ERASMUS UNIVERSITY ROTTERDAM

Erasmus School of Economics

MSc thesis program Behavioural Economics

The influence of an irrelevant context on dictators in a dictator game.

Name student: L. D. C. Bakker

Student ID number: 448393

Supervisor: M. A. J. van Hulsen

Second assessor: N. J. A. van Exel

Date final version: 9 July 2020

Abstract

In this study it is estimated if a third irrelevant player has an influence on the decision a dictator makes in a dictator game. In literature it is found that a different context, such as including a third player, can influence the decisions people make. However, it has not been studied yet if this is also the case when the third player has no direct influence on the decisions. In this study, a normal dictator game is played, in which the dictator divides 100 euros between him/herself and the receiver. Within this dictator game a third player is added. This third player has no direct influence on the endowments of the dictator and the receiver. There are four treatments, with different endowments for player C in every treatment, namely 0, 25, 75 and 100 euros. For this study, a between-subjects design is used with in total 159 respondents. The results are estimated with a Kruskall Wallis-test, a one sample t-test and some multiple linear regressions. The results show no effect of the treatment on the payoff of player A. Although overall, the dictators in this experiment pass more money towards the receiver, compared to the standard two-person dictator game. A possible explanation for this could be the inclusion of an irrelevant third player. However, an alternative explanation could be the that the different behaviour of the respondents is caused by the hypothetical design of this experiment. As it is not yet evident what causes the influence, further research is necessary.

Acknowledgments

The last few months, I enjoyed working on my master thesis on the behaviour of people when adding a third irrelevant player to the standard two-person dictator game. This thesis is written as part of my graduation from the program Behavioural Economics at the Erasmus University Rotterdam. I would like to express my gratitude and appreciation to my supervisor M. A. J. van Hulsen, for her guidance and feedback during the writing process of my thesis.

Lisa Bakker

Rotterdam, July 2020

Table of contents

1. Introduction

Based on standard economic theory, economists expect people to act in a way that they maximize their own utility. People behave selfish when they need to make decisions (Tversky, 1967). This theory is based on statements of Adam Smith (1776), who states that if everyone gets the freedom to choose what is best for them, a lot of economic problems would solve themselves. The remaining economic problems should be solved by the government. Smith's theory is based on the idea that if everybody chooses that what is best for themselves, everybody will end up with what is best for them individually, as well as for the community. This is the precursor of the liberalism society. This idea of maximization of your own utility is based on the rationality of a person. If a person thinks rational and does not let emotions take control, (s)he will make decisions that are best for him/herself (Flache & Dijkstra, 2015).

However, it is not always the case that people only maximize their own utility. People give money to charity or care about the wealth of other people, which is called social preferences. If someone exhibit social preferences (s)he does not only care about his/her own payoff, but also about the payoff of someone else. (Fehr & Fischbacher, 2002). In economics, social preferences are often measured by means of dictator games. A dictator game is a game with two players. The 'dictator' in this game makes a choice about the outcome of himself and the outcome of the other player (the 'receiver'). The receiver receives the amount of money allocated to him/her by the dictator, and thus cannot influence the amount of money (s)he will receive. This is called a standard two-person dictator game (Angner, 2016).

There are two main social preferences models in dictator games according to which people can make chooses. The first of these models is the 'Difference aversion model', where people have an inequity aversion. In this model people want to reduce the difference between them and others. The second models is the 'Social welfare model', according to which people want to increase the total surplus. Especially helping those with the lowest payoffs is important in this model. Social welfare in a dictator game can be seen as sacrificing a part of their own endowment to pass towards the receiver. In addition to the two main models, there are more social preference models, for instance the 'Reciprocity model'. This model tells that people react to the behaviour of the other. They want to raise someone's payoff if this person also

had a positive action towards them. However, this model is harder to measure with a dictator game (Charness & Rabin, 2002).

Literature states that a lot of decisions made in psychological games, such as the dictator game, are context dependent. Examples of what is meant with context are the title for the game which is played or the way in which outcomes are shown (Dufwenberg, Gächter, & Henning-Schmidt, 2006). In 1993, Tversky and Simonson already found that the preferences people have differ when the context is different, the so-called contrast effect. With the contrast effect is meant that people see an object different due to the context of that object. As an example, a circle seems smaller when it is surrounding by big circles compared to when it is surrounded by small circles. In this example, a single attribute, the circle, looks different when it is surrounded with a different context. Tversky and Simonson (1993) state that there are not only contrast effects with a single attribute, but also between different attributes. An example they mention is the so called 'Local context'. Initially, there are product A and product B. Next to that a third alternative, product C, will be added. This product C is clearly better than product A but not to product B. In this case, they see that people do not act out of rational inference and choose the best option, product B. People will choose more often for product A compared to the previous situation without product C.

Another example is from Tan and Forgas (2010), who found in both a field and lab experiment that the mood of a subject has an influence on the decision they make. They conducted two experiment, of which the first experiment was a dictator game held in a public place. Participants rated their mood on three different 7-point scales, namely happy-sad, good-bad and tense-relax. In the second experiment, Tan and Forgas again played a dictator game. However, this experiment took place in the lab and respondents viewed a short film to bring them into a certain mood before they played the dictator game. Again, at the end participants had to rate their mood on the three different 7-point scales. They concluded that people in a positive mood act more selfish, whereas subjects in a sad mood act fairer. This can be seen as a context of the decision.

If the decisions people make are different when the context of the same decision differs, it is likely that the decisions made in a dictator game also change when the context changes. However, it is not yet clear if these decisions also change if the context does not directly influence the decision. The literature about decision making in a dictator game, which will be

explained later, only shows to what extent the decisions differ if the third player of the dictator game has a relevant function. Therefore, the research question of this paper is:

'To what extent does adding an irrelevant third player to the standard dictator game influence the decision a player makes?'

This question is of academical relevance because it will fill in the gap in the literature about decision making with an irrelevant context. It is found that relevant context influences people's behaviour, but not to what extent irrelevant context changes people's behaviour. It is important for further research of psychological games, to take into account both of these influences. Besides that, this paper is of social relevance, because the paper makes clear to what extent irrelevant context has an influence at decisions people make. Companies, governments and people could keep this in mind when they offer a decision to other people. If they expected people to go for a certain option, because of a relevant influence, they should also keep in mind the influence of irrelevant context. In that way, it can be the case that people choose another option than expected at first sight. Therefore, they could take into account the consequences.

In this study, a dictator game with three players will be performed. The dictator has to divide an amount of 100 euros between him/herself and the receiver, similar to the standard two-persons dictator game. However, in this study there will be a third irrelevant player. This means that the third player is mentioned in the dictator game and receives an amount of money. This third player has no direct influence on the payoffs of the dictator and the receiver. The dictator game is completely hypothetically, the respondents of this experiment are all dictators and no money will be paid. Next to that, three questions about the willingness of the respondents in certain situations will be asked. The first question is about the willingness to give although the respondent does not get something in return. The second question is about the willingness of the respondent to give when there could be some costs for the respondent. The last questions are about the willingness of the respondent to make sure that every group member gets an equal amount.

In this thesis, firstly previous literature will be discussed about different dictator games and how context can influence decisions. This will be followed by the experimental design and the methodology of this study. In the methodology the following analysis will be explained. First

the payoffs of player B in the different treatments will be compared to each other and to the payoffs of player C. Furthermore, a multiple linear regression will be made to find out if the treatment of a subject has an influence on the payoff of player B. At last, three multiple linear regression will be estimated to discover whether the willingness to give to others has an influence on the payoff of player A. Next to that, the results of the experiment will be explained. The results show that dictators pass a higher amount of money to the receiver, compared to in the standard two-person dictator game. However, no significant difference can be found between the different treatments. Finally, there will be a discussion and a conclusion will be drawn.

2. Theoretical Framework

In this theoretical framework, first the dictator game will be discussed by explaining outcomes of the standard two-person dictator game and dictator games with multiple players. Next to that, theory about anchoring, social preference models and moral licensing will be discussed. At last, the hypotheses will be formulated based on the literature.

2.1 Dictator game

In a dictator game, it is often found that people do not only care about their own payoff, as they sometimes choose the option which gives a more equal outcome or a better total for the surplus (Bardsley, 2008). In a standard dictator game around 60 percent of the dictators give a positive amount to the recipient. The average amount these 60 percent of the dictators passes to recipients, is around 20 percent of the dictator's endowment (List, 2007). The median amount is slightly higher in a lot of studies. However, the median percentages differ among studies between 20 and 35 percent of the dictator's endowment. For example, a study of Korenok et al. (2012) found that the median amount is 33 percent of the dictator's endowment in the standard two-person dictator game. They found that this percentage stays the same when the dictator's endowment increases. The results of List (2007) can be compared to the results of this study, to see the differences between a standard two-person dictator game and a dictator game with a third irrelevant player.

2.1.1 Dictator games with multiple players

There are a lot of different versions of the dictator game which can be found in the literature, especially with multiple players. Bahr and Reguate (2014) played a dictator game with three players. First player A had to divide an amount of money between him and player B. Then, player B had to divide this part between himself and player C. There were two different treatments in this experiment. The baseline treatment consisted of the dictator game described as above with no communication between the different players. In the second treatment player A and B had interaction before the dividing took place. The same applies to player B and player C. The results show that in the baseline treatment, player A gave a bigger amount of the money to player B, compared to the two-person dictator game. Additionally, the experiment showed more kindness of player A and player B when there was interaction between the players before the decision-making. Another study found that when players can communicate with each other beforehand, attractiveness also plays a role. When the dictator thinks the recipient is attractive, (s)he chose to give a higher amount of his/her endowment to the recipient (Camerer, 2003). This could strengthen the effect of giving more money when two players interact before the dictator has to divide an amount of money. The results of Bahr and Reguate (2014) show a different outcome when the dictator game consists of three players instead of two players. Other than in the study of Bahr and Reguate (2014), the third player in the study of this paper has no direct influence on the payoff of the dictator and the receiver. However, it could be that there is an indirect influence in the study of this paper. Looking at the first treatment in the study of Bahr and Reguate it can be seen that the first dictator, player A, gives a higher amount to player B compared with a standard two-person dictator game. This is caused by the presence of a third player in the game, even though this third player has no direct influence on the endowment of player A. For that reason, it is likely that the third player in our study will have an influence on player A, the dictator, as well. However, in the study of Bahr and Reguate (2014) the payoff has to be divided between three people, in the study of this paper between two people. The fact that the dictator gave on average more endowment towards the receiver could also result from the dictator caring about the endowment of the third player. In that way, the third player could have a direct influence on the behaviour of the dictator.

Another study with three players is from Fehr & Fischbacher (2004). They studied a dictator game with a third player who has a so-called punishment option. In their version, player A, the

dictator, has to divide 100 points between the recipient, player B, and him/herself. Player A can give 0, 10, 20, 30, 40 or 50 points to player B, who initially has no endowment. Player C has an endowment of 50 points and can, after seeing the transfer of A, punish player A. In that way the endowment of player A is reduced. However, if player C gives a punishment to player A it will also reduce his/her own endowment. In that way, you would expect that player C will not punish player A, because (s)he cares only about his/her own payoff. Nevertheless, Fehr and Fischbacher found that if player A transfers less than 50 points to player B, about 60% of players C punished player A, the dictator. The average amount of points that were transferred by the dictator was similar to the normal dictator game without punishment, which is around 20% of the endowment. In the study of Bahr & Reguate (2014) with three players, the third player in the baseline treatment has an indirect influence at the behaviour of the dictator. However, this study showed that the behaviour of the dictator is the same when there are two or three players. This shows that the changing behaviour of the dictator depends on what kind of role the third player has. Besides that, an important factor could be between how many people the endowment needs to be divided. In the study of Bahr & Reguate (2014) the endowment needs to be divided between three people and shows a higher amount passed by the dictators compared to the standard two-person dictator game.

Panchanathan, Frankenhuis and Silk (2013) performed a dictator game in which there was one receiver player, but different dictators decided how much of their endowment they want to share with the receiver. They found that dictators choose to share a smaller amount of their endowment when there are more dictators in comparison to when they are the only dictator. This is due to the so-called bystander effect, in which people do nothing when there are a lot of people around the situation which takes place (Panchanathan, Frankenhuis & Silk, 2013). Although this study shows the results of multiple dictators instead of multiple receivers, it still shows a game with multiple players. These results show, that when multiple players play in a dictator game, they have a different influence at each other, compared to in a standard two-person dictator game. Adding a different context to the standard dictator game, changes decisions players make. Although the context of the dictator game changes in this example, it could be that the different decisions from the dictators, are due to the substantial difference in the game compared to a standard two-person dictator game. However, it shows that the role a person has, in relation to the other players of the game, has an influence on the

decisions (s)he makes. In the studies mentioned, the changing context is relevant for the dictators. However, in the current study the different context, the third player, is irrelevant. Therefore, it is not yet proven whether the influence of a different context remains if the context is irrelevant to the dictator.

2.2 Anchoring

Not only the context can influence people's decisions, people can also use anchoring to make decisions. Anchoring is a heuristic in which people make use of a value that is already shown. This value is regarded as the starting point to use when they make decisions (Tversky & Simonson, 1993). Anchoring is used in many different areas and studies tested it with various questions about for instance, general knowledge, probabilities or valuations (Furnham & Boo, 2011). One of the first studies about anchoring effect is by Tversky and Kahneman (1974), in which subjects were asked to estimate the percentage of African nations in the United Nations. The first group had to give a percentage by themselves. The second group had to say if the percentage was lower or higher than a certain number, which was decided by spinning a wheel. Besides that, they are asked to give an absolute percentage. Caused by the human tendency to be consistent, the brain searches for evidence that the number that came out of the spinning wheel is somehow true. Therefore, when the subject is asked to give a percentage, this previous number comes to mind first. As a result, people give percentages close to this number out of consistency. The number on the spinning wheel is used as an anchor. (Mussweiler, 2002). The number given by the spinning wheel is not related to the percentage of African nations in the United Nations, which provides evidence that the anchor effect even plays a role if the number is not relevant to the answer the subject needs to give. This is confirmed by other studies, for example Englich et al (2006), who used a set of dice as an anchor, proving that an anchor does not need to be relevant. In the study of this paper, it is expected that the dictators use the endowment of player C as anchor. The endowment of player C is irrelevant information for the dictator, so it can be seen as an irrelevant anchor. However, the anchor is a monetary amount, as well as the endowment player A needs to pass towards player B. In that way the anchor can be seen as a relevant anchor. In either case, the anchor effect could play a role.

2.3 Social preference model

In a lot of psychological games like the dictator game, people do not act selfishly although standard economic models predict they would, due to social preferences. As previously discussed, one of the main social preference models is the 'Difference aversion model'. Psychological evidence is found that most people have inequity aversion and thus they want to reduce the differences among subjects. Inequity can be self-centred, which means people only care about their own endowment compared to other subjects. However, there are people who care about the inequity among other people as well (Fehr & Schmidt, 1999). A study from Korenok et al. (2012) found more evidence for this claim. In a normal dictator game, the recipient starts with an endowment of zero and ends up with the endowment the dictator gives to the recipient. In the study of Korenok et al. (2012), the recipient starts with the same endowment as the dictator. This means that the receiver and the dictator both start with an endowment of 100 euros. The dictator then can decide which amount of his/her endowment (s)he wants to give to the receiver. The payoff of the receiver is then the first 100 euros (s)he got from the experimenter, and the amount (s)he receives from the dictator. They found that in that case, the amount a dictator passes decreases and the number of dictators that passes a positive amount decreases as well, which is linked to inequality aversion. The dictator passes positive amount to the recipient in the standard dictator game, because they want to reduce the differences, so if the recipient's endowment is the same as the dictator's endowment, like in the study of Korenok et al. (2012), they stop doing that.

In the study of this paper, the dictator has multiple options to reduce the differences. The first option is to reduce the difference between him/herself and the receiver, player B. Secondly, (s)he can reduce the difference between him/herself and player C, by keeping the same amount for him/herself as the amount of player C. The last option the dictator has is to reduce the difference among all three players. However, this is in some treatments not possible for the dictator due to the fact that (s)he only has an influence on his/her own endowment and the endowment of the receiver, player B. When player C has an endowment of 25 or 75 euros, the dictator can divide the endowment such as that (s)he and the receiver have somehow the same endowment.

2.4 Moral licensing

Although people sometimes have social preferences, there are still different reasons why people want to act selfishly, especially when they can convince themselves that they are acting morally, even though they are not. Research shows that people are seeking for evidence and excuses in order to act selfishly, especially if the decision is made under uncertainty (Gino, Norton & Weber, 2016). This phenomenon is called moral licensing (Merritt, Effron, & Monin, 2010). Moral licensing is when people feel like they can act in a certain way because they did a positive action first. However, they would not act in that way if they had not done the positive action. A well-known example of that is that a lot of people treat themselves with an unhealthy snack after they did a workout (Tiefenbeck et al, 2013). Another example of moral licensing is about hiring decisions. Monin & Miller (2001) conducted an experiment in the lab where subjects had to imagine they were a manager in a certain company and needed to hire someone for their team. There were different rounds and every round the subjects made the hypothetical hiring decisions for a different company. They found if people have to make two hiring decisions and in the first round they picked a woman, they were more likely to pick a male in the second round. They reasoned that this was due to that the subjects were no longer concerned about the possibility someone might accuse them of sex discrimination. They made the decision which fit best with their own needs. This shows that moral licensing even occurs when the two decisions had nothing to do with each other and people will base their moral choices on previous actions. People will find their way to act selfishly.

Combining the literature about social preferences, anchoring and moral licensing the behaviour of participants in this study was predicted. When player C has less than half of the endowment of player A, it can be expected that player A will give the same amount to player B as the payoff of player C. As mentioned before, people like to reduce the differences between subjects. Besides that, Player A -the dictator- will ‘use’ the endowment of player C to establish moral licensing. It can be expected that the dictator sees the endowment of player C as a right to give less than half of his/her own endowment to player B, the receiver. In that way the dictator can act selfishly without feeling like (s)he is acting in a selfish way. For that reason, the first hypothesis is:

H1: In treatment 1 and treatment 2, player A will give the same payoff to player B as the endowment of player C.

If player C has an endowment which is more than half of the endowment of player A, moral licensing does not occur. The dictator will not act selfishly if (s)he gave the same amount to player B as the endowment of player C. This is because the dictator's payoff will be less than the endowments of player B and C. The anchoring effect could play a bigger role in this situation. A study from Strack & Mussweiler (1997) tells that when the anchoring is higher, the anchoring effect is larger. Later they found that the difference between a low or high anchor only holds if the anchor is relevant to the answer subjects need to give (Mussweiler & Strack, 2001). In this study it can be expected that the anchor will be the endowment of player C. This anchor is in that way relevant to the task of the subject. It can be expected that the dictator will pass an amount between half of his/her own endowment and the payoff of player C, to the receiver. This is because it is expected that the dictator feels obligated to give a higher amount to the receiver, due to the anchoring effect. For that reason, the second hypothesis will be:

H2: In treatment 3 and treatment 4, player A will give an amount between half of his own endowment and the endowment of player C.

The last hypothesis is based on the social preference models 'Difference aversion model' and 'Social welfare model'. If the willingness of a respondent to make sure every member of a group gets an equal amount of endowment is high, this respondent uses the Difference aversion model. If the willingness of a respondent to give to others, even though it may cost them something is high, (s)he uses the Social welfare model. In that way, the respondent wants to give to others who have less endowment. If people prefer to act in a kind way and are willing to give to other people or to make sure that everybody as an equal amount of money, it is likely that they would give more to the receiver, player B, in a dictator game. Therefore, the third hypothesis will be:

H3: When the willingness to give to other people or the willingness to make sure that every person has an equal amount increases, the payoff of player B will also increase.

3. Methodology

The aim of this study is to determine to what extent the context in a dictator game has an effect on the decisions a dictator makes during the game. The context which is different in this dictator game compared to a standard dictator game is an irrelevant third player. The collected data is completely anonymous and of no physical or mental harm to respondents.

3.1 Experimental design

This experiment is done through an online survey in Qualtrics. Through the online survey respondents play a dictator game with three players. This includes the dictator, the receiver and a third irrelevant player. The endowment of this third player, player C, differs between the four treatments. In treatment 1 player C receives no money, in treatment 2 (s)he receives 25 euros, in treatment 3 (s)he receives 75 euro and in treatment 4 player C receives 125 euros. These endowments have been chosen, because in this way there are two payoffs below half of the starting endowment of player A and two payoffs above half of the starting endowment of player A. Besides that, it can be interesting to see if the payoffs of 0 euro and 125 euros have a different influence on the behaviour of the dictator than the payoffs of 25 and 75 euros. It can be the case that the payoffs 0 and 125 euro are less relevant for the dictator. This can be due to that with these payoffs it is harder to make sure every player gets an equal amount. The endowment of player C has no influence on the payoff of the dictator and the receiver. In every treatment the dictator, player A, divides an amount of 100 euros between himself and player B, the receiver. The respondents are equally divided between the four treatments through Qualtrics and participation took 3 to 5 minutes of their time.

In this experiment all respondents are a dictator. This means that the receiver, player B and player C are hypothetical players. Besides that, the game is hypothetical, so dictators will not be paid due to cost constraints. The disadvantage of a hypothetical game is that, it could be the case that subjects make decisions differently compared to the decisions they would have made in the real world. It is easier for dictators to pass more money towards the receiver, because they do not feel the actual loss they would have if they would have been paid. However, the advantages of a hypothetical game are the following. First of all, it costs less money to not pay every player in this dictator game. Besides that, a hypothetical game costs less time for the subjects. If the game would not be hypothetical, subjects would need to come

together, in for example a computer room, to put them in groups of three to play the dictator game. Lastly, for this study only information about the dictator is needed. It would not be necessary to gain information about player B and player C.

The experiment is a between-subjects design. In that way, every respondent answers the questions for one of the four treatments. Although a within-subjects designs controls for an individual fixed effect, a learning effect could occur (Nielsen Norman Group, 2018). When every subject receives all four of the treatments, it is likely that the subject will give the same answer in every treatment, because they want to be consistent. For these reasons this experiment is a between-subjects design.

Besides the dictator game, the online survey also consists of three questions about the willingness of people to give to other people in three situations. These questions will be used to see if there are interesting correlations between the willingness and the amount dictators keep for themselves. The questions are about the willingness to give without expecting anything in return, willingness to give to others although there may be costs for the respondent and the willingness to make sure every member of a group has an equal endowment although there may be costs for the respondent. The questions are based on a study of Falk et al. (2016). Respondents state their willingness based on a scale from 0 till 10. Lastly, some demographic questions are included. The complete survey can be found in the appendix.

The following variables emerge from this experiment. First, the variable *Payoff player A*. The payoff of player A is the amount of money the subject chooses to keep for him/herself. The variable is a continues variable between 0 and 100 euros. The second variable is *Payoff player B.* The payoff of player B is the amount of money the subject chooses to give to the receiver, player B. The variable is also continues variable between 0 and 100 euros. Next to that, the variable *Payoff player C.* The payoff of player C is fixed in a certain treatment. In treatment 1, the payoff is 0 euro, in treatment 2 the payoff is 25 euros, in treatment 3 the payoff is 75 euros and in treatment 4 the payoff is 100 euros. At last the variable *Treatment* is created. The variable treatments shows which treatment the subject undertook. This can be treatment 1, 2, 3 or 4. Therefore, this variable is a categorical variable.

The survey questions about the willingness subjects have for giving to other people give the following variables. First, the variable *Willingness to give without return.* This variable shows the willingness of the subject to give to someone else without getting something in return. It is a continues variable between 0 and 10. 0 represents the person is completely unwilling to act in that way. 10 means that the person is completely willing to act in that way. The scores have one decimal place, for example a score of 6.4. Second, the variable *Willingness to give with costs*. This variable shows the willingness of the subject to give to someone, although there may be costs for themselves. It is a continues variable between 0 and 10. 0 represents the person being completely unwilling to act in that way. 10 means that the person is completely willing to act in that way. The scores have again one decimal place. The last variable about willingness is the variable *Willingness to make sure equal*. This variable shows the willingness of the subject to make sure every member of a group has an equal endowment although there may be costs for themselves. It is a continues variable between 0 and 10. 0 represents the person being completely unwilling to act in that way. 10 means that the person is completely willing to act in that way. The scores have again one decimal place.

At last, five demographic variables are collected. The first variable is *Age*. This variable is a continues variable and represents the age of a participant. Second, the variable *Gender. This variable* represents the gender of a participant and is a categorical variable. The variable can take the values male, female and other/prefer not to say. Next to that, the variable *Education* is collected. The variable represents the highest attained level of education of the participant. The variable is categorical and can take the following values: No schooling degree, Primary school, High school, MBO, HBO, Bachelor's degree, Master's degree and Doctorate degree. The fourth demographic variable is *Income*. The variable income represents the monthly disposable income of a respondent. The variable is a categorical variable and can take the following values: Less than 1000 euro, Between 1001 and 2000 euro, Between 2001 and 3500 euro, Between 3501 and 5000 euro, more than 5000 euro or the respondents could choose I don't know/I prefer not to say. The last demographic variable is *Living situation*. This variable represents the living situation of a participant. This is a categorical variable which can take the following values: I live alone, I live alone with a child or children, I live together with my partner, I live together with my partner and child or children, I live together with one or multiple housemates, I live with my parents or Other.

3.2 Descriptive statistics

In table 1 below, the descriptive statistics of the interesting variables can be found.

Table 1. The descriptive statistics of variables of interest.

Variable	*Obs.*	*Mean*	*Std. Dev.*	*Minimum*	*Maximum*
Overall payoff A	159	€62.38	18.94	5	100
Overall payoff B	159	€37.62	18.94	0	95
Treatment 1 payoff A	38	€64.45	22.43	5	100
Treatment 2 payoff A	43	€62.44	18.91	30	100
Treatment 3 payoff A	42	€59.64	17.01	25	100
Treatment 4 payoff A	36	€63.33	17.44	50	100
Willingness to give without return	159	6.73	2.19	0	10
Willingness to give with costs	159	5.60	2.29	0	10
Willingness to make sure equal	159	5.89	2.33	0	10

These results show that the overall payoff of B is higher than in a standard two-person dictator game, namely around 35 percent of the dictators endowment compared to around 20 percent of the dictators endowment in a two-person dictator game. This indicates overall, that when adding a third irrelevant player to the standard two-person dictator game, people do change their behaviour. Nonetheless, there could be other factors which play a role in this changing behaviour. For instance the fact that this dictator game is hypothetical.

When looking at the differences between the four treatments, we see that in the first three treatments the average payoff of A decreases when the amount of money player C has increases. This means that player A gives more money to the receiver, when the amount of money of player C is higher. However, in the fourth treatment, when player C has the highest amount of money, the payoff of A increases again towards an average of €63.33. This can be due to the fact that in treatment 4 player C has a higher amount of money than the start endowment of player A. In that way, player A cannot strive for an equal amount between the players.

Besides that, around 60 percent of the dictator pass a positive amount to the receiver in a standard two-person dictator game. However, in this dictator game 141 subjects passed a positive amount toward the receiver, which is 88.68 percent.

When looking at the descriptive statistics of the variables willingness to give without return, willingness to give with costs and willingness to make sure equal, it can be seen that the answers respondents give on average are between the 5.5 and 7 for the three variables. The variable willingness to give without return has the highest score compared to the other two variables. This can be due to the fact that the other two variables include the fact that there may be costs for the respondents.

3.3 Sample

The total amount of respondents is 159 subjects. Qualtrics equally spread the different treatments among the respondents. For treatment 1 there are 38 subjects, for treatment 2 there are 43 subjects, for treatment 3 42 subjects and for treatment 4 there are 37 subjects.

To see what power a sample size of 159 subjects has, some power calculation was performed. First a power calculation for a multiple linear regression is done with an alpha of 0.05 and a R-squared of 0.1104. The corresponding power is 0.9930. This means that there is a change of 0.0070 that the null hypothesis will not be rejected although it is not true. The power calculation for a one-sample means test with an alpha of 0.05 give the corresponding power of 1.00. This means that there is no chance that the null hypothesis will not be rejected although it is not true.

The online survey is spread through different social media platforms such as Facebook, LinkedIn and WhatsApp. There were no restrictions for answering the survey. The survey is spread amongst different age categories, genders and educations levels. The sample consists of 85 women and 74 men. The average age is 30.7 years old with a standard deviation of 13.15. The age range is between 17 years and 74 years old. However, most respondents are between the age of 20 and 25 years old. Most of the respondents have a Bachelor degree as education level, namely 39.62 percent. If we look at the monthly income of the respondents, most respondents have an income of less than 1000 euros per month, namely 37.74 percent. Most of the respondents live with their parents, namely 33.33 percent, followed by 21.38 percent

who live with one or multiple housemates. The remaining percentages can be found in table 2, 3 and 4 in the appendix. The demographic characteristics are about equal spread amongst the four treatments. For the variable age the average age in treatment 1 is 30.7 years old, 31.2 years old in treatment 2, 31.1 years old in treatment 3 and 30.8 years old in treatment 4. The other results of the demographic variables per treatment can be found in table 5, 6, 7 and 8 in the appendix.

Furthermore, the demographic variables show that the average payoff of B slightly differ among gender. On average, males give 38.42 euro and females 36.92 euros. The variable *Income* shows that the average payoff of B goes up when the income level is higher. However, the category 3501 euro till 5000 euro per month shows on average a lower payoff of B compared to the category 2001 euro till 3500 euro, namely 40.77 euro compared to 43.17 euro. The category more than 5000 euro shows again a higher payoff of B, namely 45.77 euro. The variable *Education* shows that the average payoff of B is higher when the level of education is higher. Nonetheless, the category Bachelor's degree has a lower average payoff of player B. This could be caused by the fact that it is likely that a lot of respondents with a Bachelor's degree are currently still a bachelor student. This is due to a lot of students within the network of the experimenter. The variable *Living situation* shows that the average payoff of B in the categories Living together with my partner and Living together with my partner and child(ren) are similar. However, the categories living together with one or multiple housemates and living with my parents show a lower average payoff of player B. This can be due to the fact that it is likely that a lot of respondents in this categories are students and therefore have less money to spend. The category I live alone shows also a lower average payoff of player B. The variable *Age* shows that the median of this sample is 23 years old. Therefore, the average payoff of player B is estimated above and under the age of 23 years old. If respondents are under the age of 23 years old, on average the payoff of player B is 32.11 euro. The average payoff of player B when respondents are 23 years or older is 41.28 euro. This can be due to that respondents have more to spend when they are older.

3.3 Method of analysis

To test whether the third irrelevant player, player C, has an influence on the decision subjects make (H1, H2), first the non-parametric Kruskal-Wallis test is done to see if the average

endowments of player B in the four treatments differ. This test ranks the scores of the dependent variable from low to high. Within a group, the independent variable, the rank numbers are added together and estimated if these group differ from each other. The dependent variable in this test is *Payoff B* and the independent variable is *Treatment*. The assumptions that need to be met for a non-parametric test are the following. First, the observations need to be independent. Second, it is important that the data is drawn from an underlying continuous distribution (Stoop, 2020)[1]

Second, a one-sample t-test is done for the first three treatments to see if the average payoff of player B in that treatment is equal to the payoff of player C in that treatment. For the first treatment, the payoff of player B is compared to 0 euro. In the second treatment, the payoff of player B is compared to 25 euros. Last, in the third treatment, the payoff of player B is compared to 75 euros. In treatment four the payoff of player C is 125 euros. Due to the fact that the starting endowment of player A is 100 euros, the payoff of player B cannot be equal to the payoff of player C. The dependent variable for this test is the variable *Payoff player B* in the specific treatment. There are some assumptions that need to be hold. The first assumption tells that the data need to be independent (Laerd Statistics, 2018). This assumption holds, there is no relationships between the observations. The second assumption is that there should be no significant outliers. The last assumption that needs to hold, is that the dependent variable should be normally distributed (Laerd Statistics, 2018). Again, both of these assumptions hold.

Next, a multiple linear regression will be performed to see what influence the treatment has on the payoff of player B. The dependent variable in this regression is *Payoff player B*. The independent variable is the variable *Treatment*. Besides that, the control variables *Gender, Age, Education, Income* and *Living situation* will be added. This give the following regression:

$$Payoff\ player\ B = \beta_0 + \beta_1 * Treatment\ 1 + \beta_2 * Treatment\ 2 + \beta_3 * Treatment\ 3 + \beta_4 * Treatment\ 4 + \beta_5 * Gender + \beta_6 * Age + \beta_7 * Education + \beta_8 * Income + \beta_9 * Living\ situation$$

[1] Source from Canvas EUR (not publicly accessible).

The assumptions which need to be made for a multiple linear regression are the following. First there need to be a linear relationship between the independent and dependent variables (Statistics Solutions, 2020). To see if there is a linear relationship between the payoff of player B and treatment, a scatter plot is made. This scatterplot can be found in the appendix in figure 1. Second, the data need to be randomly collected and the observations needs to be independent. That is the case in the sample of this study. Third, there need to be no multicollinearity (Statistics Solutions, 2020). It is not likely that the independent variables are highly correlated with each other. To test this assumption, the variance inflation factor is calculated. The lower the variance inflation factor, the lower the multicollinearity. The outcomes of these test suggest there is no multicollinearity. The results can be found in table 9 in the appendix. At last, it is important that the homoscedasticity assumption is met (Statistics Solutions, 2020). To check for this assumption, we plot the residuals against the predicted values. The results can be found in figure 2 in the appendix.

To test whether the dictator uses the anchor effect to determine his own payoff instead of the payoff of player B, again a one sample t-test will be estimated. The dependent variable in this test is the variable *Payoff player A*. For treatment 1 this dependent variable will be compared with 0 euro, for treatment 2 with 25 euros and for treatment 3 with 75 euros. Treatment 4 will be compared to 100 euros. Although player C receives 125 euros in treatment 4, it is not possible for player A to keep 125 euros for themselves. This is due the fact that player A receives 100 euros to divide between him/herself and player B. The same assumptions need to be made as with the previous one sample t-test. Therefore, the assumptions that need to be made again hold.

To test hypothesis three and to find out if the willingness to give without return, the willingness to give with costs and the willingness to make sure equal have a relationship with the payoff of player A three multiple linear regression will be estimated. The dependent variable in these three regressions is the variable *Payoff player A*, thus the amount of money the dictator keeps for him/herself. The independent variable changes in the three regressions. In the first regression the independent variable is *Willingness to give without return*, in the second regression the independent variable is *Willingness to give with costs* and in the last regression the independent variable is *Willingness to make sure equal*. Besides that, the

variables *Age*, *Gender*, *Education*, *Income* and *Living situation* will be added as control variables.

This give the following regressions:

$$Payoff\ A = \beta_0 + \beta_1 * Willingness\ to\ give\ without\ return + \beta_2 * Age + \beta_3 * Female + \beta_4 * Education + \beta_4 * Income + \beta_5 * Living\ situation$$

$$Payoff\ A = \beta_0 + \beta_1 * \text{Willingness to give with costs} + \beta_2 * Age + \beta_3 * Female + \beta_4 * Education + \beta_4 * Income + \beta_5 * Living\ situation$$

$$Payoff\ A = \beta_0 + \beta_1 * \text{Willingness to make sure equal} + \beta_2 * Age + \beta_3 * Female + \beta_4 * Education + \beta_4 * Income + \beta_5 * Living\ situation$$

There are different reasons why is chosen for three separated linear regressions. First of all, there is high correlation between the three variable *Willingness to give without return, Willingness to give with costs* and *Willingness to make sure equal.* Namely, a correlation of 0.5563 between *Willingness to give without return* and *Willingness to give with costs*. A correlation of 0.5996 between *Willingness to give with costs* and *Willingness to make sure equal.* At last, a correlation of 0.6243 between the variables *Willingness to give without return* and *Willingness to make sure equal.* This high correlation can lead to a high variance inflation factor, so to a high multicollinearity. Second, the different variables show a different social preference model. The variable *Willingness to make sure equal* shows the Difference aversion model. The variable *Willingness to give with costs* shows the Social welfare model, this is because this level willingness shows to what extent the respondents wants to give to others to help although there may be costs for them. The variable *Willingness to give without return* shows a less strong form of altruïsm. This willingness score shows to what extent a respondent wants to help, but there are no costs for them.

The assumptions that need to be hold are the same as with the previous multiple linear regression. Therefore, the same calculations have to be done. First there need to be a linear relationship between the independent and dependent variables (Statistics Solutions, 2020). It is likely for all three the linear regressions that there is a linear relationship. The depended variables about willingness have probably a negative effect on the amount of money the

dictator keep for him/herself. The scatterplots made in Stata can be found in figure 3, 4 and 5 in the appendix.

Second, the data need to be randomly collected and the observations needs to be independent. That is the case in the sample of this study. Third, there need to be no multicollinearity (Statistics Solutions, 2020). It is not likely that the independent variables are highly correlated with each other. To test this assumption, the variance inflation factor is calculated. The lower the variance inflation factor, the lower the multicollinearity. The results can be found in table 10, 11 and 12 in the appendix. At last, it is important that the homoscedasticity assumption is met (Statistics Solutions, 2020). This assumption is checked earlier, the results can be found in figure 2 in the appendix.

4. Results

4.1 Results hypothesis 1 and hypothesis 2

To test whether the third irrelevant player C changes the decisions in a way that the dictator, player A, uses moral licensing, anchoring or a social preference model (H1, H2), first a Krukskall-Wallis test is performed. The dependent variable is *Payoff player B* and the independent variable is *Treatment*. There are some ties in the payoffs of player B, therefore we look at the probability of the 'chi-squared with ties'. The probability is 0.5326, which is larger than 0.05. Therefore, we reject the null hypothesis at a 5 percent significance level. This means that there are no differences between the four treatments. According to this test, the different payoffs of player C have no influence on the decisions the dictators made. If this would be the case, there would have been a difference between the four treatments. The other results of the Kruskall-Wallis test can be found in table 13 in the appendix.

4.1.1 One sample t-test

Next to that, a one sample t-test is performed for the first three treatments. For the first treatment, the variable *Payoff players B* in treatment 1 is set equal to 0.0. This is the endowment of player C. The test gave a probability of 0.000, which is smaller than 0.05. Therefore, we reject the null hypothesis at a 5 percent significance level. The average payoff of player B in treatment 1 is not equal to the payoff of player C.

For the second treatment, the variable *Payoff players B* in treatment 2 is set equal to 25.0, the endowment of player C. This gave a probability of 0.0001, which is smaller than 0.05. Therefore, we reject the null hypothesis at a 5 percent significance level. The average payoff of player B in treatment 2 is not equal to the payoff of player C. For the third treatment, the variable *Payoff players B* in treatment 3 is set equal to 75.0, which is the endowment of player C. This gave a probability of 0.000, which is again smaller than 0.05. Therefore, we reject the null hypothesis at a 5 percent significance level, so the average payoff of player B in treatment 3 is not equal to the payoff of player C.

4.1.2 Multiple linear regression

To test whether being in a different treatment has an effect on the payoff of player B, a multiple linear regression is estimated with the dependent variable *Payoff player B* and the independent variable is the categorical variable *Treatment*. The model has a R-Squared of 0.0931. This means that approximately 9 percent of the observed variation can be explained by the models input. The model is statistically significant, $F(8,150) = 3.01$, $p = 0.0037$. Overall, the model can significantly predict the dependent variable. The results can be seen in table 14 below.

Table 14: The outcomes of the multiple linear regression with the variable Treatment as dependent variable.

Variable	*Coefficient*	*Std. Err.*	*t*	*P > |t|*	*95% Conf. Interval*
Treatment:					
2	2.572	4.38	0.59	0.56	[-6.091; 11.235]
3	3.891	4.40	0.88	0.38	[-4.800; 12.582]
4	-0.299	4.52	-0.07	0.95	[-9.229; 8.631]
Age	0.356*	0.16	2.26	0.03	[0.045; 0.667]
Gender	1.961	3.09	0.64	0.53	[-4.137; 8.057]
Education	0.390	1.35	0.29	0.77	[-2.268; 3.049]
Income	0.707	1.60	0.44	0.66	[-2.461; 3.874]
Living Situation	-0.122	1.42	-0.09	0.93	[-2.919; 2.674]
Constant	21.399*	11.09	1.93	0.05	[-0.522; 43.319]

*p < 0.05, **p<0.01.

The results show a positive coefficient for treatment 2 and treatment 3. This indicates that when a subject got treatment 2 or 3, this dictator passed more money towards the receiver. However, the coefficients of the different categories of treatment are not significant. Therefore, nothing can be said about the effect of treatment on the payoff of player B. The same applies to treatment 4, which has a negative coefficient. This is in line with the previous results, the difference of the four treatments has no influence on the average payoff of player B.

The variable *Age* has a positive coefficient. If the age of the subjects goes up by 1 year, the payoff of player B goes up by 0.356 euros, ceteris paribus. This indicates that on average, when people get older, they pass a higher amount towards player B. The variable is significant at a 5 percent significance level. The other variables are not significant, therefore there are no other effects.

4.1.3 Second one sample t-test

The last test done to find out if hypothesis 1 and hypothesis 2 are true is again a one sample t-test. With this test is estimated, if dictators use the endowment of player C to determine his/her own payoff. For the first treatment, the variable *Payoff player A* in treatment 1 is set equal to 0.0. This is the endowment of player C. The test gave a probability of 0.000, which is smaller than 0.05. Therefore, we reject the null hypothesis at a 5 percent significance level. The average payoff of player A in treatment 1 is not equal to the payoff of player C.

For the second treatment, the variable *Payoff player A* in treatment 2 is set equal to 25.0, the endowment of player C. This gave a probability of 0.000, which is smaller than 0.05. Therefore, we reject the null hypothesis at a 5 percent significance level. The average payoff of player A in treatment 2 is not equal to the payoff of player C.

For the third treatment, the variable *Payoff players A* in treatment 3 is set equal to 75.0, which is the endowment of player C. This gave a probability of 0.000, which is again smaller than 0.05. Therefore, we reject the null hypothesis at a 5 percent significance level, so the average payoff of player A in treatment 3 is not equal to the payoff of player C.

For the fourth treatment, the variable *Payoff players A* in treatment 4 is set equal to 100.0. This is not the endowment of player C, but the maximum endowment player A can keep for

him/herself. This gave a probability of 0.000, which is smaller than 0.05. Therefore, we reject the null hypothesis at a 5 percent significance level, so the average payoff of player A in treatment 4 is not equal to 100 euros.

These results suggest the dictators do not use the anchoring effect. However, if the payoff of player A or the payoff of player B are about equal to the payoff of player C, they can still use the anchoring effect. The descriptive statistics show a higher payoff of player B when the payoff of player C is higher. This is not the case in treatment 4, where player C has an endowment of 125 euros. In this treatment the payoff of player B decreases again. Although, the average payoff of player B increased when the payoff of player C increased, the payoffs of both player A and player B are not near to the payoff of player C.

4.2 Results hypothesis 3

To test whether the willingness of subjects to give to others or to make sure that every person has an equal amount has an influence on the payoff of player A (H3), three multiple linear regressions are estimated with the dependent variable *Payoff Player A.* The first multiple linear regression includes the independent variable *Willingness to give without return*. The model has a R-Squared of 0.1104. This means that approximately 11 percent of the observed variation can be explained by the models input. This model is statistically significant, $F(6, 152) = 3.72$, $p = 0.0037$. This means that the model can significantly predict the dependent variable.

The variable *Willingness to give without return* has a negative coefficient of 1.415. When the willingness to give without return goes up by 1 point, the payoff of player A decreases with 1.415 euros, ceteris paribus. The variable is significant at a 5 percent significance level. This effect means that when a subject is more willing to give to other people without getting something in return, this subject passes more to the receiver, player B. The other results can be found in table 15 below, however the other variables are not significant. Thus, there are no other effects.

Table 15. The results of the linear regression of the relation between Willingness to give without return and Payoff player A.

Variable	*Coefficient*	*Std. Err.*	*t*	*P > |t|*	*95% Conf. Interval*
Willingness to give without return	-1.415*	0.723	-1.96	0.049	[-2.844; 0.014]
Age	-0.304	0.169	-1.79	0.08	[-0.638; 0.031]
Gender	-0.813	3.072	-0.26	0.79	[-6.881; 5.256]
Education	-0.178	1.277	-0.14	0.89	[-2.702; 2.345]
Income	-0.836	1.674	-0.50	0.62	[-4.144; 2.472]
Living situation	0.206	1.390	0.15	0.88	[-2.541; 2.953]
Constant	83.481**	11.800	7.07	0.00	[60.167; 106.796]

*p < 0.05, **p<0.01.

The second multiple linear variable has the variable *Willingness to give with costs* as independent variable. The model has a R-Squared of 0.1654. This means that approximately 16 percent of the observed variation can be explained by the models input. This model is significant, $F(6, 152) = 5.19$, $p = 0.0001$. This means that the model can significantly predict the dependent variable. The variable *Willingness to give with costs* has a negative coefficient of 2.472. When the willingness to give with costs goes up by 1 point the payoff of player A decreases with 2.472 euros, ceteris paribus. This effect is significant at a 1 percent significance level. This effect means that when the willingness to give with costs goes up, the dictators passes a higher amount to the receiver.

The variable *Age* has a negative coefficient of 0.344. When the age of a subject goes up by 1 year, the payoff of player A decreases with 0.344 euros, ceteris paribus. This effect is significant at a 5 percent significance level. This effect means that when a subject is older, (s)he passes a higher amount towards the receiver. The variable *Age* is only significant in this model and not in the other two models about willingness. The variables *Age* and *Income* are correlated with each other, namely a correlation of 0.6915. Due to the fact that the variable *Willingness to give with costs* includes that the respondent has to sacrifice money, it could be that people want to give more money when they have a higher income. A higher income is

correlated with a higher age, therefore it could be that a higher age significantly has a negative effect on the amount of money the dictator keeps for him/herself.

The remaining variables are not significant, thus do not show an effect, these results can be found in table 16 below.

Table 16. The results of the linear regression of the relation between Willingness to give with costs for you and Payoff player A.

Variable	*Coefficient*	*Std. Err.*	*t*	*P > |t|*	*95% Conf. Interval*
Willingness to give with costs	-2.472**	0.709	-3.49	0.001	[-3.874; -1.071]
Age	-0.344*	0.160	-2.15	0.03	[-0.661; -0.027]
Gender	-1.894	3.046	-0.62	0.54	[-7.912; 4.123]
Education	-0.928	1.243	-0.75	0.46	[-3.383; 1.527]
Income	-0.629	1.655	-0.38	0.70	[-3.898; 2.640]
Living situation	-0.312	1.331	-0.23	0.82	[-2.942; 2.318]
Constant	94.069**	11.540	8.15	0.00	[71.270; 116.868]

*p < 0.05, **p<0.01.

At last, the multiple linear regression with the variable *Willingness to make sure equal* as independent variable. The model has a R-Squared of 0.2687. This means that approximately 26 percent of the observed variation can be explained by the models input. The model is statistically significant, $F(6, 152) = 11.79$, $p = 0.000$. This means that the model can significantly predict the dependent variable.

The variable *Willingness to make sure equal* has a negative coefficient of 3.583. When the willingness of the subject to make sure every person has an equal amount goes up by 1 point, the payoff of player A decreases with 3.583 euros, ceteris paribus. This effect is significant at a 1 percent significant level. This effect shows that when someone is more willing to make sure every person has an equal amount, the dictator passes a higher amount towards the receiver. The other results can be found in table 17 below, however the results of the remaining variables are not significant.

Table 17. The results of the linear regression of the relation between Willingness to make sure equal and Payoff player A.

Variable	*Coefficient*	*Std. Err.*	*t*	*P > |t|*	*95% Conf. Interval*
Willingness to make sure equal	-3.583**	0.566	-6.33	0.001	[-4.702; -2.465]
Age	-0.251	0.162	-1.55	0.124	[-0.571; 0.069]
Gender	-1.507	2.682	-0.56	0.58	[-6.805; 3.791]
Education	-1.506	1.272	-1.18	0.24	[-4.019; 1.007]
Income	-0.736	1.565	-0.47	0.64	[-3.829; 2.357]
Living situation	0.165	1.258	0.13	0.90	[-2.321; 2.650]
Constant	98.408**	10.309	9.55	0.00	[78.041; 118.775]

*p < 0.05, **p<0.01.

5. Discussion

In this study, the effect of a third irrelevant player on the decisions of the dictator, is tested in a dictator game with three players. In that way, it can be determined whether changing the context of the game changes the behaviour of players. In this discussion the results will be linked to the literature described earlier. Besides that, some limitations and some suggestions for further research will be discussed.

5.1 Results

The first results showed that the dictators give more endowment to the receiver in this dictator game, compared to a standard two-person dictator game. This changing behaviour supports the previous literature. Different dictator games with a third players gave a different outcome. Besides that, it showed that people have social preferences. Almost 90 percent of the respondents choose to give a positive amount towards player B, the receiver. If these respondents do not have social preferences, they would act completely selfishly. The use of a social preference model is common in dictator games. However, the amount of positive endowments and the passed endowments itself are higher in the dictator game of this study,

indicating that a changing context of the game changes the behaviour of players. This changing behaviour applies to this study, but the question remains if this also applies to other studies due to the used data. It could be the case that there are experimenter demands effects in this study. This means that the respondents in this experiment passed a higher amount of money towards the receiver, because they thought that was the desirable answer. In combination with the fact that the game is hypothetical, it is 'easier' for respondents to pass a higher amount. The respondents do not feel the loss of money if they pass the higher amount towards the receiver. Therefore, further research is needed to find out if the changing behaviour is a uniform effect. What kind of further research is needed will be explained later.

The results from the Kruskall Wallis-test showed that there is no difference between the four treatments. This indicates that the anchor effect discussed in the literature review does not apply to this dictator game. If the anchor effect did apply, the averages of the payoff of B in the different treatments should be different. This is confirmed by the one sample t-test, this test showed that the average payoff of B per treatment is not equal to the payoff of player C from treatment 1, 2 and 3. If the anchor effect did apply, the averages of player B's endowment should be equal to the payoff of player C for that treatment. With the multiple linear regression is again tested if the different treatments have an influence on the payoff of player B. Although the coefficients of treatment 2 and 3 are positive and the coefficients of treatment 4 is negative, the effects are not significant. Therefore, there is no effect of treatment on the payoff of player B.

From the previous tests, it can be seen that the anchor effect is not used to determine the payoff of player B. If moral licensing occurred in treatment 1 and treatment 2, the payoff of player B should also be similar to the payoff of player C. This is due to the fact that player A, the dictator, uses the small payoff of player A as an excuse to give a small payoff to player B as well. The payoff of player B and player C are not equal. Besides that, the payoff of player B is on average higher than the payoff of player C in treatment 1 and treatment2. Therefore, player A does not use moral licensing to determine the amount of money (s)he passes towards player B.

However, it could be that player A uses the anchor effect to determine his/her own payoff. Therefore, a one sample t-test is done to see if the payoff of player A is equal to the endowment of player C. The results showed that again for every treatment the average payoff

of player A is not equal to the payoff of player C. The average payoff of player A in treatment 4 is not equal to 100 euros, the maximum amount player A can keep for him/herself. Therefore, player A does not use the endowment of player C as an anchor to determine his/her own payoff.

Nonetheless, the dictators in this study could still have used the anchoring effect even if the previous results suggest they did not. If the payoff of player A or the payoff of player B is near the payoff of player C, the anchoring effect can still be used. The average payoff of player B increased when the payoff of player C increased. This is not the case in treatment 4, where player C has an endowment of 125 euros. In this treatment the payoff of player B decreases again. It can be the case that this is due to that the dictator sees the payoff of player C in treatment 4 as irrelevant because the payoff is higher than the payoff (s)he has to divide. Therefore, the dictator cannot give the same amount towards the receiver. Although, the average payoff of player A and player B changes slightly between the four treatments, the average payoffs are not near to the payoff of player C. This indicates again that the anchoring effect is not used to determine the amount of money dictators pass toward the receivers.

The previous results suggest that both hypothesis 1 and hypothesis 2 are not true. The dictators do not use the anchoring effect or moral licensing. Therefore, the endowment of player B is not equal to the endowment of player C in treatment 1 and treatment 2. In treatment 3 and treatment 4 the endowment of player B is not between half of the endowment of player A and the endowment of player C. This is not in line with the discussed literature. This can be due to some limitations which will be discussed later.

The results of the last three multiple linear regression showed that all three variables about the willingness of respondents have a negative coefficient. Therefore, these variables have a negative influence on the payoff of player A. If on average, the willingness of a respondent goes up, the average endowment passed towards player B goes up as well. This is in line with the previous expectations. The three variables are highly correlated with each other. Nonetheless, the variable *Willingness to make sure equal* has the highest influence on the payoff of player A. This can be due to the fact, that this variable includes that there can be costs for the respondent, if (s)he tries to make sure every player gets an equal amount of

money. If the respondent is willing to make a sacrifice for other players, it can be that it is easier for this respondent to give more to player B in the dictator game as well. The variable *Willingness to give without return* does not include the fact that it can lead to costs for the respondents and has the lowest influence on the payoff of player A. Therefore, it can be the case that respondents easily choose to give to others. However, if the respondents need to choose how much they want to pass to the receiver, it will cost money for this respondent. When it costs money to give money to others, it is more likely that respondents think it is less attractive to give to others.

The variable *Willingness to make sure equal* represents the Difference aversion model. The variable *Willingness to give with costs* the Social welfare model. This indicates that the use of the Difference aversion model has a higher influence on the amount of money a dictator wants to pass compared to the use of the Social welfare model. However, the difference between the coefficients is small, namely -3.583 and -2.472. These coefficients are both significant at a 5 percent significance level.

5.2 Limitations and suggestions for further research

There are some limitations of this study. First of all, the sample size of this study is 159. Although the power of the sample size is sufficient, to see an even better effect of the third irrelevant player on the decision the dictator made, the sample size should be bigger. Therefore, the first suggestion for future research is to extant the sample size.

Next to that, this study is hypothetical. The respondents of this experiment are all dictators, so there are no subjects who are receivers and no subjects who are player C. These players are hypothetical. Therefore, it could occur that respondents choose to act differently in this dictator game, compared to when they would face this situation in real life. Furthermore, the dictators of this game do not get the payoff they choose. When respondents have to make a decision about a payoff which they actually going to get, they could act differently than when the payoff is hypothetical. However, due to time and cost constraints a hypothetical experiment is chosen. As described earlier, this could be the reason why the dictators in this dictator game give a higher amount of money to the receiver. A suggestion for further research is to make an experiment which contains all three players and to make sure that every respondent knows all players are attending. Next to that, a suggestion for further

research is to pay every player the payoff they collected at the end of the game or to pay a part of the players based on a random lottery. In that way, respondents will act more like they would act in the real world.

The recommendation for further research is thus to conduct an experiment in the lab. In the lab all three players of the dictator game are physically present. The three players play the dictator game like in this experiment. Again, four different treatments should be made with a between-subject design. However, the payoffs gained by the players need to be paid towards all three players. In that way, the dictators feel the loss if they pass money towards the receiver and it is less likely that experimenter demands effects occur.

5.3 Relevance and policy implications

The relevance of the results in this experiment are debatable. There could be an influence of the third irrelevant player on the decisions of the dictator. However, as described earlier further research is needed to find out if this effect is due to the irrelevant third player or that there are other reasons that causes this effect. Next to that, it is found that there is no anchoring effect or moral licensing effect when the third player is irrelevant.

The policy implications are therefore, that an irrelevant context of a decision does not need to be taken into account. However, a recommendation is hard to give due to debatable relevance of the results.

6. Conclusion

This paper studied the effect of a third irrelevant player in a dictator game on the decisions dictators make. Therefore, the paper gives an answer to the following research question:

'To what extent does adding an irrelevant third player to the standard dictator game influence the decision a player makes?'

Based on previous literature three hypotheses are made. The first two hypotheses are the following:

H1: In treatment 1 and treatment 2, player A will give the same payoff to player B as the endowment of player C.

H2: In treatment 3 and treatment 4, player A will give an amount between half of his own endowment and the endowment of player C.

The results showed overall, that more dictators passed a positive amount and dictators passed a higher amount towards the receivers, compared to a standard two-person dictator game. This means respondents have social preferences, otherwise they would have acted completely selfishly. However, the results showed that dictators do not pass the same amount towards the receiver, as the endowment of player C. Next to that, the payoff of player B is not near the payoff of player C. Therefore, respondents do not act out of moral licensing or use the anchoring effect. Besides that, the treatment a respondent is part of, has no influence on the amount of money the respondent passed towards the receiver, player B. Therefore, it can be concluded that hypotheses 1 and hypotheses 2 are not true.

The third hypothesis based on previous literature is the following hypothesis:

H3: When the willingness to give to other people or the willingness to make sure that every person has an equal amount increases, the payoff of player B will also increase.

The results of the questions about the willingness of respondents showed that a higher willingness of respondents to give to others or to make sure that everyone gets an equal amount, leads to a higher passed amount towards the receiver. This applies to all three variables, *Willingness to give without return, Willingness to give with costs* and *Willingness to make sure equal.* Therefore, it can be concluded that hypothesis 3 is true. The variable *Willingness to make sure equal* has the highest influence on the payoff of player A.

Although the results show that there is no anchoring effect or moral licensing and hypotheses 1 and 2 are not true, the reason why dictators passed more towards the receiver in this dictator game, compared to a normal two-person dictator game, is not certain. In conclusion, the dictators of this experiment are willing to give to others and therefore pass on average a positive amount towards player B, the receiver. This amount is a higher amount compared to

the standard two-person dictator game. In this experiment, adding an irrelevant third player to the standard dictator game does influence the decision a player makes. However, further research is needed, as explained in the previous chapter *Discussion,* to see what causes this influence and if this influence is uniform.

If it is known what causes this influence companies, governments and other people could take into account the different decision someone could make due to an irrelevant context. However, due to the debatable relevance of the results it is hard to give a recommendation.

References

Angner, E. (2016). *A course in Behavioral Economics* (2nd edition). London, United Kingdom: Palgrave MacMillan.

Bahr, G., & Requate, T. (2014). Reciprocity and giving in a consecutive three-person dictator game with social interaction. *German Economic Review*, *15*(3), 374-392.

Bardsley, N. (2008). Dictator game giving: altruism or artefact?. *Experimental Economics*, *11*(2), 122-133.

Camerer, C. F. (2003). Behavioral game theory: Plausible formal models that predict accurately. *Behavioral and Brain Sciences*, *26*(2), 157-158.

Charness, G., & Rabin, M. (2002). Understanding social preferences with simple tests. *The Quarterly Journal of Economics*, *117*(3), 817-869.

Dufwenberg, M., Gächter, S., & Henning-Schmidt, H. (2006). *The framing of games and the psychology of strategic choice* (No. 19/2006). Bonn Econ Discussion Papers.

Englich, B., Mussweiler, T., & Strack, F. (2006). Playing dice with criminal sentences: The influence of irrelevant anchors on experts' judicial decision making. *Personality and Social Psychology Bulletin*, *32*(2), 188-200.

Falk, A., Becker, A., Dohmen, T. J., Huffman, D., & Sunde, U. (2016). The preference survey module: A validated instrument for measuring risk, time, and social preferences.

Fehr, E. & Fischbacher, U. (2002). Why social preferences matter–the impact of non-selfish motives on competition, cooperation and incentives. *The economic journal*, *112*(478), C1-C33.

Fehr, E., & Fischbacher, U. (2004). Third-party punishment and social norms. *Evolution and human behavior*, *25*(2), 63-87.

Fehr, E., & Schmidt, K. M. (1999). A theory of fairness, competition, and cooperation. *The quarterly journal of economics*, *114*(3), 817-868.

Flache, A. & Dijkstra, D. (2015). Rationality in Society. *International Encyclopedia of the Social & Behavioral Sciences (2)*, 907-912.

Furnham, A., & Boo, H. C. (2011). A literature review of the anchoring effect. *The journal of socio-economics*, *40*(1), 35-42.

Gino, F., Norton, M. I., & Weber, R. A. (2016). Motivated Bayesians: Feeling moral while acting egoistically. *Journal of Economic Perspectives*, *30*(3), 189-212.

Korenok, O., Millner, E. L., & Razzolini, L. (2012). Are dictators averse to inequality?. *Journal of Economic Behavior & Organization*, *82*(2-3), 543-547.

Laerd Statistics. (2018). *One-sample t-test using Stata*. Retrieved from https://statistics.laerd.com/stata-tutorials/one-sample-t-test-using-stata.php

List, J. A. (2007). On the interpretation of giving in dictator games. *Journal of Political economy*, *115*(3), 482-493.

Merritt, A. C., Effron, D. A., & Monin, B. (2010). Moral self-licensing: When being good frees us to be bad. *Social and personality psychology compass*, *4*(5), 344-357.

Monin, B., & Miller, D. T. (2001). Moral credentials and the expression of prejudice. *Journal of personality and social psychology*, *81*(1), 33.

Mussweiler, T. (2002). The malleability of anchoring effects. *Experimental Psychology, 49*(1), 67–72. https://doi.org/10.1027//1618-3169.49.1.67

Mussweiler, T., & Strack, F. (2001). Considering the impossible: Explaining the effects of implausible anchors. *Social Cognition*, *19*(2), 145-160.

Nielsen Norman Group. (2018). *Between-Subjects vs. Within-Subjects Study Design*. Retrieved from https://www.nngroup.com/articles/between-within-subjects/

Panchanathan, K., Frankenhuis, W. E., & Silk, J. B. (2013). The bystander effect in an N-person dictator game. *Organizational Behavior and Human Decision Processes*, *120*(2), 285-297.

Smith, A. (1776). *An Inquiry into the Nature and Causes of the Wealth of Nations.*

Statistics Solutions. (2020). *Assumptions of Multiple Linear Regression*. Retrieved from https://www.statisticssolutions.com/assumptions-of-multiple-linear-regression/

Stoop, J. (2020). Statistical Tests in Experiments [PowerPoint]. Retrieved from https://canvas.eur.nl/courses/27464/files/18042791?module_item_id=398967

Strack, F., & Mussweiler, T. (1997). Explaining the enigmatic anchoring effect: Mechanisms of selective accessibility. *Journal of personality and social psychology*, *73*(3), 437.

Tan, H. B., & Forgas, J. P. (2010). When happiness makes us selfish, but sadness makes us fair: Affective influences on interpersonal strategies in the dictator game. *Journal of Experimental Social Psychology*, *46*(3), 571-576.

Tiefenbeck, V., Staake, T., Roth, K., & Sachs, O. (2013). For better or for worse? Empirical evidence of moral licensing in a behavioral energy conservation campaign. *Energy Policy*, *57*, 160-171.

Tversky, A. (1967). Additivity, utility, and subjective probability. *Journal of Mathematical Psychology 4(2),* 175-201.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *science*, *185*(4157), 1124-1131.

Tversky, A., & Simonson, I. (1993). Context-dependent preferences. *Management science*, *39*(10), 1179-1189.

Appendix

The following survey questions are provided to the respondents:

Introduction

Thank you for participating in this experiment about decision making. The questions of this survey are hypothetical. Therefore, you will not be paid for this survey. However, we ask you to act like how you would behave if you would receive the money. The results of this survey will be used for my master thesis at The Erasmus University in Rotterdam. You will remain completely anonymous. Answering the questions should take approximately 5 minutes of your time.

In case you have any questions, feel free to contact me!

Lisa Bakker

448393lb@student.eur.nl

Treatment 1

Imagine you received 100 euro from the experimenter. You have to split this amount of money between you and player B. Player B is also a participant of this survey and is matched to you. A third participant, player C, received no amount of money. This has no influence on the money you and player B will receive. You can decide how much of the 100 euros you want to give to player B. The other part of the 100 euros you can keep for yourself.

First, fill in the amount of money you want to keep for yourself. In the second box you can fill in the amount of money you want to give to player B. These two answers should add up to a total of 100 euros.

Treatment 2

Imagine you received 100 euro from the experimenter. You have to split this amount of money between you and player B. Player B is also a participant of this survey and is matched to you. A third participant, player C, already received an amount of money of 25 euros. This has no influence on the money you and player B will receive. You can decide how much of the 100 euros you want to give to player B. The other part of the 100 euros you can keep for yourself.

First, fill in the amount of money you want to keep for yourself. In the second box you can fill in the amount of money you want to give to player B. These two answers should add up to a total of 100 euros.

Treatment 3

Imagine you received 100 euro from the experimenter. You have to split this amount of money between you and player B. Player B is also a participant of this survey and is matched to you. A third participant, player C, already received an amount of money of 75 euros. This has no influence on the money you and player B will receive. You can decide how much of the 100 euros you want to give to player B. The other part of the 100 euros you can keep for yourself.

First, fill in the amount of money you want to keep for yourself. In the second box you can fill in the amount of money you want to give to player B. These two answers should add up to a total of 100 euros.

Treatment 4

Imagine you received 100 euro from the experimenter. You have to split this amount of money between you and player B. Player B is also a participant of this survey and is matched to you. A third participant, player C, already received an amount of money of 125 euros. This has no influence on the money you and player B will receive. You can decide how much of the 100 euros you want to give to player B. The other part of the 100 euros you can keep for yourself.

First, fill in the amount of money you want to keep for yourself. In the second box you can fill in the amount of money you want to give to player B. These two answers should add up to a total of 100 euros.

Additional questions for every treatment:

The following questions are about your behaviour in certain situation and how willing you are to act in that certain way. We ask you to give your answer on a scale from 0 to 10. 0 means that you are completely unwilling to act in that way. 10 means you are completely willing to act in that way. You can choose every number in between.

1. How willing are you to give to good causes without expecting anything in return?

2. How willing are you to give away to others although there may be costs for you?

3. How willing are you to make sure that every member of a group have an equal endowment although there may be costs for you?

These questions are based on a study from Falk et al. (2016).

Demographic questions:

1. What is your age?
2. What is your gender?
    a. Male
    b. Female

c. Other/Prefer not to say

3. What is currently your highest attained level of education?
    a. No schooling degree
    b. Primary school
    c. High school
    d. MBO
    e. HBO
    f. Bachelor's degree
    g. Master's degree
    h. Doctorate degree
4. What is your current monthly disposable income?
    a. Less than 1.000 euro
    b. Between 1.001 and 2.000 euro
    c. Between 2001 and 3.500 euro
    d. Between 3.501 and 5.000 euro
    e. More than 5.000 euro
    f. I don't know/I prefer not to say
5. What is your living situation?
    a. I live alone
    b. I live alone with a child or children
    c. I live together with my partner
    d. I live together with my partner and child or children
    e. I live together with one or multiple housemates
    f. I live with my parents
    g. Other, namely

Table 2. The percentages of subjects for the corresponding education levels.

Education level	*Percentage*
High school degree	8.18%
MBO degree	11.95%
HBO degree	21.38%
Bachelor degree	39.62%
Master degree	17.61%
Doctorate degree	1.26%

Table 3. The percentages of subjects with the corresponding monthly income.

Monthly income	*Percentage*
Less than €1000	37.74%
€1001 - €2000	16.35%
€2001 - €3500	22.01%
€3501 - €5000	8.18%
More than €5000	8.18%
Don't know/Prefer not to say	7.55%

Table 4. The percentages of subjects with the corresponding living situations.

Living situation	*Percentage*
I live alone	5.03%
I live alone with a child or children	0.63%
I live together with my partner	18.87%
I live together with my partner and child(ren)	20.13%
I live together with multiple housemates	21.38%
I live with my parents	33.33%
Other	0.63%

Table 5. The amount and corresponding percentage of subjects in a certain category for treatment 1.

Variable	*Amount*	*Percentage*
Gender		
Female	20	52.6%
Education		
High school	4	10.5%
MBO	9	23.7%
HBO	4	10.5%
Bachelor	14	36.8%

Master	6	15.8%
PhD	1	2.6%
Income		
Less than €1000	10	26.3%
€1001 - €2000	5	13.2%
€2001 - €3500	13	34.2%
€3501 - €5000	4	10.5%
More than €5000	2	5.3%
I don't know/prefer not to say	4	10.5%
Living situation		
Alone	2	5.3%
Alone with child(ren)	0	0.0%
Together with partner	8	21.1%
Together with partner and child(ren)	7	18.4%
Together with one or more housemates	5	13.2%
With my parents	16	42.1%
Other	0	0.0%

Table 6: The amount and corresponding percentage of subjects in a certain category for treatment 2.

Variable	*Amount*	*Percentage*
Gender		
Female	21	48.8%
Education		
High school	3	7.0%
MBO	5	11.6%
HBO	9	20.9%
Bachelor	15	34.9%
Master	11	25.6%
PhD	0	0.0%
Income		

Less than €1000	22	51.6%
€1001 - €2000	10	23.3%
€2001 - €3500	4	9.3%
€3501 - €5000	2	4.7%
More than €5000	4	9.3%
I don't know/prefer not to say	1	2.3%
Living situation		
Alone	3	7.0%
Alone with child(ren)	0	0.0%
Together with partner	8	18.6%
Together with partner and child(ren)	3	7.0%
Together with one or more housemates	12	28.0%
With my parents	16	37.2%
Other	1	2.3%

Table 7: The amount and corresponding percentage of subjects in a certain category for treatment 3.

Variable	*Amount*	*Percentage*
Gender		
Female	17	41.5%
Education		
High school	4	9.8%
MBO	4	9.8%
HBO	10	24.4%
Bachelor	15	36.6%
Master	7	17.1%
PhD	1	2.4%
Income		
Less than €1000	11	26.8%
€1001 - €2000	7	17.1%
€2001 - €3500	8	19.5%

€3501 - €5000	6	14.6%
More than €5000	6	14.6%
I don't know/prefer not to say	3	7.3%
Living situation		
Alone	3	7.0%
Alone with child(ren)	1	2.4%
Together with partner	6	14.6%
Together with partner and child(ren)	14	34.1%
Together with one or more housemates	8	19.5%
With my parents	9	22.0%
Other	0	0.0%

Table 8: The amount and corresponding percentage of subjects in a certain category for treatment 4.

Variable	*Amount*	*Percentage*
Gender		
Female	27	90.2%
Education		
High school	2	5.4%
MBO	1	2.7%
HBO	11	29.7%
Bachelor	19	51.4%
Master	4	10.8%
PhD	0	0.0%
Income		
Less than €1000	17	45.9%
€1001 - €2000	4	10.8%
€2001 - €3500	10	27.0%
€3501 - €5000	1	2.7%
More than €5000	1	2.7%
I don't know/prefer not to say	4	10.8%

Living situation		
Alone	0	0.0%
Alone with child(ren)	0	0.0%
Together with partner	8	21.6%
Together with partner and child(ren)	8	21.6%
Together with one or more housemates	9	24.3%
With my parents	12	32.4%
Other	0	0.0%

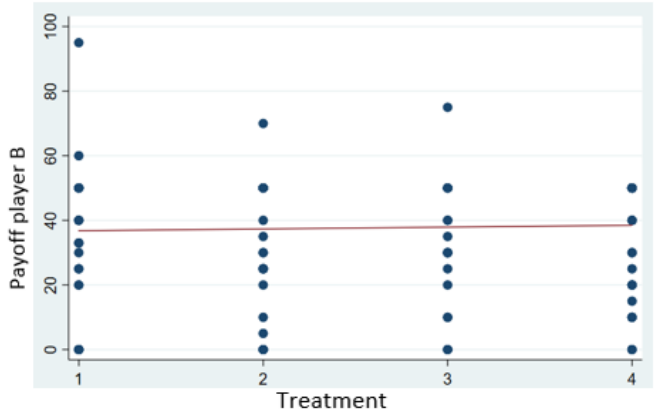

Figure 1: The linear relationship between the variable Payoff player B and Treatment.

Table 9: The VIF scores of the multiple linear regression with the corresponding variables from the regression Payoff player B as independent variable.

Variable	*VIF*
Treatment	
2	1.68
3	1.59
4	1.63
Gender	1.15
Age	2.26
Education	1.02
Income	2.14
Living situation	1.30
Mean VIF	*1.59*

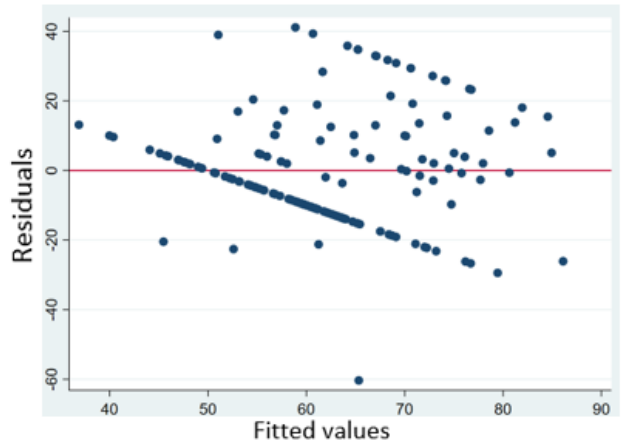

Figure 2: A plot of the residuals against the predicted values to check for homoscedasticity.

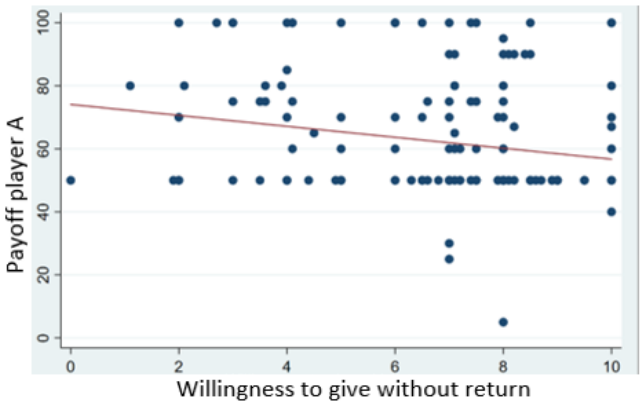

Figure 3: The linear relationship between the variables Payoff of player A and the willingness to give without return.

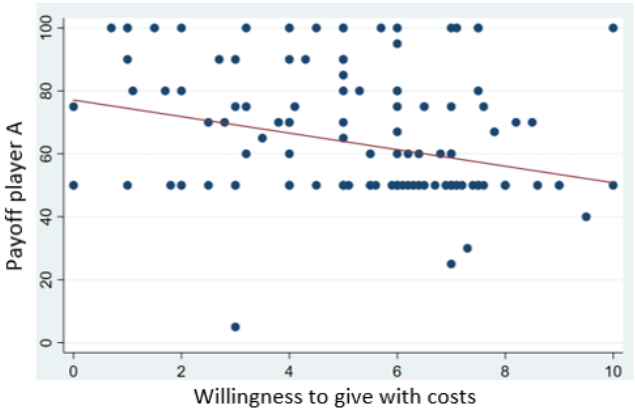

Figure 4: The linear relationship between the variables Payoff of player A and the willingness to give with costs.

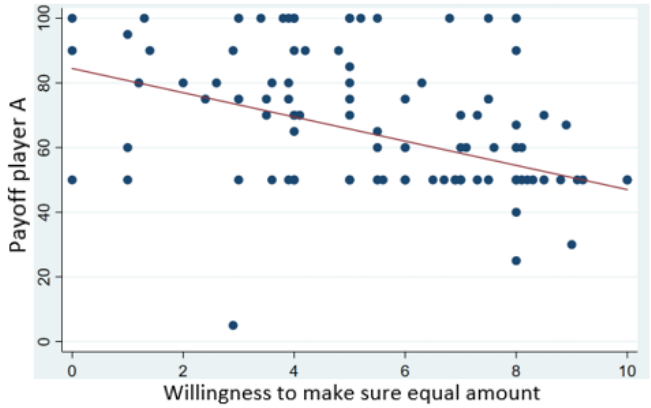

Figure 5: The linear relationship between the variables Payoff of player A and the willingness to make sure that the amounts are equal.

Table 10: The VIF scores of the multiple linear regression with the corresponding variables from the regression with 'Willingness to give without return' as independent variable.

Variable	*VIF*
Age	2.22
Income	1.99
Living situation	1.28
Gender	1.09
Willingness to give without return	1.05
Education	1.02
Mean VIF	*1.44*

Table 11: The VIF scores of the multiple linear regression with the corresponding variables from the regression with 'Willingness to give with costs' as independent variable.

Variable	*VIF*
Age	2.15
Income	1.98
Living situation	1.30
Gender	1.09
Willingness to give with costs	1.04
Education	1.02
Mean VIF	*1.43*

Table 12: The VIF scores of the multiple linear regression with the corresponding variables from the regression with 'Willingness to make sure equal' as independent variable.

Variable	*VIF*
Age	2.19
Income	1.98
Living situation	1.28

Gender	1.09
Willingness to make sure equal	1.05
Education	1.04
Mean VIF	*1.44*

Table 13: The results of the Kruskall-Wallis test with the dependent variable Payoff B and the independent variable Treatment.

Treatment	*Observations*	*Rank Sum*
1	38	2837.50
2	43	3482.50
3	41	3580.50
4	37	2819.50
Chi-squared	1.819 with 3 d.f.	
Probability	0.6107	
Chi-squared with ties	2.197 with 3 d.f.	
Probability	0.5326	