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From Selfish to Selfless

A study on self-other choices regarding fairness

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Abstract

This study investigates behavior and beliefs regarding fairness. The main goal is to examine whether putting oneself in another's shoes enhances fairness in subsequent decisions. To test that, an experiment, involving real incentives, was designed and conducted. In this experiment, students were asked to first predict another's choice and then choose for themselves or to first choose for themselves and then predict another's choice. Afterwards, the subjects' associations regarding fair and unfair behaviors were elicited. Evidence supported the theories of perspective-taking, anchoring, the consensus effect and the egocentric fairness bias, while the theories of empathy gap and cognitive dissonance were refuted. Perspective-taking, anchoring and the consensus effect correctly predicted that thinking of another's choice prior to one's own choice, does not enhance fairness. The subjects also reported that they perform a greater amount of fair than unfair actions, while others perform the same amount of fair and unfair actions. Hence, subjects were found to believe that they are fairer than others (egocentric fairness bias), although they previously acted the same way others did. Thus, an unresolved cognitive dissonance between beliefs and actions was found.

1 Introduction

Over the past decades, it has been discovered that there are systematic and predictable ways in which humans act unethically beyond their own awareness (Chugh et al., 2005, chap. 5). From the supermarket queue to wage allocations, people unfairly discriminate others showing that fairness is not an outdated issue, yet. There is still a need for new ways of nudging people to be fairer when fairness is the desired outcome. One of these new ways could be rooted in the old saying; "Before making decisions, think of others first. Don't do to others what you don't want others to do to you". If indeed thinking of others first leads to fairer or more equal distributions, then choices should be presented to people framed in ways that would nudge them to put themselves in other's shoes before making a decision.

In this thesis, in order to test the effectiveness of this saying, subjects were asked to put themselves in other's shoes by predicting other's choices. Different theories support or refute that predictions can enhance fairness of subsequent choices. These theories are analyzed and their predictions are tested. People's perceptions regarding fair behavior are analyzed as a contender that could influence decisions towards fairness. Thus, it is tested whether an egoistic (or altruistic) attitude is related to an egoistic (or altruistic) behavior. The perceptions are elicited through the subject's associations of their actions and other's actions with fairness.

This is an experimental study based on a dictator game. This game is easy to explain and understand and just like Hoffman et al. (1996a) said "dictator games are an interesting vehicle for studying the meaning and interpretation of fairness". In a dictator game, one player, the dictator, divides a fixed amount of money between himself and another player, the recipient. The recipient can only accept this amount. In this context, I want to find out if the dictator would increase or decrease the proposed share in case he had to predict first what somebody else would do in his position. And if his prediction would be influenced in case he had to choose first. The dictator's perception towards fair behavior is also analyzed and compared with his own offer and his prediction of the other's offer. Dictator games leave little room for reciprocity (see section 2.9) to influence the subjects' perception of fairness. Thus, a dictator game provides a more simplistic definition of fairness. In my experiment, the equal split of the initial endowment that is given to the dictator is considered to be the fair split.

This paper is organized as follows. Firstly, I review the literature to present background theories that this paper is based upon (see section 2). Secondly, I present the hypotheses proposed by the different theories (see section 3). Thirdly, I explain the methodology of the experiment conducted in this paper (see section 4). Fourthly, I present the results of the experiment (see section 5). Fifthly, I discuss similarities and differences of this study with previous studies, address certain limitations of the paper and suggest further research ideas (see section 6).

2 Literature Review

In this section, different theories that attempt to explain behavior (one's choices and predictions) as well as perceptions over fairness are presented. Firstly, the theories that predict similarities between choices and predictions are analyzed (see sections 2.1, 2.2, and 2.3) Secondly, theories that predict differences between choices and predictions are analyzed (see sections 2.4, 2.5 and 2.6). Thirdly, theories of self-other choices under risk are presented (see section 2.7). Fourthly, the literature of the well-known dictator game and the notion of reciprocity are reviewed (see sections 2.8 and 2.9). Table 1 summarizes the basic ideas that are mentioned below.

Literature	Theory	Effect
Galinsky et al. (2005)	**Perspective-taking:** • see others in oneself → ↑ mimicry & synchrony • see oneself in others → ↓ prejudice & stereotyping	Fosters similarities between oneself and other.
Tversky and Kahneman (1974), Ariely et al. (2003) Wilson et al. (1996)	Self- and experimenter-generated **anchoring**, affects choices unintentionally or non-consciously	Fosters similarities between oneself and other.
Ross et al. (1977), Dawes (1989)	**Consensus Effect:** Own choices are more common and appropriate	Fosters similarities between oneself and other.
Batson et al. (1997)	Imagine how the other feels → ↑ **empathy** Imagine oneself as the other → ↑ **empathy and distress**	One's choices are fairer when preceded by predictions.
Farwell and Weiner (1996), Messick et al. (1985), Liebrand et al. (1986)	**Egocentric Bias:** One is above average in favorable characteristics	One is fairer than the other.
Festinger (1962); Festinger and Carlsmith (1959)	**Cognitive Dissonance:** Beliefs and actions should match	Fosters consistency between one's beliefs and actions.
Faro and Rottenstreich (2006)	**Risk-as-feelings & empathy gap**	Predictions reflect a muted fourfold pattern of choices.
Loewenstein et al. (2001), Hsee and Weber (1999)	**Risk-as-feelings**	Understanding emotional reactions over risks enhances predictions.
Li et al. (2013)	**Risk-as-value & anchoring**	Prior predictions enhance strong rationality in choices regarding losses.
Rabin (1993), Camerer and Thaler (1995), Kahneman et al. (1986a)	**Reciprocity** changes perception of fairness	It is fair is to reward when being rewarded and punish when being punished.

Table 1: A brief summary of the papers and the theories that influence the present study.

2.1 Perspective-taking

The notion of perspective-taking can affect the difference between one's own choice and one's prediction of other's choice. Galinsky et al. (2005) define perspective-taking as the process of imagining oneself in other's shoes. Perspective-taking can be activated when someone is asked to think or predict someone else's choice. Galinsky et al. (2005) support that the moment a person takes the perspective of another, there is a greater overlap between mental representations of the self and mental representations of the other. Consequently, perspective-taking fosters social bonds in two ways. First, perspective-taking helps one to see more of oneself in others, which decreases prejudice and stereotyping. Second, perspective taking helps people see more of others in themselves, which increases mimicry and synchrony in interactions with others. In my study, perspective-taking is involved when predicting other's choices. Thus, predictions can help one to see more of oneself in others and more of others in oneself. Both forces predict similar choices and predictions.

Dixon and Moore (1990) suggest that perspective-taking consists of two components. First, the information effect. In this situation one has complete information while other has partial information. Perspective-taking is shown when one can successfully focus on the information that are known to the other. Second, the weighting effect. In this effect the subjects have the same information and perspective-taking is shown when one interprets or evaluates the available information the same way that the other does. Ruby and Decety (2001, 2003) found evidence for both effects. In my study, the effect that can be involved in the subjects' decision making process is the weighting effect since all the subjects have the same information. Hence, perspective-taking will be involved if the subjects are able to assess this information correctly and as a result predict other's choices accurately.

2.2 The Anchoring Effect

Tversky and Kahneman (1974) defined anchoring as a person's tendency to base his or her subsequent judgments on an initial value. Thus, decisions are biased towards a starting point, the anchor. Anchoring can bias choices towards predictions when predictions are preceded and predictions towards choices when choices are preceded.

Tversky and Kahneman (1974) support that anchoring does not only occur when a starting point is given to the subjects but also when the subject estimates a number on their own. Subjects were given a random number and a question, such as "What is the percentage of African

countries in the United Nations?". Then, they were asked whether the response to the question is a number higher or lower than the random one. Afterwards, they were asked to estimate the exact number as a response to the question. Using this experimental design, it was found that the given starting point (the initial random number) affected significantly the subjects' subsequent estimations. In another experiment, the subjects were given the chance to estimate the product of 8 in an ascending or descending sequence in a few minutes. The descending sequence was $8*7*6*5*4*3*2*1$ and the ascending sequence was $1*2*3*4*5*6*7*8$. The multiplication of the first numbers in the ascending sequence gives a relatively smaller number than the one in the descending sequence. Since the subjects anchored to the multiplication of the first numbers of each sequence, the estimates in the ascending sequence were relatively smaller than the ones in the descending sequence. This result shows that the subjects can be also anchored to their own first calculations.

Ariely et al. (2003) found strong evidence for the anchoring effect. After participants wrote down the last two digits of their Social Security number, they were asked to value a number of items and experiences. Although students were reminded that the Social Security number is a random quantity conveying no information, those who happened to have high Social Security numbers were willing to pay much more for the products or experiences that were presented to them. Evidently, a random starting point can significantly influence the subjects' willingness to pay.

Wilson et al. (1996) investigated different situations in which the anchoring effect occurred. They found that even completely arbitrary numbers can anchor people's judgments, supporting the results of Tversky and Kahneman (1974) and Ariely et al. (2003). The anchoring effect can be moderated from the amount of knowledge a participant has, presumably because he or she can retrieve from memory the answer that he or she thinks is correct. People are also required to pay sufficient attention to an arbitrary number for the anchoring effect to occur. There is also evidence that anchoring occurs unintentionally and non-consciously since participants were not able to recognize that their responses were influenced by the anchor.

Strack and Mussweiler (1997) found evidence for the notion that anchoring is a special case of semantic priming. This notion suggests that anchoring activates information that subsequently is more accessible to subjects when they make decisions. They found that the anchoring effect is stronger when the activated information is more applicable. The anchoring effect may lead to different results if the initial information is similar or different than the subsequent judgment. They support that the anchoring effect does not just "activate" a specific number but rather a

specific type of information. When the subjects were presented with an implausible anchor the subsequent decisions were more time-consuming.

2.3 The Consensus Effect

Ross et al. (1977) found evidence for the existence of the "false consensus" bias. According to this notion, people tend to perceive their own choices, judgments or beliefs as relatively more common or appropriate and the alternatives as relatively uncommon or inappropriate. That way, one's predictions of other's choices can be influenced by one's own choices.

Ross et al. (1977) presented different scenarios to subjects. Afterwards, the subjects were asked how possible it could be that they themselves or their peers would make a specific decision. The subjects predicted that others will choose more frequently the same choices that they themselves chose as well. Therefore, choosing different alternatives changed the subjects' perspective of others' choices. Subjects' predictions deviate towards their own responses which, according to an extensive amount of literature, cannot result from accurate estimation procedures. Thus, people tend to overestimate the degree to which others are like them. This is relevant to the present study since one's own choice (or intention)[1] can affect one's prediction of other's choice. Thus, someone who treated other in a fair (unfair) manner thinks that the other will do the same. Ross et al. (1977) did not examine if the consensus effect is affected by the order of predictions and choices. Thus, I assume that the consensus effect is not affected by the order of choices and predictions.

This behavior was characterized as "false" as it was thought to be irrational and egoistically biased. However, Dawes (1989) showed that this effect can be rational under Bayesian statistics and it can contribute to accurate estimations. Thus, the consensus effect exists but is not "false" since it is positively related to predictive accuracy.

2.4 Empathy

Empathy refers to the capacity to understand and respond to the unique affective experiences of another person (Decety and Jackson (2004)). Lamm et al. (2007) summarize the three primary components of empathy:

[1] According to Ross et al. (1977), if one first chooses and the predicts his or her own choices can affect subsequent predictions. I also assume that even when one first predicts and then chooses, his or her predictions can be influenced by his or her intentions regarding choices. These intentions are revealed in his subsequent choices.

1. an emotional response to another person which might entail sharing other's feelings
2. a cognitive capacity to take the perspective of another person
3. a monitoring mechanism that accounts for the origin (self or other) of the experienced feeling

Ruby and Decety (2001) also support that empathy is about recognizing the other person's feelings as one self's whilst a clear separation between the two exists. According to Batson et al. (1997), one can take the perspective of another person in two ways; imagining how other feels and imagining oneself in other's shoes. The former evokes pure empathetic emotion and altruistic motivation to oneself while the latter evokes a mixture of other-oriented empathy and self-oriented personal distress which evokes egoistic motivation. Both altruistic and egoistic motives can lead to prosocial behavior although the patterns of prosocial behavior are different in each case (Eisenberg and Miller (1987)).

According to Aron et al. (1991), the way oneself sees others has three dimensions that are highly related to the closeness of oneself to the other. First, the closer a subject is to the other, the more he or she cares for the other's share. In that sense, one is expected to help more a friend than a stranger. Second, the closer a subject is to the other, the more he or she can recall the other's actions or performance. Thus, one can more easily recall an action that a friend performed rather than an action that a stranger performed. Third, the closer a subject is to the other, the more closely interconnected are the cognitive representations of self and other. In this study, the subjects do not know the partner they are matched with in the tasks. This "distance" between the subjects may lead to more selfish choices as well as predictions that are far from the actual choices of others. In other words, this social "distance" between the subjects can cause an empathy gap. The empathy gap can be decreased when the subjects think of others first. The existence of the empathy gap is tested here. Evidence that support this notion were also found by Faro and Rottenstreich (2006) (see section 2.7).

Eisenberg and Miller (1987) reviewed a big part on the literature that relates empathy to prosocial behavior. They conclude that the association between the two varies due to the different ways of measuring empathy. The different ways of measuring empathy include:

- subjects' self-assessed emotional state after being exposed to pictures, stories or slides about a hypothetical other's affective state
- subjects' self-assessed emotional state after being exposed to experimentally simulated distress situations involving real people, audiotapes, or films

- subjects' self-assessed level of empathy or sympathy as a personality trait
- subjects' ratings of other's facial, gestural, and/or vocal reactions to another's emotional state
- subjects' physiological responsivity to others' predicament
- other's report of a subject's empathy
- the use of experimental induction procedures or manipulations (other than mere presentation of a needy other) designed to induce empathic responding.

The degree of association between empathy and prosocial behavior varied considerably from 0.10 to 0.36 (significant correlations). The relations were strongest for self-report indices of empathy in simulated experimental situations, physiological indices of empathy, misattribution procedures, and manipulations of similarity designed to induce empathy.

In this study, empathy is not measured. However, it is examined whether thinking of the other evokes empathetic motives that lead to subsequent fairer choices. This study tests whether the empathy gap is reduced when thinking of others first. If that is true, then the subjects that think of others first should choose fairer distributions of the initial endowment.

2.5 The Egocentric Fairness Bias

Part of the literature suggests that people tend to think of themselves as better than others in admirable areas. Farwell and Weiner (1996) support that subjects tend to perceive that they are above average in a number of desirable characteristics, including fairness. When subjects were asked to reward and punish others according to their responsibilities[2], the subjects reported that they were fairer as they based their judgments more on the other's responsibility. They also supported that they treat in-group and out-group members fairer than others. In general, subjects perceived themselves as more benevolent, less biased towards in-groups and more judicious compared to others.

Messick et al. (1985) also found evidence that people associate themselves with fairer actions and others with less fair actions. Subjects were asked to think of fair and unfair actions and address them to themselves or others, according to how frequently each is possible to perform them. They were asked to start each sentence with "I" if they perceive that they perform this

[2]A judgement is considered fair when it is mostly based on other's actual responsibilities.

activity more often or "They" if they perceive that others perform this activity more often. It was found that self-ascribed behaviors were rated as fairer than other-ascribed behaviors. This bias is called the egocentric fairness bias and it leads subjects to think that their actions produce relatively fairer outcomes than other's actions. The egocentric fairness bias can be computed as follows:

$$\text{Egocentric Fairness Bias} = (I_{fair} + T_{unfair}) - (I_{unfair} + T_{fair}) \tag{1}$$

where I_{fair} is the number of fair cases that a subject addresses to oneself, T_{unfair} is the number of unfair cases that a subject addresses to others, I_{unfair} is the number of unfair cases that a subject addresses to oneself and T_{fair} is the number of fair cases that a subject addresses to others.

The same bias was found by Liebrand et al. (1986) when they repeated the study in the Netherlands. Liebrand et al. (1986) also added the dimension of memorability. They asked the subjects to recall some of the previously presented fair and unfair tasks. Unfair behavior of others was the most frequently recalled behavior. This finding implies that subjects consider others as less fair than themselves. A similar technique is used in this paper to test if subjects are indeed associating themselves with fairer actions and whether this is related to self-other choices. Here, the subjects were also asked to address fair and unfair actions to themselves or others according to who is more inclined to perform them[3].

The same method was also used by Allison et al. (1989). They tested whether the egocentric fairness bias exists regarding fairness and intelligence. A fair behavior was described to the subjects as a good behavior and an unfair behavior as a bad behavior. The subjects indicated that they perform better and more intelligent behaviors than others. However, they reported that they perform a higher number of good behaviors than intelligent ones. The subjects also rated the frequency of these actions claiming that fair actions occur more often than intelligent ones. Intelligent behaviors of oneself were as frequent as the intelligent behaviors of others. The same results were found when the experimenter asked the subjects to read specific scenarios, that included good or intelligent actions, and estimate the probability that they themselves would perform that action and the probability that someone else would perform that action. Even when this different method was used, the subjects had the tendency to think that they are more likely than their peers to perform a moral action. This tendency is also called the illusion

[3]The subjects were asked to start their sentences with "I" if they thought that they were more inclined to perform that action or with"He/She" if they thought that others were inclined to perform that action.

of uniqueness.

Similarly, in this study the number of fair and unfair behaviors addressed to oneself and other is tested. According to this theory, it is expected that people address a more fair and less unfair behaviors to oneself than other.

2.6 Cognitive Dissonance

An extensive amount of literature has been devoted to cognitive dissonance (Festinger, 1962; Festinger and Carlsmith, 1959, p. 1-32). According to Festinger (1962) an individual strives towards consistency within himself. Individual's related opinions or attitudes are consistent with each other. Any discovered inconsistencies can be dramatic for an individual as they stand out in contrast with all the other consistencies.

This kind of consistency can also involve beliefs and actions. People are sensitive to inconsistencies between actions and beliefs. The existence of dissonance makes people psychologically uncomfortable. Recognizing such a discrepancy motivates individuals to resolve it. People try to reduce this dissonance and they actively avoid situations and information that would increase it.

Three different ways are used to resolve an inconsistency between beliefs and actions. First, a change of beliefs. People can change what they believe so that their changed beliefs are in line with their actions. Second, a change of actions. People can change their actions so that their changed actions are in line with their initial beliefs. Third, a change on the perceptions of actions. People can also change their attitude regarding an action so that their beliefs and actions are aligned.

In this study, cognitive dissonance might play a significant role. Its effect is examined in relation to the hypothesis of perspective-taking, anchoring, consensus effect and the egocentric fairness bias. In the dictator games, the actions of the subjects regarding fairness are observed. In the tasks of reporting fair and unfair cases, the beliefs of the subjects regarding fairness are observed. According to the theory of cognitive dissonance, actions and beliefs should be aligned. The theories of perspective-taking, anchoring and the consensus effect predict that the subjects are just as fair as others. If this is true, then the notion of cognitive dissonance predicts that people should also believe that others are just as fair as themselves. On the other hand, the egocentric fairness bias theory assumes that people believe that others are less fair than themselves. If this is true, then the notion of cognitive dissonance predicts that people should also act fairer than others.

2.7 Self-other Choices under Risk

In the literature, self-other choices are specifically analyzed under risk. Three notions have been introduced concerning choices and predictions under risk (Hsee and Weber (1999)). Firstly, the default hypothesis which assumes that people predict what others would do based on their own preferences over risk. In this case, predictions and choices appear to be similar. Secondly, the risk-as-value notion in which risk seeking is an admirable characteristic and subjects consider themselves better and thus more risk seeking than others. Thirdly, the theory of risk-as-feelings in combination with the empathy gap. The former predicts that subjects react emotionally to risk and uncertainty and the latter supports that people cannot predict others' choices completely accurately and so they consider them more neutral.

Faro and Rottenstreich (2006) support that one's own choices and one's predictions of others' choices can be enhanced when they are preceded by predictions of others' choices and one's own choices, respectively. That way, predictions can become more accurate and decisions more effective. According to Faro and Rottenstreich (2006), decisions are more effective when they are risk neutral[4]. They support that this improvement is caused by a positive anchoring effect between the first and the second decision in every case (see section 2.2 for a further analysis on the anchoring effect). In other words, deciding for oneself provides an anchor that increases the accuracy of the prediction of other's behavior while predicting other's behavior provides an anchor that increases the effectiveness of a subsequent choice for oneself. They also found evidence for the notion of risk-as-feelings and the empathy gap. They support that subjects predicted a more muted form of the fourfold pattern that actually prevails (Tversky and Kahneman (1986), Kahneman and Tversky (1979)).

Similarly, Li et al. (2013) found a difference in behavior of subsequent choices influenced by prior predictions. They investigated strong and weak rationality over choices between lotteries. Strong rationality exists when choices are risk neutral (considering moderate amounts). Weak rationality exists when there are no preference reversals between different decisions of the same subject. Li et al. (2013) found a switch in behavior towards strong rationality when subjects

[4]If an individual is risk neutral, he invests in the prospects with the highest expected return ignoring the risk features of these choice. On the other hand, a risk averse individual would invest in prospects based on their risk features although these choices could decrease his expected returns. Thus a risk neutral individual can have a higher expected return and a greater variance in possible returns. According to Shavell (2009, p.190), risk neutrality is more effective since the existence of risk-neutral individuals affects positively the social welfare. Assuming for convenience that the social welfare is the sum of individual's expected utilities, the shift of risks from the less to the more risk neutral raises the social welfare because the bearing of risk by the less risk averse individuals, results in a greater reduction in the expected utility than will the bearing of risk by the more risk neutral individuals.

made predictions first, regarding losses (the same did not hold for gains). They found no improvement of weak rationality. Li et al. (2013) defended the risk-as-value theory combined with anchoring.

Loewenstein et al. (2001) highlighted the role of emotions in decision making. They claim that right predictions demand from the subjects to think how someone else would handle his or her emotions in a particular decision. Hsee and Weber (1999), were the first to explore the discrepancy between self-other choices. They also found evidence for the notion of risk-as-feelings.

Faro and Rottenstreich (2006) also discussed other theories that predict self-other choice inconsistencies regarding risk choices. They suggest that in certain situations, choices and predictions can be made according to what is "socially sanctioned" or "normatively appropriate". The same holds for the present study. The subjects are aware that their choices will be analyzed by an experimenter and so the "observer bias" might lead to decisions that do not reflect reality. The subjects may behave in a more prosocial manner or according to what they think the experimenter wants to find. Moreover, Faro and Rottenstreich (2006) proposed that predictions may be influenced by group stereotypes and social norms. In the experiment of this paper, the subjects can infer that all participants are students. If they hold a specific stereotype regarding university students then this can influence their predictions about others' choices as well.

2.8 Dictator Game

As it is explained in the introduction (see section 1), the experiment that is used here to analyze self-other choices is based on the dictator game. The dictator game is an easy and well-known game that has been analyzed in the literature multiple times. It was introduced by Kahneman et al. (1986b) and a lot of attention has been drawn to it due to the conflict between theoretical and empirical results. The Nash equilibrium of this game suggests that the rational self-interested dictator will maximize his payoff by offering zero amount of money to the recipient, who cannot influence the outcome at all. In contrast, empirical results suggest that the subjects give away non-trivial amounts of money (Kahneman et al. (1986b), Forsythe et al. (1994)). More specifically, Forsythe et al. (1994) found that the histogram of the offers of the dictator is bimodal with peaks at the zero offer and at the equal-shares offer. In the experiment conducted in this paper, I am curious to see if this distribution shifts closer to the equal-shares offer when the subjects first predict other's choices. Another point to investigate is whether the distribution of predictions is influenced by the existence of preceded choices.

Cason and Mui (1998) found a switch towards fairer distributions in sequential dictator games, when certain information was revealed to the subjects. They discovered that revealing relevant and irrelevant information can affect fairness in a sequential dictator game. In their experiment, all subjects played the dictator game as dictators. Afterwards, some socially relevant or irrelevant information was revealed to the subjects by the experimenter. The information was about the player that they were matched with in the following dictator game. Relevant information involved for example the other player's offer on the first dictator game while irrelevant information involved the other player's birthday. In the second dictator game, the subjects made their decisions while having a 50% chance to be the dictator and a 50% chance to be the recipient. Subjects on average became less fair when irrelevant information was revealed. Those who were less fair on their first decision were less likely to change their attitude in the second game. Thus, not only revealed information but also the starting point influenced subsequent decisions indicating some sort of anchoring. In the present thesis, no type of information is revealed to the subjects in between their tasks, so the effect of revealed information is not tested.

Camerer and Thaler (1995) tried to explain why game theory fails to predict the empirical results of the ultimatum[5] and dictator games. Camerer and Thaler (1995) suggest that just allowing for some kind of altruistic utility function to explain the equal split, is problematic. According to Camerer and Thaler (1995), even if we assume that the utility of a player depends on the payoff of the other player, it is impossible to find out if the average subject has a positive or negative attitude towards the other player's payoff. This is the case because in the dictator game, the dictator seems to assign a positive value to the other's payoff, due to positive offers, while the same subject as a recipient in an ultimatum game would reject small offers indicating a negative value to the other's payoff.

2.9 Reciprocity and Fairness

Reciprocity refers to the way one behaves in return to another's prior behavior. Thus, rules of reciprocity are informal guidelines that affect how people respond to others' behavior. Farwell and Weiner (1996) support that the perception of fairness varies depending on context. According to Rabin (1993) fairness dictates reciprocating "good" behavior with "good" behav-

[5]The ultimatum game is similar to the dictator game but in the ultimatum game the recipient has the right to accept or reject the offer. In the case of acceptance, each player receives the payoffs offered by the proposer while in the case of rejection both players receive zero payoffs.

ior and "mean" behavior with "mean" behavior. People think that they act in a fair manner when their behavior is aligned with other's prior behavior towards them. So one's fair behavior and perception of fairness is affected by other's prior behavior. Trying to combine fairness and game theory, Rabin (1993) defined as fairness equilibria every mutual-max (when each player maximizes the other's payoffs) or mutual-min (when each player minimizes the other's payoffs) equilibrium.

As an example of reciprocal behavior, Ben-Ner et al. (2004) analyzed a sequential dictator game, similar to the one used in this study. In the first game, the subjects were the recipients and in the second game they acted as dictators. When the pairs of players were the same in both games (partner design), the proposed offer of the second game was highly correlated with the received offer of the first one. When the pairs of players changed between the two games (perfect stranger design), a less significant and lower-valued correlation, between the two amounts, was found. This behavior difference is caused by reciprocity as subjects reacted to their partner based on his or her prior behavior to them. This study implies that choices can be indeed manipulated by previous situations and reciprocal behavior arises when the subjects interact with each other.

Kahneman et al. (1986a) analyzed the way people perceive fairness. They conducted experiments based on the ultimatum game and situations that involved the consumers' responses to different business decisions. Kahneman et al. (1986a) found that people care about being fair and treating others in a fair manner. In practise, customers were willing to resist an unfair brand even with a cost for themselves. Kahneman et al. (1986a) suggest that a person's criteria regarding fairness are based on implicit rules. These judgments regarding fairness are influenced by framing and other factors that are considered irrelevant in most economic experiments. Kahneman et al. (1986b) also suggested that the perceived social norms act as rules of fairness in terms of business practice.

Camerer and Thaler (1995) suggest that a subject does not care about the other's payoff but desires some sort of equity. They choose to stress the meaning of manners and suggest that the behavior of people is a manifestation of reciprocity rules that they learn every day. People tend to apply these rules regardless of the situation they are in. In my experiment, reciprocation is not observed since the subjects have no prior interaction with each other and the recipient accepts the offer without being able to interact with the dictator. Thus, the subjects' perception of fairness is not influenced by reciprocal behavior that could be different from subject to subject and hard to analyze overall. Hence, reciprocity cannot easily influence

the meaning of fairness as a confound factor. Consequently, fairness is mostly associated with equality and more specifically with an equal distribution of the subject's endowment in the dictator game.

3 Hypotheses

This study tests hypotheses that are formed based on the different theories analyzed in the previous section. The hypotheses involve theories regarding perspective-taking, anchoring, the consensus effect, the empathy gap, the egocentric fairness bias and cognitive dissonance. Based on these theories two are the possible scenarios; predictions and choices being similar, or choices being fairer than predictions. The former is supported by the theories of perspective-taking,

Hypotheses		Theory
H1	Choices are similar to predictions, regardless their order	Perspective-taking, Anchoring Effect, & Consensus Effect
H2	Choices are fairer, when predictions are preceded	Empathy Gap
H3	Oneself is fairer than the other	Egocentric Bias
H4a	Self-other choices and self-other perceptions of fairness are related	Cognitive Dissonance, Perspective-taking, Anchoring Effect & Consensus Effect
H4b	Oneself is as fair as the other	
H5a	Self-other choices and self-other perceptions of fairness are related	Cognitive Dissonance & Egocentric Fairness Bias
H5b	Choices are fairer than predictions, regardless their order	

Table 2: A summary of the hypotheses and the theories that support them.

anchoring and the consensus effect. The latter is supported by the theories of empathy and the egocentric fairness bias. The theory of cognitive dissonance assumes a "bridge" between actions and beliefs[6] and is combined with both sets of these theories.

The order of one's predictions of other's choices and one's own choices is assumed to play a significant role only according to the theory of the empathy gap. Each theory on its own sup-

[6]Beliefs (or perceptions) of one's and other's fair behaviors are measured through the subjects' associations of themselves or others with fair and unfair cases. Subjects are asked to recall fair and unfair actions and then report who is more likely to perform them; themselves or another random participant. By the reported associations of oneself or another with fair or unfair cases, it is found whether people believe that oneself or other is more fair.

ports a certain causality between choices and predictions. In case different theories propose the same outcome, it will not be possible to disentangle them. Table 2 summarizes the hypotheses proposed by these different theories.

3.1 Perspective-taking

The effects of perspective-taking are caused when a person is called to take the perspective of another person (see section 2.1, Galinsky et al. (2005)). Perspective-taking evokes synchrony between oneself and other in two different ways; through seeing oneself in others and through seeing others in oneself. The former can be caused when subjects first make their own choices and then predictions since the subjects first focus on oneself and then on the other. The latter can be caused when subjects first make predictions and then their own choices since the subjects focus first on the other and then on themselves. Both of these effects increase synchrony between predictions and choices (see figure 1). Thus, perspective-taking enhances similarities between predictions and choices when choices precede predictions and when predictions precede choices (see hypothesis 1).

Hypothesis 1 (Perspective-taking) *One's own choices are similar to one's predictions of other's choices, regardless of the order of these two decisions.*

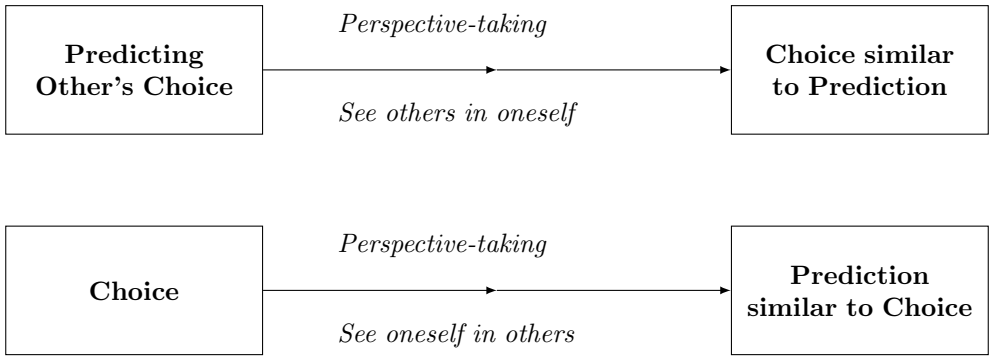

Figure 1: Perspective-taking enhances similarities between predictions and choices when either predictions or choices are preceded.

3.2 The Anchoring Effect

Evidence show that people tend to let prior decisions affect subsequent ones (see section 2.2, Tversky and Kahneman (1974), Ariely et al. (2003), Wilson et al. (1996), Strack and Mussweiler (1997)). Based on the theory of anchoring, subjects' choices can be influenced by prior

predictions and predictions can be influenced by prior choices (see hypothesis 1). Assuming that the subjects anchor to their very first decision, the difference between choices and predictions should be very small, when choices are prior to predictions and when predictions are prior to choices (see figure 2).

Hypothesis 1 (Anchoring) *One's own choices are similar to one's predictions of other's choices, regardless of the order of these two decisions.*

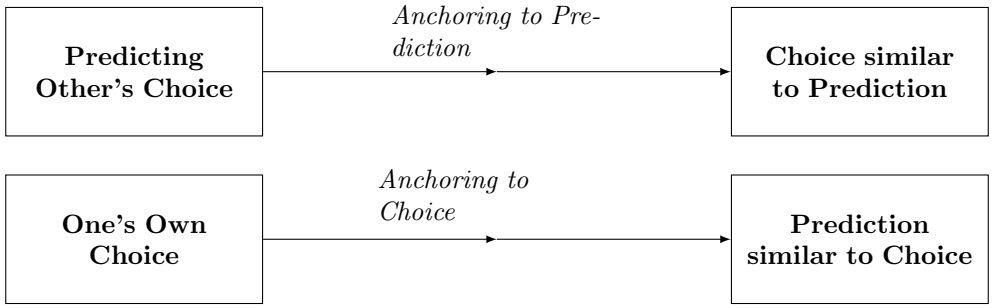

Figure 2: Anchoring enhances similarities between predictions and choices regardless of the order of the two tasks.

The theories of perspective-taking and anchoring lead to the same results regarding choices and predictions, thus the hypotheses of these two theories are the same. Both of these theories predict that regardless of the order of predictions and choices the difference between the two should be really small. In this study, the effect of these two theories is examined. Since they both lead to the same result, it is not possible to disentangle them or identify which of the two theories is more or less effective. It is also impossible to identify if there is a difference in the effectiveness of these two theories when choices or predictions are preceded.

3.3 The Consensus Effect

There is evidence that people tend to perceive their own actions as more common than other alternatives (see section 2.3, Ross et al. (1977), Dawes (1989)). Assuming that the order of reporting one's own choices does not affect the consensus effect, one's own choices influence predictions of others' choices. Thus, one's own choices drive one's prediction of other's choice closer to one's own choices regardless of the order in which choices and predictions are presented (see figure 3, hypothesis 1).

Hypothesis 1 (Consensus Effect) *One's own choices are similar to one's predictions of other's choices, regardless of the order of these two decisions.*

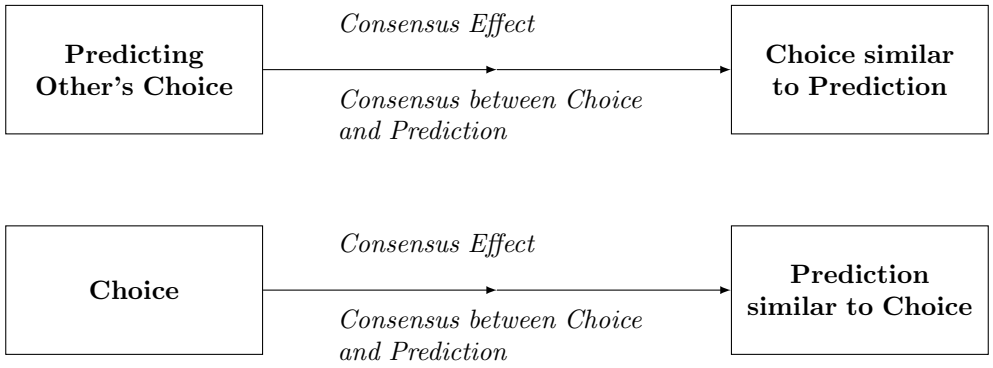

Figure 3: The consensus effect enhances similarities between predictions and choices regardless of the order of the two tasks.

The theories of perspective-taking, anchoring and the consensus effect lead to the same results regarding choices and predictions, thus the hypotheses of these three theories are the same. All of the three theories predict synchrony between choices and predictions regardless of the order of the two. In this study, it is examined whether the effect of these three theories is true. Since they all lead to the same result, it is not possible to disentangle them or identify which of the three theories is more or less effective. It is also impossible to identify if there is a difference in their effectiveness when choices or predictions are preceded.

3.4 The Empathy Gap

There is evidence that empathetic emotions can evoke prosocial behavior (see section 2.4, Batson et al. (1997); Eisenberg and Miller (1987)). If thinking of another person evokes some sort of empathy, then this emotion can drive people to act more prosocially or fairer. However, when thinking of others is not preceded, empathic emotions are involved less in decision making and subjects behave less prosocial or fair (empathy gap). Thus, predicting the choice of another person could lead to empathic emotions that subsequently increase fairness of one's own choice (see figure 4, hypothesis 2).

Hypothesis 2 (Empathy Gap) *One's own choices are fairer when one's predictions of the other's choices are preceded.*

Hypotheses 2 and 1 are not necessarily contradictory. Hypothesis 1 can be true within subjects and at the same time hypothesis 2 can be true between subjects. For example, it could be that between subjects, choices subsequent to predictions are fairer than choices prior predictions (hypothesis 2), whilst within subjects there is no difference between predictions

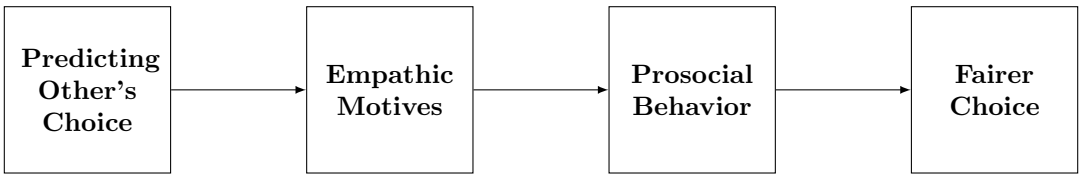

Figure 4: The empathy gap is reduced when predicting other's choice prior to one's own choice. Choices are fairer only when they are preceded by predictions.

and choices (hypothesis 1). Under both of these hypotheses, predictions are similar to choices regardless of their order and choices are fairer when predictions are preceded.

3.5 The Egocentric Fairness Bias

Part of the literature suggests that people perceive themselves fairer than others (the egocentric fairness bias; see section 2.5, Allison et al. (1989); Liebrand et al. (1986); Messick et al. (1985)). The existence of the egocentric bias is tested in this study (see hypothesis 3). All subjects report and address first fair and then unfair cases to themselves or other. This theory supports that subjects report more fair and fewer unfair cases to themselves. The order of the fair and unfair cases is fixed thus ordered effects cannot be measured. The theory of the egocentric fairness bias suggests that the results on self-other perceptions of fairness do not depend on any previous tasks in hand. Thus, the order of choices and predictions should not affect the existence of this bias.

Hypothesis 3 (Egocentric bias) *Subjects perceive themselves fairer (or less unfair) than others. A positive egocentric fairness bias exists.*

Hypothesis 3 is not contradictory to any of the above hypotheses since they are not closely related.

3.6 Cognitive Dissonance

According to the theory of cognitive dissonance, actions and beliefs should be aligned (see section 2.6, (Festinger, 1962; Festinger and Carlsmith, 1959, p. 1-32)). If there is any discrepancy between actions and beliefs, subjects can change any of the two to resolve such an issue.

The theories of perspective-taking, anchoring, consensus effect predict that the subjects act as fair as others. In this case, the notion of cognitive dissonance would predict that people should have beliefs similar to their actions (see hypothesis 4a). Thus, the subjects should not only act

as fair as others but they should also believe that they are as fair as others (see hypothesis 4b, figure 5).

Hypothesis 4a (Cognitive Dissonance) *The difference between one's own choice and one's prediction of other's choice is related to the difference between one's perception of one's and other's fair behavior.*

Hypothesis 4b (Perspective-taking, Anchoring, Consensus Effect & Cognitive Dissonance) *Subjects perceive themselves just as fair (and unfair) as others. A zero egocentric fairness bias exists.*

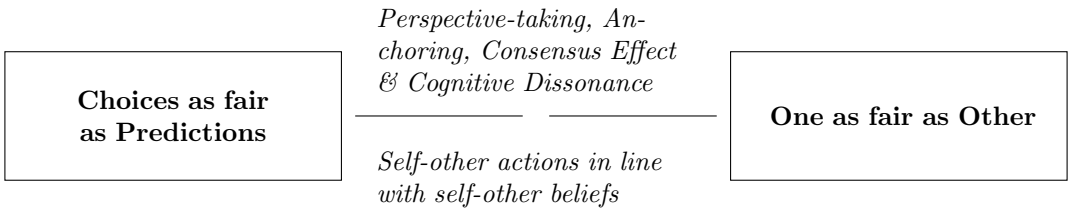

Figure 5: Perspective-taking, anchoring, the consensus effect and cognitive dissonance suggest that if one acts as fair as another, he or she should believe that he or she is as fair as another subject

On the other hand, the egocentric fairness bias theory assumes that people believe that others are less fair than themselves. In this case, the notion of cognitive dissonance would predict that people should act similar to their beliefs (see hypothesis 5a). Thus, the subjects should not only believe that they are fairer but they should also act fairer than others (see hypothesis 5b, figure 6[7]).

Hypothesis 5a (Cognitive Dissonance) *The difference between one's perception of one's and other's fair behavior is related to the difference between one's own choice and one's prediction of other's choice.*

Hypothesis 5b (Egocentric Fairness Bias & Cognitive Dissonance) *One's predictions of others' choices are less fair than one's own choices, regardless the order of these two decisions.*

Hypothesis 4a is similar to hypothesis 5a, as they are both proposed by the theory of cognitive dissonance. Hypothesis 4b is proposed by the theories of perspective-taking, anchoring and the

[7]In figure 5, actions are in the first quadrangle since the theories of perspective-taking, anchoring and consensus predict actions. Then, the theory of cognitive dissonance connects actions with beliefs. In figure 6, beliefs are in the first quadrangle since the egocentric fairness bias predicts beliefs. Then, the theory of cognitive dissonance connects beliefs with actions.

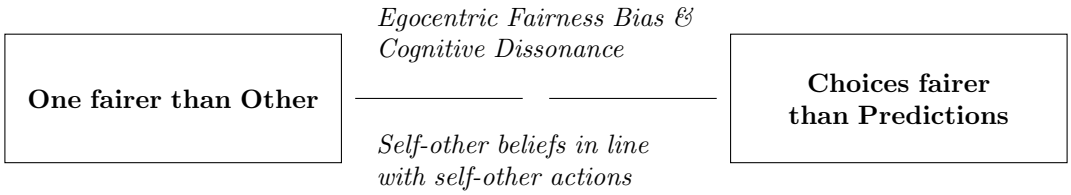

Figure 6: The egocentric fairness bias and the cognitive dissonance theory suggest that if one believes that he is fairer than the other then he should act fairer than the other.

consensus effect combined with the theory of cognitive dissonance. Hypothesis 5b combines the theories of the egocentric fairness bias and cognitive dissonance. Hypotheses 4b and 5b are not closely related.

Hypotheses 4b and 3(proposed by the egocentric fairness bias) are contradictory since the former predicts a zero egocentric bias while the latter a positive one. Moreover, hypotheses 1 (proposed by perspective-taking, anchoring and the consensus effect) and 5b are contradictory since the former predicts a minimum difference between choices and predictions while the latter predicts choices to be fairer than predictions.

Hypothesis 4b is not closely related to hypothesis 2 (proposed by the theory of the empathy gap). Hypothesis 5b is somewhat similar to hypothesis 2 since they both predict that choices are fairer than predictions. However, hypothesis 5b predicts that the order does not matter while hypothesis 2 suggests that choices are fairer especially when predictions are preceded.

Predictions of other's choice is also in a sense what people believe of other's fair behavior. However, the notion of cognitive dissonance is not tested in that stage.

4 Experimental Method

The experiment conducted in this paper has a cross-over double blind design[8]. It includes two treatments with four main tasks each. The subjects are students that are recruited online. Every subject had to predict what a dictator would do in a dictator game having €10 to share with another participant, the recipient (task P). Every subject had to play the dictator game by choosing his or her offer to a random other recipient (task C)[9]. Every subject was asked to

[8]In this experiment, the subjects could not observe the others' choices and the experimenter could not identify the subjects' with their choices

[9]The framing of the dictator game instructs the dictator to divide an endowment of €10 that is his or hers to dispose of

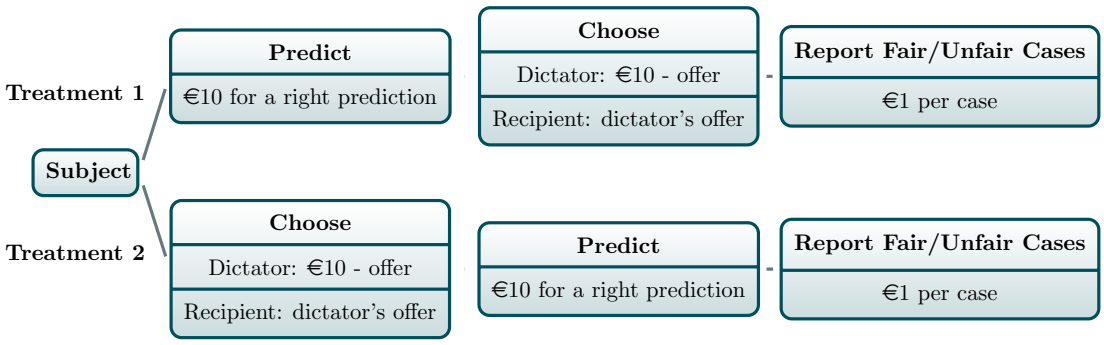

Figure 7: The design of the treatments and its monetary rewards.

report fair and unfair actions and address them to oneself or another participant based on who is most possible to perform them (tasks F and U)[10].

The two treatments include all four tasks (P, C, F and U) in a different order. In the first treatment (PCFU) the subjects predict, then choose as dictators and afterwards report fair and unfair actions. In the second treatment (CPFU), the subjects choose as dictators, then predict and afterwards report fair and unfair actions. Each subject is randomly assigned to a treatment. Appendices A.1 and A.2 consist of the exact questionnaires used in this experiment. The demographics that were included in the survey were gender, age, educational level, race and gross monthly income.

Monetary incentives were provided to incentivize subjects to participate in the experiment and to have a controlled economic experiment (Smith (1982)). Monetary incentives in the present experiment are designed carefully to attract and motivate the subjects in line with the task in hand. Ten subjects were randomly chosen to play for real money (random lottery incentive). One of the four tasks was chosen to be paid out for each of the ten subjects. The recipients that were matched with the dictators did not receive money from any other task. The dictators received their share of the €10 and the recipients received the dictators' offers. The questions in which subjects had to report a fair or an unfair case were incentivized by giving to subjects the chance to get €1 per case they reported. Up to 10 cases were rewarded in both fair and unfair cases. Since the survey was conducted online, the subjects have to fill in their e-mails to receive their monetary rewards. In order to stick to the double blind design a person different than the experimenter calculated and distributed the gift cards.

[10]The framing of these tasks instructs the subjects to type sentences about fair and unfair cases. The sentences should start with "I" if the subjects think that they are most possible to perform the action of the sentence or with "He or She" if they think that someone else is most possible to perform the action of the sentence. The other's gender does not matter.

5 Results

In this part of the thesis, the results of the experiment are analyzed. The analysis includes a general description of the data, relevant hypotheses testing as well as an examination of the demographics that are considered insightful.

5.1 General Description of the Sample

The sample of this experiment consists of 130 observations (59 males, 71 females). Amongst these observations there are several missing values[11] especially in the tasks where the subjects had to report fair and unfair cases. These questions were required to move on to subsequent demographic ones, so students that did not fill them in, did not fill in the rest of the demographics either[12].

67 subjects (30 males, 37 females) were randomly assigned to treatment 1 where they first had to predict and then choose. The rest 63 subjects (29 males, 34 females) were assigned to treatment 2 where they first had to choose and then predict. All the subjects were asked to address fair and unfair cases to themselves or other. They were all asked to report the same demographics. Subjects that responded to the demographic questions and belong in the same demographic categories were somewhat evenly divided between the two treatments[13]. Thus, the two treatments do not seem to differ across the demographic categories[14]. Hence, any difference that may exist between the results of the two treatments, excluding the subjects with missing values, is probably not caused by any demographic differences.

A more detailed description of the distributions of the main variables (choices, predictions, fair and unfair cases as well as the egocentric fairness bias) of this research is presented in appendix B.

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[11] Only the subjects that did not fill in a question at all are included in the missing values. Partially responded questions do not count as missing values. The missing values per task are: 0 for the task C, 3 for the task P, 57 for the task F (29 in treatment 1, 28 in treatment 2) and 62 for the task U (32 in treatment 1, 30 in treatment 2).

[12] Gender was asked before the four tasks while age, race, educational level and income were asked afterwards. Thus, gender has no missing values. Race, educational level and income have 54 while age has 55 missing values.

[13] For example, 36 individuals of age between 19 and 28 years old were assigned to treatment 1 and 34 to treatment 2. 32 individuals that earn below € 39,999 were assigned to treatment 1 and 28 to treatment 2. 34 individuals that that are Caucasian white belong to treatment 1 and 30 to treatment 2. 36 individuals that that had some college, Bachelor's or Master's educational experience belong to treatment 1 and 33 to treatment 2. A similar situation holds for the rest of the categories.

[14] The two treatments are not that different considering the demographics that are available to the experimenter. Since there are a lot of missing values in the variables of the age, educational level, income and race, this homogeneity of the two samples may be misleading.

5.2 Choices and Predictions

After describing the data collected in the experiment, a deeper analysis follows. In this section data from the first two tasks (C and P) are examined. The distributions of choices and predictions in the two treatments are presented in figures 8 and 10, respectively.

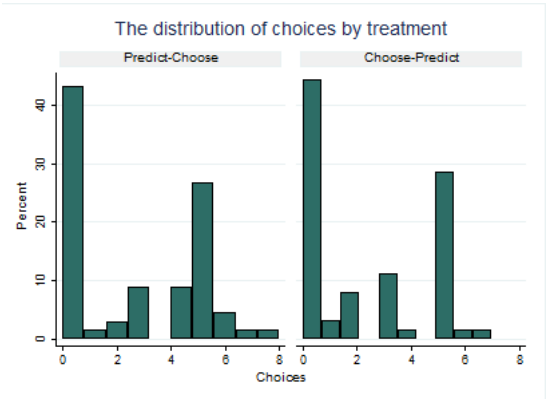

Figure 8: The distribution of choices in the two treatments (in percent)

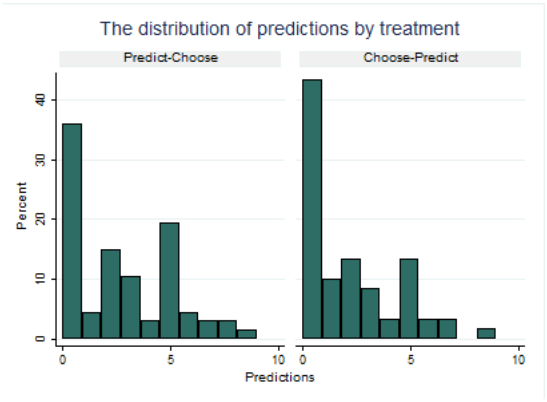

Figure 9: The distribution of predictions in the two treatments (in percent)

The distributions of choices and predictions seem to be related in both treatments (see figures 10 and 11) In fact, the Spearman correlation factor in treatment 1 is 0.5165 and statistically significant even at a 1% significance level (p-value=0.0000). The correlation in treatment 2 is 0.5534 and statistically significant even at a 1% significance level (p-value=0.0000). The correlation in both treatments combined is 0.5439 and statistically significant at a 1% significance level (p-value=0.0000)[15]. This correlation coefficient indicates a moderate positive relation between choices and predictions. Thus, subjects that act relatively fair, tend to predict that others act also relatively fair.

This positive relation is depicted in figures 10 and 11[16]. The two diagrams include the linear, the quadratic fit and the 45^o diagonal line. Both the linear and the quadratic functions seem to fit the data in a similar manner. The points that fall in the diagonal indicate the subjects that chose and predicted the same amount in both tasks. These subjects predicted that others are just as fair (unfair) as themselves. The points above the diagonal indicate the subjects that predicted amounts higher than those that they chose. These subjects predicted that others are

[15]The Spearman's correlation coefficient is the non-parametric alternative to the Pearson's correlation coefficient and is more appropriate since there is a significant departure from normality in choices and predictions (see appendix B)

[16]In the two tasks, the subjects' choices and predictions were limited to the integers between €0 and €10. However, the points in the figures are perturbed a bit using random noise (an automatic procedure in STATA) in order to be able to comprehend the number of points that overlap.

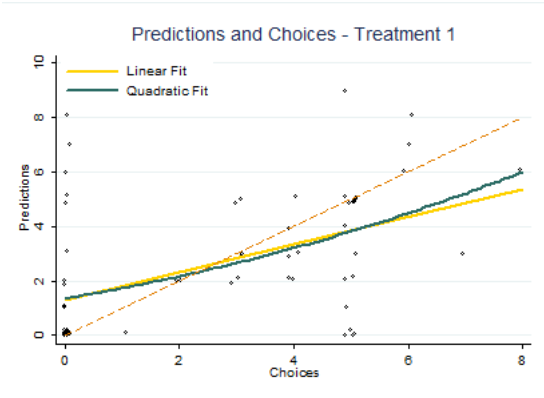

Figure 10: The scatter plot of predictions and choices in treatment 1

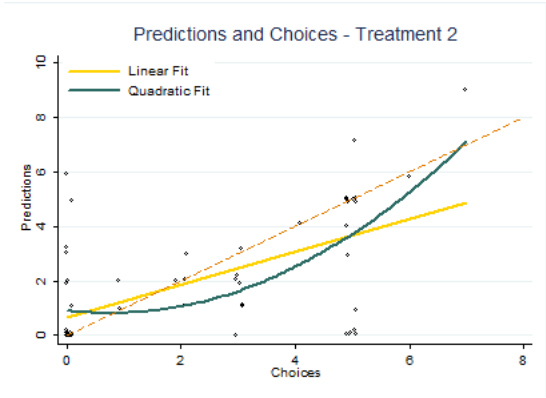

Figure 11: The scatter plot of predictions and choices in treatment 2

fairer (less unfair) than themselves. The points below the diagonal indicate the subjects that predicted amounts lower than those that they chose. These subjects predicted that others are less fair (more unfair) than themselves. The distribution of subjects in these three categories is very similar in the two treatments (see table 3). In both treatments, most of the subjects predict that others are just as fair (unfair) as themselves. The similarities among the two treatments imply that the order of choices and predictions did not influence the subjects.

	P >C	P = C	P <C
Treatment 1	16	33	18
Treatment 2	15	33	15

Table 3: The number of subjects that predicted others to be just as, more or less fair (unfair) than themselves.

5.2.1 Comparing Choices between Subjects

In this section, I am specifically interested to test whether the choices of the two treatments are similar. This would confirm that the order of predictions does not affect choices. Based on the Mann-Whitney U test (or else the Mann-Whitney-Wilcoxon or Wilcoxon-Mann-Whitney or Wilcoxon rank-sum test), there is no statistically significant difference between the choices of the two treatments even at a 10% significance level (p-value=0.5492). Thus, putting oneself in others' shoes does not increase (decrease) fairness. Fair behavior is not affected by thinking of others first.

This result violates the hypothesis proposed by the theory of the empathy gap (see hypothesis

H2). The empathy gap assumes that putting oneself in others' shoes triggers empathic emotions that enhance fairness, however, this result proposes that thinking of others first does not make a significant difference in fair behavior. Based on the results of this experiment, putting oneself in other's shoes before making a decision does not lead to fairer choices.

5.2.2 Comparing Predictions between Subjects

Along the same lines, I am interested to see whether the predictions of the two treatments are similar. This would confirm that the order of choices does not play a significant role. Based on the Mann-Whitney U test, there is no statistically significant difference between the predictions of the two samples even at a 10% significance level (p-value=0.1879). Thus, prior choices did not affect the subjects' predictions. One's predictions of other's choices are not influenced by one's prior choices.

5.2.3 Comparing Predictions and Choices within Subjects

Besides the comparison of predictions and choices between subjects, it is also interesting to see whether choices and predictions within each treatment (within subjects) are similar. Based on the Wilcoxon signed rank test, it is found that there is no statistically significant difference between the choices and predictions of the subjects in both treatments even at a 10% significance level (treatment 1: p-value=0.8283, treatment 2: p-value=0.5389). This indicates that choices are close to predictions regardless of their order.

This result confirms the hypothesis of perspective-taking, anchoring and the consensus effect (see hypothesis H1). These theories correctly predicted that choices and predictions will not have any significant differences in both treatments. This result might be the effect of successfully taking another's perspective. It may also be caused by anchoring to the number of the first choice or by the subjects' tendency to reach a consensus between choices and predictions. Those three effects cannot be disentangled in this experiment.

This result rejects the hypothesis proposed by the theories of the egocentric fairness bias and cognitive dissonance (see hypothesis H5b). These two theories assume that since people perceive themselves fairer than others then they should also act fairer than others. On the contrary, in this experiment, people acted just as fair as their perceptions of others' fair actions.

5.2.4 Comparing Predictions and Choices between Subjects

In this part, choices and predictions are compared between the treatments. First, I compare the predictions of treatment 1 to the choices of treatment 2. That way, I can see if the tasks that come first in order have similar distributions. Based on the Mann-Whitney U test, it is found that there is no statistically significant difference between the two samples even at a 10% significance level (p-value=0.4186).

Second, I compare the choices of treatment 1 to the predictions of treatment 2. Here, I can see if the tasks that come second in order have similar distributions. Based on the Mann-Whitney U test, it is found that there is no statistically significant difference between the two samples even at a 10% significance level (p-value=0.3061).

These two results indicate that the tasks with the same order have similar distributions. This is quiet reasonable since none of the above comparisons did not find any differences. Consequently, it seems like predictions and choices are similar with each other across treatments.

5.3 Egocentric Fairness Bias

In this section, the egocentric fairness bias and its components are analyzed and tested. That way, we can investigate similarities and differences between fair and unfair cases addressed to oneself and other[17].

I am interested to see if students reported about the same number of fair and unfair cases, regardless of the person that they addressed them to. The Wilcoxon signed-rank test within subjects suggests that the number of fair and unfair cases reported in both treatments is significantly different. This difference is statistically significant at a 1% significance level in treatment 1 (p-value=0.0077) and at a 10% significance level in treatment 2 (p-value=0.058). This result implies that the subjects reported fewer unfair than fair cases in both treatments. Hence, subjects seem to be more engaged in reporting fair cases than unfair ones. This result may be caused by the order of these two tasks but since fair cases were always first in both treatments, any ordered effects cannot be measured.

Another interesting element that can be examined is whether there is a difference on fair or unfair cases between the two treatments. A significant difference would indicate that the

[17] In STATA, when missing values are included in the sample, they are ignored from any statistical calculations. They are not substituted with zero. Thus, the employed tests for fair cases include 73 observations, while for unfair they include only 68 observations.

order of choices and predictions can affect subsequent tasks. According to the Mann-Whitney U test there is no statistically significant difference in fair (p-value=0.5847) or unfair cases (p-value=0.4409) between subjects at a 10% significance level. Thus, the volume of reported fair cases in treatment 1 is similar to the one of treatment 2. The same holds for unfair cases, as well.

Regarding the high number of missing values in the tasks of reporting fair and unfair cases, it is examined whether this missingness is associated with the treatment that the subjects were assigned to. Using the χ^2 test it is tested whether the missing values were randomly distributed in the two treatments. Based on the results, the missingness of fair cases does not seem to be significantly associated with the variable of treatment (p-value=0.894) at a 10% significance level. The same holds for the missingness of unfair cases (p-value=0.987) at a 10% significance level. Thus, the missing values of fair and unfair cases seem to be randomly distributed among the two treatments. Similarly, Fisher's exact test also indicated that the missing values of fair and unfair cases are evenly distributed in the two treatments (fair cases: p-value=0.517, unfair cases: p-value=0.563)[18].

The fair and unfair cases were addressed by the subjects to either themselves or others. Hence, it is possible to test if the number of fair and unfair cases addressed to oneself or other differs between subjects. Using the Mann-Whitney U test, it is found that the number of fair cases addressed to oneself in treatment 1 does not differ significantly from the amount of fair cases addressed to oneself in treatment 2 (p-value=0.8708) at a 10% significance level. The same holds for fair cases addressed to others (p-value=0.4783), for unfair cases addressed to oneself (p-value=0.7527) and for unfair cases addressed to others (p-value=0.5526) at a 10% significance level. Thus, across treatments the amounts of fair and unfair cases that are addressed to oneself or other are not significantly different. Thus, subjects would report about the same number of fair and unfair cases regardless of the treatment they were assigned to.

Another test that can be conducted includes the comparison of fair cases addressed to oneself and fair cases addressed to other, within subjects. A similarity in this case, would mean that the subjects address the same number of fair cases to themselves and to others. Based on the Wilcoxon signed-rank test, there is a statistically significant difference between the number

[18]The χ^2 test assumes that each of the expected frequencies of the combined categories of the two variables, is at least five or higher. The Fisher's exact test does not have such an assumption and can be used regardless of how small the expected frequency or the sample is. In this data set the expected frequencies are all higher than 5, however the results of both tests are presented.

of fair cases addressed to oneself and the number of fair cases addressed to others, at a 1% significance level in treatment 1 (p-value=0.0074) and at a 10% significance level in treatment 2 (p-value=0.0795). Thus, the subjects addressed more fair cases to oneself than other, in both treatments. This finding indicates that people consider themselves fairer than others.

Along the same lines, it would be interesting to test whether the subjects perceive themselves as unfair as others. Using the Wilcoxon signed-rank test within subjects to compare unfair cases addressed to oneself and unfair cases addressed to other, it is found that in both treatments the subjects targeted more unfair cases to others than themselves. This effect is statistically significant at a 5% significance level in treatment 1 (p-value=0.013) and at a 1% significance level in treatment 2 (p-value=0.0078). Thus, the subjects not only consider others to be less fair but they also consider them to be more unfair than themselves. These two findings imply a positive egocentric fairness bias in both treatments. Table 4 describes the exact number of people who addressed more, less or an equal amount of fair and unfair cases to themselves and others. It is noticeable that most subjects perceive themselves fairer and others less fair[19].

	Fair Cases			Unfair Cases		
	One >Other	One = Other	One <Other	One >Other	One = Other	One <Other
Treatment 1	25	5	7	8	8	19
Treatment 2	18	5	10	5	10	18

Table 4: The number of subjects that addressed the same, a higher or a lower number of fair and unfair cases to themselves and others

Another similar issue that can be tested is the difference between the amount of fair and the amount of unfair cases addressed to oneself or other within subjects. The Wilcoxon signed-rank test supports that there is a statistically significant difference between fair and unfair cases addressed to oneself in both treatments, at a 1% significance level (treatment 1: p-value=0.0001, treatment 2: p-value=0.0012). This indicates that subjects find themselves involved in a higher number of fair than unfair cases. On the other hand, the amount of fair and unfair cases addressed to others was not statistically significant in both treatments at a 10% significance level (treatment 1: p-value=0.3394, treatment 2: p-value=0.1075). This indicates that subjects report about the same amount of fair and unfair cases to others. These results imply that subjects perceive themselves more fair than unfair while they perceive others as equally fair and

[19]When calculating the amounts presented in table 4, the missing values were excluded.

unfair (see table 5).

	One			Other		
	F >U	F = U	F <U	F >U	F = U	F <U
Treatment 1	22	11	2	8	13	14
Treatment 2	19	9	5	8	10	15

Table 5: The number of subjects that addressed the same, higher or lower number of fair and unfair cases to themselves and others

Combining the results of the tests regarding fair and unfair cases addressed to one and other, a few things are noticeable. Subjects perceive themselves fairer and less unfair than others. This is true since they think that they themselves are involved in a greater number of fair actions, while they think that others are involved in the same number of fair and unfair actions.

Using the Wilcoxon signed-rank test to test the significance of the egocentric fairness bias it is found that there is a positive egocentric fairness bias in treatment 1 (p-value=0.0013), in treatment 2 (p-value=0.0062) and in both treatments (p-value=0.0000) even at a 1% significance level. Similarly to the previous experiment, it is interesting to see if there is a difference in the egocentric fairness bias between subjects. The egocentric fairness bias appears to have no statistically significant difference between the two treatments (Mann-Whitney U test: p-value=1.0000) at a 10% significance level. Thus, the egocentric fairness bias is positive and does not differ across treatments. Thus, the assignment on a treatment does not affect the egocentric fairness bias of the subjects.

These results indicate that the egocentric fairness bias exists. Thus, hypothesis H3 is confirmed. On the other hand, hypothesis H4b which assumed that subjects who act as fair as others, should also believe that they are as fair as others, is rejected. In this data set, there is evidence that people act as fair as others while associating themselves with fairer actions. If the subjects are consciously aware of this discrepancy between actions and beliefs, the hypothesis of cognitive dissonance is violated.

5.4 Choices, Predictions and the Egocentric Fairness Bias

The results so far imply that there is no difference between one's own actions and one's perception of other's actions. At the same time, the subjects believe that they themselves are fairer than others. These two findings seem contradictory. There seems to be a discrepancy between one's

actions (compared to other's) and one's beliefs. The existence of this discrepancy is analyzed in this section.

The correlation between the difference of choices and predictions and the egocentric fairness bias is tested. According to the Spearman correlation coefficient, there is no significant relation between the difference of choices and predictions, and the egocentric fairness bias in both treatments (treatment 1: 0.0830, p-value=0.6353; treatment 2: 0.2548, p-value=0.1575) at a 10% significance level. The correlation is depicted in the scatter plots 12 and 13, which are similar to the one's used in previous sections. This finding suggests that there is no linear relation between these two variables.

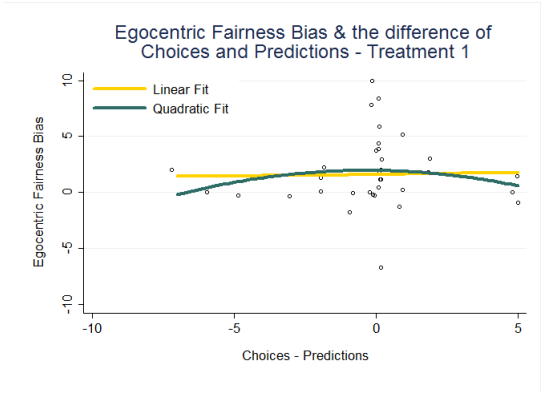

Figure 12: The scatter plot of the difference of choices and predictions, and the egocentric fairness bias in treatment 1

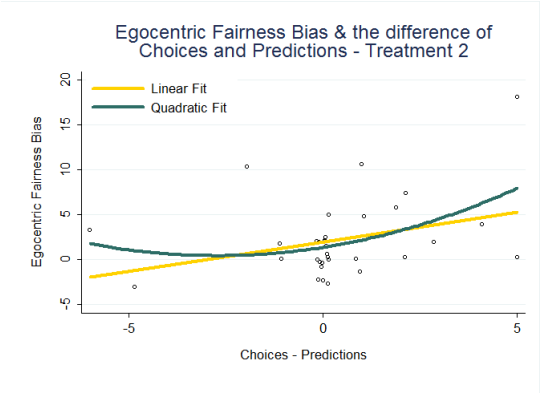

Figure 13: The scatter plot of the difference of choices and predictions, and the egocentric fairness bias in treatment 2

To test whether there is a statistically significant difference between the difference of choices and predictions and the egocentric fairness bias, the Wilcoxon signed-rank test is used. Based on this test, there is a statistically significant difference between choices, predictions and the egocentric fairness bias even at a 1% significance level for treatment 1 (p-value=0.0077) and at a 5% significance level for treatment 2 (p-value=0.0307). Thus, actions and beliefs are significantly different.

These findings suggest that hypotheses H4a and H5a are violated. In this case, there is no significant relation between the choices and the beliefs of the subjects. Since actions and beliefs are not related, there is an unresolved cognitive dissonance between the subjects' beliefs and actions.

5.5 Demographics

A demographic variable that has been analyzed in the literature is gender. Previous studies have addressed differences and similarities regarding reciprocity, emotional response and empathy among subjects with a different gender. These similarities and differences are also addressed in this section. The distributions of choices, predictions and the egocentric fairness bias of the two different genders in both treatments are displayed in figures 14, 15 and 16, respectively.

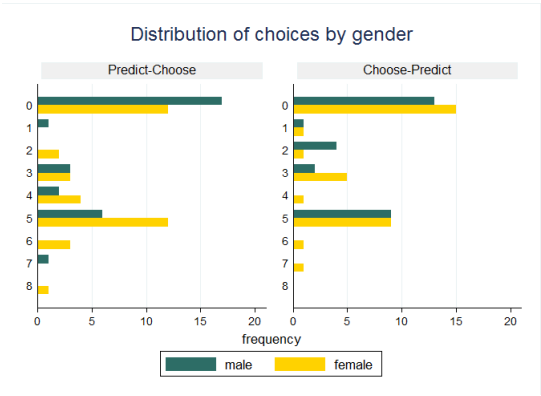

Figure 14: The distribution of choices across gender in both treatments

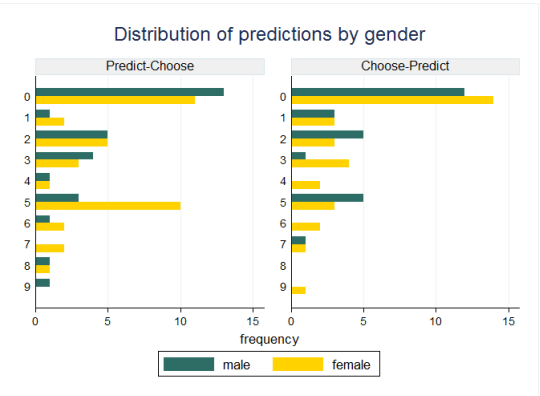

Figure 15: The distribution of predictions across gender in both treatments

It would be interesting to test similarities between the choices of males and females in both treatments. Such a finding would suggest that both males and females are equally fair. Using the Mann-Whitney U test it is found that there is a statistically significant difference among choices of males and females in treatment 1 (p-value=0.035) at a 5% significance level, but not in treatment 2 (p-value=0.6872) even at a 10% significance level. This means that females make significantly fairer choices than males in treatment 1 but not in treatment 2.

Furthermore, it would be interesting to test similarities between the predictions of males and females in both treatments. Based on the Mann-Whitney U test, it is found that there is no statistically significant difference between the predictions of males and females in both treatments (treatment 1: p-value=0.1646, treatment 2: p-value=0.6241) at a 10% significance level. Thus, males and females view others' actions in the same manner.

Another interesting test would include the comparison of choices or predictions for each gender separately across treatments. According to the Mann-Whitney U test, no significant difference is found at a 10% significance level. Thus, prior predictions did not influence choices for both males (p-value=0.5323) and females (p-value=0.2113) and prior choices did not influence predictions for both males (p-value=0.6444) and females (p-value=0.1791).

Regarding males' and females' perceptions of fairness, it is plausible to question whether there

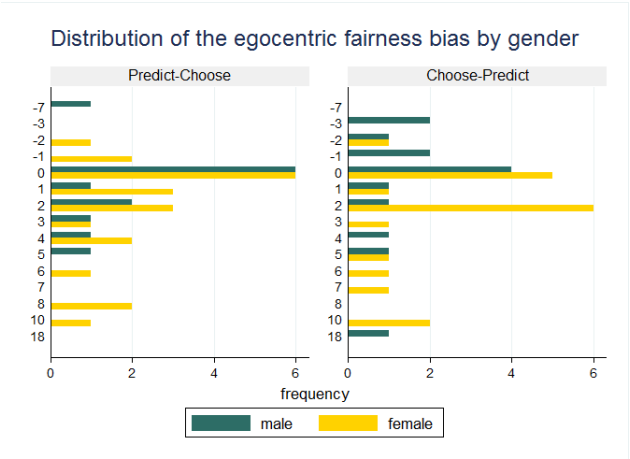

Figure 16: The distribution of the egocentric fairness bias across gender in both treatments

are similarities on fair and unfair cases addressed to oneself or other between the two genders. However, the number of subjects is very small to be able to have representative results in this area. Baring that in mind, the Mann-Whitney U test regarding the egocentric fairness bias suggests that there is a statistically significant difference between males and females' egocentric fairness bias in treatment 2 (p-value=0.0521, obs=33) and in both treatments combined at a 10% significance level (p-value=0.0555, obs=68), but not in treatment 1 (p-value=0.5068, obs=35) even at a 10% significance level. Thus, it could be that females are more egoistically biased regarding fairness but there is still a need for a greater amount of data to confirm such a finding.

The rest of the demographics in this research did not have a lot of variation to analyze and they had a greater number of missing values. Thus, age, educational level, race and income are not analyzed in a similar manner.

5.6 Regression

Regressing the results from both treatments we can see whether there is also a significant association between the variables of the first two tasks. The association of choices and predictions is especially examined since this is the main focus of this study. When variables other than gender, choice and predictions are included in the regression, the number of total observations decline, since there are a lot of missing values. As a result, significant results are hard to appear. In the estimated regressions, the demographics of gender and educational level were also included, however their effects were not always significant and they are not presented in tables 6 and 7. The demographics of age, income and race are excluded from the regressions

since they were not statistically significant and did not contribute to the overall explanatory power of the models[20].

Similar models were estimated for both treatments (see tables 6 and 7). The only difference is between choices and predictions. In treatment 1 (PCFU), predictions were preceded, thus choices could depend on predictions. In this case, the variable of predictions is an independent variable, while the variable of choices is the dependent variable. In treatment 2 (CPFU), choices were preceded, thus predictions could depend on choices. In this case, the variable of predictions is the dependent variable, while the variable of choices is an independent variable. In tables 6 and 7 the coefficients (β's) and their p-values are presented as well as the R-squared (R^2) and adjusted R-squared ($\overline{R^2}$) as measures of goodness of fit[21].

In appendix C the assumptions of an OLS model are analyzed (Wooldridge, 2012, p.212-269). Several tests were conducted to support some of the assumptions of the linear regression. The results of these tests are also presented in appendix C. According to these tests the error terms are homoscedastic and normally distributed. However, tables 6 and 7 present only the distributions with robust standard errors[22].

Analyzing the regression estimates of treatment 1, it is worth to mention that in every regression the coefficient that is constantly statistically significant at a 10% or a 5% significance level is the coefficient of predictions. This shows that prior predictions are associated positively and significantly with subsequent choices of individuals (treatment 1). In fact, if a subject's prediction of other's offer increases by €1, his or her own choice is predicted to increase by €0.3803 to €0.4857, ceteris paribus.

The next most relevant component is fair cases addressed to oneself. Although in most regressions its coefficient is not statistically significant its coefficient is the largest and it impacts positively the adjusted R-squared. As it is expected, if there is an increase in the number of fair cases that people address to themselves, then the amount of money that people are predicted to give to another participant increases as well, ceteris paribus. This association is reasonable since a person who considers himself fairer, might also act fairer by giving away more (holding everything else constant).

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[20]The explanatory power refers to how well the fit explains the total variation of the data. The measures of goodness of fit that are utilized here are the R-squared and the adjusted R-squared ($\overline{R^2}$).

[21]The R^2 and $\overline{R^2}$ indicate how well the fit explains the total variation of the data. The $\overline{R^2}$ is generally more valid since it corrects for the number of independent variables in the model.

[22]With the robust option, the estimates of the coefficients are exactly the same as in the regular OLS, but the standard errors take into account issues concerning heterogeneity and lack of normality.

	Choices[a]					
	1	2	3	4	5	6
Constant	2.7675*	1.4990	0.7391	0.7166	0.4468	2.7726*
	(0.069)[b]	(0.362)	(0.665)	(0.680)	(0.509)	(0.086)
Predictions	0.4857**	0.4728**	0.4706**	0.4682**	0.4468**	0.3803*
	(0.012)	(0.017)	(0.019)	(0.021)	(0.037)	(0.064)
Fair (oneself)		0.3014*	0.2518	0.2585	0.12	
		(0.056)	(0.129)	(0.161)	(0.644)	
Unfair (oneself)			0.2845	0.3128	0.327	
			(0.260)	(0.375)	(0.351)	
Fair (other)				-0.0296	-0.0659	
				(0.898)	(0.739)	
Unfair (other)					0.2945	
					(0.306)	
Egocentric Bias						0.1175
						(0.171)
Observations	41	36	35	35	35	35
R^2	0.3159	0.3833	0.411	0.4113	0.4312	0.3626
$\overline{R^2}$	0.2605[c]	0.3037	0.3094	0.2851	0.2837	0.2776

Table 6: Regression estimates for the models of treatment 1

[a] This table does not include the coefficients of gender and education that are part of the model. The models are estimated with robust standard errors. In the coefficients, one star symbolizes statistical significance at a 10% significance level, two stars at a 5% significance level and three stars at a 1% significance level.

[b] The numbers in brackets indicate p-values.

[c] The $\overline{R^2}$ measure is not calculated in a regression with robust standard errors. These $\overline{R^2}$ numbers come from the same model estimated without robust standard errors. In a regression with robust standard errors, different observations contribute a different amount of information, thus an observation is no longer equal to one degree of freedom. Hence, there is no valid way to correct the R^2 the way $\overline{R^2}$ does.

	Predictions [a]					
	1	2	3	4	5	6
Constant	-3.4023**	-2.3341	-2.0860	-1.816	-1.8422	-3.4778**
	(0.026[b])	(0.087)	(0.176)	(0.474)	(0.487)	(0.030)
Choices	0.5069**	0.5288***	0.5236***	0.5131***	0.5066**	0.5645**
	(0.002)	(0.000)	(0.000)	(0.000)	(0.002)	(0.001)
Fair (oneself)		-0.2632***	-0.2458**	-0.2508	-0.2686*	
		(0.004)	(0.036)	(0.163)	(0.054)	
Unfair (oneself)			-0.0761	-0.0843	-0.0678	
			(0.696)	(0.696)	(0.749)	
Fair (other)				-0.0535	-0.0689	
				(0.474)	(0.826)	
Unfair (other)					0.0294	
					(0.886)	
Egocentric Bias						-0.1253*
						(0.095)
Observations	35	33	33	33	33	33
R^2	0.3087	0.4035	0.4054	0.4063	0.4068	0.3508
$\overline{R^2}$	0.2418[c]	0.3183	0.2953	0.2693	0.2407	0.2580

Table 7: Regression estimates for the the models of treatment 2

[a] This table does not include the coefficients of gender and education that are part of the model. The models are estimated with robust standard errors. In the coefficients, one star symbolizes statistical significance at a 10% significance level, two stars at a 5% significance level and three stars at a 1% significance level.

[b] The numbers in brackets indicate p-values.

[c] The $\overline{R^2}$ measure is not calculated in a regression with robust standard errors. These $\overline{R^2}$ numbers come from the same model estimated without robust standard errors. In a regression with robust standard errors, different observations contribute a different amount of information, thus an observation is no longer equal to one degree of freedom. Hence, there is no valid way to correct the R^2 the way $\overline{R^2}$ does.

The variables of the fair cases addressed to other, unfair cases addressed to oneself and unfair cases addressed to other are not statistically significant and do not really seem to add a lot to the explanatory power to the model. The same holds for the egocentric fairness bias.

The explanatory power of this model varies from 26.05% to 30.94%. Thus, the presented models of treatment 1, explain from 26.05% to 30.94% of the variation of the collected data. This is not a very optimistic result. This percent might actually imply that there are important omitted variables that could have explained more of the observed variation of the data.

Analyzing the regression estimates of treatment 2, it is worth to mention once again that in every regression the coefficient that is constantly statistically significant at a 5% or a 1% significance level in every regression, is the coefficient of choices. This shows that prior choices are associated positively and significantly with subsequent predictions of individuals (in treatment 2). In fact, if a subject's offer increases by €1, his or her own prediction of other's offer is predicted to increase by €0.5066 to €0.5645, ceteris paribus.

The next most effective component is fair cases addressed to oneself. Its coefficient is statistically significant at a 10%, a 5% or a 1% significance level. As it is expected, if there is an increase in the fair cases that a person address to oneself, the amount of money he or she predicts that someone would give to the other participant is predicted to decrease by €0.2458 to €0.2686, ceteris paribus. This association could be a reasonable finding since a person who considers himself fairer, would expect the other to act less fair, holding everything else constant.

The variables of fair cases addressed to other, unfair cases addressed to oneself and unfair cases addressed to other are not statistically significant and do not really seem to add a lot to the explanatory power to the model. As for the egocentric fairness bias, its addition does not affect the explanatory power of the model as much but it is (marginally) statistically significant at a 10% significance level. According to its coefficient, if there is an increase in the egocentric fairness bias, then the amount of money that someone predicts that another would offer, is expected to decrease, ceteris paribus. This result is reasonable since people who perceive themselves fairer (and less unfair) than others could also think that others would offer less.

The explanatory power of this model varies from 24.07% to 31.83%. Thus, the presented models of treatment 2, explain from 24.07% to 31.83% of the variation of the collected data. Again, this is not a very optimistic outcome. Important omitted variables, that could explain more of the observed variation, might exist.

6 Discussion

In this section, results from related literature are presented to demonstrate any differences or similarities with the present study. Other issues regarding the design of the experiment are analyzed. Limitations and input for further research are also discussed.

6.1 Related Literature

In this section, findings of this study and previous studies are compared. The results of other studies that are chosen to be presented are the ones that come from experiments that are highly relevant and similar to the one in the present study. Thus, fair comparisons can be made. The comparisons involve the subjects' offers in the dictator game as well as their egocentric fairness bias. The role of gender and race are also demonstrated with the use of previous studies. The role of framing, anonymity and monetary incentives is also discussed regarding the design of an experiment.

6.1.1 Dictator's Offers

An interesting first comparison would be between the dictator's offers in this and other relevant papers of the literature. Table 8[23] presents the most basic descriptive statistics regarding the distributions of the dictator's offers in the dictator games conducted in previous experiments as well as the present experiment. Based on this table, the results of this paper are close to the ones proposed in the literature. The results would be even closer to the ones proposed in the literature if more subjects would choose the zero offer instead of the equal split. That way, the shape of the distribution would look more like a χ^2 distribution with a higher peak at the zero offer like the most common ones in the literature. The shape of the distribution of predictions looks more like a χ^2 distribution especially in treatment 2 (CPFU). The distribution of predictions looks even closer to the ones found in the literature.

[23]The information that is not clearly provided in the literature is also missing from this table.

Paper	Monetary Incentive	Frequency (zero offer)	Frequency (equal split)	Mean[a]	Distribution[b]
Ben-Ner et al. (2004)	\$10	32%	20%	\$2.83	bimodal
Bolton et al. (1998)	\$10[c]	50%	15%	\$1.35	χ^2 & bimodal
Bohnet and Frey (1999)	\$10	28%	25%		
Cason and Mui (1998)	\$40[d]	38%	30%	\$27.1	
Forsythe et al. (1994)	\$10	40%	20%	\$2.33	χ^2 & bimodal
Hoffman et al. (1994)	\$10	40%	0%	\$1.05	χ^2
Choices in PCFU	€10[e]	29%	18%	€2.54	bimodal
Choices in CPFU	€10	28%	18%	€2.22	bimodal
Predictions in PCFU	€10	24%	13%	€2.6	χ^2 & bimodal
Predictions in CPFU	€10	26%	8%	€2	χ^2 & bimodal

Table 8: Literature findings regarding the offers of the dictator in the dictator game

[a] In Bohnet and Frey (1999), the mean of the dictators' offers was not provided

[b] In Bohnet and Frey (1999) and Cason and Mui (1998) only the cumulative distribution of the offers was provided

[c] In Bolton et al. (1998), the offers ranged from \$0 to \$5 restricted to \$1 increments

[d] In Cason and Mui (1998), the offers were restricted to \$2 increments

[e] In the present study, participants were incentivized with a chance of getting €10 (random lottery incentive).

6.1.2 Egocentric Fairness Bias

Another finding that is interesting to compare with related work, involves the egocentric fairness bias. Table 9 includes the mean numbers of fair and unfair cases addressed to oneself and other in the present and other relevant studies. It is worth to mention that in the present study the subjects were incentivized to report a fair or unfair case (with a chance of receiving €1 per case), while incentives were not incorporated in other studies. In Messick et al. (1985), Liebrand et al. (1986) and Allison et al. (1989), the subjects had 5 minutes to complete each task (10 minutes for both F and U tasks). In this study, assuming that the subjects who did not respond to the F and U tasks took 0 minutes to fill in the survey, the average amount of time that the subjects needed for the entire survey was 5.81 minutes. Excluding the subjects who left the F and U tasks unanswered, the average amount of time that the subjects needed for the entire survey was 12.9 minutes. The boundary that the subjects had was the amount of tasks that

would be rewarded (up to 10). In the present study, the fair and unfair tasks were subsequent to the tasks of choice and prediction of other's choice. Previous tasks could have influenced subsequent responses. The results of the other studies displayed in table 9 came only from the experiments in which the subjects were asked to report first fair and then unfair cases, similar to the present experiment. The results of the experiments in which the reverse order was used are not mentioned.

Comparing the results of the present study with the results of previous studies, it is obvious that the subjects in the present study reported fewer fair and unfair cases for both themselves and others. The difference between self and other in the fair task is positive and in the unfair task negative, similar to the previous studies. These differences however are a little smaller than the ones found in the literature since subjects reported a totally smaller number of fair and unfair cases.

Paper	Task	Fair/Good			Unfair/Bad			Time
		I	Other	Total	I	Other	Total	
Messick et al. (1985)	Fair-Unfair	4.85	2.95	7.8	2.85	4	6.85	10 min
Liebrand et al. (1986)	Fair-Unfair	3.54	2.54	6.08	2.87	4.19	7.06	10 min
Allison et al. (1989)	Good-Bad	7.61	4.29	11.9	4.71	7.32	12.03	10 min
PCFU & CPFU	Fair-Unfair	2.51[a]	1.49	4	1	1.99	2.99	5.81 (or 12.9) min[b]

Table 9: The mean numbers of fair and unfair cases addressed to oneself and other.

[a]The means of fair and unfair cases are calculated excluding the missing values.

[b]The mean of time is 5.81 when the time of the subjects that did not fill in the tasks is considered 0, and 12.9 when these subjects are excluded.

6.1.3 Demographics

Ben-Ner et al. (2004) in their sequential dictator game where subjects were first dictators and then recipients, gender played a significant role. It is found that males offer more money than females, holding the initial amount they received constant. Moreover, females reciprocate more than males, so they offered more money back for every dollar they initially received. This is contradictory to the findings of the present study. Here, females offered significantly more (in treatment 1) although they had a higher average egoistic fairness bias. Ben-Ner et al. (2004) also found that personality traits (the "big five" personality factors) significantly affect reciprocity. Loewenstein et al. (2001) suggest that gender differences in decision making are related with the

parallel differences in emotional responsiveness between males and females. It has been proved that females experience emotions more intensely than males. When males and females are asked to recall their saddest memory, the females' brain activity is significantly higher than the males' brain activity (George (1999)).

Roth et al. (1991) conducted ultimatum games in four different places in the world (Jerusalem, Ljubljana, Pittsburgh, and Tokyo) to find out if there are any interesting differences among these cultures. In their paper, the similarities were remarkable and only few differences were found in some of the sessions in the experiments. In this study, the subjects did not vary in race enough to be able to investigate any cultural differences.

6.1.4 Framing

The sensitivity of the dictator game towards different experimental designs is broadly discussed in the literature. From completely different treatments to slight changes regarding framing, anonymity, monetary incentives etc., it is proved that alternative designs can influence the results drastically.

Kahneman et al. (1986b) suggest that judgments regarding fairness are influenced by framing. Hoffman et al. (1996b) tested the seller-buyer instructions in order to explain the dictator game to the subjects. In this wording, the subject that acts as a dictator is a seller that has to set a price. The seller receives the amount of money that is equal to the price and the buyer receives €10 - price. When this framing was combined with the double blind design and an "earned" first move[24], 66% of the subjects offered nothing to the recipient[25]. Hence, different design details affected the dictator's offer significantly.

Since the subjects' willingness to offer a positive amount of money to the recipient is context dependent, Forsythe et al. (1994) and Bolton et al. (1998) made different suggestions about the framing of the task for the dictator. They insist on instructing the dictator to divide the endowment of $10. They suggest that the seller-buyer design makes the seller (dictator) more attached to the $10 which might lead to smaller offers from the dictator. In the experiment of this study, the second set of instructions is chosen as it seems more neutral.

Regarding the third and fourth tasks of the treatments, Messick et al. (1985) and Liebrand et al. (1986) asked the subjects to write some fair and unfair tasks and address them to others by

[24] An "earned" first moved refers to the player's property rights regarding the role of the dictator. So a player after scoring high in a general language quiz, "earns" the right to be a dictator and move first in the game.

[25] See table 8 for more details.

starting with the subjects "I" or "They", according to who would be more probable to perform each task. In this study the subject "they" was substituted with the subjects "He or she". This substitution was necessary since the subjects can always address an action to more than one other person as the probability of an (abstract) amount of people performing an action is reasonably larger than the probability of just one other person performing the same action. I find that the one-to-one comparison is fairer and does not nudge the subjects towards addressing a larger number of fair and unfair behaviors to others. It is also important to mention to the subjects that the gender of the other does not matter.

6.1.5 Anonymity

Hoffman et al. (1996a) discussed the effect of conducting the dictator game as a single or double blind experiment with two different variations in each case. In a single blind design, every subject knows that his or her choices cannot be observed by other participants but they can be observed by the experimenter. In a double blind design, every subject knows that his or her choices cannot be observed by other participants or the experimenter. Thus, in a single blind design there is anonymity between the subjects whilst in a double blind design there is anonymity between the subjects and between the subjects and the experimenter. Hoffman et al. (1996a) used two variations of the double and single blind procedures. In the double blind design, in the first treatment they used sealed envelopes for the experimenter to distribute the monetary rewards, while in the second treatment they used sealed envelopes for a monitor to distribute the monetary rewards[26]. In the single blind design, in the first treatment the dictators received cash from the experimenter, while in the second treatment the dictators also had a face-to-face contact with the experimenter.

Comparing the results of the four treatments, Hoffman et al. (1994) suggested that decreasing the social distance[27] activates the individuals' dispositional knowledge about social norms and reciprocity. Hence, subjects' offers are not affected by their "taste" of fairness but by their social concern of what others might think about their behavior as they strive to maintain their social status (the "observer bias"). Hoffman et al. (1996a) found that when the level of anonymity increases, people deviate more from fair distributions.

Commenting on what causes this deviation, Bohnet and Frey (1999) added the dimension

[26]The monitor was a random subject of the sample that did not participate as a dictator or a recipient.

[27]Social distance is considered to be the distance between the dictator and the experimenter.

of anonymity among the participants. They suggest that when the social distance between two subjects is decreasing, the subject's view towards reciprocity is not changed. What changes is that the recipient is no longer anonymous but it is an "identifiable" victim. According to Bohnet and Frey (1999), a decrease in social distance[28] does not necessarily increase the strength of reciprocal motivation but rather eliminates anonymity which makes people care more.

In the case of the dictator game, where social preferences are measured, Ben-Ner et al. (2004) support the double blind design for the anonymity of their subjects. Faro and Rottenstreich (2006) support that when subjects need to report their preferences over social issues, the effect of the "observer bias" is increasing[29]. In contrast, Bolton et al. (1998) found no evidence of the observer bias. In this paper, the double blind design is used in order for the subjects to report freely their real choices and perceptions over fairness.

6.1.6 Monetary Incentives

The use of monetary incentives in a dictator game has proved to influence the choices of the dictator. Forsythe et al. (1994) tested fairness with and without monetary incentives in the dictator game. After conducting the same dictator game without monetary incentives, they found that the results became more ambiguous. A big amount of the participants shifted to distributions of equal-shares proposal when no monetary incentives were provided. Hence, providing monetary incentives can affect the distribution of the outcome significantly. This finding also supports that violation of the non-satiation, saliency and dominance precepts proposed by Smith (1982) can have a big effect on the results of a dictator game. The violation of these precepts is possible when no monetary or other incentives are given to the subjects. Consequently, real monetary incentives were provided to the subjects in this experiment.

Stoop, Noussair, and Van Soest (2012) used time as a medium of reward instead of money in a dictator game. This different medium had a significant impact to the results. While the behavioral patterns were similar, the time reward increased pro-sociality for the dictators. This indicates that the dictator game is susceptible to different experimental designs.

Hoffman et al. (1996b) investigated whether there is any difference caused by higher stakes in an ultimatum game. They reported no significant difference in the distributions of the offers when the stakes varied from \$0 to \$5, from \$5 to \$10 and from \$10 to \$100. These results show

[28] Social distance in Bohnet and Frey (1999) is considered to be the distance between the participants.

[29] According to Faro and Rottenstreich (2006), the observer bias appears when the subjects know that they are being observed and they are concerned of what others might think about their behavior.

that the generated data in cases of high or low stakes are indistinguishable.

Bolton et al. (1998) analyzed presenting restricted and unrestricted offers as well as having several recipients in a dictator game. In the case of restricted offers, the dictator had to choose between an equal distribution and one that favors himself. When restricted distributions were presented to the dictator, he became less fair per game but equally fair when analyzing the results of an entire session. In my experiment the dictator faced an unrestricted integer set of choices between €0 and €10. When several recipients were involved in the study of Bolton et al. (1998), the dictator had the tendency to be less generous. Multiple recipients are avoided in my experiment to eliminate such influences.

Monetary incentives are an important element to this research not only for the dictator game but also to motivate the subjects to think of a great amount of fair and unfair cases. Students needed to exert an amount of mental effort to come up with fair and unfair situations on the spot. However, Allison et al. (1989); Liebrand et al. (1986); Messick et al. (1985) did not make use of the monetary incentives in similar experiments, at all.

6.2 Limitations

In this section, some of the limitations of this study are discussed. As it has been mentioned above, the theories of perspective-taking, anchoring and the consensus effect predicted accurately similarities between choices and predictions. Nevertheless, the effects of each of these three theories could not be disentangled based on the present experimental design. Consequently, any of these three theories might have had no actual effect in the choices and predictions of the subjects, but since their effects cannot be distinguished the assumptions that can be driven are limited.

One of the hypotheses that were derived included the theory of empathy. However, in the experiment of this study, empathy was not measured. If it was measured it would be easy to examine the relation between empathy and prosocial behavior. Another limitation regarding empathy could be the framing of choices and predictions. The framing that was employed could have been too neutral to evoke empathic emotions. A decrease on the empathy gap that would allow fairer choices after putting oneself in others' shoes might have been hard to achieve with the quiet neutral framing that was used in these two tasks.

Limitations regarding the monetary incentives are also discussed. Real monetary rewards were used in this study in order to incentivize the subjects to act in a realistic environment. Based on the similarities and differences of this study with previous ones, it would be safe to

assume that the monetary incentives were reliable to an extent. Subjects were quiet incentivized to fill in the first two tasks (C and P) in a somewhat truthful manner. However, not all of the subjects seem to be motivated in the following two tasks (F and U), to report the amount of cases they were rewarded for.

In the case of fair and unfair cases, monetary rewards were utilized in order to make subjects exert more mental effort. However, the majority of the subjects reported none to very few fair and unfair cases. The cause of such a behavior could be that subjects found the promise of monetary rewards unreliable. If subjects had been deceived in the past, they could assume that this experiment would deceive them again. The monetary amount offered for each sentence might have also been considered small. Thus, subjects did not really feel motivated.

Students could also have a wrong perception of randomness. Knowing that the participants are rewarded randomly they could think that they themselves would never win among a hundred other students. This perception is false since the subjects were informed that the winners would be selected completely randomly. The subjects could have also thought that they need to know the experimenter personally in order to win, although it was highlighted that they are all anonymous to the experimenter.

Since the survey was distributed online, the subjects may have shared the survey to their friends to participate. In that case, the participants are not completely anonymous to each other. According to Aron et al. (1991), this violation of anonymity, decreases the social distance between the subjects. The participants can feel the need to offer more money to the recipients. The accuracy of their predictions also rises in this case.

Furthermore, this study would be even more insightful if a larger number of observations was included. The limited number of observations did not contribute to more statistically significant results. More observations could also increase the chances of having a representative sample. A larger number of observations (or a smaller number of missing values) could also allow for comparisons across different demographics. A bigger sample also assists in having more statistically significant results. Another limitation of this study could be related to relevant omitted variables. Other variables may have explained the observed results better. Thus, the explanatory power of the model would be enhanced further.

From the large amount of missing values in the tasks where the subjects had to report fair and unfair cases, one can assume that the way of measuring the egocentric fairness bias is not the most effective one. Subjects might consider coming up with fair and unfair cases a time consuming task while in fact they come across fair and unfair cases daily. Consequently, they

did not really engage to it, reporting very few to none such actions.

Moreover, the theory of cognitive dissonance seems to be refuted in this study. On the other hand, it was not measured whether the subjects realized the existing discrepancy between their actions and their beliefs. If they did not realize that a dissonance between their actions and beliefs existed, then the notion of cognitive dissonance is not really violated. Cognitive dissonance assumes that the subjects understand and then have the urgency to resolve such a discrepancy.

6.3 Further Research

Some input for further research is discussed in this section. The following suggestions can be useful for further research on the same topic. The reliability of this survey is one of the things that could be enhances further. If reliability is provided, then the monetary incentives are more enticing and motivating to the subjects. Setting a date in which the random winners would receive their rewards could be more convincing to the subjects. Conducting the experiment on the lab, also gives more reliability that the monetary incentives are real. In order to motivate the subjects' to fill in the entire list of fair and unfair tasks, the elimination of the random lottery could also be helpful. If the subjects knew that the ones who would fill in the entire list would be paid out for sure, they would be more intrigued to do so.

In this study it is found that the theories of perspective-taking, anchoring and the consensus effect predicted accurately similarities between choices and predictions. However, the effectiveness of each of these theories was not investigated. In future related work, it would be interesting to attempt to disentangle these three effects. Thus, one could find if all of them have the same or a different effect in decision making. This insight could help in designing a nudge that would not have to utilize all possible theories but the most effective one(s) since combining all three is not always possible.

The theory of the empathy gap predicts that putting oneself in others' shoes, increases fairness in one's subsequent choices. Empathy is a strong emotion that is proved to affect decision making in the literature (see section 2.4). However, this theory was not proved to be true in this experiment. One of the reasons that this happened could be the very neutral way of putting the subjects in others' shoes. Different levels of evoking empathic emotions could be employed in order to find the level that increases fairness the most. Hence, the first treatment of the present study (PCFU) could be used as a baseline while other treatments could involve higher levels and different means of putting oneself in others' shoes before making

a decision. Findings from such a study could enhance the effectiveness of nudging towards fairer distributions.

New ways of objectively measuring the subjective egocentric fairness bias could also be investigated. The way that the egocentric fairness bias is measured in this paper, is previously proposed in the literature. However, this method could be misleading since it might be hard for the participants to admit that they perform a smaller number of fair and a higher number of unfair actions than others. Thus, there is room for new ways of extracting the participants' associations between a subject (oneself or other) and an action. A comparison between different methods could also be useful for future experimental studies. Conventional and new ways of measuring fairness and beliefs of fairness, can be combined in future research. Incorporating tools from Neuroscience into this experimental design, could give a new dimension of decision making.

The theory of cognitive dissonance has also been proved to be an effective explanation in many other cases in the literature (see section 2.6), however, in this study it did not predict the results accurately. It would be interesting to examine in this case whether the subjects are aware of the existence of this cognitive dissonance between actions and beliefs. If they were not aware of it, then that could explain why this dissonance was not resolved but if they were aware of it, then the cognitive dissonance theory is violated. Either way, a new insight on behavior could be provided by such a research suggestion.

7 Conclusion

This study investigated fair behavior and beliefs. The primary goal was to examine whether putting oneself in other's shoes enhances fair behavior. To test that, an experiment was designed and conducted. In this experiment, subjects first predicted another's choice and then chose for themselves or, they first chose for themselves and then predicted another's choice. Subsequently, the subjects' associations regarding fair and unfair behavior were tested. Evidence supported the theories of perspective-taking, anchoring, the consensus effect and the egocentric fairness bias, while the theories of empathy gap and cognitive dissonance were refuted. It was proved that thinking of others' choices, did not enhance fairness. Instead, people's choices are similar to their predictions, just like perspective-taking, anchoring and the consensus effect predicted. On the contrary, the subjects reported that they perform a greater amount of fair than unfair actions, while others perform the same amount of fair and unfair actions, on average. Hence, subjects

were found to believe that they are fairer than others (egocentric fairness bias), although they act the same way that others do. Thus, an unresolved cognitive dissonance between beliefs and actions was found. These results are quiet informative as they demonstrate that just by thinking of what others would do in a similar situation does not necessarily help people become more fair. At the same time, people were found to believe in a different way than they act, although they are supposed to have a need to resolve such an inconsistency (cognitive dissonance).

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A Appendix: The Questionnaire of the Experiment

A.1 Treatment 1: Predict, Choose, Report fair and unfair cases (PCFU)

Dear participant,

Welcome!

This experiment will take you about 15 min in total and includes 4 main questions.

During the experiment you will make decisions over monetary amounts. 10 of the participants of this experiment will be selected to be paid according to their choices. If you are selected to be paid, you will receive the amount you earned in one of your decision in the form of an Amazon.com gift card.

Every participant has an equal chance to be selected to get paid for real.

You will be asked to fill in your e-mail address in order to receive the gift card. However, both the experimenter and the other participants will not be able to observe the choices you make, even when you receive your gift card.

1 of the 4 following questions will be randomly selected to be played for **real money** so it is in your own interest to **treat each choice carefully**.

1. In this part of the survey you are asked to predict the choices of another participant.

   In this question you will be randomly paired with another participant. If you predict his or her choice correctly, you will get €10 to your gift card.

   Imagine that the other participant gets €10 in a gift card for participating in this survey. These €10 are his or hers to dispose of. He or she has the choice to give part of this amount to another random participant who is not selected to be paid according to his or her responses to the experiment.

   How much money do you think he or she offers to the other participant? _____

2. In this part of the survey you are asked to make choices for yourself.

   Imagine that you get €10 in your gift card for participating. These €10 are yours to dispose of. Additionally, you have the choice to give part of this amount to another random participant who is not selected to be paid according to his or her responses to the experiment.

   How much money do you offer to the other participant? _____

3. In the space below, please write as many things that you think of, that you do, or that someone else does, that you would describe as fair. If you think that you do these things more often than someone else, begin the sentence with "I...". If you think that a random other does these things more often than you do, then start the sentence with "He/she...". (The gender does not matter.)

   For each case you write you can earn €1. Up to 10 cases will be rewarded.

   _____

4. In the space below, please write as many things that you think of, that you do, or that someone else does, that you would describe as unfair. If you think that you do these things more often than someone else, begin the sentence with "I...". If you think that a random other does these things more often than you do, then start the sentence with "He/she...". (The gender does not matter.)

   For each case you write you can earn €1. Up to 10 cases will be rewarded.

   _____

A.2 Treatment 2: Choose, Predict, Report fair and unfair cases (CPFU)

Dear participant,

Welcome!

This experiment will take you about 15 min in total and includes 4 main questions.

During the experiment you will make decisions over monetary amounts. 10 of the participants of this experiment will be selected to be paid according to their choices. If you are selected to be paid, you will receive the amount you earned in one of your decision in the form of an Amazon.com gift card.

Every participant has an equal chance to be selected to get paid for real.

You will be asked to fill in your e-mail address in order to receive the gift card. However, both the experimenter and the other participants will not be able to observe the choices you make, even when you receive your gift card.

1 of the 4 following questions will be randomly selected to be played for **real money** so it is in your own interest to **treat each choice carefully**.

1. In this part of the survey you are asked to make choices for yourself.

Imagine that you get €10 in your gift card for participating. These €10 are yours to dispose of. Additionally, you have the choice to give part of this amount to another random participant who is not selected to be paid according to his or her responses to the experiment.

How much money do you offer to the other participant? _____

2. In this part of the survey you are asked to predict the choices of another participant.

   In this question you will be randomly paired with another participant. If you predict his or her choice correctly, you will get €10 to your gift card.

   Imagine that the other participant gets €10 in a gift card for participating in this survey. These €10 are his or hers to dispose of. He or she has the choice to give part of this amount to another random participant who is not selected to be paid according to his or her responses to the experiment.

   How much money do you think he or she offers to the other participant? _____

3. In the space below, please write as many things that you think of, that you do, or that someone else does, that you would describe as fair. If you think that you do these things more often than someone else, begin the sentence with "I...". If you think that a random other does these things more often than you do, then start the sentence with "He/she...". (The gender does not matter.)

   For each case you write you can earn €1. Up to 10 cases will be rewarded.

   _____

4. In the space below, please write as many things that you think of, that you do, or that someone else does, that you would describe as unfair. If you think that you do these things more often than someone else, begin the sentence with "I...". If you think that a random other does these things more often than you do, then start the sentence with "He/she...". (The gender does not matter.)

   For each case you write you can earn €1. Up to 10 cases will be rewarded.

   _____

B Appendix: Descriptive Statistics

Here, the distributions of the main variables are analyzed and tested for normality.

The distributions of choices and predictions are depicted in figures 17 and 18. The distribution of choices looks like a bimodal distribution with peaks at the zero and equal shares. In treatment 1, the choices (or the offers in the dictator game) have an average of €2.5375. The 50th percentile (median) of choices in treatment 1 is €3. In treatment 2, the mean of choices is €2.2222 while the median is €2. The highest offer is €8 in treatment 1 and €7 in treatment 2 while the lowest is €0 in both treatments. As expected, the Skewness-Kurtosis normality test shows that the distributions of choices in treatment 1, in treatment 2 and in both treatments combined do not fit the normal distribution even at a 1% significance level (see table 10).

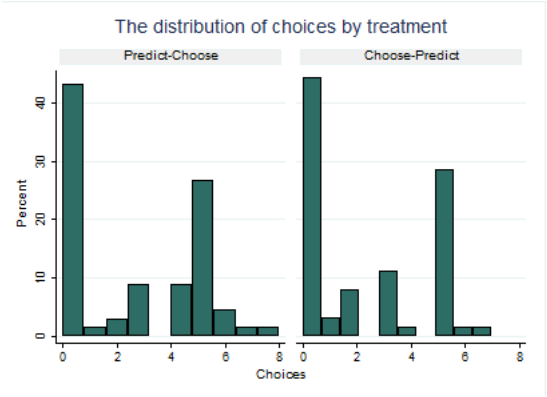

Figure 17: The distribution of choices in the two treatments (in percent)

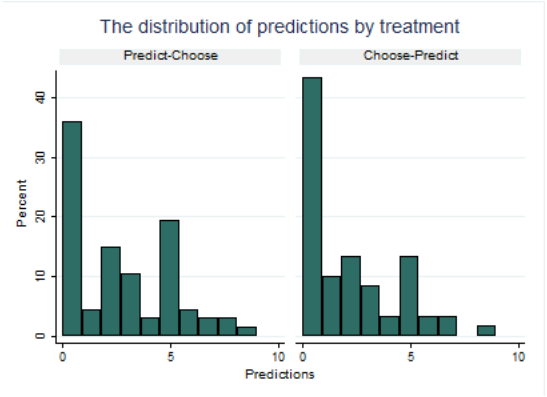

Figure 18: The distribution of predictions in the two treatments (in percent)

	Treatment 1 (PCFU)	Treatment 2 (CPFU)	PCFU & CPFU
Mean	€2.5375	€2.2222	€2.3846
Median	€3	€2	€2
Skewness	0.1923	0.3344	0.2665
Kurtosis	1.5244	1.4899	1.5194
SK test	(0.0000)	(0.0000)	(0.0000)

Table 10: Basic descriptive statistics and the results of the Skewness-Kurtosis normality test, regarding choices

The distribution of predictions looks like a hybrid between a bimodal and a χ^2 or an F distribution. In treatment 1, the subjects' predictions of others' offers have an average of €2.5970 while the median of predictions is €2. In treatment 2, the mean of predictions is €2 while the median is €1. The highest offer is €9 and the lowest is €0 in both treatments. As expected, the Skewness-Kurtosis normality test shows that the distributions of predictions in

treatment 1, in treatment 2 and in both treatments combined do not fit the normal distribution at a 5% significance level (see table 11).

	Treatment 1 (PCFU)	Treatment 2 (CPFU)	PCFU & CPFU
Mean	€2.5970	€2	€2.315
Median	€2	€1	€2
Skewness	0.5756	0.9791	0.7559
Kurtosis	2.2483	2.9753	2.5109
SK test	(0.0450)	(0.0185)	(0.0046)

Table 11: Basic descriptive statistics and the results of the Skewness-Kurtosis normality test, regarding predictions

Since significant departures from normality are found, non-parametric tests are used to test the hypothesis of this study that involve choices and predictions.

The number of fair and unfair cases that the subjects addressed to themselves and others are the elements of the egocentric fairness bias. Thus, it is important to analyze their distributions (see figures 19, 20, 21 and 22). On average, in both treatments the subjects addressed about 2.5 fair cases to themselves. In both treatments, the median for fair cases addressed to oneself is 2. The fair cases addressed to others are on average 1.5 in both treatments. The median of fair cases addressed to others is 1. On the other hand, in both treatments the subjects addressed on average about 1 unfair case to themselves. In both treatments, the median for unfair cases addressed to oneself is also 1. On average, the unfair cases addressed to others are about 2 while the median is 1 in both treatments. Similar results are found in the descriptive statistics of both treatments combined (see table 12).

The distribution of fair cases addressed to oneself does not fit the normal distribution in treatments 1 and 2 and in both treatments combined even at a 1% significance level. The same holds also for the distribution of fair cases addressed to other as well as unfair cases addressed to oneself and other (see table 12)

Since significant departures from normality are found, non-parametric tests are used to test the hypotheses of this study that involve fair and unfair cases addressed to oneself and other.

The reported number of fair and unfair cases shapes the distribution of the egocentric fairness bias. The egocentric fairness bias is calculated as the difference between the number of fair situations addressed to oneself and others plus the difference between the number of unfair

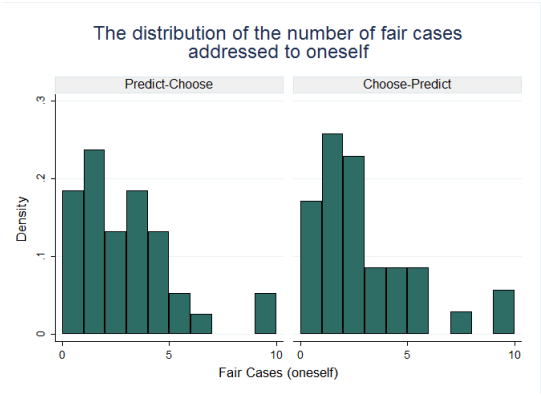

Figure 19: The distribution of the fair cases addressed to oneself in the two treatments

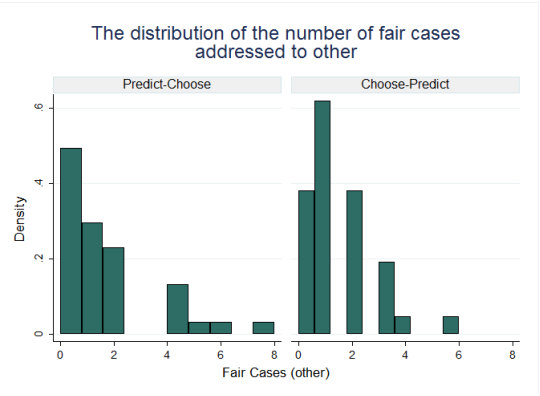

Figure 20: The distribution of the fair cases addressed to other in the two treatments

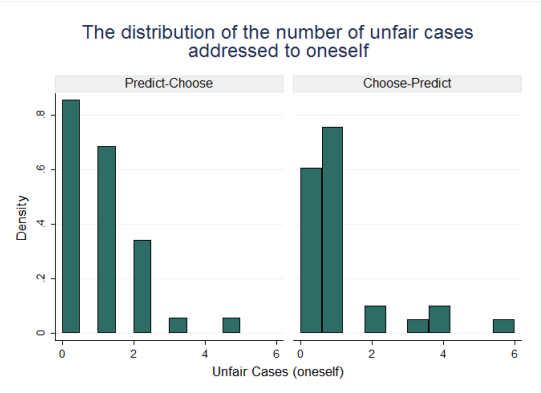

Figure 21: The distribution of the unfair cases addressed to oneself in the two treatments

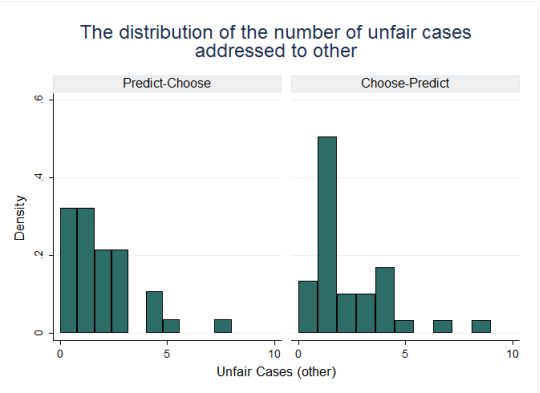

Figure 22: The distribution of the unfair cases addressed to other in the two treatments

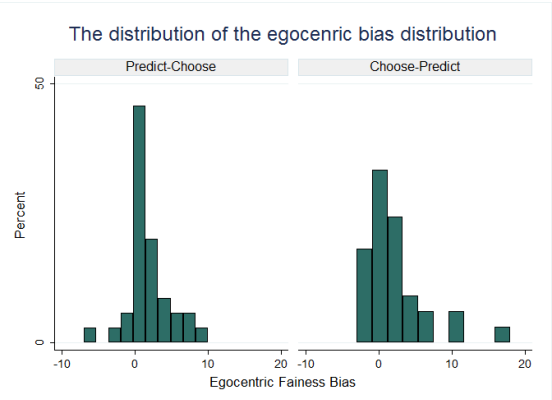

Figure 23: The distribution of the egocentric fairness bias in the two treatments (in percent)

situations addressed to others and oneself (see equation 1). A positive egocentric fairness bias shows that people perceive themselves fairer than others while a negative egocentric fairness bias shows that people perceive others fairer than themselves. An egocentric fairness bias equal to zero indicates that people perceive themselves equally fair (and equally unfair) to others.

	Fair Cases (oneself)			Fair Cases (other)		
	PCFU	CPFU	PCFU & CPFU	PCFU	CPFU	PCFU & CPFU
Mean	2.5	2.5143	2.5068	1.5263	1.4571	1.4932
Median	2	2	2	1	1	1
Skewness	1.3965	1.5685	1.4941	1.5657	1.3182	1.6065
Kurtosis	5.1684	5.1949	5.2215	5.0966	5.3629	5.8829
SK test	0.0015	0.0010	0.0000	0.0008	0.0021	0.0000
	Unfair Cases (oneself)			Unfair Cases (other)		
	PCFU	CPFU	PCFU & CPFU	PCFU	CPFU	PCFU & CPFU
Mean	0.9143	1.0909	1	1.8286	2.1515	1.9853
Median	1	1	1	1	1	1
Skewness	1.6720	1.8977	1.9212	1.3218	1.5495	1.4921
Kurtosis	6.6712	1.9472	7.2549	5.3056	5.3161	5.5443
SK test	0.0002	0.0001	0.0000	0.0022	0.0022	0.0000

Table 12: Basic descriptive statistics and the results of the Skewness-Kurtosis normality test, regarding fair and unfair cases addressed to oneself and other

The distribution of the egocentric fairness bias is presented in figure 23. The median of the egocentric fairness bias is 1 in both treatments. The mean in treatment 1 is 1.6571 and in treatment 2 is 2.1818. The Skewness-Kurtosis normality test shows that the egocentric fairness bias is approximately normally distributed in treatment 1 but not in treatment 2 or in both treatments combined at a 1% significance level (see table 13).

Since significant departures from normality are found in treatment 2 and in both treatments combined, non-parametric tests are used to test the hypothesis involving this bias. In treatment 1, parametric tests can also be used, however, in order to make "fair" comparisons between the results of the tests non-parametric tests are chosen.

C Appendix: Linear Regression Hypotheses

Part of this study is the estimation of an OLS model involving the variables of interest. In order to acquire BLUE estimators (Best Linear and Unbiased estimators) in an OLS model, a few

	Treatment 1 (PCFU)	Treatment 2 (CPFU)	PCFU & CPFU
Mean	1.6571	2.1818	1.9118
Median	1	1	1
Skewness	0.441	1.8464	1.5256
Kurtosis	4.4900	7.0834	7.3446
SK test	(0.0782)	(0.0001)	(0.0000)

Table 13: Basic descriptive statistics and the results of the Skewness-Kurtosis normality test, regarding the egocentric fairness bias

assumptions need to be held. The following four assumptions need to be present in order to have linear and unbiased estimators while the fifth one provides best (or else efficient) estimators:

1. The equation to be estimated is linear in parameters

2. Random sample of n observations

   This assumption consists of following three sub-assumptions:

   - The sample consists of n-paired observations that are drawn randomly from the population.
   - The number of observations is greater than the number of parameters to be estimated.
   - The independent variables are non-stochastic, whose values are fixed. This assumption means there is a unilateral causal relationship between the dependent variable and the independent variables.

3. Zero conditional mean

   According to this assumption, there should be no relationship between the error terms and the independent variables.

4. No Perfect Collinearity

   According to this assumption, there should be no exact linear relationship among the independent variables.

5. Homoscedasticity

   According to this assumption, the error terms have the same variance and are not correlated with each other.

The first assumption is supposed to be held because when different non-linearities were incorporated the model's explanatory power declined. The second assumption is supposed to be held by the design and the way the survey was distributed. The third assumption is tested with the RESET test (for the misspecification of the model), however there still could be relevant omitted variables[30] that are not available in our data set. The forth assumption is most probably held otherwise the STATA software would automatically exclude one of the variables that would be (perfectly and) linearly related to another one. The fifth assumption is tested with the Breusch-Pagan test.

Model	1	2	3	4	5	6
Breusch-Pagan	0.2629	0.1584	0.2432	0.2688	0.2749	0.3051
RESET	0.8019	0.7667	0.7930	0.7812	0.9296	0.9450
Normality of residuals	0.9158	0.6311	0.5994	0.5899	0.9126	0.4224

Table 14: The p-values of the OLS regression tests in homoscedasticity, misspecification and normality of residuals (treatment 1)

Model	1	2	3	4	5	6
Breusch-Pagan	0.2856	0.2266	0.3283	0.2409	0.2930	0.3878
RESET test	0.6737	0.8637	0.7723	0.7982	0.7427	0.7654
Normality of residuals	0.0317	0.2140	0.1915	0.2027	0.2400	0.1516

Table 15: The p-values of the OLS regression tests in homoscedasticity, misspecification and normality of residuals (treatment 2)

According to the Breusch-Pagan, RESET and Skewness - Kurtosis test of normality, all the regressions fulfill the assumption of homoscedasticity, well specification of the model and the normality of the residuals in treatment 1 (see table 14). The same holds for treatment 2 (see table 15).

[30] Relevant omitted variables are the ones that are left in the error term and are correlated with the independent variables. If such variables exist then the coefficients of the estimation are biased because they include the effect of the variable that is included (and is related to the omitted one) and the effect of the omitted variable.