tested, while in the second part hypothesis 1b is tested. At the beginning of part 1, subjects will read the instruction on the cheap talk (better discussed later). For the first part of the survey, instructions will be the following. 'Consider the following scenario. You and another individual just won the famous Random Award. The Random Award is a lump sum that is randomly given to two individuals for sharing. The only condition to be met to receive the money, is that the winners must share the sum according to the following procedure. The proposer will propose how much of the award he wants to keep for him-self, while the receiver will decide if to

accept the proposal, or if to reject it. If receiver rejects, both the proposer and the receiver get nothing.’.

To check if subjects correctly understood the rules, before presenting the offer to the subjects they will have to answer to three questions. For example:

‘Assume to be the receiver. The lump sum is 500 and the other winner offers to you 170.

- How much do you get if you accept? Write the answer here:
- How much do you get if you reject? Write the answer here:
- How much does the other winner get if you reject? Write the answer here:’

After the questions to check the understanding of the rules, it will be revealed to subjects how much it has been offered to them. The offer will be 1 euro out of 100 euros in the control group, and 10,000 euros out of 1,000,000 euros in the treatment group. But before providing the answer, subjects will also answer the questions on the consequential design (better discussed later).

Usually, offers that are under the 30% tend to be refused because considered unfair (Yamagishi et alia, 2012). Nonetheless, it is not to take for granted that an offer of the 1% will be refused if the total sum is 1,000,000 euros. This because 1% of 1,000,000 euros is 10,000 euros, and this sum is sufficiently high to generate a prohibitively high opportunity cost for acting fairly. Hence, the expectation is to observe a higher acceptance rate in the treatment group, and it will be assessed if the greater size of the payoff has a significant effect on the acceptance/rejection decision.

Unfortunately, it wouldn’t be possible to pay each couple of subjects 1,000,000 euros. Hence, all the payoffs will be purely hypothetical. This introduces a potentially invalidating ‘hypothetical bias’. According to Oxford’s catalogue of bias, ‘hypothetical bias’ happens when subjects report unrealistic answers during an experiment, so introducing a discrepancy between what the individual is declaring he/she would do in a hypothetical situation against what he/she would do in a real-life scenario. Alas, it is not possible to replicate the state of cognitive dissonance (7) that an individual would experience in a similar situation by the means of an experiment without spending millions of euros. If an individual was to decide if to accept or reject an unfair offer for 10,000 euros, he/she would probably feel powerful emotions (e.g.: anger, resentment, joy, etc...)

and such emotions would play a fundamental part in the decision-making process. Therefore, the emotional aspect of the decision-making process is not fully captured in this experiment. Hence, it should be considered that this crucial lack of emotions in the decision-making process might make the reported answer more deliberate/rational and less intuitive/emotional.

To decrease the hypothetical bias, I will use 2 of the methods suggested by Loomis (2013).

1. Consequential design. This is typically used for public good games. It consists of three features. Consequentiality: the answer provided must generate consequences for the respondent (e.g.: higher taxes to be paid in the future in the case of a public good). Binary format: for the choice to be truthful, the possible answers must be provided in a binary format (i.e.: yes or no should be the only possible answers). Compulsiveness: the consequences of the choices should be considered as binding (e.g.: in a public good game tax payment must be considered compulsory). Therefore, to implement a consequential design in this experiment subjects will be asked some questions before being allowed to report the final answer. The questions will be 'How would you feel if you accepted this offer? How would you feel if you rejected this offer?'. For each of these two questions, subjects will be asked to answer by assigning a value from 1 to 10, where 1 = 'extremely negative feelings' and 10 = 'extremely positive feelings'. The purpose of these two questions is to emphasize the emotional consequences of an eventual acceptance/rejection of the offer, in analogy to what is done in a public good game when it is emphasized that the WTP (willingness to pay) revealed will lead to consequences (i.e.: to higher taxes). For what concerns the binary dimension of the choice no adjustments are needed, because subjects are only presented with a yes or no question (i.e.: accept or reject). To account for the compulsiveness instead, subjects will be presented with the following questions 'How long do you think the feeling would take to fade away (in case of acceptance)? How long do you think the feeling would take to fade away (in case of rejection)?'. As for before, subjects will be asked to answer with a rating from 1 to 10, where 1 = 'a few seconds' and 10 = 'maybe never'. The purpose of these questions is to bring subjects to assume that they will not be able to neglect the consequences of their choice (in this case, consequences are the emotions that they would be feeling). When subject will start reasoning about the needed timespan to neglect the emotions, in their reasoning they will implicitly assume their emotions to be unavoidable (i.e.: therefore compulsory). It must be

stressed that the traditional use of the consequential design is very far from the one I'm considering: consequential design is usually employed to reveal WTPs in public good games. Nonetheless, performance of consequential design in eliminating the hypothetical bias are excellent, and it is reasonable to believe that the implementation done doesn't betray the rationale behind the theory. However, the effectiveness of this method would deserve to be tested separately.

2. Cheap Talk was proved to be effective in some studies to reduce the 'hypothetical bias'. This method consists in communicating to subjects that most of the time, people report answers to such experiments that do not correspond to what they would do in real life; hence, subjects are asked to answer as if it was a real-life situation and as if it was their own money at stake. According to Loomis, in 6 studies out of 8 Cheap Talk has been effective in eliminating/decreasing the hypothetical bias. Hence, at the beginning of the survey I will use Cheap Talk on subjects (the Cheap talk is at the beginning of the survey, and the survey is in the appendix).

Part 2 instead, will be similar to the previous one, but with negative payoffs. Instruction will be as follow 'Consider the following scenario. You used a car sharing service and you took a fine. In the car it was you and another stranger. Now this fine must be paid. According to company policy, burden sharing must happen by the following procedure. The driver will propose how much he/she is willing to pay for the fine, then the passenger can decide if to accept, or if to reject. If the passenger rejects, both the driver and the passenger pay the fine individually. You are the passenger, and someone else is the driver'. In the control group the fine will amount to 80 euros (and the driver will offer to pay 4 euros), while in the treatment group the fine will amount to 80,000 euros (and the driver will offer to pay 4,000 euros). It should be noted, that both offers are at the 5% of the total, and that (as mentioned before) such unfair offers tend to be rejected. The same procedures to decrease the hypothetical bias in part 1 will be applied also for part 2: subjects already read the Cheap Talk at the beginning of the survey (so that it will not be repeated), and the questions used to implement the consequential design will be used again. As before, after reading the instruction subjects will answer to three questions to check their understanding. These questions will be

'Assume there is a fine of 500 and that the driver proposes to pay 230.

- How much will you pay if you accept? Write your answer here
- How much do you pay if you reject? Write your answer here
- How much does the driver pay if you reject'. Write your answer here

After the control questions subjects will be informed about the proposal of the driver, they will answer to the questions on the consequential design, and they will decide if to accept or reject. As before, it will be assessed if the greater size of the payoff has a significant effect on the acceptance/rejection decision. Furthermore, at the end of the survey subjects will have to provide information about age, gender, and educational level (university or high school).

For part 2, the expectation is to observe results coherent with ones of part 1: it should be observed a higher acceptance rate.

2.4: Methodology for testing hypothesis 2

To test the second hypothesis, I will test individually its two sub-hypotheses, 2a and 2b. The aim of the experiment is to see if it is possible to surreptitiously incentivize people to behave fairly by the means of the priming effect. To do so, I will use the priming effect to set a subconscious goal in the ultimatum game. According to goal setting theory (Locke & Latham, 2002) the goal conditions behavior in four ways. In first place the goal directs attention towards relevant information and away from irrelevant information; second, the goal motivates individuals to achieve the outcome; third, the goal makes individuals more persistent; fourth, the goal motivates individuals to discover and apply knowledge and strategies to achieve the goal. Furthermore, Bargh et alia (2001) demonstrated that the goal can be activated even on a subconscious basis. More specifically, they have been successfully able to induce cooperation (i.e.: to activate a cooperation goal) by the means of a priming manipulation (i.e.: by leveraging the priming effect). With respect to the ultimatum game, especially if it's just one round, information to process is minimal, there is not a need for persistence, and it is not possible to formulate elaborated strategy or learn. Nonetheless, I am especially interested in motivating individuals to achieve a fair (or selfish outcome). It follows that by using words related to unfairness or related

to fairness to achieve the priming effect, one should be able to set sub-consciously a selfish goal or a fairness goal, that will lead to a possibly significantly different outcome.

Therefore, there will be one control group and two treatment groups (one for hypothesis 2a, the other for hypothesis 2b). To avoid anchoring effect, I will use different subjects for each group. Anchoring effect is a cognitive bias that consists in the excessive reliance upon the first piece of information we consider (Harvard law school, daily blog). Implication for our experiment is that subjects that in the neutral round provided an answer (e.g.: to offer 40% of their endowment) may tend to give the same answer in the later round because of anchoring, so offsetting the priming effect. Hence, to avoid anchoring three different groups of subjects will be used (one control group, a treatment group for hypothesis 2a, and another treatment group for hypothesis 2b).

The experiment will be carried out taking example from the one of Guth and alia (2003). In their experiment, Guth and al. designed an ultimatum game with a format suitable for a survey. So, in this experiment a similar format will be used. At the beginning of the survey, subjects will be exposed to the textual prime (the idea of using a textual prime has been inspired by the previously mentioned work of Israel and al.). A textual prime, is a short story in which there are concepts related to fairness/selfishness, or neutral concepts in the case of the control group. Then subjects will be asked to specify a strategic vector: they will have to say if they would accept or reject the offer for any of the presented values (that are ranging from 0 to 1000 in intervals of 50), then they will have to specify how much they would offer, how much they expect the other participants to offer, how much they think it would be fair to offer, and how much they think it would be fair to offer according to someone else. To avoid demand effects, in the questions the word 'fair' hasn't been used in favor of the expression 'right on average'. All technicalities will be avoided in the instructions: the ultimatum game will be presented as a hypothetical situation where there is an inheritance to be shared and before providing the relevant information, subjects will answer to three questions to check their understanding. Then at the end of the survey, subjects will have to provide information about their gender, age, and education (if they have been to college or not).

To test hypothesis 2a, the first treatment group of subjects will play the ultimatum game as described above. Before playing subjects will read the textual prime associated with fairness. In

the textual prime there is written as follows: 'He was the hero of the day. He shared his hard earned bread with those who needed, and he fought with all his strength for what he believed to be fair'. Then subjects will be playing the game with the previously described format. Finally, the results will be compared with the ones of the other two groups. In theory, because of the priming effect subjects should make more generous offers and at the same time, they should have a higher threshold for acceptance.

To test hypothesis 2b, the second treatment group of subjects will play the ultimatum game as described above, but with a textual prime associated with selfishness. In the textual prime it will be written as follow. 'He always cared for no one else but himself. He kept his hard earned bread, and he thought that his own needs came before the needs of everybody else'. The aim of the prime is to induce a selfish behavior (I.e.: to elicit unfair offers). Hence, the expectation is to observe lower offers with respect to the control group, and a lower threshold for acceptance.

It will be therefore studied if the primes had a significant effect on the offered sums and on the acceptances/rejections of the offers. As before, three control variables will be included in the regression: age, gender, and college.

It is important to remark that in the control group a neutral prime will be used. The content of the neutral prime will be 'He was just an ordinary man. He had some bread, and no particular convictions or ideas'.

For all the surveys, participants will be recruited by the means of MTurk, so that the random sample will consist of MTurk workers located in the US. MTurk is a crowdsourcing platform used to hire workers to complete short tasks in exchange for a small fee. To ensure that participants took the survey dully, there were several control questions aimed at checking if subjects were paying attention. Therefore, only the surveys that answered correctly to the control questions have been considered.

Chapter 3 – Results

3.1: Results for hypothesis 1

To elaborate the data from the survey on the opportunity cost, a logistic regression has been used, where the dummy Accept/Reject is the dependent variable, the size of the offer (big vs small) is the explanatory variable, and age, gender, and college are the control variables. Subjects in the control group were 49, while subjects in the treatment group were 51. The sample consisted of 28 males and 21 females for the control group, while in the treatment group there were 28 males and 23 females. In the control group 42 subjects out of 49 have been to college, while in the treatment group 44 out of 51 did. For the first part of the questionnaire (the one to test hypothesis 1a) acceptances/rejections in the control group were respectively, 15 and 34, while for the treatment group they were 26 and 25. The variables age, gender, and college didn't result to be significant, with a p-value of respectively 0.81, 0.78, and 0.41. According to the Hosmer-Lemeshow test the model didn't result to be statistically significant: p-value of the test is 0.31, hence there is not enough evidence to reject the model. The explanatory variable (big vs small) didn't result to be significant for an alpha of 0.05 but it resulted to be significant for an alpha of 0.01 (p value of big vs small is 0.058). Hence, by computing the odd ratio for a beta coefficient of 0.807, the conclusion is that receiving a big offer (i.e.: receiving an unfair offer of 10,000 euros instead of 1 euro) makes 2.24 times more likely for someone to accept the unfair offer (8). It is noteworthy that the confidence interval of the odd ratio at the 90% is quite large (1.11 - 4.52). Therefore, there is the 95% probability that another estimate carried out on a different sample would yield a value of the odd ratio greater than 1.11, and only a 5% probability of obtaining a value for the odd ratio inferior to 1.11.

	<i>coeff b</i>	<i>s.e.</i>	<i>Wald</i>	<i>p-value</i>	<i>exp(b)</i>	<i>lower</i>	<i>upper</i>
Intercept	-0,64061	0,997155	0,412726	0,520589	0,526971		
Age	0,003692	0,016118	0,052465	0,818828	1,003699	0,977438	1,030665
Gender	0,119782	0,421279	0,080844	0,776157	1,127251	0,563741	2,25404
College	-0,48879	0,592078	0,681528	0,409061	0,613369	0,231617	1,624327
Big offer vs small offer	0,807339	0,42641	3,584736	0,058313	2,241935	1,111774	4,520947

Variables that are not significant should be excluded from the model, and by excluding the variable age, the p-value of the Hosmer-Lemeshow test is 0.293, so that for alpha = 0.1 we lack sufficient evidence to reject the mode. Therefore, in the regression with the variables gender, college, and big vs small, it resulted that the variables college and gender are not significant (with a p-value of respectively 0.39 and 0.77), while the variable

big vs small resulted to be statistically significant for alpha = 0.1, and it resulted to be weakly significant for an alpha equal to 0.05 (p value is equal to 0.0596). The estimated coefficient is 0.791 and the related odd ratio is 2.206. Lastly, confidence interval of the odd ratio at the 90% level is (1.105 - 4.403).

	<i>coeff b</i>	<i>s.e.</i>	<i>Wald</i>	<i>p-value</i>	<i>exp(b)</i>	<i>lower</i>	<i>upper</i>
Intercept	-0,46473	0,634563	0,536355	0,463947	0,628305		
Gender	0,120955	0,42111	0,0825	0,773938	1,128574	0,56456	2,256056
College	-0,5002	0,590691	0,717072	0,397106	0,606411	0,229513	1,602239
Big offer vs small offer	0,791217	0,420087	3,547429	0,059638	2,20608	1,105432	4,402613

Instead by considering a regression with just college and big vs small, the variable college is still not statistically significant (p value is equal to 0.39), while the opposite is still true for the variable big vs small for alpha = 0.1 (p value is equal to 0.0605). According to the Hosmer-Lemeshow test the model is not statistically significant for an alpha of 0.1 (p value of the model is 0.626), so that we can't reject the model. Confidence interval of the odd ratio for the variable big vs small is now (1.102 - 4.385) with the best guess being 2.199, for a coefficient equal to 0.788.

	<i>coeff b</i>	<i>s.e.</i>	<i>Wald</i>	<i>p-value</i>	<i>exp(b)</i>	<i>lower</i>	<i>upper</i>
Intercept	-0,39394	0,583933	0,45513	0,499909	0,674394		
College	-0,50137	0,59037	0,721227	0,395742	0,605699	0,229364	1,599515
Big offer vs small offer	0,787881	0,419687	3,524278	0,060476	2,198732	1,102475	4,385065

Lastly, by carrying out the regression with only the explanatory variable (big vs small), there are two interesting facts emerging. First, there is a significant difference between the model with the single predictor and the model with just the intercept for alpha equal to 0.1 (p value of the chi-square test is 0.0593), so that the variable big vs small gives a significant contribution to the model (9). Second, the coefficient of the explanatory variable is equal to 0.779, with a p value of 0.0622 (therefore it is still significant when alpha = 0.1), it has an odd ratio of 2.179 and the CI of the odd ratio at the 90% is (1.09 - 4.33).

	<i>coeff b</i>	<i>s.e.</i>	<i>Wald</i>	<i>p-value</i>	<i>exp(b)</i>	<i>lower</i>	<i>upper</i>
Intercept	-0,81831	0,309965	6,969637	0,00829	0,441176		
Big offer vs small offer	0,77909	0,41778	3,477602	0,062205	2,179487	1,096258	4,33307

In conclusion, there is enough evidence to confirm hypothesis 1a that stated that

Hypothesis 1(a): if the opportunity cost (i.e.: the money that one would gain by renouncing to the fair outcome) becomes higher, then individuals are more likely to accept unfair offers.

According to our analysis, an individual is 2.179 more likely to accept an unfair offer if the potential gains are of great size.

For what concerns hypothesis 1b instead, in the control group there were 17 accepted offers and 32 refused offers, while in the treatment group there were 17 accepted offers and 34 accepted offers. None of the variables resulted to be statistically significant. The p value of the variable age is 0.68, the p value of the variable gender is 0.66, the p value of the variable college is 0.85, and the p value of the variable big vs small is instead 0.83.

	<i>coeff b</i>	<i>s.e.</i>	<i>Wald</i>	<i>p-value</i>	<i>exp(b)</i>	<i>lower</i>	<i>upper</i>
Intercept	-0,12362	1,008623	0,015022	0,902451	0,883713		
Age	-0,00687	0,016452	0,174228	0,676381	0,993156	0,96664	1,020399
Gender	-0,18719	0,42501	0,193976	0,659628	0,82929	0,412192	1,668448
College	-0,11239	0,606151	0,034377	0,852908	0,893699	0,329751	2,422122
Big offer vs small offer	-0,09278	0,428538	0,046877	0,828589	0,911391	0,450379	1,844298

Even by regressing the model on a single coefficient, it has been observed that the p value of the explanatory variable is not statistically significant, and that there is not a significant difference between the model with only the intercept and the model with the intercept and the explanatory variable. Hence, the explanatory variable doesn't add a significant contribution to the model. Therefore, there is no evidence to support hypothesis 1b that stated that

Hypothesis 1(b): if the opportunity cost (i.e.: the money that one would not lose by renouncing to the fair outcome) becomes higher, then individuals are more likely to accept unfair offers.

3.2: Results for hypothesis 2

For what concerns Hypothesis 2 instead, several regressions have been made to test the effect of the primers on several dependent variables. In the control group there were 49 participants.; among them, 24 were males (25 females) and 42 of them have been to college. In the positive treatment group, there were 53 participants.; among them, 24 were males (29 females) and 49 of them have been to college. In the negative treatment group, there were 49 participants.; among them, 18 were males (31 females) and 46 of them have been to college.

3.2.1: Regression with contribution as dependent variable

Contribution (10) has been regressed against five variables: age, gender, college, negative primer, positive primer (11). In this regression none of the variables emerged to be statistically significant.

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	462,8346	32,57967	14,20624	3,01E-29	398,4422	527,227	398,4422	527,227
Age	0,416071	0,490263	0,848669	0,397465	-0,55291	1,385057	-0,55291	1,385057
Gender	6,095357	13,00823	0,468577	0,640076	-19,6149	31,80559	-19,6149	31,80559
College	-10,3586	22,2149	-0,46629	0,641707	-54,2655	33,54824	-54,2655	33,54824
Neg. P.	-11,931	15,91527	-0,74966	0,454676	-43,3869	19,52491	-43,3869	19,52491
Pos. P.	18,05573	15,54371	1,161611	0,247302	-12,6658	48,77724	-12,6658	48,77724

By reducing the model (I.e.: by eliminating the variables that do not result to be statistically significant) there are apparently bemusing results. In a regression with both the positive and negative prime as predictor variables, it emerged that the coefficients are not significant (p values of both coefficient is equal to 0.32) and that the model is not significant (the F test is not significant with a p-value of 0.139); but when the regression is performed with just one of the two predictors, they individually result to be statistically significant, so that the model fits the data significantly better when either negative prime or positive prime are added to the regression individually.

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	476,5306	10,91679	43,65118	2,03E-86	454,9577	498,1035	454,9577	498,1035
Neg. P.	-15,3061	15,43867	-0,99141	0,323101	-45,8148	15,20258	-45,8148	15,20258
Pos. P.	14,97882	15,14457	0,989056	0,32425	-14,9487	44,90635	-14,9487	44,90635

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	468,8776	7,718891	60,74416	5E-107	453,6249	484,1302	453,6249	484,1302
Pos. P.	22,63188	13,02883	1,737062	0,084443	-3,11326	48,37702	-3,11326	48,37702

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	484,3137	7,565908	64,01264	2,7E-110	469,3634	499,2641	469,3634	499,2641
Neg. P.	-23,0892	13,28163	-1,73843	0,0842	-49,3339	3,155446	-49,3339	3,155446

More specifically, in the regression with the constant and the positive prime only, the explanatory variable has a p value of 0.0844 for a coefficient of 22.63 and a standard error of 13.02, so that it is possible to say that the variable is significant for alpha equal to 0.1. Even the variable negative prime results significant by running a regression with just a constant and the predictor: the coefficient of the variable negative prime is -23.09 with a standard error of 13.28 and a p value of 0.0842 (so that the variable is significant for alpha equal to 0.1). It is very likely that in a regression with both positive prime and negative prime as predictors, both variables result not significant because of multicollinearity: being that the two variables are strongly correlated with each other (correlation is equal to -0.51), including both variables in the regression leads to unreliable estimates. Hence, one should consider just the regressions with the single predictors. According to these, we can say that hypothesis 2a and 2b are true. More specifically...

Hypothesis 2(a): by the means of a fair textual prime it is possible to corroborate the effect of fairness in the decision-making process.

According to our data it is possible to affirm that people primed with the fair textual prime on average made offers that were 22.63 euros higher, and at the 90% confidence level it is possible to say that the increase in the offered sum due to the prime should fall between 1.067 euros and 44.20 euros. Instead for hypothesis 2b...

Hypothesis 2(b): by the means of an unfair textual prime it is possible to weaken the effect of fairness in the decision-making process.

According to our data it is possible to affirm that people primed with the unfair textual prime on average made offers that were 23.09 euros lower, and at the 90% confidence level it is possible to say that the decrease in the offered sum due the prime should fall between –45.07 euros and -1.11 euros.

Hence, hypothesis 2 has been confirmed, but beyond these two effects, there are several other findings that emerged from the other regressions, and now they are going to be discussed too.

3.2.2: Regression with contribution belief as dependent variable

Contribution belief (12) has been regressed against age, gender, college, negative prime, positive prime, and it has emerged that the only significant variable is negative prime.

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	429,5229	46,18065	9,300928	1,98E-16	338,2487	520,797	338,2487	520,797
Age	0,896251	0,694933	1,289695	0,19921	-0,47726	2,269758	-0,47726	2,269758
Gender	-7,31508	18,43875	-0,39672	0,692155	-43,7585	29,12836	-43,7585	29,12836
College	-9,255	31,48891	-0,29391	0,769245	-71,4916	52,98156	-71,4916	52,98156
Neg. P.	-46,5032	22,55939	-2,06137	0,041054	-91,0909	-1,91549	-91,0909	-1,91549
Pos. P.	1,39191	22,03271	0,063175	0,949714	-42,1548	44,93866	-42,1548	44,93866

By eliminating the variables that are not statistically significant, it results that the coefficient of the variable negative prime is equal to –48.33, with a p value of 0.0113. Therefore, the variable is significant for alpha equal to 0.05.

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	458,3333	10,72947	42,71724	1,72E-85	437,1318	479,5349	437,1318	479,5349
Neg. P.	-48,3333	18,83513	-2,56613	0,011271	-85,5518	-11,1149	-85,5518	-11,1149

It is possible to conclude that people primed with the negative prime should assume others to make offers that are 48.33 euros lower with respect to what they would normally assume, and it is possible to say at the 95% confidence level that subjects primed with the negative prime consider other people’s offers to be lower for a

number included between -85.55 and -11.11 . The variable positive prime instead wasn't significant, even if regressed with only the constant (p value of the variable positive prime is 0.25).

3.2.3: Regression with norm as dependent variable

In the regression with norm (13) as dependent variables and age, gender, college, negative prime, and positive prime as independent variables, negative prime resulted to be marginally significant for alpha equal to 0.1 (p value is 0.109), while all the other variables didn't result to be statistically significant.

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	497,8771	22,52316	22,10512	2,77E-48	453,361	542,3933	453,361	542,3933
Age	0,123346	0,338932	0,363927	0,716443	-0,54654	0,793231	-0,54654	0,793231
Gender	-2,48718	8,992919	-0,27657	0,782504	-20,2613	15,28697	-20,2613	15,28697
College	-11,2107	15,35773	-0,72997	0,466587	-41,5646	19,14326	-41,5646	19,14326
Neg. P.	-17,7383	11,00264	-1,61219	0,109095	-39,4846	4,007945	-39,4846	4,007945
Pos. P.	1,841017	10,74576	0,171325	0,864207	-19,3975	23,07958	-19,3975	23,07958

By eliminating all the variables that are not statistically significant, it results that the variable negative prime is significant for alpha equal to 0.05 (p value is 0.0379).

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	493,1373	5,210688	94,63956	5,6E-135	482,8409	503,4336	482,8409	503,4336
Neg. P.	-19,1577	9,147144	-2,09439	0,037918	-37,2325	-1,08279	-37,2325	-1,08279

The value of the coefficient for the variable negative prime is -19.158 . This means that people exposed to the negative prime on average estimated a fair offer 19.16 euros lower than those who weren't exposed to the prime, and it is possible to say with the 95% confidence level that people exposed to the negative prime will think of a fair offer that is lower for a number included between -37.23 euros and -1.08 euros. The positive prime instead, didn't result to be significant even in the regression with just the positive prime and the intercept (p value of the predictor is equal to 0.27).

3.2.4: Regression with normative belief as dependent variable

The regression with normative belief (14) as dependent variable and gender, age, college, positive prime, and negative prime as independent variables didn't show any significant relationship, except for the variable negative prime that was marginally significant for alpha equal to 0.1 (p value is equal to 0.12).

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	456,0805	32,52462	14,02262	9E-29	391,7969	520,3641	391,7969	520,3641
Age	0,687499	0,489435	1,404678	0,162256	-0,27985	1,654847	-0,27985	1,654847
Gender	19,38339	12,98625	1,492609	0,137712	-6,2834	45,05018	-6,2834	45,05018
College	-13,0763	22,17736	-0,58962	0,556361	-56,9089	30,75639	-56,9089	30,75639
Neg. P.	-24,9392	15,88838	-1,56965	0,118676	-56,3419	6,463565	-56,3419	6,463565
Pos. P.	0,496923	15,51744	0,032023	0,974497	-30,1727	31,16652	-30,1727	31,16652

By eliminating a control variable instead (age) the variable negative prime resulted to be statistically significant for alpha equal to 0.1, while all the other variables were still statistically not significant.

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	490,0572	21,81585	22,46335	3,16E-49	446,9415	533,1728	446,9415	533,1728
Gender	17,73556	12,97618	1,366778	0,173796	-7,90986	43,38098	-7,90986	43,38098
College	-14,0108	22,24113	-0,62995	0,529712	-57,967	29,94536	-57,967	29,94536
Neg. P.	-28,0111	15,78952	-1,77403	0,078142	-59,2166	3,194451	-59,2166	3,194451
Pos. P.	-3,05949	15,36044	-0,19918	0,842399	-33,417	27,29804	-33,417	27,29804

After eliminating all the variables that weren't significant, the only variable left therefore has been negative prime. In the regression with only the negative prime and the intercept, it emerged that the coefficient of the variable negative prime is -28.91, the p value of the variable is 0.032 (hence it is significant for alpha equal to 0.05), and the confidence interval of the coefficient at the 95% is between -55.29 and -2.52.

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	484,3137	7,605873	63,67628	5,8E-110	469,2844	499,343	469,2844	499,343
Neg. P.	-28,9056	13,35179	-2,16492	0,031986	-55,2889	-2,52225	-55,2889	-2,52225

It is possible to interpret these data in the following way. People primed with the negative prime (with respect to those who weren't) consider a lower number when estimating what is the value of a fair offer according to

someone else; this number is lower by -28.91 euros and at the 95% confidence level it is possible to say that the estimate should fall between -55.29 euro and -2.52 euros.

3.2.5: Regression with LAO as dependent variable (lowest acceptable offer)

The variable LAO (15) has been regressed against the five variables (gender, age, college, positive prime, negative prime) and in other two regressions on the explanatory variables (negative prime and positive prime) individually. In none of the regressions any of the five variables resulted to be statistically significant. Hence, one must conclude that the primer had no effect on the lower offer that an individual would be willing to accept.

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	255,3422	75,2917	3,391373	0,000896	106,5312	404,1532	106,5312	404,1532
Age	1,219535	1,133	1,076377	0,283546	-1,01979	3,458864	-1,01979	3,458864
Gender	-15,4321	30,06204	-0,51334	0,608493	-74,8485	43,98427	-74,8485	43,98427
College	-64,4015	51,33868	-1,25444	0,211699	-165,87	37,06728	-165,87	37,06728
Neg. P.	13,69624	36,78023	0,37238	0,710153	-58,9984	86,39089	-58,9984	86,39089
Pos. P.	42,15702	35,92154	1,173586	0,242485	-28,8404	113,1545	-28,8404	113,1545

3.2.6: Regression on HAO (highest acceptable offer)

The variable HAO (16) has been regressed on all the five variables and in other two regressions on the explanatory variables (negative prime and positive prime) individually. In none of the regressions any of the five variables resulted to be statistically significant. Hence, one must conclude that the primer had no effect on the highest offer that an individual would be willing to accept.

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	1013,312	41,56108	24,38128	3,72E-53	931,1685	1095,456	931,1685	1095,456
Age	-0,42313	0,625417	-0,67655	0,499769	-1,65924	0,812985	-1,65924	0,812985
Gender	24,8396	16,59427	1,496878	0,136599	-7,95831	57,6375	-7,95831	57,6375
College	-36,2452	28,33899	-1,27899	0,202944	-92,2561	19,76565	-92,2561	19,76565
Neg. P.	9,289022	20,30272	0,457526	0,647978	-30,8385	49,41653	-30,8385	49,41653
Pos. P.	3,095825	19,82872	0,156128	0,876149	-36,0948	42,28648	-36,0948	42,28648

3.2.7: Effects of contribution belief, norm, and normative beliefs on contribution

It has been tested the effect of the variables contribution belief, norm, and normative beliefs on the dependent variable contribution. Being that these variables are not independent from each other, to avoid multicollinearity the effect has been estimated individually. So, each of these variables has been regressed individually against the variable contribution.

- The variable contribution belief resulted significant with a p value equal to $8.02 \cdot 10^{-15}$ for a coefficient of 0.40 and a confidence interval at the 95% of (0.31 - 0.49). This implies that believing that other people will contribute 1 euro more will cause the individual to contribute 40 cents more, and at the 95% confidence level we are sure that the individual contribution will increase for a number included between 31 and 49 cents for every euro of increase in the belief about others' contribution.

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	298,5513	21,2579	14,04425	4,5E-29	256,5454	340,5572	256,5454	340,5572
Contri. B.	0,402734	0,046607	8,641091	8,02E-15	0,310638	0,49483	0,310638	0,49483

- The variable norm resulted significant with a p value of $1.17 \cdot 10^{-16}$ for a coefficient of 0.88 and a confidence interval at the 95% of (0.69 - 1.07). This implies that an increase of 1 euro in the sum considered to be fair will cause an increase in the contribution of 0.88 cents, and at the 95% confidence level we are sure that the individual contribution will increase for a number included between 69 and 107 cents for every euro of increase in the sum that the individual considers to be fair.

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	48,58448	46,03247	1,055439	0,292933	-42,3763	139,5452	-42,3763	139,5452
Norm	0,87948	0,093982	9,357957	1,17E-16	0,69377	1,065189	0,69377	1,065189

- The variable norm belief resulted significant with a p value equal to $1.11 \cdot 10^{-9}$ for a coefficient of 0.47 and a confidence interval at the 95% of (0.32 - 0.61). This implies that believing that other people consider the fair contribution 1 euro more will cause the individual to contribute 47 cents more, and at the 95% confidence level we are sure that the individual contribution will increase for a number included between 32 and 61 cents for every euro of increase.

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	255,8679	34,42122	7,433434	7,68E-12	187,8511	323,8847	187,8511	323,8847
Norm								
Bel.	0,46523	0,07153	6,503993	1,11E-09	0,323886	0,606574	0,323886	0,606574

That said, one may conjecture that the effect of the prime is mediated by these variables: the prime affects the norm, normative beliefs, contribution beliefs, and these in turn affect contribution behavior. If this was to be true, we wouldn't yet be able to explain why the positive prime had a significant effect on contribution, because the positive prime didn't have a significant effect on norm, normative belief, and contribution belief. Hence the most likely hypothesis is that the prime has a direct effect (i.e.: the effect is not mediated by the upper mentioned three variables). Nonetheless, it is worth saying that the individual contribution behavior is significantly affected by these three variables. It must be also mentioned that there is this result may be potentially invalidated by a sequential effect (17): the first question in the survey is about the contribution behavior (i.e.: how much would you offer?), so the answer to the second question 'how much do you expect other people would offer?' is likely to be conditioned by the answer to the previous question. The same applies for the answers to the two following questions 'how much do you think it would be right to offer on average?' and 'how much do you think it would be right offer on average, according to someone else?'. Especially for the variable norm, it would be not surprising to observe that people provided an answer whose value is under or equal to what they are willing to offer. If this sequential effect was to be true, there would be a problem of reverse causality (18) in the regression, that would cause the results to be unreliable. It would be interesting for future research to check if there is indeed a sequential effect.

Conclusion

There are several limitations in this paper. Here are the limitations of which the author is aware:

- The methodology applied to reduce the hypothetical bias (cheap talk and consequential design) may be not effective, it may overcompensate for the bias, or it may be able to offset just partially the hypothetical bias. In this paper the combination of Cheap Talk and consequential design has been assumed to be effective. Nonetheless, in the worst-case scenario this methodology could generate biased results. Therefore, the lack of awareness about the effectiveness of this methodology is undoubtedly a limitation, and it would be interesting to test the validity of this method in another paper.
- Second limitation is about the binary nature of the subjects' payoff in the experiments on the opportunity cost. In these experiments, it has been considered the effect on fairness preference of a payoff that is 10,000 times larger (or 1,000 times larger) than the payoff of the control group. Hence, it is not yet clear if this change in the fairness preference (with respect to change in the payoff) is linear, non-linear, or if there is a categorical change that takes place for some monetary value (that could be either absolute or relative to the individual income). That said, it has been nonetheless proven that when there is the possibility of a great potential gain, there is a switch from a fairness-oriented response to a utility-oriented response for many individuals. According to our results, it is not possible to confirm that the same happens when there is the possibility of a great potential loss. For the purpose of future research, it could be interesting to relate this heterogeneity in changes of fairness preferences with personality traits by the means of psychological tests (e.g.: the Big 5 or the Myers-Briggs test).
- In this paper the ultimatum game has been assumed to be appropriate to investigate fairness preferences. Nonetheless, it has been discussed in the introduction that rejection of unfair offers in the ultimatum game might also be due to something else and not to fairness. Therefore, this paper relies on an assumption that could be wrong, and this is indeed a limitation.

Limitations aside, the insights derived from this research have several implications. It has been proven that by the means of a textual prime it is possible to influence people's behavior. For example, it could be possible to use a fair textual prime to increase the provision of funds to a charity. It is also important to be aware of the effects of the unfair textual prime. Of course, it is

difficult to imagine a reason to intentionally incentivize unfair behaviors. It may happen instead, to be randomly and inadvertently exposed to an unfair textual prime for some feature of the environment. For example, a graffiti written on a wall with an 'unfair content' (i.e.: a textual content conceptually related with unfairness) could have the effect of an unfair textual prime on the people who read it, and it is important to know how the environment in which we live affects us. It has also been proven that people's attitudes towards fairness are not imperative: if the personal gain at stake is sufficiently high fairness is put in second place and people pursue utilitarian goals. It is interesting to observe that the same didn't happen with losses. It is interesting because this is not consistent with the loss aversion bias. My conjecture is that the difference in outcomes is due to anchoring. In the experiment on the gains, the anchor is zero: the participants have been considering the offer of 10,000 having 0 as a reference point. In the experiment on the losses instead, participants have been considering the offer of paying 76,000 euros instead of 80,000 euros, so minus 80,000 was the reference point. Although in percentage terms both offers are considered 'unfair' in the ultimatum game (offer for the random award is the 1% and offer for the fine payment is the 5%), the differences in the payoffs in case of acceptance against the payoffs in case of rejection vary remarkably: (payoff for acceptance) - (payoff for rejection) = (10,000 - 0) in the case of the random award while in the case of the fine (payoff for acceptance) - (payoff for rejection) = - (80,000 - 76,000). Hence such notable difference in relative losses/gains and the different anchors might be the underlying cause of the different outcomes.

It has also been proven that the unfair textual prime affected beliefs about the behavior of other participants. The exposure to the negative textual prime led people to assume the other to behave more selfishly. In situations where the belief about others' behavior is crucial to achieve cooperation, the accidental exposure to an unfair textual prime could have accidental negative effects. It has also been proven that the unfair textual prime can affect the way in which we assess fairness (i.e.: what we deem fair or unfair) and our belief of what others believe to be fair. This is crucial if we consider that norms and normative beliefs determine the individual behavior, especially when there is actual/potential exposure to social judgment.

Lastly, according to our results there is no evidence to conclude that primed subjects (either with the fair prime or with the unfair prime) have a different acceptance threshold (both upper and lower) with respect to non-primed subjects.

Notes

- (1): the researchers adopted the definition of social norm of Young (2008). It is argued that for a social norm to exist, it must be known by a sufficient number of people and a sufficient number of people must follow it.
- (2) The scramble sentence paradigm consists in a task where subjects have to align words to form a sentence in the correct order. In this way, subjects are primed without becoming aware of the manipulation.
- (3) Atheist were subjects that declared adherence to no religion and that scored below the midpoint of the scale on a question assessing belief in God. Theist instead were subjects that declared adherence to no religion, but that scored above the midpoint.
- (4) To prime the subject the scramble sentence paradigm has been used. In one the two control groups primed concepts were about social justice and the social contract. More specifically, primed words were civic, jury, court, police, and contract. In the religious prime group instead, subjects have been primed as in the previous experiment.
- (5) With respect to the previous study the authors adopted a new and stricter classification of atheist: he/she must declare himself as atheist or agnostic and he/she has to score below the midpoint of the scale on a question assessing the belief in God.
- (6) The researchers are referring to the theory of the Hyper Agency Detection Device. This theory suggests that humans ascribe events in the environment to the intention of other agents.
- (7): Cognitive dissonance is defined as that state of discomfort experienced by an individual due to conflicting cognitions.
- (8) $e^{(\text{coefficient of Big offer vs small offer})} = e^{(0.807)} = 2.24$ is how the odd ratio is computed. The odd ratio represents the increase in probability associated with a certain event. In our case, an odd ratio of 2.24 indicates that for someone who receives a big offer, the acceptance is 2.24 times more likely.
- (9) This claim is based on the result of the Goodness of fit test, also referred to as the '2 log likelihood'. Mathematically we can write that $G = -2\ln[(\text{likelihood without the$

predictor)/(likelihood with the predictor)] = 3.557 where G is distributed as a chi square statistic with 1 degree of freedom, so that p-value is 0.0592 and for alpha = 0.1 it is possible to say that the model fit is significantly improved by adding the variable 'Big offer vs small offer'.

(10) The answer to the question 'how much would you offer?'

(11) The issue of the dummy variable trap has been solved by omitting the neutral primer from the regression.

(12) Contribution belief is the answer to the question 'how much do you expect other people would offer?'

(13) Norm is the answer to the question 'how much do you think it would be right to offer on average?'

(14) Norm belief is the answer to the question 'how much do you think it would be right to offer on average, according to someone else?'

(15) The idea was to check if the prime (either positive or negative) could lead subjects to accept lower offers.

(16) The idea was to check if the prime (either positive or negative) could lead subjects to accept higher offers.

(17) Sequential effect indicates the influence of a precedingly completed task on a successive task.

(18) Reverse causality happens when the dependent variable of the regression conditions the independent variable (or variables) of the regression.

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5zCixkSVDVmiJbA4Sgs5jXkXBYuGNzcu6nq7frZAedlZk3H5ef%2FEO9ZxzpTpiDWj2y0WdaTq2EzPfu
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Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20220603T135421Z&X-Amz-
SignedHeaders=host&X-Amz-Expires=300&X-Amz-
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Amz-
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Appendix

Control questionnaire on the opportunity cost

Part 1

Please, provide your worker ID

.....

Dear participant, most of the time people answer to these experiments as if it was just a task and not a real-life situation. So please, try to give answers that are truthful to what you'd do in real life.

Consider the following scenario. 'You and another individual just won the famous Random Award. The Random Award is a lump sum that is randomly given to two individuals for sharing.

The only condition to be met to receive the money, is that the winners must share the sum according to the following procedure. The proposer will propose how much of the award he wants to keep for him-self, while the receiver will decide if to accept the proposal, or if to reject it. If receiver rejects, both the proposer and the receiver get nothing.'

Assume to be the receiver. The lump sum is 500 and the other winner offers to you 170. How much do you get if you accept?

Assume to be the receiver. The lump sum is 500 and the other winner offers to you 170. How much do you get if you reject?

Assume to be the receiver. The lump sum is 500 and the other winner offers to you 170. How much does the other winner get if you reject?

You have been told that you're the receiver. So now you've just received the offer. The other winner offered you 1 euro out of 100 euros.

How would you feel if you accepted this offer? Assign a rate from 1 to 10 where 1 = extremely negative feelings and 10 = extremely positive feelings.

.....

How long do you think the feeling would take to fade away? Assign a rate from 1 to 10 where 1 = a few seconds, and 10 = maybe never.

.....

How would you feel if you rejected this offer? Assign a rate from 1 to 10 where 1 = extremely negative feelings and 10 = extremely positive feelings.

.....

How long do you think the feeling would take to fade away? Assign a rate from 1 to 10 where 1 = a few seconds, and 10 = maybe never.

.....

Do you accept or reject the offer?

.....

Part 2

Consider the following scenario. 'You used a car sharing service and you took a fine. In the car it was you and another stranger. Now this fine must be paid. According to company policy, burden sharing must happen by the following procedure. The driver will propose how much he/she is willing to pay for the fine, then the passenger can decide if to accept, or if to reject. If the passenger rejects, both the driver and the passenger pay the fine individually. You are the passenger, and someone else is the driver.'

Assume there is a fine of 500 and that the driver proposes to pay 230. How much do you pay if you accept?

.....

Assume there is a fine of 500 and that the driver proposes to pay 230. How much do you pay if you reject?

.....

Assume there is a fine of 500 and that the driver proposes to pay 230. How much does the driver pay if you reject?

.....

The total of the fine is 80. It turns out, that the driver is offering to pay 4 euros out of 80 euros.

How would you feel if you accepted this offer? Assign a rate from 1 to 10 where 1 = extremely negative feelings and 10 = extremely positive feelings.

.....

How long do you think the feeling would take to fade away? Assign a rate from 1 to 10 where 1 = a few seconds, and 10 = maybe never.

.....

How would you feel if you rejected this offer? Assign a rate from 1 to 10 where 1 = extremely negative feelings and 10 = extremely positive feelings.

.....

How long do you think the feeling would take to fade away? Assign a rate from 1 to 10 where 1 = a few seconds, and 10 = maybe never.

.....

Do you accept or reject the offer?

.....

What's your age?

.....

What's your gender?

.....

Have you been to college?

.....

Treatment questionnaire on the opportunity cost

Part 1

Please, provide your worker ID

.....

Dear participant, most of the time people answer to these experiments as if it was just a task and not a real-life situation. So please, try to give answers that are truthful to what you'd do in real life.

Consider the following scenario. 'You and another individual just won the famous Random Award. The Random Award is a lump sum that is randomly given to two individuals for sharing. The only condition to be met to receive the money, is that the winners must share the sum according to the following procedure. The proposer will propose how much of the award he

wants to keep for him-self, while the receiver will decide if to accept the proposal, or if to reject it. If receiver rejects, both the proposer and the receiver get nothing.'

Assume to be the receiver. The lump sum is 500 and the other winner offers to you 170. How much do you get if you accept?

Assume to be the receiver. The lump sum is 500 and the other winner offers to you 170. How much do you get if you reject?

Assume to be the receiver. The lump sum is 500 and the other winner offers to you 170. How much does the other winner get if you reject?

You have been told that you're the receiver. So now you've just received the offer. The other winner offered you 10,000 euro out of 1,000,000 euros.

How would you feel if you accepted this offer? Assign a rate from 1 to 10 where 1 = extremely negative feelings and 10 = extremely positive feelings.

.....

How long do you think the feeling would take to fade away? Assign a rate from 1 to 10 where 1 = a few seconds, and 10 = maybe never.

.....

How would you feel if you rejected this offer? Assign a rate from 1 to 10 where 1 = extremely negative feelings and 10 = extremely positive feelings.

.....

How long do you think the feeling would take to fade away? Assign a rate from 1 to 10 where 1 = a few seconds, and 10 = maybe never.

.....

Do you accept or reject the offer?

.....

Part 2

Consider the following scenario. 'You used a car sharing service and you took a fine. In the car it was you and another stranger. Now this fine must be paid. According to company policy, burden sharing must happen by the following procedure. The driver will propose how much he/she is willing to pay for the fine, then the passenger can decide if to accept, or if to reject. If the passenger rejects, both the driver and the passenger pay the fine individually. You are the passenger, and someone else is the driver.'

Assume there is a fine of 500 and that the driver proposes to pay 230. How much do you pay if you accept?

.....

Assume there is a fine of 500 and that the driver proposes to pay 230. How much do you pay if you reject?

.....

Assume there is a fine of 500 and that the driver proposes to pay 230. How much does the driver pay if you reject?

.....

The total of the fine is 80,000. It turns out, that the driver is offering to pay 4,000 euros out of 80,000 euros.

How would you feel if you accepted this offer? Assign a rate from 1 to 10 where 1 = extremely negative feelings and 10 = extremely positive feelings.

.....

How long do you think the feeling would take to fade away? Assign a rate from 1 to 10 where 1 = a few seconds, and 10 = maybe never.

.....

How would you feel if you rejected this offer? Assign a rate from 1 to 10 where 1 = extremely negative feelings and 10 = extremely positive feelings.

.....

How long do you think the feeling would take to fade away? Assign a rate from 1 to 10 where 1 = a few seconds, and 10 = maybe never.

.....

Do you accept or reject the offer?

.....

What's your age?

.....

What's your gender?

.....

Have you been to college?

.....

Control questionnaire on the priming

Please, provide your worker ID

.....

Please, read the following passage.

'He was just an ordinary man. He had some bread, and no particular convictions or ideas'

Now consider the following scenario.

'A far relative of yours that you've never met passed away. You and an individual in a very distant country just inherited together 1000 euros. You are never going meet each other, nor you can communicate. Neither of you ever met Aunt Polly. In the testament it is specified that you can share the inheritance only according to a predefined procedure. One of the two has to offer how much of the total sum he/she wants to give to the other. Who receives the offer can decide if to accept the sum, or if to reject it. If a rejection takes place, both inherit nothing. If there's an acceptance, the sum is split according to the proposal.'

If you are offered 350 euros out of the total inheritance, how much do you get if you accept?

.....

If you are offered 450 out of the total inheritance, how much do you get if you reject?

.....

If you are offered 450 out of the total inheritance, how much does the other party get if you reject?

.....

Now please, for each value specify if you would accept or reject the offer. (click on the offers you would accept). (N.B.: the survey was run on Qualtrics, and it was possible to click on the offers to select them)

- 0
- 50
- 100
- 150
- 200
- 250
- 300
- 350
- 400
- 450
- 500
- 550
- 600
- 650
- 700
- 750
- 800
- 850
- 900
- 950
- 1000

How much would you offer?

.....

How much do you expect other people would offer?

.....

How much do you think it would be right to offer on average?

.....

How much do you think it would be right to offer on average, according to someone else?

.....

What's your age?

.....

What's your gender?

.....

Have you been to college?

.....

Treatment questionnaire on the priming (negative)

Please, provide your worker ID

.....

Please, read the following passage.

'He always cared for no one else but himself. He kept his hard earned bred, and he thought that his own needs came before the needs of everybody else.'

Now consider the following scenario.

'A far relative of yours that you've never met passed away. You and an individual in a very distant country just inherited together 1000 euros. You are never going to meet each other, nor can you communicate. Neither of you ever met Aunt Polly. In the testament it is specified that you can share the inheritance only according to a predefined procedure. One of the two has to offer how much of the total sum he/she wants to give to the other. Who receives the offer can decide if to accept the sum, or if to reject it. If a rejection takes place, both inherit nothing. If there's an acceptance, the sum is split according to the proposal.'

If you are offered 350 euros out of the total inheritance, how much do you get if you accept?

.....

If you are offered 450 out of the total inheritance, how much do you get if you reject?

.....

If you are offered 450 out of the total inheritance, how much does the other party get if you reject?

.....

Now please, for each value specify if you would accept or reject the offer. (click on the offers you would accept). (N.B.: the survey was run on Qualtrics, and it was possible to click on the offers to select them)

- 0
- 50
- 100
- 150
- 200

- 250
- 300
- 350
- 400
- 450
- 500
- 550
- 600
- 650
- 700
- 750
- 800
- 850
- 900
- 950
- 1000

How much would you offer?

.....

How much do you expect other people would offer?

.....

How much do you think it would be right to offer on average?

.....

How much do you think it would be right to offer on average, according to someone else?

.....

What's your age?

.....

What's your gender?

.....

Have you been to college?

.....

Treatment questionnaire on the priming (positive)

Please, provide your worker ID

.....

Please, read the following passage.

'He was the hero of the day. He shared his hard earned bread with those who needed, and he fought with all his strength for what he believed to be fair.'

Now consider the following scenario.

'A far relative of yours that you've never met passed away. You and an individual in a very distant country just inherited together 1000 euros. You are never going to meet each other, nor you can communicate. Neither of you ever met Aunt Polly. In the testament it is specified that you can share the inheritance only according to a predefined procedure. One of the two has to offer how much of the total sum he/she wants to give to the other. Who receives the offer can

decide if to accept the sum, or if to reject it. If a rejection takes place, both inherit nothing. If there's an acceptance, the sum is split according to the proposal.'

If you are offered 350 euros out of the total inheritance, how much do you get if you accept?

.....

If you are offered 450 out of the total inheritance, how much do you get if you reject?

.....

If you are offered 450 out of the total inheritance, how much does the other party get if you reject?

.....

Now please, for each value specify if you would accept or reject the offer. (click on the offers you would accept). (N.B.: the survey was run on Qualtrics, and it was possible to click on the offers to select them)

- 0
- 50
- 100
- 150
- 200
- 250
- 300
- 350
- 400
- 450
- 500
- 550

- 600
- 650
- 700
- 750
- 800
- 850
- 900
- 950
- 1000

How much would you offer?

.....

How much do you expect other people would offer?

.....

How much do you think it would be right to offer on average?

.....

How much do you think it would be right to offer on average, according to someone else?

.....

What's your age?

.....

What's your gender?

.....

Have you been to college?

.....

SUMMARY

Introduction

The ideal of fairness played an important part in our history as humans, and the concept of fairness appears to affect our decision-making processes, either be it for cultural reasons or for biological ones. There are reasons to believe that fairness played an important role in our evolution: it has been widely proven that the decision-making activity of monkeys is affected by the concept of fairness. Nonetheless, there are also scientists who argue that animal behaviors considered as 'fair' may not be necessarily due to fairness concerns but rather to the action of other cognitive mechanisms.

Be it cultural or biological, it is an evident fact the influence of fairness concerns in our decision-making processes.

Alas, fairness (and morals more in general) are not considered by economic theory most of the time.

A pillar of economic theory is the rational choice theory.

Rational choice theory plays a central role in most of the theory conceived by the neo-classical economics, and rational choice theory assumes perfect rationality.

Nowadays the notion of perfect rationality is harshly criticized, and scholars agree that a better description of human behavior is provided by the theory of 'bounded rationality'. Furthermore, there is widespread consensus among the scholars that concerns of fairness, altruism, and reciprocity are a powerful motivator for many individuals, and that these ones should be considered when modeling individual preferences.

Therefore, rational choice theory's incorrect assumptions about human's rationality and self-interest lead to theoretical predictions that are systematically contradicting empirical evidence, and this has been observed in many settings.

A setting in which rational choice theory systematically failed to describe the individual behavior is the ultimatum game. Several theories have been proposed to explain deviations from the rational conduct observed in the ultimatum game.

There are several papers, that explain the existence of fair offers in the ultimatum game by the means of reputation or repeated interactions: these models predict that reputation or repeated interaction outside the

lab (cultural explanation) or either at the biological level, led to the development of a sense of fairness that functions automatically and such sense of fairness would be responsible for the behaviors we observe in the ultimatum game (even when reputation and repetition are absent). At the same time, several authors affirm that rejections in the ultimatum game are not due to fairness.

With respect to some of the theories explaining deviations from the rational conduct in the UG, it is possible to affirm that:

- Fear of rejection is not a per se sufficient explanation for the behavior of the proposer in the ultimatum game. It is sufficient to consider what happens in the dictator game to understand why.
- Even the presence of punishment as a strategic option (N.B.: not the fear of being punished, but the rational expectation that this may happen) is not sufficient per se to explain the behavior of the proposer in the ultimatum game. Again, it suffices to consider what happens in the dictator game to understand why.
- The lack of information (I.e.: is the UG a competitive or cooperative interaction? Who's entitled to the endowment?) is instead a more delicate issue, but there is not enough ground to say with certainty that the irrational behaviors observable in the ultimatum game are caused by the information ambiguity.
- Envy has the potential to be a good explanation for the behavior of the receiver: envy and guilt entail a heavier weight attributed to fairness, where the subjective nature of morals views (and hence of what's fair and what's not) is the main determinant of the emotional response. Unpleasant emotions (I.e.: anger, contempt, irritation, envy and sadness) tend to be more intense for the receiver when the proposed offer is lower. The intensity of the negative emotions significantly increases the probability of rejecting the offers. Such emotions should be considered along-side fairness and equity concerns to explain responder's behavior.

In this paper it is going to be assumed that deviations from the rational conduct in the ultimatum game are caused by fairness concerns. The effects of two elements on fairness are going to be tested:

- The effect of the opportunity cost on fairness' salience
- The effect of the priming effect on fairness' salience

Literature review

- From the literature review for the first hypothesis, it emerged that fairness concerns are sensible to the opportunity cost. More specifically, in public good games people react to the changes in the cost of punishment as they would for changes in the price of standard goods, where the magnitude of the punishment and its price are the main determinant of the level of punishing (and of the minimum contribution threshold that triggers punishment). It has also emerged that fairness concerns are sensible to the social context, to the individual endowment, to the social distance between individuals (i.e.: to what extent it is possible to empathize with thy neighbor), and to gender differences.
- From the literature review for the second hypothesis, it emerged that the priming effect is successfully able to condition people's behavior/preferences, leading people to the enactment of fair or unfair behaviors (depending on the prime). The effectiveness of the prime largely depends upon the context (e.g.: online experiment, lab experiment, etc....), the medium used for the priming (e.g.: pictures, unscramble sentence task, etc....), and from the conceptual content of the prime (e.g.: fairness, God, money, etc....).

Method

In this paper I'm going to test two hypotheses.

Hypothesis 1: if the opportunity cost (i.e.: what you forgo in order to obtain a fair outcome) becomes higher, fairness loses salience.

Hypothesis 1a: if the opportunity cost (i.e.: the money that one would gain by renouncing to the fair outcome) becomes higher, then individuals are more likely to accept unfair offers.

Hypothesis 1b: if the opportunity cost (i.e.: the money that one would not lose by renouncing to the fair outcome) becomes higher, then individuals are more likely to accept unfair offers.

Hypothesis 2: the priming effect can make more/less influential fairness considerations in the decision-making process.

Hypothesis 2a: by the means of a fair textual prime it is possible to corroborate the effect of fairness in the decision-making process.

Hypothesis 2b: by the means of an unfair textual prime it is possible to weaken the effect of fairness in the decision-making process.

For each hypothesis, an experiment will be carried out. Both experiments are surveys consisting in the ultimatum game.

- The first experiment is aimed at understanding if people switch from a fairness-based response to a utility-based response when they receive an unfair offer whose opportunity cost in case of rejection is prohibitively high. In the first sub-hypothesis (1a), opportunity cost is defined as forgone gain, while in the second sub-hypothesis (1b) it is defined as avoided losses (i.e.: the money that one is not losing by accepting the offer). The survey is divided in two parts, where part one is aimed at testing the first sub-hypothesis, while part two is aimed at testing the second sub-hypothesis. The difference between the control questionnaire and the treatment questionnaire will be the opportunity cost: with respect to the control questionnaire, in the treatment questionnaire the opportunity cost associated to a rejection will be prohibitively high. Hence, it will be assessed if this difference in the opportunity cost has a significant effect on the acceptance/rejection decision. Furthermore, to decrease the hypothetical bias two methodologies have been used: the Cheap Talk, and a tailored implementation of the consequential design.
- In the second experiment, subjects will play the ultimatum game by specifying their strategy on the survey, and at the beginning of the experiment subjects will be primed with either a fair prime, a selfish prime, or a neutral prime. It will be then assessed if the prime has a significant effect on the proposed offers, on the lowest/highest acceptable offers, on what the individual considers the others will offer, on what the individual considers to be a fair offer, and on what the individual considers to be a fair offer according to someone else.

To decrease the hypothetical bias in the first experiment, a combination of two methods have been used.

1. Consequential design. This is typically used for public good games. It consists of three features. Consequentiality, binary format, and compulsiveness. To implement the consequential design in the experiment subjects will be asked some questions before being allowed to report the final answer. The questions will be 'How would you feel if you accepted this offer? How would you feel if you rejected this offer?'. For each of these two questions, subjects will be asked to answer by assigning a value from 1 to 10, where 1 = 'extremely negative feelings' and 10 = 'extremely positive feelings'. The purpose of these two questions is to emphasize the emotional consequences of an eventual acceptance/rejection of the offer, in analogy to what is done in a public good game when it is emphasized that the WTP (willingness to pay) revealed will lead to consequences (i.e.: to higher taxes). For what concerns the binary dimension of the choice no adjustments are needed, because subjects are only presented with a yes or no question (i.e.: accept or reject). To account for the compulsiveness instead, subjects will be presented with the following questions 'How long do you think the feeling would take to fade away (in case of acceptance)? How long do you think the feeling would take to fade away (in case of rejection)?'. As for before, subjects will be asked to answer with a rating from 1 to 10, where 1 = 'a few seconds' and 10 = 'maybe never'. The purpose of these questions is to bring subjects to assume that they will

not be able to neglect the consequences of their choice (in this case, consequences are the emotions that they would be feeling). When subject will start reasoning about the needed timespan to forget the emotions, in their reasoning they will implicitly assume their emotions to be unavoidable (i.e.: therefore compulsory).

2. Cheap Talk was proven to be effective in some studies to reduce the 'hypothetical bias'. Subjects are simply asked to answer as if it was a real-life situation and not a lab experiment.

Results

Results for hypothesis 1

To elaborate the data from the survey on the opportunity cost, a logistic regression has been used, where the dummy Accept/Reject is the dependent variable, the size of the offer (big vs small) is the explanatory variable, and age, gender, and college are the control variables. The variables age, gender, and college didn't result to be significant. After eliminating the variables that were not significant, the explanatory variable (big vs small) resulted to be significant for an alpha of 0.01: the coefficient of the explanatory variable is equal to 0.77, with a p value of 0.0622, it has an odd ratio of 2.179 and the CI of the odd ratio at the 90% is (1.09 - 4.33). In conclusion, there is enough evidence to confirm sub-hypothesis 1a that stated that

Hypothesis 1(a): if the opportunity cost (i.e.: the money that one would gain by renouncing to the fair outcome) becomes higher, then individuals are more likely to accept unfair offers.

and according to our analysis, an individual is 2.179 more likely to accept an unfair offer if the potential gains are of great size.

For what concerns sub-hypothesis 1b instead, none of the variables resulted to be statistically significant. The p value of the variable age is 0.68, the p value of the variable gender is 0.66, the p value of the variable college is 0.85, and the p value of the variable big vs small is instead 0.83. Even by regressing the model on a single coefficient, it has been observed that the p value of the explanatory variable is not statistically significant, and that there is not a significant difference between the model with only the intercept and the model with the intercept and the explanatory variable. There is no evidence to support sub-hypothesis 1b that stated that

Hypothesis 1(b): if the opportunity cost (i.e.: the money that one would not lose by renouncing to the fair outcome) becomes higher, then individuals are more likely to accept unfair offers.

Results for hypothesis 2

For what concerns hypothesis 2 instead, several regressions have been made to test the effect of the primers on several dependent variables.

Regression with contribution as dependent variable

Contribution has been regressed against five variables: age, gender, college, negative prime, positive prime. In this regression none of the variables emerged to be statistically significant. When the regression is performed with just one of the two predictors, they individually result to be statistically significant, so that the model fits the data significantly better when either negative prime or positive prime are added to the regression individually. In a regression with both positive prime and negative prime as predictors, both variables result not significant because of multicollinearity: being that the two variables are strongly correlated with each other (correlation is equal to -0.51), including both variables in the regression leads to unreliable estimates. Hence, one should consider just the regressions with the single predictors. According to these, we can say that sub-hypothesis 2a and 2b are true. More specifically...

Hypothesis 2(a): by the means of a fair textual prime it is possible to corroborate the effect of fairness in the decision-making process.

According to our data it is possible to affirm that people primed with the fair textual prime should make offers that are 22.63 euros higher, and at the 90% confidence level it is possible to say that the increase in the offered sum due to the prime should fall between 1.067 euros and 44.20 euros. Instead for hypothesis 2b...

Hypothesis 2(b): by the means of an unfair textual prime it is possible to weaken the effect of fairness in the decision-making process.

According to our data it is possible to affirm that people primed with the unfair textual prime should make offers that are 23.09 euros lower, and at the 90% confidence level it is possible to say that the decrease in the offered sum due the prime should fall between -45.07 euros and -1.11 euros.

Hence, hypothesis 2 has been confirmed.

Regression with contribution belief as dependent variable

Contribution belief has been regressed against age, gender, college, negative prime, positive prime, and it has emerged that the only significant variable is negative prime. By eliminating the variables that are not statistically significant, it results that the coefficient of the variable negative prime is equal to -48.33 , with a p value of 0.0113. It is possible to conclude that people primed with the negative prime should assume others to make offers that are 48.33 euros lower with respect to what they would normally assume.

Regression with norm as dependent variable

In the regression with norm as dependent variable and age, gender, college, negative prime, and positive prime as independent variables, negative prime resulted to be marginally significant for alpha equal to 0.1 (p value is 0.109), while all the other variables didn't result to be statistically significant. By eliminating all the variables that are not statistically significant, it results that the variable negative prime is significant for alpha equal to 0.05 (p value is 0.0379). The value of the coefficient for the variable negative prime is -19.158 . This means that people exposed to the negative prime (*ceteris paribus*) should estimate a fair offer 19.16 euros lower than those who aren't exposed to the prime.

Regression with normative belief as dependent variable

The regression with normative belief as dependent variable and gender, age, college, positive prime, and negative prime as independent variables didn't show any significant relationship, except for the variable negative prime that was marginally significant for alpha equal to 0.1 (p value is equal to 0.12). After eliminating all the variables that weren't significant, the only variable left therefore has been negative prime. In the regression with only the negative prime and the intercept, it emerged that the coefficient of the variable negative prime is -28.91 , the p value of the variable is 0.032 (hence it is significant for alpha equal to 0.05), and the confidence interval of the coefficient at the 95% is between -55.29 and -2.52 . It is possible to interpret these data in the following way. People primed with the negative prime should estimate a lower number (with respect to the number they would normally estimate) when considering what is the value of a fair offer according to someone else; this number is lower by -28.91 euros and at the 95% confidence level it is possible to say that the estimate should fall between -55.29 euros and -2.52 euros.

Regression with LAO as dependent variable (lowest acceptable offer)

The variable LAO has been regressed against the five variables (gender, age, college, positive prime, negative prime) and in other two regressions against the explanatory variables (negative prime and positive prime) individually. In none of the regressions any of the five variables resulted to be statistically significant. Hence, one must conclude that the prime had no effect on the lowest offer that an individual would be willing to accept.

Regression on HAO (highest acceptable offer)

The variable HAO has been regressed on all the five variables and in other two regressions on the explanatory variables (negative prime and positive prime) individually. In none of the regressions any of the five variables resulted to be statistically significant. Hence, one must conclude that the prime had no effect on the highest offer that an individual would be willing to accept.

Effects of contribution belief, norm, and normative beliefs on contribution

It has been tested the effect of the variables contribution belief, norm, and normative beliefs on the dependent variable contribution. Being that these variables are not independent from each other, to avoid multicollinearity the effect has been estimated individually. So, each of these variables has been regressed individually against the variable contribution.

- The variable contribution belief resulted significant with a p value equal to $8.02 \cdot 10^{-15}$ for a coefficient of 0.40 and a confidence interval at the 95% of (0.31 - 0.49). This implies that believing that other people will contribute 1 euro more should cause the individual to contribute 40 cents more.
- The variable norm resulted significant with a p value of $1.17 \cdot 10^{-16}$ for a coefficient of 0.88 and a confidence interval at the 95% of (0.69 - 1.07). This implies that an increase of 1 euro in the sum considered to be fair should cause an increase in the contribution of 0.88 cents.
- The variable norm belief resulted significant with a p value equal to $1.11 \cdot 10^{-9}$ for a coefficient of 0.47 and a confidence interval at the 95% of (0.32 - 0.61). This implies that an increase of 1 euro in what the individual believes that other people consider the fair contribution will cause the individual to contribute 47 cents more.

That said, one may conjecture that the effect of the prime is mediated by these variables: the prime affects the norm, normative beliefs, contribution beliefs, and these in turn affect contribution behavior. If this was to be true, we wouldn't yet be able to explain why the positive prime had a significant effect on contribution, because the positive prime didn't have a significant effect on norm, normative belief, and contribution belief. Hence the most likely hypothesis is that the prime has a direct effect (i.e.: the effect is not mediated by the upper mentioned three variables). Nonetheless, it is worth saying that the individual contribution behavior is significantly affected by these three variables. It must be also mentioned that this result may be potentially invalidated by a sequential effect: the first question in the survey is about the contribution behavior (i.e.: how much would you offer?), so the answer to the second question 'how much do you expect other people would offer?' is likely to be conditioned by the answer to the previous question. The same applies for the answers to the two following questions 'how much do you think it would be right to offer on average?' and 'how much do you think it would be right to offer on average, according to someone else?'. Especially for the variable norm, it would not be surprising to observe that people provided an answer whose value is inferior or equal to what they are willing to offer. If this sequential effect was to be true, there would be a problem of reverse causality in the regression (i.e.: Y conditions X), that would cause the results to be unreliable. It would be interesting for future research to check if there is indeed a sequential effect.

Discussion/Limitations/Conclusion

There are several limitations in this paper. Here are the limitations of which the author is aware of:

- The methodology applied to reduce the hypothetical bias (cheap talk and consequential design) may be not effective, it may overcompensate for the bias, or it may be able to offset just partially the hypothetical bias. In this paper the combination of Cheap Talk and consequential design was assumed to be effective. Nonetheless, in the worst-case scenario this methodology could generate biased results. Therefore, the lack of awareness about the effectiveness of this methodology is undoubtedly a limitation, and it would be interesting to test the validity of this method in another paper.
- Second limitation is about the binary nature of the subjects' payoff in the experiments on the opportunity cost. In this experiment, it has been considered the effect on fairness preference of a payoff that is 10,000 times larger (or 1,000 times larger) than the payoff of the control group. Hence, it

is not yet clear if this change in the fairness preference (with respect to change in the payoff) is linear, non-linear, or if there is a categorical change that takes place for some monetary value (that could be either absolute or relative to the individual income). That said, it has been nonetheless proven that when there is the possibility of a great potential gain, there is a switch from a fairness-oriented response to a utility-oriented response for many individuals. According to our results, it is not possible to confirm that the same happens when there is the possibility of a great potential loss. For the purpose of future research, it could be interesting to relate this heterogeneity in changes of fairness preferences with personality traits by the means of psychological tests (e.g.: the Big 5 or the Myers-Briggs test).

- In this paper the ultimatum game has been assumed to be appropriate to investigate fairness preferences. Nonetheless, it has been discussed in the introduction that rejection of unfair offers in the ultimatum game might also be due to something else and not to fairness concerns. Therefore, this paper relies on an assumption that could be wrong, and this is indeed a limitation.

Limitations aside, it has been proven that by the means of a textual prime it is possible to influence people's behavior. For example, it could be possible to use a fair textual prime to increase the provision of funds to a charity. It has also been proven that people's attitudes towards fairness are not imperative: if the personal gain at stake is sufficiently high fairness is put in second place and people pursue utilitarian goals. It is interesting to observe that the same didn't happen with losses. It is interesting because this is not consistent with the loss aversion bias. My conjecture is that the difference in outcomes is due to anchoring. In the experiment on the gains, the anchor is zero: the participants have been considering the offer of 10,000 having 0 as a reference point. In the experiment on the losses instead, participants have been considering the offer of paying 76,000 euros instead of 80,000 euros, so minus 80,000 was the reference point. Although in percentage terms both offers are considered 'unfair' in the ultimatum game (offer for the random award is the 1% and offer for the fine payment is the 5%), the differences in the payoffs in case of acceptance against the payoffs in case of rejection vary remarkably: (payoff for acceptance) - (payoff for rejection) = (10,000 - 0) in the case of the random award while in the case of the fine (payoff for acceptance) - (payoff for rejection) = - (80,000 - 76,000). Hence such notable difference in relative losses/gains and the different anchors might be the underlying causes of the different outcomes.

It has also been proven that the unfair textual prime affected beliefs about the behavior of other participants. The exposure to the negative textual prime led people to assume the others to behave more selfishly. In situations where the belief about other people's behavior is crucial to achieve cooperation, the accidental exposure to an unfair textual prime could have notable negative effects. It has also been proven that the unfair textual prime can affect the way in which we assess fairness (I.e.: what we deem fair or unfair) and our belief of what others believe to be fair. This is crucial if we consider that norms and normative beliefs determine the individual behavior, especially when there is actual/potential exposure to social judgment.

Lastly, according to our results there is no evidence to conclude that primed subjects (either with the fair prime or with the unfair prime) have a different acceptance threshold (both upper and lower) with respect to non-primed subjects.