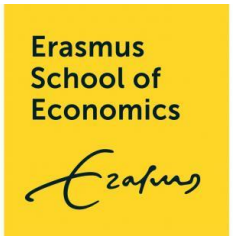

Price elasticity in charity donations

The effect of emotional and reference information on giving behavior

Abstract: In 2017, individual gifts were accountable for approximately 70% of all donations to charity in the USA. Prior literature identified several predictors of giving behavior, among which gender, age, income and education. This thesis aims to investigate the effect of providing additional information on the price elasticity of giving behavior. A survey was designed where subjects were asked to divide money between themselves and UNICEF, against different price ratios (1:1, 1:2 and 1:3) and with different initial amounts. Subjects within the treatment groups received either emotional or reference information before making their decisions about the deviation of money. The results show that females are more sensitive to changes in price compared to males, because they donate a significantly higher amount of money to charity when it becomes cheaper to donate. Moreover, the payoff to UNICEF from females is significantly higher in both treatment groups compared to males, suggesting that females are more sensitive to additional information. However, no hard evidence was found to conclude that donations within the treatments are higher in comparison with the control group.

Keywords: charity, altruism, emotional/reference information, philanthropy, giving behavior, donations

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1. Introduction

On April 15th 2019 at around 18:20h, the fire alarm in the Notre-Dame in Paris went off. The Cathedral was on fire and as a result, one of the main towers as well as a part of the roof collapsed (NU.nl, 2019). The President of France, Emmanuel Macron, immediately announced the start of a national collection campaign for the restoration of the Cathedral. Within 24 hours over €700 million euros had already been donated to rebuild the monument (NU.nl, 2019). The main donors consisted of wealthy families, millionaires, the government and companies. As examples, the oil company Total donated an amount of €100 million, the government of Paris €50 million euros, the CEO of Gucci, Francois-Henri Pinault, €100 million euros and the founder of Louis Vuitton, Bernard Arnault, €200 million euros (NU.nl, 2019). The speed and the high amount of the donations attracted a lot of criticism from all over the world. In no time, almost a billion euros had been collected to rebuild a historical monument, whilst there are so many people living in poverty or in need of help with education, health and medicines. What is it that makes people want to donate money now, whilst charitable organizations see their fixed gifts declining every year and having a hard time to find regular donors? A possible explanation could be the emotional response of individuals to the somewhat drastic burning images of the Cathedral. They might be familiar with the building, because they have been there themselves.

1.1 Philanthropic sector

The philanthropic sector is unique in a way that it consists of organizations that can add to public goals by offering products and services against a non-profit constraint (Srivastava and Oh, 2010). This results in the fact that these organizations can provide products and services to people who cannot afford them and can acknowledge problems across borders of the entire world (Liket, 2014). Charitable organizations try to find solutions for, and eliminate, social problems at home and abroad in different fields, like health, international aid, culture, climate and the welfare of humans and animals (Goede Doelen Nederland, 2018). Charitable organizations are an important foundation of the society, because the government does not have the resources to take care of all these problems (Goede Doelen Nederland, 2018).

Since the 1960s, the philanthropic sector has increased enormously (Boris and Steuerle, 2006). As estimated in the annual report of Giving USA (2018), in 2017 $410.02 billion dollars was

given to charitable organization, which is equal to 2.1% of US GDP. This is an increase of 5.2% in comparison with 2016. The donations are adjusted for inflation and consisted of giving by individuals, foundations, bequest and corporations (Giving USA, 2018). Donations to charities that focus on education account for the largest proportion of all donations (14%), followed by donations to human services organizations (12%) and foundations (11%) (Giving USA, 2018). Through foundations of well-known and wealthy individuals, the philanthropic sector has become more visible (Liket, 2014). For example, one of the largest foundations worldwide is the Bill and Melinda Gates foundation, which is valued at $42.3 billion (Chepkemoi, 2017).

Gifts by individuals are one of the major sources of income for non-profit organizations across the world (Anheier and Salamon, 2006). That makes it important to address people directly to ask for donations. In 2017, individual gifts are accountable for 70% of all donations in the USA and this is again an increase of 3% compared to 2016 (Giving USA, 2018). Within the Netherlands, individual gifts amounted to €727.6 million euros compared to gifts from companies that accounted for €32.8 million euros (De Graaf & Verwiel, 2018). Research shows that especially the younger generation wants to be involved differently and connect to social goals in a different way (Van Uffelen, 2019). This results in supporting charitably organizations with a one-time gift, often linked to a specific project or event (Van Uffelen, 2019). A recent example of such an event is the swimming tour of Maarten van der Weijden. On Monday June 24 around 19:30h, Maarten arrived in Leeuwarden where he finished his swimming tour of approximately 200 kilometers via eleven cities in Friesland (Geels, 2019). Van der Weijden is an Olympic-gold swimmer and survivor of leukemia and the goal of this tour was to collect money for the KWF for research to cancer (Geels, 2019). With his tour, that started on Friday June 21, he raised over €5.1 million euros. In four days, one single individual was able to collect such an amount of money for charity. What makes people willing to support such individual sports performances? People might feel emotionally connected to Maarten his goal, because they have loved ones who have fought or died of cancer as well. When individuals are familiar with a disease, they are more likely to donate to an organization that helps preventing the disease (Bekkers & Meijer, 2008).

There are economists that have a more critical and realistic look to charitable donations and refer to the so-called ‘doing good’ paradox (Liket, 2014). It is not that they are against donating money to charity, but they argue for effective altruism: a name for a rapidly growing movement

of people who rationally weigh their gifts (Steenhuis, 2018). Sometimes people think they are doing a good deed when actually their impact is negligible or their actions even have the opposite effect (Liket, 2014). Liket (2014) is in favor of effective altruism as well and she encourages people to look at the difference in impact of each dollar donated and tries to create awareness of this effect. She defines 'impact' as a measure of deeply influencing the well-being of human lives or nature. To explain the concept of effective altruism better, Liket (2014) gives an example. Imagine you have €100,- to support your preferred goal that children in Africa can go to school longer. There are many different ways to contribute to that goal: for example, you can support an organization that builds the school, you can buy school uniforms for the children or you can pay the teachers. However, the impact of your €100,-, so the actual number of school years you buy for those children, can differ a lot. When supporting the organization that provides school uniforms, you 'buy' two additional school years on average. But, supporting the organization that helps deworming the children, you 'buy' forty additional school years. This is a huge difference in impact of the money you donated. Liket (2014) emphasizes that the approach of charitable organizations in solving the same problem can differ a lot. Economists that support effective altruism stimulate people to look more at statistical facts when deciding how to spend their money to charity. According to philosopher Bruers, an effective altruist thinks critically like a scientist, rationally like a rational consumer and results-oriented like an investor (Steenhuis, 2018). Are individuals more willing to donate money based on facts or is it a an emotion-based decision?

There are several factors that determine the amount people donate to charitable organizations and what motivates them to give money away. Prior research focused mainly on the question of what drives people to give to charity and identified factors that increase the amount of giving. In this research paper, the impact of providing both emotional and factual information on the amount of money donated to charity will be investigated. This will be combined with a core concept in economics: price elasticity of demand. This concept both reflects the direction of the change in price as well as quantifying the change. When the price of a good increases, the demand for the same good changes, i.e. typically decreases. This change can be quantified as a 1% increase in the price leads to a x% decrease in demand. Andreoni and Vesterlund (2001) have adopted a new approach to the concept of price elasticity, because they apply it on charitable giving. They treat the amount of money a person donates to charity as the good for which the demand can change depending on the price. Andreoni and Vesterlund (2001) show that when the price elasticity changes, i.e. when it becomes cheaper to give, the behavior of

their male participants changes. In reality, it can become cheaper to give money away, for example due to the fact that charitable donations are tax deductible or when companies multiply the amount of money donated. To contribute to their research, this paper will investigate whether giving behavior of subjects changes when (i) they receive additional information and (ii) the price of giving changes. In this research paper, emotional information consists of images from children. As historian van der Hoeven says, the suffering of children affects people and evokes emotion (RTL Nieuws, 2019). The term reference information is an overarching term for factual and statistical information (Smith and Berger, 1996). More specifically, this research paper will answer the question: *What is the effect of providing emotional or reference information on the price elasticity of giving behavior?*

1.2 Summary paper

The data used to compile this research paper has been gathered from a survey that was conducted using a sample consisting of 224 participants, divided over three different groups: one control group and two treatment groups. Participants were asked to divide money between themselves and UNICEF, against different price ratios and with different initial amounts. Both treatment groups received additional information before making the decision. One treatment group had to look at emotional information, the other treatment group was first presented with reference information. The control group had no additional information.

The results suggests that both treatments have a positive effect on the average amount of money each subject donates, but the result is insignificant. Based on this sample, it can be concluded that on average, females donate a higher amount of money to charity compared to males against all price ratios and within every treatment. The findings have implications in reality, because charitable organizations can adjust their campaigns to raise awareness in line with the findings.

The structure of this thesis is as follows: in section 2 an overview of prior literature will be provided, related to charitable donations and factors that explain giving behavior of people. Based on the literature review the hypotheses are derived, which are presented in section 2 as well. Next, in section 3 the method of the experiment is described, as well as the variables used in the research. In section 4, the collected data is analyzed in detail; the hypotheses are tested and the results are discussed. Finally, this thesis will end with a discussion about several limitations of the research and a conclusion in section 5 and 6.

2. Literature review

2.1 Philanthropy

Philanthropy is derived from the Greek word 'philanthrôpos' and literally means the love of humanity. Philanthropy is often defined as encouraging the well-being of others as a principle of action, most of the times by charitable giving, a voluntary action or social help (Kidd, 1996). There is some disagreement about the way of using the term 'philanthropy'. Wright (2001) explains the different approach between the US and the UK. Within the US, philanthropy is used for both the act of giving to charity and for describing how people behave (Wright, 2001). On the contrary, within the UK philanthropy has a negative shade: it is seen as ineffective, patronizing and judgmental (Wright, 2001). To describe the action of giving, the preferred terms in the UK are 'charity' and 'charitable giving' (Wright, 2001). In this thesis, the US terminology is followed.

2.2 Giving behavior

What motivates people to give to charity? There are several theories that describe giving behavior of individuals and try to explain this. People contribute to the demands of the public good (Becker, 1974), they like to give due to personal benefits (Andreoni, 1989) or they feel social pressure (Akerlof and Kranton, 2000). Overall, individuals need to be aware of the need for help in order to be able to give money. The awareness can be accomplished by for example media coverage or marketing campaigns (Bekkers & Wiepking, 2011).

2.2.1 Public good theory

Becker (1974) introduced the public good theory of philanthropy, relying on three major assumptions: publicness, utility maximization and Nash conjectures. Firstly, the publicness assumption states that in theory, charitable activity is a public good (Samuelson, 1954). An example of a public good could be to mitigate poverty. Charitable organizations satisfy the unfilled demand of public goods, which is left open by government supplies (Kingma, 2003). Secondly, the assumption of utility maximization describes that an individual always maximizes his own utility and all his actions regarding philanthropy are connected to that (Sugden, 1982). Finally, the assumption of Nash conjectures is indicating that an individual takes gifts of others as the standard when deciding about their own gift (Sugden, 1982). The theory looks at what would happen with the income of the charitable organization when the

donation of a specific individual changes, assuming that other contributors act on Nash conjectures (Sugden, 1982). This means for example when an individual increases his average amount of money donated to charity, other donors will reduce their gifts by approximately the same amount (Sugden, 1982). So, to summarize: this theory explains giving behavior of individuals as a contribution to the public good, whilst an individual is always maximizing his own utility and overall donations follow a Nash conjectures.

2.2.2 Pure altruism

When individuals give money to contribute to the public good without benefitting themselves, this is called 'pure altruism'. This model beliefs that an individual's decision only depends on the total supply of the public good (Andreoni, 1990). The term altruism comes from the Latin word 'alter', which means 'other' (Steinberg, 2010). Altruism indicates regard and concern for others, without regard for oneself (Simmons, 1991). Altruism is a personal characteristic and a state of mind (Simmons, 1991). For an altruistic person it does not matter whether he loves the receiver or not (Khalil, 2004). In other words, the welfare of others is most important and the intention of altruistic behavior is to benefit and help others (Schwartz, 1977). The support of pure altruistic individuals is voluntary: any compensation is refused (Simmons, 1991; Nagel, 1970; Steinberg, 2010).

However, pure altruism and private philanthropy have been criticized by some economists. In theory, government support for charitable cases should crowd out individual donations (Becker, 1974). From an economic point of view, private philanthropy is inefficient, because it results in an insufficient arrangement of charitable actions caused by the free-rider problem (Sugden, 1982). Sugden (1982) argues that this problem can be relieved when one acknowledges that people might do something based on moral principles instead of only self-interest. Following his approach of moral behavior is contradictory to the theory of impure altruism (Andreoni, 1990).

2.2.3 Impure altruism

When both the total amount of the public good and their gift to the public good matter for an individual, this is called impure altruism (Andreoni, 1990). Individuals support the public good because the demand increases, so people become more altruistic (Andreoni, 1989). Additionally, some individuals contribute to the public good because they receive personal intrinsic benefits from giving, like a 'warm glow' (Andreoni, 1989). Psychological benefits

from giving money are the contribution to a positive self-image, having 'joy of giving', mitigating personal guilt feelings and creating a good mood (Bekkers and Wiepking, 2011). Those benefits result in a more emotion-based decision to donate money. Other factors that could influence an individual's decision to contribute to the public good are for example social pressure (Akerlof and Kranton, 2000) or sympathy (Andreoni, 1990). Due to these private benefits, arrangements by the government to support the public good would not crowd out private gifts according to this model (Simmons and Emanuele, 2004).

2.2.4 Effective altruism

As mentioned earlier, the amount of money that has been given to charity increases from year to year. However, there is less focus on the fact whether philanthropy is also efficient in making a distinction or not in answering social problems (Liket, 2014). Transparency about costs and benefits is not sufficient, the question arises if the products and services offered by a charitable organization are actually effective in making a difference for the human civilization and help solving the current problems (Liket, 2014). Generally, the value that organizations create is called their social impact and it is defined as the positive development within society, generated by philanthropic actions (Anheier and Leat, 2006). There are several methods and frameworks to measure the value that altruistic organizations generate for society. Nevertheless, these organizations find it difficult to truly define their impact (Carman & Fredericks, 2010).

The movement that encourages to look more specifically to the impact of actions is being called effective altruism. Effective altruism aims to improve the world in the most effective way and to help as many people as possible by the use of proof and data to justify operations and to ensure that every dollar is spent most efficiently (Berkey, 2018). An example of an organization that looks into the effectiveness of altruistic actions is GiveWell. They analyze different charitable organizations and give recommendations about the effectiveness of giving opportunities. Their judgements are well-justified and they work completely transparently since all their analyses can be found online (GiveWell, 2019). Besides the effectiveness of fundraising costs of a charitable organization, they research the effectiveness of the program the organization performs, in terms of lives that are being saved or improved per dollar spent (GiveWell, 2019). Within their analysis they value charitable organizations based on four different criteria: evidence of effectiveness, cost-effectiveness, room for more funding and transparency (GiveWell, 2019). This organization encourages people to choose the charitable organization they want to support based on reference information and effectiveness. GiveWell

would not have supported the fundraising campaign of Macron to rebuilt the Notre Dame Cathedral, because such an amount of money that was collected there could have done a lot of good elsewhere.

2.3 Providing information

Providing information before making the decision to give money to charity impacts the decision of individuals. In this research, a distinction between two different kinds of information is provided: emotional and reference information.

2.3.1 Images and emotions

Individuals are often influenced by emotions and make decisions based on their emotions. Using this fact by triggering specific emotions can increase donations. Showing a picture evokes more emotions and generosity (Genevsky et al., 2013; Bandes & Salerno, 2014), especially images with children generate strong responses (Burt and Strongman, 2005). An individual that donates money feels empathy for the victim on the picture and captures the emotion the victim has (Small and Verrochi, 2009). Images that induce negative emotions or show unhappy victims increase the level of sympathy and increase the average monetary amount donated (Burt and Strongman, 2005; Small and Verrochi, 2009). Guilt is another emotion charitable organizations use within their advertisements to elicit empathy from their consumer (Huhmann and Brotherton, 1997). By providing the possibility of donating money and helping the victim shown on the image, an individual has the opportunity of transforming his negative emotion into a positive emotion (Merchant, Ford and Sargeant, 2010).

2.3.2 Reference information

Showing pictures increases the amount of donations compared to presenting a description only (Small, Loewenstein and Slovic, 2007). Statistics are clear to illustrate the problem but refrains people to respond to the problem (Small, Loewenstein and Slovic, 2007). On the other hand, presenting facts about charities needs cognitive effort to process the information and does impact the amount of money that has been donated (Smith and Berger, 1996). Individuals are sensitive to the way the factual information is presented, because the same fact can be declared in different time periods (Chandran and Menon, 2004). As an example, the sentence *"UNICEF accomplished that 32.7 million people received access to safe water in 2017"* mathematically and factually says the same as *"UNICEF helps 3.743 people every hour with access to safe water"*, but the framing and mental process of both facts is different (Chang and Lee, 2009).

For statistics about health, a shorter time frame can increase the persuasiveness of the fact (Chang and Lee, 2009). Moreover, when statistics are displayed in small numbers, they strengthen the effects of the negatively framed advertisement of a charitable organization (Chang and Lee, 2010). On the other hand, when statistics are presented in large numbers, they make the positive message charitable organizations establish more powerful (Chang and Lee, 2010). Prior research showed that males in the usual population prefer factual and statistical information (Baron-Cohen, 2002).

2.4 Price elasticity

Within economics, elasticity it is often expressed as the proportion of a percentage change from a dependent variable and the percentage change of an independent variable. The elasticity of Y is an indicator of the sensitivity of a variable X to the change in another variable Y. Elasticity can be calculated for many different things, for example for supply, demand and income. Within this research, the focus will be at the price elasticity of demand.

Price elasticity of demand is a measure that indicates how the demand of a product reacts to a change in price and helps quantifying the change (Kenton, 2018). It is a measurement of the change in price relative to the change in demand. Typically, the change in demand is expressed in the amount of the good, for example liters, kilos, number of goods etc. The change in price is a monetary change. Mathematically the formula is:

$$Price\ elasticity\ E = \frac{\%\ \Delta\ Quantity\ Demanded}{\%\ \Delta\ Price}$$

To calculate the change in the quantity demanded or the change in price, the following formula is used:

$$\%\ \Delta\ Q\ or\ P = \frac{(New - Old)}{Old} * 100\%$$

Price elasticity of demand will always be negative, due to the negative relationship between price and demand: when the price of a good increases, the demand for that good decreases.
The demand for a good is relatively inelastic when the ratio of the quantity demanded changes less than the price ratio, resulting in an elasticity of a value between 0 and -1. The quantity demanded is quite stable and consumers are not sensitive to price changes. This is often the case for necessary, primary goods. The demand is completely inelastic when there is no

reaction at all to a change in price. The elasticity has a value equal to 0. When the quantity demanded changes with the same amount as the price, the elasticity has an absolute value equal to -1. When the demand is relatively elastic, the demand strongly reacts to changes within the price. The ratio of the quantity demanded changes with a higher percentage compared to the price ratio. The elasticity will be valued lower than -1. When consumers are sensitive to price changes, these are often more luxury goods.

In this research, the approach of elasticity used by Andreoni and Vesterlund (2001) is followed. They treat charitable giving as the good for which the demand can change depending on the price. This is a new kind of approach, because usually the good you consume is for yourself, while charity donations are given for the well-being of another person.
The 'good' is now expressed in money as well, resulting in a change in the formula: both numerator and numerator are declared in monetary amounts. The assumption Andreoni and Vesterlund (2001) make is that the amount of money individuals give to charity depends on the price of giving. Costs of giving can exist in transaction costs, but also in physical or personal effort. Different people have different prices of giving, among others depending on income. This is mainly because income usually affects the marginal tax rate, which often affects the extent of tax discounts for donations.

When it becomes 'cheaper' to donate money, giving behavior increases (Karlan and List, 2007). Moreover, when there are less barriers to give, the likelihood of giving increases (Smith and McSweeney, 2007). For individuals it can be cheaper to give money due to tax deduction (Simmons and Emanuele, 2004) or donation matching (Karlan and List, 2007), which could influence their willingness to donate money. This is why the price elasticity is also a relevant concept to apply to charitable giving. In section 2.4.1 and 2.4.2 both concepts will be explained in more detail.

2.4.1 Tax deduction

Firstly, the government stimulates charitable giving by offering a more favorable tax treatment, for example the possibility of tax deduction for donations (Ariely, Bracha and Meier, 2009; Blumkin and Sadka, 2007). Within the Netherlands, donations to charity are deductible when they are given to a public benefitting institution (Belastingdienst, 2019). Recurring gifts can be deducted completely, normal gifts not. Recurring gifts are gifts that satisfy the following three conditions: the amount of money needs to be the same every year, the transaction needs to

occur at least 5 years in a row and it is recorded in a notarial contract when the annual gift will be terminated (Belastingdienst, 2019). On the other hand, a normal gift is a one-time donation or an annual gift but not contractually determined (Belastingdienst, 2019). This gift is only deductible when it exceeds the threshold value and the amount of money that can be deducted has a maximum (Belastingdienst, 2019). Most people qualify for the one-time donation and therefore the amount that can be deducted from tax payments is individually depend on each income and personal situation. Thus, the price of giving is different for different people.

2.4.2 Donation matching

Secondly, by donation matching the price of giving can differ. Signaling what others already donated can influence both an individual's decision to give as well as the amount of money donated. Next, the announcement of a donation match increases both the amount of money donated as well as the probability of donating (Karlan and List, 2007). However, there is no significant difference in the probability of donating between small (1:1) and large (1:3) matching ratios (Karlan and List, 2007). In addition to the previous research, Karlan, List and Shafir (2011) also investigated donation matches at a ratio smaller than 1:1. They found that there is not necessarily a correlation between larger match ratios and a higher amount of money donated. Still, for some individuals the price ratio does matter (Karlan et al., 2011). A marketing campaign where a well-known company doubles every dollar donated to a charitable organization resulted in an increase of the amount of money donated compared to the same campaign where an anonymous company doubled the dollar (Karlan and List, 2014). So, the demand curve of the 'good' becomes more elastic when the well-known company doubles the donation. Another experiment illustrates that a different form of donation matching, the so-called 75% contingent match, is an effective method as well (Anik, Norton & Ariely, 2014). This method gives an announcement at the payment check-out that the charitable organization will double all donations made that day if 75% of the donors agrees to upgrade their initial donation (Anik et al., 2014). When a company offers to match charitable gifts from their staff, staff members are more likely to give money to charity (Okunade and Berl, 1997). Donation matching can be a signal of confidence as well, because it radiates that the matching party trusts the goal and efficacy of the organization (Bekkers and Wiepking, 2011).

2.5 Predictors of charitable donations

There are several predictors defined in prior research that are related to charitable donations. In this thesis the following control variables are included: gender, age, level of education and

level of income. However, there are other variables that might impact an individual's giving behavior, such as marital status, family composition, religion, happiness, volunteer, employment, race and ethnicity, geographic location and political preference.

Gender

In general, prior literature finds that women are more generous, altruistic and empathic compared to men (Mesch et al., 2011, Andreoni & Vesterlund, 2001; Simmons & Emanuele, 2007). Within their giving behavior are differences found as well. Women are more sensitive to emotions and use philanthropy to express their caring (Mesch et al., 2011). On average, women are more likely to donate money to charity (Simmons & Emanuele, 2007; Mesch et al., 2001) and will give higher amounts than men (Mesch et al., 2011). However, about the amount of money that individuals give there is disagreement within the literature: other research found that men give higher amounts of money (Andreoni et al., 2003). Men are more sensitive to price changes: women are more generous when it is relatively expensive to give, men are more generous when the price of giving decreases (Andreoni & Vesterlund, 2001).

Income

There is a positive relationship between income and donating money to charity, indicating that when individuals have a higher income, they donate more to charity (Havens et al., 2006; Auten et al., 2002). The same holds for the level of wealth: the more wealth people have, the more donations they make (Havens et al., 2006). On the other hand, research has shown that individuals with lower income donate a relatively larger proportion of their income to charity (Bennett, 2018). The amount of money that is given by individuals at a high-income level is quite volatile, while the lower- and middle level income groups have a more stable pattern (Auten & Rudney, 1990).

2.6 Hypotheses

Based on the literature review, the following hypotheses are derived. The hypotheses are phrased in terms of the outcome that is expected, rather than as statistical null hypotheses.

H1a: The amount of money donated to charity within both treatment groups is higher compared to the control group.
H1b: The amount of money donated to charity is the highest within the emotional treatment.

Subgroup: Control group
H2a: Within the control group, females donate more money to charity compared to males when the price ratio is equal to 1:1.
H2b: Within the control group, males donate more money to charity compared to females when it becomes cheaper to give money away, i.e. at price ratios 1:2 and 1:3.

Subgroup: Treatments
H3a: Within the emotional treatment group, females donate more money to charity compared to males for all price ratios.
H3b: Within the reference treatment group, males donate more money to charity compared to females when it becomes cheaper to give money away, i.e. at price ratios 1:2 and 1:3.

Subgroup: Gender
H4a: Within the female subject group, females donate more money to charity within the emotional treatment compared to the reference treatment.
H4b: Within the male subject group, males donate more money to charity within the reference treatment compared to the emotional treatment.

3. Method

3.1 Participants

The survey has been created and the data is generated with Qualtrics (Qualtrics, Provo, UT; 2018). The survey is designed in Dutch to create a more homogenous subject pool, to eliminate international different cultural effects and to ensure that as many subjects as possible finish the survey. As a result of the language of the survey, only Dutch people fill in the survey and subjects do not drop out by for example language barriers due to the fact that they do not understand the questions. Moreover, there are practical reasons why it is more suitable to have the survey in Dutch, for example to make the payment of the lottery more efficient and to create common knowledge about the education system.

All participants are recruited through personal network, so they consist of friends, family, friends of friends and other students. The survey was open for responses from Friday May 10th until Monday June 3rd, a total of 25 days. In total there are 224 subjects that completed the survey. On average, the subjects are 34.8 years old (SD = 16.41) and the variable gender is almost equally distributed. The sample consists of 122 females (54.46%) and 102 males (45.54%).

3.2 Experiment

To test all the hypotheses, an experiment has been set up with a randomized controlled trial. Within the experiment subjects are asked to divide money between themselves and UNICEF in five different situations that are presented to them. In every situation, both the monetary amount they receive and the price ratio to give money away changes. The experiment consists of three different groups: one control group and two treatment groups, as presented in table 1. Subjects are randomly divided into one of the three treatments.

Table 1: Different treatments in survey.

Group	Type	Treatment
1	Control group	No information
2	Treatment group	Emotional information
3	Treatment group	Reference information

Charitable organization

The charitable organization used in this research is UNICEF. Worldwide there are many charitable organizations that differ in all kind of aspects, such as goal, size, location and marketing. UNICEF has been chosen because it is a large, well-known and global organization that operates worldwide. UNICEF has a large brand awareness, resulting in the fact that almost everybody within the Netherlands is familiar with the organization. As part of the United Nations, UNICEF has the responsibility to control if all countries uphold their obligations to children's rights as included in the treaty of the Rights of the Child (UNICEF, 2019). Moreover, UNICEF has a humanitarian focus, instead of for example a focus on animals (WNF) or the climate (Greenpeace). Therefore is assumed that almost everybody cares about other children, because the organization and their mission to support children resonates with many people globally.

Control group

Within the control group, subjects do not receive any additional information before they have to make the decision to divide money between themselves and UNICEF. After the demographic questions they are immediately asked to split the money between themselves and UNICEF in each of the five scenarios.

Treatment group

There are two different treatments in this experiment. In both treatments, subjects will receive information before they have to divide money between themselves and UNICEF. The difference between the treatments is the kind of information they receive. One treatment group has to look at information that aims to provoke emotions, the other treatment groups has to look at reference information which aims to generate a more rational way of thinking.

In the emotional treatment, subjects are asked to take a look at the picture that is presented to them. The picture consists of seven different photos related to UNICEF. Four pictures are so-called 'negative' images, and three pictures are 'positive' images. The 'negative' images are presented on the left and show the subject that his or her money is needed for helping children, which UNICEF can provide to them. The photos show heavily thinned children and children that cry or sleep on the street. The 'positive' images show the effect of the work UNICEF does and what they do with the money donated by the subject. These photos are presented on the right and show happy and hopeful children, who can go to school because of the donation and

have access to safe drinking water. Both positive and negative images are used to indicate both sides of the spectrum. UNICEF helps to avoid the negative images and turn them into the positive images. The content of the images provided to participants need to be relevant for what is being studied and the images need to support the goal they intend to reach. The aim of showing the images is to trigger emotions of the participants. Another reason to use both kinds of images, is the fact that some participants feel more emotions with the positive way of providing information, while other subjects feel this when shown negative images (Small and Verrochi, 2009).

In the reference treatment, subjects are asked to read the following information that is presented to them. The information consists of an explanation of UNICEF's goal and five listed facts consisting of several accomplishments of UNICEF in 2017. The facts are obtained from the annual report of UNICEF in 2018. According to Chang and Lee (2010), when statistics are being displayed in large numbers, they intensify the positive message UNICEF tells. The aim of this treatment is to present actual facts to subjects what UNICEF can do with the money donors give to them and to show the subject real numbers.

Survey design

The survey starts with six questions regarding demographics of subjects, regarding their gender, age, level of education and yearly income. When subjects indicate that their highest level of education is an HBO or university degree, they are also asked about their study background and whether they are a student at the moment. These questions are necessary to create the control variables.

Next, the subjects are randomly divided into one of the three treatments. Five different situations are presented to them, where they have to divide money between themselves and UNICEF. The order of these five questions is randomized in every treatment, to avoid the order effect (Holt & Laury, 2005). The five situations are based on the study of Andreoni and Vesterlund (2001) and the same price ratios are followed. There are two questions where the price ratio equals 1:1, two questions where the price ratio equals 1:2 and one question where the price ratio equals 1:3. Besides that, the proportions between the monetary amount they receive within the experiment and the tokens they received within the experiment of Andreoni and Vesterlund (2001) are the same as well. In their study, subjects received 40, 60, 75 or 100 tokens. In this research, 100 tokens are equal to €20,-, and based on the same proportions as

Andreoni and Vesterlund (2001) use, the amounts of €8, €12 and €15 are calculated. Table 2 gives an overview of the relation.

Table 2: Overview comparison this research paper and research Andreoni & Vesterlund (2001).

Andreoni & Vesterlund (2001)	Thesis	Price ratio	Price
40 tokens	€8,-	1:3	0.33
60 tokens	€12,-	1:1	1
60 tokens	€12,-	1:2	0.50
75 tokens	€15,-	1:2	0.50
100 tokens	€20,-	1:1	1

There are three important differences between the paper of Andreoni and Vesterlund (2001) and this experiment. Firstly, the dictator game used in the paper of Andreoni and Vesterlund (2001) is changed. A dictator game is a way to measure the level of altruism of subjects. In both experiments subjects need to divide money between themselves, i.e. the proposer, and another, i.e. the recipient. In their study, the recipient of the tokens is another participant in the experiment. In this research, UNICEF is the recipient, a charitable organization.

Secondly, this experiment only focuses on price ratios equal to 1 or below 1, whereas the study of Andreoni and Vesterlund (2001) also consists of price ratios above 1. The questions in this experiment have ratios were it becomes cheaper to give money away or subjects can give money away against the same price. When prices above one would have been included as well, this would not be reliable anymore, because subjects might realize that it is more efficient to not give anything in the experiment but instead to transfer the money directly to UNICEF after the experiment. In that case no money is lost, because the price ratio becomes 1:1 again. In the paper of Andreoni and Vesterlund (2001), this is less of a problem due to the fact that the receiver is another participant in the experiment. There is no possibility to transfer the money directly to the participant, because participants are randomly and anonymously connected to each other.

Finally, in the paper of Andreoni and Vesterlund (2001) subjects had to divide tokens between themselves and another participant, whereas in this experiment, subjects do not need to divide tokens but money. The reason for this is that it might be too complex to understand for some participants when they have to divide tokens that express a monetary value. When subjects can divide monetary amounts, it is more concrete and easier to follow.

Motivating participants

Unfortunately, due to practical and monetary reasons it is not possible to pay out every subject according to their decisions. In order to motivate and to make the experiment less hypothetical, subjects are informed at the beginning of the survey that after the experiment is concluded, one of the subjects will be randomly chosen and one of his/her choices during the experiment will actually be paid out. This means that one participant will receive the money he/she has given to him/herself, and that the corresponding amount will be donated to UNICEF. It is a voluntary decision for subjects to leave their email address at the end of the survey to participate in the lottery.

Procedure

The survey starts with an introduction screen, where subjects are thanked for their participation and are briefly explained what will be expected from them. Next, the reward system of the voluntary participation of the lottery is explained. On the following screen, subjects are asked to fill in their demographic information about gender, age, education and income. Then, subjects are randomly divided into one of the three different treatments by Qualtrics. When subjects are in the control group, they immediately start with the questions regarding the deviation of money. When subjects are in the treatment group, they are asked to look at the picture or read the information first. Subjects are presented with five different situations to divide money between themselves and UNICEF. The question they need to answer is: "Suppose I give you €X right now. How would you divide that between yourself and UNICEF?". In three of the situations it becomes less costly to give money away, because every euro they give away will be multiplied. In those scenarios, the following sentence is added to the question: "Note that every euro you give to UNICEF will be multiplied by 2. For example, when you choose to keep €10 and donate €5, UNICEF will receive €10". The order of the questions is randomized within every treatment and for every subject. The questions to divide money are multiple choice, with a difference of €1,- between every option. All choices start with "Keep €X and donate €Y". In the questions with a multiplier, the choices are framed as follows: "Keep €X and donate €Y, so UNICEF will receive €Z". At the final screen, subjects are thanked again for their participation and there is the possibility for subjects to leave their email address to participate in the final lottery. Some screenshots of the survey can be found in Appendix F.

3.3 Variables

In the analyzes there are several control variables used: gender, education, age, income, student and study background. The variables used in the statistical analyses are explained below:

Dmean: this variable is the dependent variable in most of the regressions and represents the average amount of money donated per subject per choice. The variable is calculated by adding the amount of money each subject donated to UNICEF in every question and divide the total sum by five. The focus for the dependent variable is on the amount of money that subjects donate, instead of the amount of money subjects keep. Both variables would tell the same, i.e. when a subjects initial amount is €10 and he decides to keep €6, he automatically donates €4. In line with the hypotheses, it is easier to explain the average amount of money donated and results in estimators with positive sign which should be more intuitive to interpret.

P1mean: this variable is the dependent variable in some of the regressions and represents the average amount of money donated per subject per choice at the price ratio 1:1. The variable is calculated by adding the amount of money that each subject donated to UNICEF in the two questions where the price ratio is equal to 1:1 and divide the total sum by two.

P2mean: this variable is the dependent variable in some of the regressions and represents the average amount of money donated per subject per choice at the price ratio 1:2. The variable is calculated by adding the amount of money that each subject donated to UNICEF in the two questions where the price ratio is equal to 1:2 and divide the total sum by two.

P3mean: this variable is the dependent variable in some of the regressions and represents the average amount of money donated per subject per choice at the price ratio 1:3.

P4mean: this variable is the dependent variable in some of the regressions and represents the average amount of money donated per subject per choice at the price ratios 1:2 and 1:3 together. The variable is calculated by adding the amount of money that each subject donated to UNICEF in the three questions where the price ratio is higher than 1:1 and divide the total sum by three.

Female: this variable is a dummy variable and represents the gender of a subject.

(0) = Male

(1) = Female

Age: this variable is a continuous variable and indicates the age of every subject.

University: this variable is a dummy variable and indicates whether the subject has a university degree or not.

(0) = No university degree

(1) = University degree

Economics: this variable is a dummy variable and indicates whether the subject has a study background in economics or not.

(0) = No economics

(1) = Economics

Student: this variable is a dummy variable and indicates whether the subject is a student at the moment or not.

(0) = No student

(1) = Student

Income: this variable is a categorical variable and represents the level of income of subjects. There are three different categories: low level of income, medium level of income and a high level of income. The income categories result in an roughly equal distribution of the subjects over each category.

(0) = Low level (€0 - €10.000)

(1) = Medium level (€10.001 - €40.000)

(2) = High level (€40.001 or more)

Treatment: this variable is a categorical variable and represents the treatment group of subjects. There are three different categories: control group, emotional treatment and reference treatment.

(0) = Control group

(1) = Emotional treatment

(2) = Reference treatment

Treatment1: this variable is a dummy variable and indicates whether the subject is within the emotional treatment or not.

(0) = Control group and reference treatment

(1) = Emotional treatment

Treatment2: this variable is a dummy variable and indicates whether the subject is within the reference treatment or not.

(0) = Control group and emotional treatment

(1) = Reference treatment

3.4 Analyses

For the statistical analyses, the program STATA version 15 (StataCorp, 2017) has been used. The hypotheses are tested with a linear regression model according to Ordinary Least Squares (OLS). The assumptions that need to hold to use a parametric test are explained and tested in Appendix B. The model used in this research is as follows:

$$y = \beta 0 + \beta 1 * Female + \beta 2 * Age + \beta 3 * University + \beta 4 * Income + \beta 5 * Student + \beta 6 * Economics + \beta 7 * Treatment1 + \beta 8 * Treatment2 + \varepsilon$$

The dependent variable (y) is not the same in all regressions. In most analyzes, the variable *dmean* is being used. Some hypotheses focus specifically on different price ratios only, so for those hypotheses the dependent variables are *p1mean, p2mean, p3mean* or *p4mean*.

Not all hypotheses have the same expectations for the betas, but for the main hypotheses that within each treatment the average amount of money donated is higher compared to the control group the expectations of the betas are as follows: the beta of the variables *female*, *age*, *medium/high level of income*, *university* and *treatment 1/2* are expected to be positive, whereas the betas of the variables *student*, *economics* and *low level of income* are expected to be negative.

4. Results

This section consists of four different paragraphs. Firstly, the data set is described and the summary statistics are presented in section 4.1. Next, the results of the regressions to test the hypotheses are presented in section 4.2. The section will start with an overview of the OLS-assumptions that will be checked and discussed. Next, the hypotheses will be tested. Then, some robustness checks of the results are provided and an additional difference-in-difference analysis is conducted. Finally, the implication, interpretation and discussion of the results are examined in section 4.4.

4.1 Summary statistics

Table 3 presents the summary statistics of the variables of the data set. The sample that has been used in the regressions consist of 224 subjects with an average age of 34.8 years old. There are 159 (70.98%) subjects that attended university and 65 (29.02%) with an HBO- or high school degree. The sample consists of 108 (48.21%) students and 116 (51.79%) subjects that are not. Next, 85 subjects have a study background in economics (37.95%) and 139 subjects have a different study background (62.05%). Finally, the sample consists of 1.120 observations, because all 224 subjects had to answer five different questions to divide money. In Appendix A, a more extensive explanation of the dataset is presented.

Table 3: Summary statistics

	Obs.	Mean	SD	Min.	Max.
Female	224	0.545	0.499	0	1
Age	224	34.804	16.411	19	81
University	224	0.710	0.455	0	1
Income category	224	0.839	0.853	0	2
Income - low	224	0.455	0.499	0	1
Income - medium	224	0.250	0.434	0	1
Income - high	224	0.295	0.457	0	1
Student	224	0.482	0.501	0	1
Economics	224	0.379	0.486	0	1
Treatment	224	1.013	0.812	0	2
Control	224	0.321	0.468	0	1
Emotional	224	0.344	0.476	0	1
Reference	224	0.335	0.473	0	1

Table 4 provides an overview of the correlation across all variables in the model. The highest correlation in the dataset is between the variables *student* and *income*, which is a negative value of -0.679. Other correlations with high values are between *income* and *age* (0.674) and between *age* and *student* (-0.669). These high levels of correlation across variables are not unexpected, due to the fact that students do not work, so they automatically have a lower income compared to working subjects. Moreover, when subjects are older, they work longer and have on average a higher income. Finally, students are younger than working subjects, so when subjects are older it is less likely that they still are a student.

Table 4: Correlations table

	Female	**Age**	**University**	**Income**	**Student**	**Economics**	**Treatment**
Female	1						
Age	-0.148	1					
University	0.067	-0.361	1				
Income	-0.246	0.674	-0.260	1			
Student	0.075	-0.669	0.400	-0.679	1		
Economics	-0.264	-0.151	-0.034	-0.079	0.203	1	
Treatment	-0.062	0.098	-0.036	-0.036	0.061	0.067	1

4.2 Regression results

To test the hypotheses and draw possible conclusions of the data, several regressions have been run. First, in paragraph 4.2.1 the mean payoffs are compared. In paragraph 4.2.2, the OLS assumptions are tested. Next, the hypotheses are tested and the results are presented in paragraph 4.2.3. Then, in paragraph 4.2.4 several robustness checks are conducted to see the impact on the results when some assumptions change. To conclude this section, in paragraph 4.2.5 an additional difference-in-difference regression is performed.

4.2.1 Mean comparison

To start, the average amount of money donated to UNICEF at each of the five separate choices will be compared, following the paper of Andreoni & Vesterlund (2001). Table 5 compares the average amount of money donated by males and females. The final column presents the *t*-statistics of the t-test whether the average donation is significantly different. As can be seen, the difference between the average donation of males and females within the sample is not significant ($t = 0.813$). The results are suggesting that on average, males and females behave very similar.

Table 5: Mean payoff to UNICEF, comparing males and females

Initial amount	Price ratio	Price	Mean	Males	Females	t-stat
€ 12	1:1	1	€ 8,38	€ 8,12	€ 8,59	0.847
€ 20	1:1	1	€ 12,87	€ 12,56	€ 13,13	0.673
€ 15	1:2	0.5	€ 20,70	€ 19,90	€ 21,36	1.086
€ 12	1:2	0.5	€ 16,96	€ 16,71	€ 17,18	0.436
€ 8	1:3	0.33	€ 17,25	€ 16,85	€ 17,58	0.654
			€ 15,23	€ 14,83	€ 15,57	0.813

The same table is constructed to compare the average amount of money donated within the control group versus within both treatment groups. As the final column of table 6 represents, the difference between the control and treatment groups is not statistically different ($t = 1.23$), but close to significance (p-value of 0.110). This is suggesting that there is no difference between the amount of money donated within the control group and treatment group, i.e. the treatments do not have an increasing effect. But, the difference in amount of money donated at the price ratio's 1:1 and 1:3 between control group and the treatments are statistically different at a level of 10%.

Table 6: Mean payoff to UNICEF, comparing control group and treatment groups

Initial amount	Price ratio	Price	Mean	Control	Treatment	t-stat
€ 12	1:1	1	€ 8,38	€ 7,86	€ 8,62	1.275*
€ 20	1:1	1	€ 12,87	€ 12,00	€ 13,28	1.419*
€ 15	1:2	0.5	€ 20,70	€ 19,92	€ 21,07	0.801
€ 12	1:2	0.5	€ 16,96	€ 16,19	€ 17,33	0.980
€ 8	1:3	0.33	€ 17,25	€ 16,13	€ 17,78	1.399*
			€ 15,23	€ 14,42	€ 15,62	1.233

However, simply comparing the sample means of the five different choices as presented in both tables, is quite misleading and leads to completely different conclusions of the results. To draw valid conclusions from the sample, the hypotheses are tested with a linear regression model based on Ordinary Least Squares (OLS).

4.2.2 Test OLS assumptions

To use OLS, there are seven assumptions that need to hold. If all OLS-assumptions are satisfied, the estimator is the best possible linear unbiased estimator. The residuals are the samples estimate of the error for each observation. To test the assumptions, several tests are executed based on the linear regression with 224 subjects (including the control variables *age,*

female, *university*, *income*, *treatment*, *student* and *economics*). The model used to test the assumptions is the one to test the first hypothesis, i.e. with *dmean* as dependent variable and both treatment dummies (*emotional* and *reference*) as control variables.

[1] Linear regression model

The parameters in the regression model need to be linear. The regression model is assumed to be linear when the dependent variable (y) is a linear function of independent variables (x) and the error term. This assumption is expected to hold. The dependent variable is the average amount of money donated to charity, which is linear.

[2] Random sample

There is a random sampling of the observations and the error terms are random. The dependent variable cannot influence the independent variables. In this research, the subjects are randomly divided over the three different treatments and the order of the questions is randomized as well. This assumption is expected to hold.

[3] Cov(x_i | x_j) = 0

This assumption states that there should be no multicollinearity. The assumption indicates that the independent variables within the model cannot have a linear relationship. When there is multicollinearity in the regression model, several variables are almost perfectly linear. When two variables have a perfect collinear relationship, they follow the exact same linear pattern. Multicollinearity is an issue because it causes misleading results, due to the fact that it inflates standard errors and gives doubtful estimates of coefficients. To test this assumption, the variance inflation factor test (VIF-test) is conducted. This is an index that measures how much the variance of a coefficient increases due to multicollinearity. Another possibility to check for multicollinearity could be to look at the correlation matrix. As a rule of thumb, when the VIF-test gives a value above four, multicollinearity could be an issue. As can be seen in table 7, none of the VIFs is above four and the mean VIF is equal to 1,73. This indicates that multicollinearity is not an issue.

Table 7: Results of the VIF-test for multicollinearity.

Variable	VIF	1/VIF
Age	2,36	0,423
Female	1,20	0,833
Income - medium	1,48	0,677
Income - high	2,80	0,357
University	1,25	0,802
Student	2,45	0,408
Economics	1,16	0,865
Emotional	1,41	0,71
Reference	1,44	0,696
Mean VIF	1,73	

[4] $E(\varepsilon_i \mid x_i) = 0$

This is the zero conditional mean assumption. The error term cannot be correlated with the independent variables, i.e. the independent variables need to be exogenous. When the error term is uncorrelated with the variables in the model, the OLS estimator is unbiased. However, when x_i and $\boldsymbol{\varepsilon}_i$ are correlated, the OLS estimator is inconsistent and biased. There are several possibilities that cause the endogeneity, such as omitted variable bias, measurement error, reverse causality or outliers.

Firstly, there is a possibility that some important variables are excluded from the model, which are correlated with both the dependent variable as well as another variable in the model. To test whether if the model suffers from omitted variable bias, the Ramsey RESET test is conducted. Under H_0, there are no omitted variables and under H_1, there are omitted variables. The Ramsey RESET test results in a *p*-value of 0.9709 and a F-statistic (3, 211) of 0.08, indicating that there is no evidence to reject H_0 at a significance level of $\alpha = 5\%$. There are no omitted variables, so there is no wrong specification in the model.

Another cause of endogeneity is the problem of outliers: some of the observations might be extreme outliers which mainly drive the results. The Cook's D-test is used to estimate the impact of a data point in an OLS-regression analysis. With the Cook's D-test can be seen if there are some data points that specifically drive the results and need to be controlled for validity. The Cook's D-test measures the effect of deleting an observation. In this sample, the Cook's D is never above 1, indicating that there are no outliers within the sample.

[5] $Var(\varepsilon_i \mid x_n) = \sigma^2 < \infty$

The variance of the error terms should be consistent and constant for all observations of x, indicating that the variance of the errors follows the condition of homoscedasticity. If the variance of the error terms does change, this is called heteroscedasticity. When the assumption of homoscedasticity is violated, the estimator is not efficient anymore. To test for homoscedasticity, the Breusch-Pagan or the White test can be used.

The Breusch-Pagan test is used to test for heteroscedasticity within a linear model. It is an inspection of the fitted values in a residuals plot. Under H_0, the variances of the error term are equal, indicating homoscedasticity. Under H_1, the variances of the error term are a multiplicative function of one or more variables, indicating heteroscedasticity. The White test can also be used to test the assumption of homoscedasticity. This test can also be used when the error terms are not normally distributed and is usually used for large samples.

As table 8 presents, the BP-test results in a *p*-value of 0.0733 and a χ^2 of 3.21, which indicates that H_0 cannot be rejected at a significance level of $\alpha = 5\%$. There is no evidence that the assumption of homoscedasticity is violated. White's test results in a *p*-value of 0.4081 and a χ^2 of 45.53 with 44 degrees of freedom. Again, H_0 cannot be rejected at a significance level of $\alpha = 5\%$. Both tests suggest that the variances of the errors are equal, so the assumption of homoscedasticity holds.

Table 8: Results of the Breusch-Pagan- and White's test for homoscedasticity.

Test	**N**	**χ^2**	**df**	***p*-value**
BP	224	3.21	1	0.0733
White	224	45.53	44	0.4081

[6] $Cov(\varepsilon_i, \varepsilon_j \mid x_n) = 0$

The error terms of different observations should not be correlated with each other, i.e. there should be no autocorrelation. The problem of autocorrelation occurs when the error terms in the regression model correlate with each other over time or depend on each other. When there is autocorrelation, the OLS-estimator is biased. To test whether autocorrelation is present within the residuals in a linear regression, the Durbin-Watson test can be used. Under H_0, the error terms are uncorrelated and under H_1, the error terms are correlated. The Durbin-Watson d-statistic ranges from 0 to 4 (Isard et al., 2017). When the DW-statistic is between 0 and lower

limit (dL), there is positive serial correlation (Isard et al., 2017). When the DW-statistic is between [4 – the upper limit (dU)] and 4, there is negative serial correlation (Isard et al., 2017). When the DW-statistic is between dU and 4-dU, including 2, there is no serial correlation (Isard et al., 2017). In this sample, the DW-statistic is 2.034 with 10 degrees of freedom. According to the DW-tables, dL is equal to 1.665 and dU is equal to 1.874 at a significance level of α = 5%. As table 9 shows, the DW-statistic of 2.034 is between dU and 4-dU, indicating that there is no serial correlation. The assumption that there is no autocorrelation holds.

Table 9: Results Durbin-Watson tests.

Positive correlation		**No correlation**			**Negative correlation**	
0	**dL**	**dU**	**2**	**4-dU**	**4-dL**	**4**
0	1.665	1.874	2	2.126	2.335	4

[7] $\varepsilon_i \sim N(0, \sigma^2)$

An optional assumption is that the error term follows a normal distribution. When the sample size increases, the distribution of the sample means automatically approaches a normal distribution, no matter the shape of the underlying population distribution. This is called the Central Limit Theorem. As a rule of thumb, this theory holds for sample sizes over 30. When the sample size is smaller than 30, it is necessary that this assumption holds. To check whether the residuals are normally distributed, the Smirnov-Kolmogorov test can be used.

The Smirnov-Kolmogorov test gives a skewness and kurtosis test for normality. Under H_0, there is no difference between the distribution of the sample and a theoretically normal distribution, i.e. the residuals follow a normal distribution. Under H_1, the residuals of the error term are not normally distributed. As table 10 presents, the SK-test results in a *p*-value of 0.0024 and an adjusted χ^2 of 12.09, which indicates that H_0 can be rejected at a significance level of α = 5%. There is evidence that the assumption of normal distribution is violated.

Table 10: Results residuals normality tests.

	N	**Pr(Skewness)**	**Pr(Kurtosis)**	**Adj. χ2**	**Prob > χ2**
Residuals	224	0.0033	0.0206	12.09	0.0024

To summarize, the OLS-regression can be used, because the model is expected to be linear, there is random sampling, there is no multicollinearity, no omitted variable bias, no outliers, there is homoscedasticity and no autocorrelation. However, the residuals do not follow a normal distribution, but the sample size is sufficiently large, so it does not matter.

4.2.3 Testing hypotheses

In this section the hypotheses are tested with different regression analyses. The dependent variable changes in each regression, as well as the sub groups that are compared. In most regressions, the dependent variable is the average amount of money donated per person per choice (*dmean*). In some regressions, the dependent variable is the average amount donated per person per choice at different price ratios (1:1, 1:2 and 1:3). In this paragraph, the regression results are presented and in paragraph 4.2.4 the implications of the results are discussed.

4.2.3.1 Hypothesis 1

To test the first hypothesis, a normal linear regression was conducted. This hypothesis states that on average, subjects within the treatment groups donate a higher amount of money to charity compared to the control group. The coefficient of both treatment variables is expected to be positive and significant. The results can be found in table 11. Both coefficients for the emotional treatment and the reference treatment are positive, suggesting that the average amount of money donated to UNICEF per person per choice is higher compared to the control group. However, the results are not significant at a significance level of $\alpha = 10\%$, because the *p*-values are 0.224 (emotional treatment) and 0.217 (reference treatment). But, hypothesis 1a is a directional hypothesis, so it can also be justified to test the hypothesis one-sided. A one-tailed test gives more power to provide an effect. In table 32 in Appendix C, the results are presented with corresponding *p*-values of the one-tailed test. Now both treatment groups are almost significant at a significance level of $\alpha = 10\%$. The *p*-value of the reference treatment is 0.109 and the p-value of the emotional treatment is 0.112. This is suggesting that both treatments do have a positive and increasing effect. Still, following the two-tailed test, hypothesis 1a cannot be confirmed with this current sample.

Table 11: Regression results hypothesis 1.

This table shows the results of the regression to test hypothesis 1. The dependent variable is *dmean*. The *p*-values are in parentheses and significance level is denominated by * (p<0.1), ** (p<0.05), and *** (p<0.01). The hypothesis is tested two-sided.

	(1)	(2)	(3)	(4)	(5)
Female		2.054**	1.996**	2.076**	2.241**
		(0.022)	(0.026)	(0.022)	(0.017)
Income – medium		3.402***	3.197***	3.466***	3.486***
		(0.002)	(0.005)	(0.004)	(0.004)
Income – high		6.062***	5.364***	5.841***	5.793***
		(0.000)	(0.000)	(0.000)	(0.000)
Age			0.0382	0.048	0.051
			(0.305)	(0.223)	(0.204)
University			1.206	1.017	1.054
			(0.233)	(0.330)	(0.314)
Student				0.977	0.857
				(0.458)	(0.520)
Economics					0.636
					(0.500)
Emotional group	1.225	1.539	1.310	1.276	**1.292**
	(0.273)	(0.141)	(0.217)	(0.229)	**(0.224)**
Reference group	1.167	1.593	1.460	1.367	**1.333**
	(0.299)	(0.132)	(0.173)	(0.205)	**(0.217)**
Constant	14.42***	10.41***	8.640***	7.736***	7.370***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Observations	224	224	224	224	224
R-squared	0.007	0.149	0.157	0.159	0.161
F-statistic	0.76	7.63***	5.73***	5.07***	4.55***

To test whether the amount of money donated per person per choice in the emotional treatment is highest, i.e. higher than the reference treatment, a linear combination test has been conducted. This test calculates whether the difference between the estimators of both treatments is significantly different from zero, given all the variance in the data. Under H_0, the two treatments are equal and under H_1, the two treatments differ. Table 12 shows that the coefficient of the linear combination test for regression five (presented in table 11) is -0.041 (SD 1.042) and the *p*-value is 0.969, indicating that H_0 cannot be rejected at a significance level of $\alpha = 5\%$. The differences between the estimators of the emotional and reference treatment are not significantly different. Hypothesis 1b cannot be confirmed with this current sample.

Table 12: Comparison emotional and reference treatment

	N	**Coef.**	**Std. Err.**	**t**	**P > |t|**	**95% Conf. Interval**	
Dmean	224	-0.041	1.042	-0.04	0.969	-2.096	2.014

As an additional test, the same regression is conducted with the different price ratios separately as dependent variable. The results of the one-tailed test are presented in table 13 (the two-tailed test can be found in table 33 in Appendix C). Regression one in table 13 reports the same results as regression five in table 11. As can be seen, both treatments become significant at the price ratio of 1:1, indicating that providing additional information when the price of giving equals one significantly increases the average amount of money donated to UNICEF compared to the control group. Moreover, as regression four shows, the treatment estimators are close to significance when the price ratio equals 1:3.

Table 13: Regression results average donation different price ratios.

This table shows the results of the additional regression. The dependent variable differs in every regression. First, *dmean* is used. Next, the regressions are repeated at each different price ratio again. The *p*-values are in parentheses and significance level is denominated by * (p<0.1), ** (p<0.05), and *** (p<0.01). The hypothesis is tested one-sided.

Total sample	(1)	(2)	(3)	(4)	(5)
Price ratio	All	1:1	1:2	1:3	1:2/1:3
Dependent	*dmean*	*p1mean*	*p2mean*	*p3mean*	*p4mean*
Female	2.241***	1.608***	2.808**	2.372**	2.663**
	(0.009)	(0.009)	(0.012)	(0.023)	(0.013)
Age	0.051	0.048*	0.0464	0.0655*	0.0528
	(0.102)	(0.048)	(0.191)	(0.097)	(0.149)
University	1.054	0.672	1.317	1.288	1.308
	(0.157)	(0.164)	(0.162)	(0.164)	(0.163)
Income – medium	3.486***	3.004***	4.353***	2.716*	3.807**
	(0.002)	(0.000)	(0.003)	(0.036)	(0.007)
Income – high	5.793***	4.554***	7.461***	4.936**	6.619***
	(0.000)	(0.000)	(0.000)	(0.007)	(0.000)
Student	0.857	0.947	1.058	0.273	0.796
	(0.260)	(0.162)	(0.274)	(0.435)	(0.319)
Economics	0.636	0.146	0.808	1.270	0.962
	(0.250)	(0.415)	(0.259)	(0.142)	(0.211)
Emotional	1.292	**1.119***	1.295	1.635	1.408
	(0.112)	**(0.072)**	(0.179)	(0.111)	(0.149)
Reference	1.333	**1.067***	1.403	1.725	1.511
	(0.109)	**(0.089)**	(0.164)	(0.103)	(0.136)
Constant	7.370***	4.254***	9.733***	8.878***	9.448***
	(0.001)	(0.003)	(0.000)	(0.000)	(0.000)
Observations	224	224	224	224	224
R-squared	0.161	0.195	0.135	0.110	0.132
F-statistic	4.55***	5.77***	3.72***	2.95***	3.61***

To compare the fits of different linear models, the F-statistic of the overall significance is reported for all regressions as well in the final row of each table. The F-test assesses all the coefficients together. The F-test compares a model without predictors (*intercept model*) to the specified model that has been used in the regression. Under H_0, the fit to the data of the intercept model and the specified model are equal and under H_1, the fit of linear regression model fits the data better. When the F-statistic is significant and H_0 can be rejected, the regression model that has been used improves the fit to the data and predicts the dependent variable better than just taking the mean of the dependent variable.

4.2.3.2 Hypothesis 2

These two sub-hypotheses are about the average amount of money donated per subject per choice within the control group. Following the paper of Andreoni and Vesterlund (2001), it is expected that females donate more money compared to males when the price ratio is equal to 1:1, while it is the other way around when it becomes cheaper to give money away, i.e. at price ratios 1:2 and 1:3.

As table 14 shows, the coefficient of the variable *female* is always positive. In regression two, the estimator is 1.477, suggesting that females donate a higher amount of money to UNICEF compared to males at a price ratio of 1:1. When the hypothesis is tested with a two-tailed test, the coefficient is not significant at a significance level of $\alpha = 10\%$, because the *p*-value in the final regression is 0.204. However, when the hypothesis is tested with a one-tailed test, indicating that H_1: female > 0, the coefficient becomes almost significant at a significance level of $\alpha = 10\%$, because the *p*-value is 0.102. Based on the results of Andreoni and Vesterlund (2001), there are solid reasons to assume the hypothesis can be tested one sided. However, the possibility to wrongly accept the null-hypothesis is larger, because it could be that giving behavior has changed in the last 18 years. Following the two sided test, hypothesis 2a cannot be confirmed with this current sample.

The results presented in regression five suggest that on average, females donate more money at a price ratio of 1:2 and 1:3 compared to males as well, because the coefficient of the variable *female* is 1.634. However, the coefficient is not significant at a significance level of $\alpha = 10\%$. This is a remarkable result, because it goes in the opposite direction of what one would expect

based on the paper of Andreoni and Vesterlund (2001). Based on this regression, hypothesis 2b cannot be accepted with this sample. In section 4.3, the results will be discussed in detail.

In Appendix C, two corresponding tables (34 and 35) are presented that provide an overview of the development when adding more variables to the model for regressions two and five. When testing hypothesis 2b, the sign of the coefficient *female* changes from negative to positive when more variables are added (table 35).

Table 14: Regression results hypotheses 2a and 2b.

This table shows the results of the regression to test hypothesis 2. The dependent variable differs in every regression, each different price ratio is used. In regression two, hypothesis 2a is tested and the dependent variable *p1mean* is used. In regression five, hypothesis 2b is tested and the dependent variable *p4mean* is used. The *p*-values are in parentheses and significance level is denominated by * (p<0.1), ** (p<0.05), and *** (p<0.01). The hypothesis is tested two-sided.

Control	(1)	(2)	(3)	(4)	(5)
Price Ratio	All	1:1	1:2	1:3	1:2/1:3
Dependent	*dmean*	*p1mean*	*p2mean*	*p3mean*	*p4mean*
Female	1.571	**1.477**	1.860	1.182	**1.634**
	(0.363)	**(0.204)**	(0.422)	(0.600)	**(0.468)**
Age	-0.015	0.010	-0.056	0.022	-0.031
	(0.844)	(0.841)	(0.567)	(0.826)	(0.749)
University	2.505	1.577	3.251	2.866	3.123
	(0.164)	(0.192)	(0.179)	(0.224)	(0.184)
Income – medium	5.412***	3.916***	7.094***	5.037*	6.409**
	(0.007)	(0.004)	(0.009)	(0.053)	(0.014)
Income – high	9.955***	7.551***	12.83***	9.016**	11.56***
	(0.000)	(0.000)	(0.001)	(0.014)	(0.002)
Student	-0.741	0.089	-1.132	-1.621	-1.295
	(0.722)	(0.949)	(0.686)	(0.553)	(0.634)
Economics	0.737	0.484	0.810	1.099	0.906
	(0.658)	(0.666)	(0.717)	(0.615)	(0.677)
Constant	7.744**	4.036*	10.87**	8.903**	10.22**
	(0.018)	(0.065)	(0.014)	(0.037)	(0.017)
Observations	72	72	72	72	72
R-squared	0.310	0.359	0.276	0.226	0.265
F-statistic	4.10***	5.13***	3.48***	2.67**	3.30***

4.2.3.3 Hypothesis 3

This hypothesis is specifically about the average amount of money donated per person per choice within the emotional treatment. Expected is that females donate more money to

UNICEF compared to males at any price ratio, because females are more sensitive for emotional triggers than males. The variable *female* is expected to be positive and significant.

In table 15, the results of this regression can be found. The coefficient of the variable *female* is always positive (2.047 in regression 1), suggesting that on average, females donate a higher amount of money to UNICEF compared to males. With a two-tailed test, the coefficient is not significant at a significance level of $\alpha = 10\%$, because the *p*-value is 0.154. These results can be found in table 36 in Appendix C. However, when testing the hypothesis one-sided, the variable *female* is significant in all regressions at a significance level of $\alpha = 10\%$. These results are indicating that within the emotional treatment, females do donate a higher amount of money to UNICEF compared to males. Based on the literature review, there is a valid and justified reason to assume this hypothesis can be tested one-sided. Females are more empathic and more sensitive to emotions (Mesch et al., 2011).

Table 15: Regression results hypothesis 3a.

This table shows the results of the regression to test hypothesis 3a. The dependent variable differs in every regression. First, *dmean* is used. Next, the regressions are repeated at each different price ratio again. The *p*-values are in parentheses and significance level is denominated by * (p<0.1), ** (p<0.05), and *** (p<0.01). The hypothesis is tested one-sided.

Emotional	(1)	(2)	(3)	(4)	(5)
Price ratio	All	1:1	1:2	1:3	1:2/1:3
Dependent	*dmean*	*p1mean*	*p2mean*	*p3mean*	*p4mean*
Female	**2.047***	**1.411***	**2.446***	**2.522***	**2.471***
	(0.077)	**(0.093)**	**(0.097)**	**(0.094)**	**(0.088)**
Age	0.165***	0.102**	0.232***	0.159**	0.208***
	(0.007)	(0.020)	(0.004)	(0.036)	(0.008)
University	2.815*	1.027	4.197**	3.628*	4.008**
	(0.060)	(0.221)	(0.039)	(0.067)	(0.041)
Income – medium	2.982*	2.298*	3.764*	2.787	3.439
	(0.080)	(0.073)	(0.088)	(0.162)	(0.101)
Income – high	4.546**	3.401**	5.972**	3.984	5.310*
	(0.047)	(0.046)	(0.046)	(0.134)	(0.061)
Student	3.734*	1.944	5.774**	3.235	4.928**
	(0.056)	(0.132)	(0.031)	(0.150)	(0.050)
Economics	0.210	-0.0874	0.0311	1.160	0.407
	(0.446)	(0.470)	(0.492)	(0.286)	(0.417)
Constant	2.581	3.392	0.973	4.173	2.040
	(0.245)	(0.111)	(0.421)	(0.202)	(0.334)
Observations	77	77	77	77	77
R-squared	0.216	0.210	0.220	0.130	0.198
F-statistic	2.71**	2.62**	2.78**	1.48	2.44**

Hypothesis 3b is specifically about the average amount of money donated per person per choice within the reference treatment. Expected is that when is becomes cheaper to give money to UNICEF, i.e. at a price ratio of 1:2 and 1:3, males donate more money to UNICEF compared to females. Following the literature review, males are more sensitive to changes in price (Andreoni and Vesterlund, 2001) and they prefer reference information.

As table 16 shows, the variable *female* is significant in almost all regressions at a significance level of $\alpha = 10\%$ ($\alpha = 5\%$). In regression five, the coefficient of *female* is 4.768, which is significant at a significance level of $\alpha = 5\%$. This result indicates that on average, females donate €4.77 more to UNICEF compared to males when the price ratio is equal to 1:2 or 1:3. This is a remarkable results, because exactly the opposite was expected. Next, as can be seen in the final row, the F-statistic is never significant, suggesting that the model used in the regression and an intercept model without predictor variables have an equal fit. In section 4.3, the results will be discussed in detail.

Table 16: Regression results hypothesis 3b.

This table shows the results of the regression to test hypothesis 3b. The dependent variable differs in every regression. First, *dmean* is used. Next, the regressions are repeated at each different price ratio again. The *p*-values are in parentheses and significance level is denominated by * (p<0.1), ** (p<0.05), and *** (p<0.01). The hypothesis is tested two-sided.

Reference	(1)	(2)	(3)	(4)	(5)
Price ratio	All	1:1	1:2	1:3	1:2/1:3
Dependent	*dmean*	*p1mean*	*p2mean*	*p3mean*	*p4mean*
Female	3.786*	2.312	4.987**	4.331*	**4.768****
	(0.052)	(0.119)	(0.048)	(0.057)	**(0.046)**
Age	0.002	0.034	-0.041	0.026	-0.018
	(0.974)	(0.559)	(0.677)	(0.767)	(0.841)
University	-1.732	-0.413	-2.812	-2.209	-2.611
	(0.368)	(0.779)	(0.261)	(0.326)	(0.296)
Income – medium	1.915	2.682	1.937	0.334	1.403
	(0.411)	(0.135)	(0.521)	(0.902)	(0.623)
Income – high	4.366	3.235	5.838	3.683	5.120
	(0.132)	(0.145)	(0.121)	(0.275)	(0.149)
Student	0.499	0.968	-0.052	0.662	0.186
	(0.860)	(0.654)	(0.989)	(0.841)	(0.957)
Economics	0.498	0.205	0.668	0.746	0.694
	(0.792)	(0.888)	(0.785)	(0.736)	(0.765)
Constant	12.53**	6.639*	17.56***	14.27**	16.47***
	(0.012)	(0.078)	(0.007)	(0.014)	(0.007)
Observations	75	75	75	75	75
R-squared	0.121	0.120	0.120	0.107	0.119
F-statistic	1.32	1.31	1.31	1.14	1.29

4.2.3.4 Hypothesis 4

These hypotheses are specifically about comparing the average amount of money donated per person per choice for each gender. Expected is that the amount of money donated to UNICEF is higher within the emotional treatment compared to the reference treatment for females, while for males it is the other way around. For both hypotheses, a linear combination test is provided after the normal linear regression to compare the differences between the two treatments. The results of the regression for females are presented in table 17 and for males in table 19.

The results of regression five (table 17) show that the coefficient of the reference treatment is significant at a significance level of $\alpha = 5\%$. On average, females within the reference treatment donate €3.04 more to UNICEF compared to the control group. This is quite surprising, because based on the literature review it was expected that females within the emotional treatment would significantly donate money to charity, but the coefficient is not even significant. In section 4.3 the results will be discussed further.

Table 17: Regression results hypothesis 4a..

This table shows the results of the regression to test hypothesis 4a. The dependent variable is *dmean*. The *p*-values are in parentheses and significance level is denominated by * (p<0.1), ** (p<0.05), and *** (p<0.01). The hypothesis is tested two-sided.

Females	(1)	(2)	(3)	(4)	(5)
Age		0.120***	0.145***	0.026	0.008
		(0.002)	(0.000)	(0.546)	(0.874)
University			2.701**	2.014	2.198*
			(0.043)	(0.107)	(0.088)
Income – medium				4.112***	3.866***
				(0.002)	(0.004)
Income – high				7.776***	7.471***
				(0.000)	(0.000)
Student					-0.906
					(0.513)
Economics					-1.003
					(0.406)
Emotional	2.100	1.395	1.249	1.782	**1.780**
	(0.135)	(0.307)	(0.355)	(0.156)	**(0.158)**
Reference	2.884**	2.089	2.134	3.028**	**3.040****
	(0.046)	(0.138)	(0.125)	(0.020)	**(0.020)**
Constant	13.95***	10.53***	7.766***	9.088***	10.416***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	122	122	122	122	122
R-squared	0.036	0.115	0.145	0.288	0.295
F-statistic	2.21	5.09***	4.96***	7.73***	5.91***

To test whether the difference between the average amount of money donated between the two treatments is significant, a linear combination test has been conducted for regression five. Table 18 shows the results of the test. The coefficient of the linear combination test is -1.260 (SD 1.263) with a *p*-value of 0.321, indicating that H_0 cannot be rejected at a significance level of $\alpha = 5\%$. There does seem to be a difference in the average amount of money donated per female per treatment, but the difference is not significant. Hypothesis 4a cannot be confirmed with this current sample.

Table 18: Comparison emotional and reference treatment for females.

	N	Coef.	Std. Err.	t	P > |t|	95% Conf. Interval	
Dmean	122	-1.260	1.263	-1.00	0.321	-3.762	1.242

For hypothesis 4b, the same regression is conducted for the subgroup males. As can be seen in table 19 (next page), the coefficient of the emotional or reference treatment is never significant at a significance level of $\alpha = 10\%$. The coefficients for both the emotional (-0.074) as well as the reference (-1.897) treatment are negative. The results are suggesting that on average, males within one of the two treatment groups give a lower amount of money to UNICEF compared to the control group.

Table 20 presents the results of the test to check whether the difference between both treatments is significant. The coefficient of the linear combination test for regression five (table 10) is 1.822 (SD 1.696) and the *p*-value is 0.285, indicating that H_0 cannot be rejected at a significance level of $\alpha = 5\%$. There does not seem to be a difference in the average amount of money donated per male per treatment in comparison to the control group. Based on this current sample cannot be concluded that showing males additional information before making their donation decision has an effect on the average amount. However, it is quite surprising that, based on the signs of the coefficients, on average men seem to give more money to charity in the control group compared to both treatment groups, even though it is not significant. In section 4.3 the results will be discussed further. Hypothesis 4b cannot be confirmed with this current sample.

Table 20: Comparison emotional and reference treatment for males.

	N	Coef.	Std. Err.	t	P > |t|	95% Conf. Interval	
Dmean	102	1.822	1.696	1.07	0.285	-1.544	5.189

Table 19: Regression results hypothesis 4b.

This table shows the results of the regression to test hypothesis 4b. The dependent variable is *dmean*. The *p*-values are in parentheses and significance level is denominated by * (p<0.1), ** (p<0.05), and *** (p<0.01). The hypothesis is tested two-sided.

Males	(1)	(2)	(3)	(4)	(5)
Age		0.113***	0.106**	0.071	0.116*
		(0.007)	(0.019)	(0.290)	(0.092)
University			-0.621	-0.383	-1.214
			(0.706)	(0.820)	(0.480)
Income – medium				1.397	4.007*
				(0.505)	(0.093)
Income – high				1.968	6.108**
				(0.438)	(0.049)
Student					5.993**
					(0.044)
Economics					1.750
					(0.233)
Emotional	0.080	0.157	0.259	0.454	**-0.074**
	(0.965)	(0.929)	(0.884)	(0.802)	**(0.967)**
Reference	-0.772	-0.746	-0.718	-0.482	**-1.897**
	(0.665)	(0.666)	(0.679)	(0.786)	**(0.298)**
Constant	15.08***	10.83***	11.45***	11.32***	5.010
	(0.000)	(0.000)	(0.000)	(0.000)	(0.174)
Observations	102	102	102	102	102
R-squared	0.003	0.076	0.077	0.084	0.147
F-statistic	0.15	2.68*	2.03*	1.46	2.01*

As additional tests, for both subsamples consisting of males and females, the regressions are repeated against all different price ratios. The results are presented in table 37 for females and in table 38 for males (Appendix C). For females, the coefficient of the reference treatment is significant in all regressions and when testing one-sided, the emotional treatment estimator is close to significance in almost all regressions. For males, the treatment variables never have a significant estimator.

Next, in table 13 (one-sided) and table 33 (two-sided, Appendix C), the results of the regression at each price ratio separately are reported. From these tables can be concluded that within this sample, females donate more money to compared to males against each price ratio, on average. The variable *female* is positive and significant in each regression at a significance level of α = 5% (1%).

To summarize, table 21 gives an overview of all hypotheses. However, for a lot of hypotheses the coefficient has the right sign. The implications will be discussed in section 4.3.

Table 21: Results testing hypotheses.

Hypothesis		Two-sided test		One-sided test	
		Significant	**Sign**	**Significant**	**Sign**
1a	Treatment > Control	No	Yes	No	Yes
1b	Emotional > Reference > Control	No		No	
2a	Control, 1:1 | Females > Males	No	Yes	No	Yes
2b	Control, 1:2/1:3 | Males > Females	No	No	No	No
3a	Emotional | Females > Males	No	Yes	Yes	Yes
3b	Reference, 1:2/1:3 | Males > Females	Yes	No	Yes	No
4a	Females | Emotional > Reference	No	No	X	
4b	Males | Reference > Emotional	No	No	X	

4.2.4 Robustness check

As robustness check for the results in paragraph 4.2.3, non-parametric tests are conducted as well. Some advantages of using nonparametric tests is the fact that they can be performed with smaller sample sizes and that outliers have less impact. To perform nonparametric tests, less assumptions need to hold compared to parametric tests. The only requirement is that the observations need to be independent and sometimes it is required that the data are drawn from an underlying continuous distribution.

The data set used in this thesis consists of three different subsamples; the control group, the emotional treatment group and the reference treatment group. The Kruskal-Wallis (KW) test can be used to compare these subgroups with each other. The KW-test tests if the median from the three different samples comes from the same population. Under H_0, the median of each of the groups is equal and under H_1, the medians are different. The result of the KW-test for treatments is presented in table 22. The *p*-value is 0.484, which is not significant at a significance level of $\alpha = 5\%$. There is no evidence to reject H_0. Based on the KW-test can be concluded that there are no significant differences in the average amount of money donated per choice between the three treatment groups.

Table 22: Result Kruskal-Wallis test for treatments.

The dependent variable used in this test is *dmean.*				
Treatment	**N**	**Rank sum**	**KW equality-of-populations rank test**	
Control	72	7567	$\chi 2$ (df 2)	1.45
Emotional	77	8830.50	*p*-value	0.484
Reference	75	8802.50		

When comparing two subsamples with each other, the Mann-Whitney-U (MWU) test can be used. The MWU-test is preferred over the Wilcoxon rank-sum test, because there is a between-subject design. In this sample, the MWU-test compares the means of two different samples and test whether they come from the same population. Under H_0, the means of the two samples are equal and under H_1, the means are different.

Table 23 shows the results of the MWU-test on the treatment groups as well as gender. As the table shows, none of the comparisons of samples is significant at a significance level of $\alpha = 5\%$, so there is no evidence to reject H_0. Based on the MWU-test can be concluded that there are no significant differences in the average amount of money donated per choice between the treatments or between males and females.

Table 23: Results Mann-Whitney-U test

Samples	**z**	**Prob > |z|**
Treatment – Control	1.198	0.231
Emotional – Reference	-0.303	0.762
Female – Male	-0.674	0.500

As some final robustness checks for hypothesis 1, first a margins plot is created to test whether the means between the treatments differ. Figure 4 in Appendix D shows the plot and based on the contrast test cannot be concluded that the means significantly differ. Next, the same regression model is conducted with a different dependent variable. Now the dependent variable is the average amount of money donated for each of the choices separately. The differences between each price ratio and each initial amount of money that subjects received can be seen. The results are reported in table 42 (two-tailed test) and table 43 (one-tailed test), presented in Appendix D. A remarkable result is that for the price ratio 1:1, both the emotional (for the choice to divide €12) and the reference (for the choice to divide €20) treatment become significant at a significance level of $\alpha = 10\%$ (table 43).

4.2.5 Moderator analysis

In the previous section it has been tested how males and females react to the treatments and if there are significant differences. As the results of hypothesis 4a showed, the average donation of females is higher in both treatments compared to the control group. For males on the other hand, both coefficients of the treatment variables are insignificant and negative. For males, the treatments do not have an increasing or decreasing effect on the average amount of money donated, their decision depends on other variables.

Surprisingly, for both males and females, there is no significant difference in the amount of money donated to charity between the treatments. This suggests that there is no difference in receiving either emotional or reference information. An additional question arising after these prior analyzes is whether the treatment effect is significantly different between females and males. So, do females react different to the treatments than males? Is there a significant difference in the average amount of money females and males donate to charity in one of the two treatments? This seems a valid question to ask, due to the contradicting results following the separate regressions. Moreover, when there is a significant difference in the way males and females react to the treatments, this has practical implications for charitable organizations. They could use different marketing advertisements and use a different approach to both males and females.

A post-hoc analysis is conducted to test the moderation effect of the treatments for each gender. This regression tests whether the predicted averages differ from each other. An interaction variable has been created, by multiplying the variable *female* with the variable *reference*. Next, a new regression is conducted with both variables as well as the interaction term. Now the slope of the variable *female* can be examined at a specific value of the treatment variable *reference*. Table 24 presents the results of the moderation effect analysis. The interaction effect, i.e. the difference of differences, shows whether the effect of the treatments on the dependent variable *dmean* is different for males and females and whether the effect of gender is different between the two treatments. According to regression one, the coefficient *female*reference* (2.10) is not significant at a significance level of $\alpha = 10\%$, suggesting that there is no difference. The coefficient of *female* (1.872) shows the effect of gender on *dmean* for the emotional treatment, suggesting that females in the emotional treatment donate on average a higher amount of money compared to males. The coefficient is insignificant as well, so this cannot be concluded for sure. The coefficient of *reference* shows the effect of the reference treatment for males and is insignificant at a significance level of $\alpha = 10\%$.

To test if there is a significant difference between males and females in the reference treatment, a similar regression with the variable *emotional* is conducted (regression two). Now the coefficient of *female* represents the gender effect on *dmean* in the reference treatment. As can be seen, the coefficient (3.972) is significant at a significance level of $\alpha = 5\%$. This indicates that females in the reference treatment donate a significantly higher amount of money compared to males. The interaction effect (-2.10) is insignificant, so the effect of the treatments on the dependent variable is not different for males and females and the effect of gender is not

different between the two treatments. The regressions are repeated for the price ratio 1:1 and the situation where it is cheaper to donate. As can be seen in regression four and six, the coefficient of the variable *female* is significant at a significance level of $\alpha = 5\%$, so based on this sample can be concluded that females within the reference treatment donate a significantly higher amount of money compared to males, against all price ratios.

In table 44 (Appendix E), the same moderation effect analysis is conducted, but now the control group is compared to both treatments. With this analysis can be tested whether the effect of the treatments on the dependent variable *dmean* is different for males and females and whether the effect of gender is different between the control group and the treatments. The difference of the differences is never significant. Only the coefficient of the variable *female* is significant in regression one, three and five. Based on these results can be concluded that females within the two treatments donate a significantly higher amount of money to UNICEF compared to females within the control group.

Table 24: Results moderation effect analysis (treatment vs gender)

This table shows the results of the moderation effect analysis. The dependent variable in regression one and two is *dmean*, in regression three and four is *p1mean* and in regression five and six is *p4mean*. The variable 'Reference' indicates whether the subject was in the reference treatment (1) or in the emotional treatment (0). The variable 'Emotional' is the reverse coded version and indicates whether the subject was in the emotional treatment (1) or in the reference treatment (0). The *p*-values are in parentheses and significance level is denominated by * (p<0.1), ** (p<0.05), and *** (p<0.01).

	(1)	(2)	(3)	(4)	(5)	(6)
Price ratio	All	All	1:1	1:1	1:2/1:3	1:2/1:3
Dependent	*dmean*	*dmean*	*p1mean*	*p1mean*	*p4mean*	*p4mean*
Female	1.872	**3.972****	1.332	**2.440****	2.232	**4.994****
	(0.211)	**(0.015)**	(0.233)	**(0.044)**	(0.235)	**(0.015)**
Age	0.089*	0.089*	0.067*	0.067*	0.103*	0.103*
	(0.072)	(0.072)	(0.068)	(0.068)	(0.096)	(0.096)
University	0.340	0.340	0.209	0.209	0.427	0.427
	(0.791)	(0.791)	(0.827)	(0.827)	(0.791)	(0.791)
Income – medium	2.541*	2.541*	2.531**	2.531**	2.547	2.547
	(0.098)	(0.098)	(0.028)	(0.028)	(0.186)	(0.186)
Income – high	4.273**	4.273**	3.352**	3.352**	4.887**	4.887**
	(0.028)	(0.028)	(0.021)	(0.021)	(0.045)	(0.045)
Student	2.199	2.199	1.531	1.531	2.644	2.644
	(0.221)	(0.221)	(0.253)	(0.253)	(0.240)	(0.240)
Economics	0.803	0.803	0.166	0.166	1.228	1.228
	(0.494)	(0.494)	(0.850)	(0.850)	(0.405)	(0.405)
Reference	-1.218	-	-0.705	-	-1.560	-
	(0.429)		(0.539)		(0.419)	
Emotional	-	1.218	-	0.705	-	1.560
		(0.429)		(0.539)		(0.419)
Fem * Ref	2.100	-	1.107	-	2.762	-
	(0.318)		(0.479)		(0.295)	
Fem * Emot	-	-2.100	-	-1.107	-	-2.762
		(0.318)		(0.479)		(0.295)
Constant	8.034***	6.816**	5.367**	4.662**	9.811**	8.252**
	(0.008)	(0.029)	(0.018)	(0.044)	(0.010)	(0.034)
Observations	152	152	152	152	152	152
R-squared	0.132	0.132	0.152	0.152	0.113	0.113
F-statistic	2.41**	2.41**	2.82**	2.82**	2.00**	2.00**

4.3 Implications results

In this research, four different hypotheses were tested, consisting of eight sub-hypotheses in total. Table 21 at the end of section 4.2.2 gives an overview of all hypotheses. In this paragraph the deviating results are discussed.

Expected sign and (almost) significant

When hypothesis 3a is tested one-sided, the coefficient of the variable *female* is significant (α = 10%) in every regression (table 15). Based on this regression can be concluded that within the emotional treatment, females donate a higher amount of money to charity compared to males. Females have an elastic demand curve, because they significantly donate more money to charity when it becomes cheaper to give, i.e. at price ratios of 1:2 and 1:3. So, females are sensitive to price changes. Charitable organizations could use this information and try to target females specifically when they have created a campaign that evokes emotions.

When conducting a one-tailed test for hypothesis 1a and 2a, the *p*-values of the related coefficients are close to 0.100 and almost become significant at a significance level of α =10%. Both hypotheses are directional, so there are solid reasons to test them one-sided. The results might become significant with a larger sample size, because the current *p*-values are close to significance. This can be interesting to examine more extensively in future research. When further studies confirm these results, charitable organizations could use the information in their (marketing) strategy of collecting money.

To repeat the results, testing hypothesis 1a one-sided results in a *p*-value of 0.112 for the *emotional* treatment and a *p*-value of 0.109 for the *reference* treatment (table 32, Appendix B). This suggests that both treatments have a positive effect on the average amount of money that has been donated, indicating that providing people with additional information before they have to make their decision to donate or not increases the amount of money donated. For charitable organization, this kind of information helps to design their campaigns, and it is preferable to provide some kind of additional information.

When hypothesis 2a is tested one-sided, the *p*-value of the variable *female* is 0.102. This is in line with the prior research paper of Andreoni and Vesterlund (2001), indicating that without additional information, females donate on average a higher amount of money to charity compared to males. When collecting money on the street, charitable organizations could better

approach and focus on females, because without context and additional information there is proof found in research that they donate on average a higher amount of money to charity.

Opposite and contradicting results

There are two hypotheses with remarkable results, because the sign of the coefficients is the opposite of what was expected. Both hypotheses are related to gender as well as the price ratio where it becomes cheaper to give, i.e. ratios of 1:2 and 1:3.

Firstly, hypothesis 2b has the opposite sign as expected. As table 14 presents, the coefficient of the variable *female* is positive instead of negative (1,634 with *p*-value 0.468), suggesting that females in the control group donate on average more money to charity than males at a price ratio of 1:2 and 1:3. The result is the contradictory with the results the research paper of Andreoni and Vesterlund (2001) found. A possible explanation causing the difference is the different group of participants. Within the experiment of Andreoni and Vesterlund (2001), only student volunteers from economic courses participated, while in this research the control group exists of both students (36 subjects) and non-students (32 subjects) as well as economic study background (26 subjects) and other study background (42 subjects). Both facts indicate that the sample within this research is more heterogeneous compared to the more homogenous sample of Andreoni and Vesterlund (2001). Another explanation could be found within the difference in recipients. In the research of Andreoni and Vesterlund (2001), the recipients were other students and in this research, the recipient was a charity: UNICEF. It could be possible that females react stronger to price differences compared to males when the recipient is a charitable organization they consider to be worthwhile, rather than another student. It might be that they consider giving money to UNICEF is more effectively altruistic than giving money to a fellow student. Females might be more willing to donate money to charity in comparison with other students, because they support the charitable goal and are aware of the fact that their money is needed more.

Secondly, hypothesis 3b has the opposite sign as expected. As table 16 shows, the coefficient of the variable *female* is positive (4,768 with *p*-value 0.046) instead of negative. In all regressions for the reference treatment, the variable *female* is positive and significant. However, based on the literature review it would have been expected that the coefficient would be negative. Males are more sensitive to price changes (Andreoni & Vesterlund, 2001) and they prefer factual and statistical information (Baron-Cohen, 2002). Based on this data analysis

can be concluded that males are less sensitive to price changes and have a more inelastic demand curve.

A possible clarification for both contradicting results is that the behavior of males has changed over time, because both papers that support the hypotheses have been published almost 20 years ago. It could be that nowadays, males donate less to charity and/or are less sensitive to changes in price ratio. On the other hand, it is also possible that behavior of females changed and became more efficient in giving money.

When looking at the F-statistic of overall significance from the models used to test hypothesis 3b, none of them are significant at a significance level of α =10%. This indicates that a model without any independent variables has an equal fit to the data as the linear regression model that has been used. This might be caused because besides the variable *female* none of the independent variables is statistically significant within this sub-sample.

Coefficients different sign

Three of the hypotheses in this research test whether there is a significant difference between the treatment effects of the emotional and reference treatment. All hypotheses have a different sub-sample group. Hypothesis 1a is about the whole sample, hypothesis 4a tests the sub-sample consisting of females and hypothesis 4b tests the sub-sample consisting of males. Testing those three hypotheses provides results that are the opposite of what was expected.

Firstly, hypothesis 1b has an insignificant result and based on this sample it cannot be proved that within the emotional treatment the average amount of money donated is higher compared to the reference treatment. As table 11 shows, both coefficients of the *emotional* (1.292) and the *reference* (1.333) treatment are positive, as was expected, but the coefficient of the *reference* treatment is larger than the *emotional* treatment. Expected was that the emotional treatment would have had the largest effect and thus would have had a larger coefficient compared to the reference treatment. These coefficients suggest that subjects in the reference treatment donate on average the highest amount of money to charity, but there is no significant difference.

Secondly, based on the test for hypothesis 4a cannot be concluded that females donate a significantly higher amount of money within the emotional treatment compared to the reference

treatment. While the coefficient of both the emotional- and reference treatment is positive, the difference is insignificant. Overall, females within the sample react pretty much as expected. However, as table 17 shows, the coefficient of the *reference* treatment (3,040) is both larger and more significant (*p*-value 0.020) than the coefficient of the *emotional* treatment (1,780 with *p*-value 0.158). This suggest that on average, females donate more money to charity within the reference treatment compared to the emotional treatment. Nevertheless, the difference is not significant so no such conclusions can be drawn. A possible explanation about the lack of significance could be that the treatment effects were not sufficiently strong. For example, when presenting a short movie instead of showing pictures, this might evoke a stronger emotional reaction, because different senses are stimulated: besides visualization there are also sounds.

Thirdly, based on the test for hypothesis 4b cannot be concluded that males donate a significantly higher amount of money within the reference treatment compared to the emotional treatment. The coefficients of both treatments have the opposite sign as expected. As table 19 presents, the coefficient of the *reference* treatment variable (-1.987) is negative instead of positive, suggesting that on average, males donate less money to charity within the reference treatment compared to the control group. The coefficient of the *emotional* treatment variable is negative as well (-0.074). Both results about the way males react to the treatments in this sample is contrary to what would have been expected. It is quite surprising that men react even less to reference treatment compared to emotional treatment and react even stronger to the control group. A possible explanation is the haziness of the goal of the reference treatment, for example because the presented facts do not impress males. Males within the sample could have had higher expectations of UNICEF and were disappointed by the presented facts of their accomplishments in 2017. Subsequently, males might not have known how to interpret the facts. For example, when reading that UNICEF immunized 78.6 million children against measles in 2017, it could be that the number is too large to estimate the actual impact and size. These kinds of problems are maybe unknown for males in the Netherlands, and they might not understand the importance of such actions or do not know what to compare it with.

Gender

Based on the results of this research (table 13) can be concluded that on average, females within this sample donate a significantly higher amount of money to charity compared to males at each different price ratio (significance level of $\alpha = 5\%$). When looking at the subsamples of the different treatments, in both the emotional and reference treatment females donate a

significantly higher amount of money compared to males, against each price ratio. Only when looking at the control group, the estimator of *female* is positive but not significant. Based on this sample can be concluded that females are more sensitive to changes in price and more altruistic, because they always donate a higher amount of money to charity. Females have an elastic demand curve and significantly donate more money to UNICEF when it becomes cheaper to give. A possible clarification for the difference could be that females have a higher level of empathy then males and care more about other people.

Price ratios

A remarkable result can be found in the results of the regression where the average amount of money donated at choice separately is tested, as presented in table 43 (Appendix D). Based on these results can be concluded that the treatment effects are only significant when the price ratio is equal to 1:1. This kind of information can be used in marketing campaigns of charitable organizations. When it becomes cheaper to donate money, i.e. at price ratios of 1:2 and 1:3, no additional information is needed to encourage people to donate. However, when the price ratio is equal, both reference and emotional information significantly increase the average amount of money that has been donated. It helps to evoke emotions or present statistical facts to increase the amount of money donated. It is justified to test the hypothesis one-sided, because it was expected that there would be a treatment effect. When looking at regression five, the estimators of both treatment variables are close to significance: the *p*-value of the *emotional* treatment is 0.111 and the *p*-value of the *reference* treatment is 0.103. This is suggesting that providing additional information has a positive and increasing effect to the average amount of money donated when the price ratio equals 1:3 again. However, this could be a specific results for this sample, because there was only one question within the survey for this price ratio.

Economics

The variable *economics* was added to the model, because it was expected that subjects with a study background in economics are more sensitive to changes in price because they understand it becomes more efficient to give. Economists are used to work with numbers, to process facts and think more rational compared to non-economists, so it was expected that subjects with a study background in economics would donate more money within the reference treatment. However, the variable *economics* is never significant, so based on this sample cannot be concluded that study background has a positive or negative impact on the average amount of money that has been donated to charity.

5. Discussion

5.1 Limitations

The data used to compile this research paper has been gathered from a survey, created in Qualtrics. Afterwards, there are some limitations to the survey design and the validity of the research that need be taken into consideration.

Survey

When creating a survey, there always exists a tradeoff in the research design between understanding the questions and creating a small bias. The possibility of creating a small framing effect or an anchoring bias (Tversky & Kahneman, 1974) is better than to confuse subjects during the experiment by randomization the order of all multiple choice questions. Next, due to practical implications, the monetary amount used in the survey have been chosen. It is possible that the monetary amounts used in the survey are too low to obtain significant results. Thirdly, it could be the case that both treatments are not sufficiently strong to achieve the intended effect. However, subjects participate on voluntary base to the survey, so there is a tradeoff between time and achieving the intended treatment effect. It was preferred that most subjects finished the survey and did not lose their attention or rush through the survey.

Alternatively, some of the control variables could have been created in a different way. The variable *student* could have been specified into more categories, such as working and retired, to gain more insights into the participants. The boxes for the variable *income* could have been more widely spread. Finally, there is always the possibility that some participants did not appreciate UNICEF and made their decision not to donate based on their feelings towards the organization instead of based on the provided information.

Validity

The external validity of this research might be limited due to the sample bias and selection bias. All subjects are contacted through personal network, resulting in a sample with mainly highly educated subjects, who are currently studying and aged between 20-25. This causes heterogeneity and a lot of variance for the variables *age* and *income*.

It could also be possible that there are limitations to the internal validity of this research. First, one can never be sure that all participants do not give random answers, do not read the questions

carefully or do not answer the questions fairly. Secondly, it could be that the bias of the experimenter demand occurs (Zizzo, 2010). After two questions, subjects might have already understood the purpose of the experiment and answer the following questions based on what they think is socially desirable rather than based on their actual intentions. Helping others is socially preferred behavior and is seen as a good thing to do (Bekkers and Wiepking, 2011). Participants are often their better selves when answering surveys and might give more money to UNICEF than in reality (Braun, Jackson & Wiley, 2010). A possible solution to avoid the socially preferred answers is to rephrase the questions and give multiple choice options with possible spending options. For example "Suppose I would give you €20 right now, what would you do with that?" and as possible choices things like: 'keep it all', 'buy a beer', 'buy clothes', 'donate X to UNICEF', or 'save'. When subjects choose the option to donate some money to UNICEF, an empty box appears where they could fill in the amount they would like to donate. An advantage to phrasing the question this way is that it forces subjects less into a specific direction. However, a disadvantage is that it would be possible that there was no useful data from the survey, because none of the participants chose to donate money to UNICEF.

Moreover, in a survey it is easier to give all the money away, because it does not feel like an actual loss. The bias that might occur is called the house money effect, which indicates that subjects act differently with money they receive compared to money that is their own (Thaler, 1999). People are more risk averse regarding their own money. Within this survey, subjects do not have the feeling that they lose money, because they do not own the hypothetical money they receive yet. It is easier to do 'good' within the survey, because there is no loss for oneself, participants will not even notice they miss it, because they never had it. In reality, subjects receive a monthly wage and have to decide to donate a part of that to charity. When making the decision, the money is already their own.

5.2 Future research

Firstly, when it is possible to obtain a more heterogeneous sample of age and education that is more representative for the Netherlands, this research could be improved by adding other variables that might impact the average amount of money individuals donate to charity, such as marital status, number of children, happiness, race, ethnicity, geographic region, residence, employment, political preference or volunteers (Bekkers & Wiepking, 2011; Okunade & Bert, 1997).

Secondly, only one factor has been researched in this experiment, i.e. the effect of providing *additional information* before making the decision to donate money to charity. Subjects were either presented with pictures or facts of UNICEF. Besides additional information, there are various other factors that might influence the willingness of participants to donate money as well as the amount of money, which could be interesting to add to the research.
For example, the location in which the charitable organization operates could be added. Does the charity operate locally or abroad? Subjects might feel more inclined to donate to initiatives that focus on smaller, grass-roots initiatives which are working locally. Also, the organization's brand awareness is interesting to take into consideration: is the organization relatively small or large and well-known? What kind of approach does the organization take to raise awareness? Thirdly, the popularity of the organization: is it an outspoken organization such as PETA? Fourthly, the media coverage about the organization is an interesting factor to take into account: does the media report about the work the organization provides? Is the reporting positive or not? Does the media report about the cause the charitable organization intends to help? This can all influence the perception of urgency for the cause. Fifthly, the factor of ambassadors of the organization is interesting to consider: does the charity have well-known or popular people as ambassadors? Also, the differentiation of the organization: what is the goal of the charity? Is the organization committed to a humanitarian cause, or one that is concerned about animals or climate? How does the charity help its target group? Is it committed to providing more safety, education, health, medicine or food? When personal values are in line with the charitable values, an individual is more likely to donate money to that organization (Bennett, 2003). Lastly, the subjects' ability to identify with the problem. For people living in the Netherlands it might be easier to identify themselves with events that happened relatively close to them geographically as well as emotionally, such as the 2019 shooting in Utrecht (Volkskrant, 2019) or the terrorist attack in 2016 in Nice (Volkskrant, 2016) compared to the war in Afghanistan (Müller & Rutenfrans, 2019). Possibly, causes a subject can relate to result in a higher level of empathy and a larger amount of money that will be donated.

Finally, provided that sufficient sources are available for a next experiment, it would be interesting to conduct a lab experiment to test several hypotheses from this research. A lab experiment could prevent subjects to rush through the survey, it could ensure that subjects emotions are triggered enough by for example showing a movie and it would increase the credibility of the experiment. A lab experiment provides the possibility to bring subject' choices closer to how they would choose with real money, because it is possible to pay out

every decision subjects make, so they are less prone to the bias of the experimenter demand effect. Next, it would be possible to use higher initial amounts of money, which might cause different results. Lastly, to avoid the house money effect, it comes closer to reality when participants actual receive the money at the beginning of the experiment and then have the option to donate some of it.

6. Conclusion

The aim of this thesis was to examine the influence of emotional and reference information on the price elasticity of giving behavior. To test the effect, a survey has been designed which has been completed by 224 subjects in total. Within the survey, subjects were asked to divide money between themselves and UNICEF, at different price ratios (1:1, 1:2 and 1:3) and different initial amounts of money (ranging from €8 - €20). There were three different groups created: a control group without additional information and two treatment groups. One treatment group had to look at 'emotional' information before making the choices to divide money, the other treatment group first had to read the 'reference' information. To investigate whether the additional information has an effect on the average amount of money each subject donates to charity, a linear regression model based on OLS has been used. In this research paper four different hypotheses were tested, consisting of eight sub-hypotheses in total.

The results of this research paper provide more insights into altruistic behavior, but the findings are not settled yet. While the results suggest that additional information has an effect on the price elasticity of giving behavior, more research is necessary to consolidate the conclusions. Clearly, income and gender play an important role in the determination of the amount of money donated to charity. In this sample, females react as was expected: the additional information, both emotional and reference, impact their giving behavior and increased their average donation significantly. Moreover, females donate on average a significantly higher amount of money to charity compared to males. This is the case when looking at the whole sample as well as in the subsamples of the two different treatments. Females are more sensitive to changes in price compared to males, because they donate a significantly higher amount of money to charity against all price ratios. So, females have a more elastic demand curve than males. A surprisingly result is the way males react to the treatments. The coefficients of both treatment variables within the subgroup males have a negative sign, suggesting that males donate the highest amount of money within the control group. The coefficients are insignificant, but are suggesting that providing additional information to males has a negative and opposite effect. The decision about donating money to charity for males is determined by other variables besides providing additional information.

As another remarkable result, the treatments have a significant effect on the average amount of money that has been donated when the price ratio equals 1:1. This is something charitable

organizations could use in their campaigns, because when the price of giving is normal, as usually when donating money, providing additional information has a positive and increasing effect to the average donation. On the other hand, when it becomes cheaper to give money, this is stimulating enough for subjects within this sample and the significance of the treatment variables disappears.

As the two extreme examples of the Notre Dame and Maarten van der Weijden in the introduction show, when people are affected by emotions, they are more willing to donate money to the cause. Macron anticipates perfectly to the fact, by tweeting that “A part of us is burning”, to intensify the emotions of the citizens in France.

References

Akerlof, G. A., & Kranton, R. E. (2000). Economics and identity. *The Quarterly Journal of Economics*, *115*(3), 715-753.

Andreoni, J. (1989). Giving with impure altruism: Applications to charity and Ricardian equivalence. *Journal of political Economy*, *97*(6), 1447-1458.

Andreoni, J. (1990). Impure altruism and donations to public goods: A theory of warm-glow giving. *The economic journal*, *100*(401), 464-477.

Andreoni, J., & Vesterlund, L. (2001). Which is the fair sex? Gender differences in altruism. *The Quarterly Journal of Economics*, *116*(1), 293-312.

Andreoni, J., Brown, E., & Rischall, I. (2003). Charitable giving by married couples who decides and why does it matter?. *Journal of human Resources*, *38*(1), 111-133.

Anheier, H. K., & Leat, D. (2006). *Creative philanthropy: Toward a new philanthropy for the twenty-first century*. Oxon: Routledge.

Anheier, H. K., & Salamon, L. M. (2006). The nonprofit sector in comparative perspective. *The nonprofit sector: A research handbook*, *2*, 89-116.

Anik, L., Norton, M. I., & Ariely, D. (2014). Contingent match incentives increase donations. *Journal of Marketing Research*, *51*(6), 790-801.

Auten, G., & Rudney, G. (1990). The variability of individual charitable giving in the US. *Voluntas: International Journal of Voluntary and Nonprofit Organizations*, *1*(2), 80-97.

Auten, G.E., Sieg, H. and Clotfelter, C.T. (2002) 'Charitable giving, income and taxes: an analysis of panel data', *The American Economic Review*, *92*(1): 371–82

Ariely, D., Bracha, A., & Meier, S. (2009). Doing good or doing well? Image motivation and monetary incentives in behaving prosocially. *American Economic Review*, *99*(1), 544-55.

Bandes, S. A., & Salerno, J. M. (2014). Emotion, proof and prejudice: The cognitive science of gruesome photos and victim impact statements. *Ariz. St. LJ*, *46*, 1003.

Baron-Cohen, S. (2002). The extreme male brain theory of autism. *Trends in cognitive sciences*, *6*(6), 248-254.

Becker, G. S. (1974). A theory of social interactions. *Journal of political economy*, *82*(6), 1063-1093.

Bekkers, R., & Meijer M.M. (2008). Straight From the Heart. In *Patients, Consumers and Civil Society: US and International Perspectives*. Advances in Medical Sociology, ed. S Chambré, M Goldner, R Root.

Bekkers, R., & Wiepking, P. (2011). Who gives? A literature review of predictors of charitable giving part one: religion, education, age and socialisation. *Voluntary Sector Review*, *2*(3), 337-365.

Bennett, R. (2003). Factors underlying the inclination to donate to particular types of charity. *International Journal of Nonprofit and Voluntary Sector Marketing*, *8*(1), 12-29.

Bennett, R. (2018). Financial charity giving behaviour of the working poor: an empirical

investigation. *Journal of Marketing Management*, *34*(17-18), 1587-1607.

Blumkin, T., & Sadka, E. (2007). A case for taxing charitable donations. *Journal of Public Economics*, *91*(7-8), 1555-1564.

Boris, E. T., and Steuerle, C. E. (2006). Scope and dimensions of the nonprofit sector. In: Powell, W.W., and Steinberg, R. (Eds.), The Nonprofit Sector: A Research Handbook (p. 66-88). New Haven, CT: Yale University Press.

Braun, H. I., Jackson, D. N., & Wiley, D. E. (2001). Socially desirable responding: The evolution of a construct. In *The role of constructs in psychological and educational measurement* (pp. 61-84). Routledge.

Burt, C. D., & Strongman, K. (2005). Use of images in charity advertising: Improving donations and compliance rates. *International Journal of Organisational Behaviour*, *8*(8), 571-580.

Carman, J. G., & Fredericks, K. A. (2010). Evaluation capacity and nonprofit organizations: Is the glass half-empty or half-full?. *American Journal of Evaluation*, *31*(1), 84-104.

Chandran, S., & Menon, G. (2004). When a day means more than a year: Effects of temporal framing on judgments of health risk. *Journal of Consumer Research*, *31*(2), 375-389.

Chang, C. T., & Lee, Y. K. (2009). Framing Charity Advertising: Influences of Message Framing, Image Valence, and Temporal Framing on a Charitable Appeal 1. *Journal of Applied Social Psychology*, *39*(12), 2910-2935.

Chang, C. T., & Lee, Y. K. (2010). Effects of message framing, vividness congruency and statistical framing on responses to charity advertising. *International Journal of Advertising*, *29*(2), 195-220.

Genevsky, A., Västfjäll, D., Slovic, P., & Knutson, B. (2013). Neural underpinnings of the identifiable victim effect: Affect shifts preferences for giving. *Journal of Neuroscience*, *33*(43), 17188-17196.

Havens, J. J., O'Herlihy, M. A., & Schervish, P. G. (2006). Charitable giving: How much, by whom, to what, and how. *The nonprofit sector: A research handbook*, *2*, 542-567.

Holt, C. A., & Laury, S. K. (2005). Risk aversion and incentive effects: New data without order effects. *American Economic Review*, *95*(3), 902-912.

Huhmann, B. A., & Brotherton, T. P. (1997). A content analysis of guilt appeals in popular magazine advertisements. *Journal of Advertising*, *26*(2), 35-45.

Isard, W., Azis, I. J., Drennan, M. P., Miller, R. E., Saltzman, S., & Thorbecke, E. (2017). *Methods of interregional and regional analysis*. Routledge, 176-178.

Karlan, D., & List, J. A. (2007). Does price matter in charitable giving? Evidence from a large-scale natural field experiment. *American Economic Review*, *97*(5), 1774-1793.

Karlan, D., List, J. A., & Shafir, E. (2011). Small matches and charitable giving: Evidence from a natural field experiment. *Journal of Public Economics*, *95*(5-6), 344-350.

Karlan, D., & List, J. A. (2014). *How Can Bill and Melinda Gates Increase Other People's Donations to Fund Public Goods? - Working Paper 292* (No. 292). (No. w17954). National Bureau of Economic Research.

Khalil, E. L. (2004). What is altruism?. *Journal of economic psychology*, *25*(1), 97-123.

Kidd, A. J. (1996). Philanthropy and the 'social history paradigm'. *Social History*, *21* (2), 180-192.

Kingma, B. R. (2003). Public good theories of the nonprofit sector. In *The study of the nonprofit enterprise* (pp. 53-65). Springer, Boston, MA.

Liket, K. K. (2014). *Why 'doing good'is not good enough: Essays on social impact measurement* (No. EPS-2014-307-STR).

Merchant, A., Ford, J. B., & Sargeant, A. (2010). Charitable organizations' storytelling influence on donors' emotions and intentions. *Journal of Business Research*, *63*(7), 754-762.

Mesch, D. J., Brown, M. S., Moore, Z. I., & Hayat, A. D. (2011). Gender differences in charitable giving. *International Journal of Nonprofit and Voluntary Sector Marketing*, *16*(4), 342-355.

Nagel, T. (1970). The Possibility of Altruism. Princeton, NJ: Princeton University Press; 3-146.

Okunade, A. A., & Berl, R. L. (1997). Determinants of charitable giving of business school alumni. *Research in higher education*, *38*(2), 201-214.

Schwartz, S. H. (1977). Normative influences on altruism. In *Advances in experimental social psychology* (Vol. 10, pp. 221-279). Academic Press.

Simmons, R. G. (1991). Presidential address on altruism and sociology. *The Sociological Quarterly*, *32*(1), 1-22.

Simmons, W. O., & Emanuele, R. (2004). Does government spending crowd out donations of time and money?. *Public Finance Review*, *32*(5), 498-511.

Simmons, W. O., & Emanuele, R. (2007). Male-female giving differentials: are women more altruistic?. *Journal of Economic Studies*, *34*(6), 534-550.

Small, D. A., Loewenstein, G. and Slovic, P. (2007). "Sympathy and Callousness: The Impact of Deliberative Thought on Donations to Identifiable and Statistical Victims." *Organizational Behavior and Human Decision Processes*, *102*(2): 143-153.

Small, D. A., & Verrochi, N. M. (2009). The face of need: Facial emotion expression on charity advertisements. *Journal of Marketing Research*, *46*(6), 777-787.

Smith, G. E., & Berger, P. D. (1996). The impact of direct marketing appeals on charitable marketing effectiveness. *Journal of the Academy of Marketing Science*, *24*(3), 219-231.

Smith, J. R., & McSweeney, A. (2007). Charitable giving: The effectiveness of a revised theory of planned behaviour model in predicting donating intentions and behaviour. *Journal of Community & Applied Social Psychology*, *17*(5), 363-386.

Steinberg, D. (2010). Altruism in medicine: its definition, nature, and dilemmas. *Cambridge Quarterly of Healthcare Ethics*, *19*(2), 249-257.

Sugden, R. (1982). On the economics of philanthropy. *The Economic Journal*, *92*(366), 341-350.

Srivastava, P., and Oh, S.A., (2010). Private foundations, philanthropy, and partnership in education

and development: Mapping the terrain. International Journal of Educational Development, 30: 460– 47.

Thaler, R. H. (1999). Mental accounting matters. *Journal of Behavioral decision making*, *12*(3), 183-206.

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

Wright, K. (2001). Generosity vs. altruism: Philanthropy and charity in the United States and United Kingdom. *Voluntas: International Journal of Voluntary and Nonprofit Organizations*, *12*(4), 399-416.

Zizzo, D. J. (2010). Experimenter demand effects in economic experiments. *Experimental Economics*, *13*(1), 75-98.

Online sources

Chepkemoi, J. (2017). This page was last updated on April 25, 2017. The Wealthiest Charitable Foundations In The World. *Worldatlas.* Online source, visited 12-5-2019. https://www.worldatlas.com/articles/which-are-the-wealthiest-charitable-foundations-worldwide.html

De Graaf, S. and Verwiel, E. (2018). Bedrijven spekken grote goede doelen met 33 miljoen euro. *Volkskrant*, 25-09-2018. Online source visited 26-06-2019. https://www.volkskrant.nl/nieuws-achtergrond/bedrijven-spekken-grote-goede-doelen-met-33-miljoen-

Geels, M. (2019). Maarten van der Weijden haalt finish van Elfstedenzwemtocht. *NRC Handelsblad.* 24-06-2019. Online source visited 26-06-2019. https://www.nrc.nl/nieuws/2019/06/24/maarten-van-der-weijden-haalt-finish-van-elfstedentocht-in-leeuwarden-a3964871

Kenton, W. (2018), updated 22-10-2018. Online source, visited 19-5-2019. https://www.investopedia.com/terms/p/priceelasticity.asp

Müller, H. and Rutenfrans, C. (2019). Amerikanen gaan weg uit Afghanistan, goed of slecht? *Volkskrant*. 4-02-2019. Online source, visited 28-06-2019. https://www.volkskrant.nl/columns-opinie/amerikanen-gaan-weg-uit-afghanistan-goed-of-slecht~b00b4493/

Steenhuis, P. H. (2018). Goede doelen steunen, dat kan veel efficiënter. *Trouw*. 21-09-2018. Online source visited 26-06-2019. https://www.trouw.nl/religie-filosofie/goede-doelen-steunen-dat-kan-veel-efficienter~b9fd4aed/

Van Uffelen, X. (2019). Goede doelen verliezen steun trouwe donateurs. *Volkskrant.* 23-09-2019. Online source visited 03-10-2019. https://www.volkskrant.nl/nieuws-achtergrond/goede-doelen-verliezen-steun-trouwe-donateurs~b415b58ad/

Online sources for introduction

- https://www.nu.nl/economie/5850882/miljardair-verdedigt-donaties-notre-dame-geen-belastingvoordeel.html
  Online source, visited 26-06-2019.
- https://www.nu.nl/buitenland/5847183/donaties-voor-reparatie-notre-dame-opgelopen-tot-700-miljoen-euro.html
  Online source, visited 26-06-2019.
- https://www.rtlnieuws.nl/nieuws/buitenland/artikel/4758926/foto-verdronken-vader-en-kind-schokt-de-wereld
  Online source, visited 26-06-2019.
- https://www.goededoelennederland.nl/vereniging/over-ons
  Online source, visited 26-06-2019.
- Giving USA 2018: The Annual Report on Philanthropy for the Year 2017. Online source, visited 15-5-2019.
  https://www.charitynavigator.org/index.cfm?bay=content.view&cpid=42

Online sources effective altruism (2.2.4)

- GiveWell. Online source, visited 12-5-2019.
  https://www.givewell.org/about
- Giving USA 2018: The Annual Report on Philanthropy for the Year 2017. Online source, visited 15-5-2019.
  https://givingusa.org/about/

Online sources for tax deduction (2.4.1)

- https://www.charitynavigator.org/index.cfm?bay=content.view&cpid=31
  Online source, visited 15-5-2019.
- https://www.belastingdienst.nl/wps/wcm/connect/nl/aftrek-en-kortingen/content/gift-aftrekken
  Online source, visited 22-5-2019.
- https://www.belastingdienst.nl/wps/wcm/connect/nl/aftrek-en-kortingen/content/verschil-periodieke-giften-gewone-giften
  Online source, visited 22-5-2019.

Online sources for discussion

- Redactie (2019). Wat we tot nu toe weten over de aanslag in Utrecht. *Volkskrant*. 18-03-2019. Online source, visited 28-06-2019.
  https://www.volkskrant.nl/nieuws-achtergrond/wat-we-tot-nu-toe-weten-over-de-aanslag-in-utrecht~be254c66/?referer=https%3A%2F%2Fwww.google.com%2F
- Redactie (2016). Teruglezen – Vrachtwagen rijdt in Nice in op menigte: tientallen doden. *Volkskrant*. 15-07-2016. Online source, visited 28-06-2019.
  https://www.volkskrant.nl/nieuws-achtergrond/teruglezen-vrachtwagen-rijdt-in-nice-in-op-menigte-tientallen-doden~b7bd4d1c/

Appendix A – Sample description

Table 25 and 26 give an overview of the deviation of all variables between the three treatments. The control group exists of 72 subjects, the emotional treatment of 77 subjects and the reference treatment of 75 subjects.

Table 25: Deviation gender, university and income between different treatments.

	Gender		**University**		**Income**			
	Males	Females	No	Yes	Low	Medium	High	Total
Control	30	42	22	50	29	22	21	72
Emotional	35	42	18	59	36	19	22	77
Reference	37	38	25	50	37	15	23	75
Total	102	122	65	159	102	56	66	224

Table 26: Deviation education, economics and student between different treatments.

	Education			**Economics**		**Student**		
	High school	HBO	University	No	Yes	No	Yes	Total
Control	4	18	50	46	26	40	32	72
Emotional	5	13	59	51	26	40	37	77
Reference	6	19	50	42	33	36	39	75
Total	15	50	159	139	85	116	108	224

The following tables 27-31 present an more specific description of the control variables and present an overview of the deviation of subjects in each category is.

Table 27: Deviation study background all subjects.

Study background	**N**	**%**	**Cum. %**
Earth & Environment	2	0,89	0,89
Economics & Business	85	37,95	38,84
Exact & Informatics	5	2,23	41,07
Behavior & Society	19	8,48	49,55
Health	26	11,61	61,16
Interdisciplinary	7	3,13	64,29
Art & Culture	11	4,91	69,20
Education	5	2,23	71,43
Law & Policy	23	10,27	81,70
Language & Culture	23	10,27	91,96
Technic	3	1,34	93,30
No Study	15	6,70	100
	224	100	

Table 28: Deviation education level all subjects.

Education level	N	%	Cum. %
VMBO	1	0.45	0.45
HAVO	3	1.34	1.79
VWO	11	4.91	6.7
HBO	50	22.32	29.02
WO BSc	53	23.66	52.68
WO MSc	102	45.54	98.21
PhD	4	1.79	100
	224	100	

Table 29: Deviation education level all subjects.

Education	N	%	Cum. %
High school	15	6.7	6.7
HBO	50	22.32	29.02
University	159	70.98	100
	224	100	

In the Netherlands, people with an VMBO or MBO-degree have a low level of education, people with an HAVO or VWO-degree after graduating high school have a medium level of education and people with an HBO-, WO- or PhD-degree are highly educated. Following this deviation, the sample has a skewed distribution: 1 subject has a low level of education (0.45%), 14 subjects have a medium level of education (6.25%) and 209 subjects have a high level of education (93.3%). To create a distribution with more variance, in the analyses the dummy variable 'university' has been used, to indicate whether a subject has a university degree or not. This results in the deviation of 159 subjects with a university degree (70.98%) and 65 subjects without a university degree (20.02%).

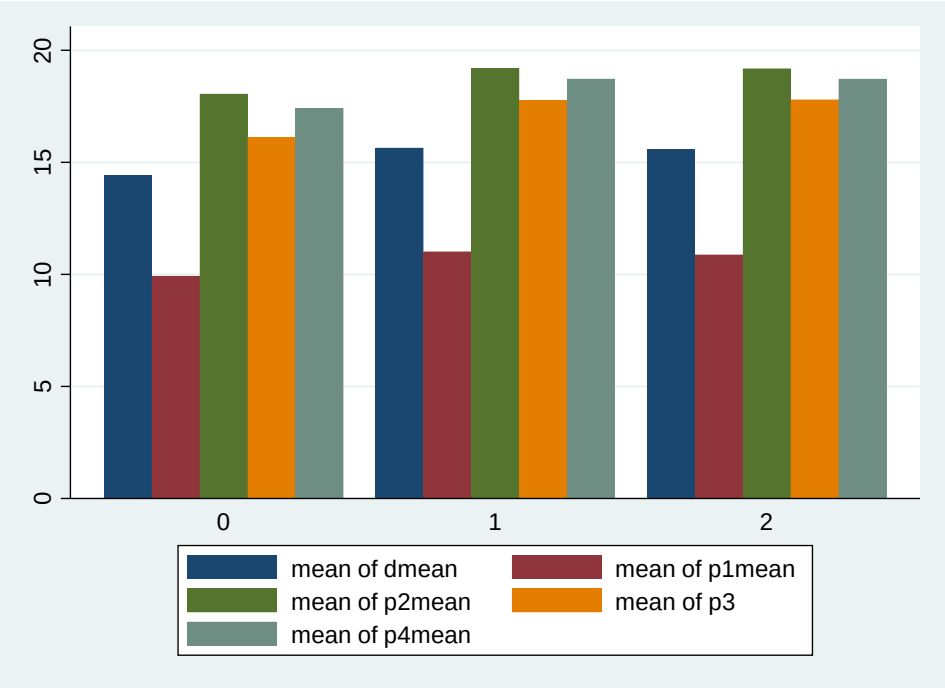
Table 30: Deviation income level all subjects.

Income	N	%	Cum. %
€0 - €10.000	102	45.54	45.54
€10.001 - €20.000	25	11.16	56.7
€20.001 - €30.000	12	5.36	62.05
€30.001 - €40.000	19	8.48	70.54
€40.001+	66	29.46	100
	224	100	

Table 31: Deviation income categories all subjects.

Income - Category	N	%	Cum. %
Low	102	45.54	45.54
Medium	56	25	70.54
High	66	29.46	100
	224	100	

Figure 1: Average donation per subject per treatment (0 = control group, 1 = emotional treatment, 2 = reference treatment) and per price ratio



Appendix B – Parametric tests

In order to perform the parametric tests used in this paper, there are four assumptions that need to hold:

1) Observations need to be independent, i.e. the value of one observation must not influence the value of another observation.
2) Observations must be drawn from a normally distributed population.
3) In case two groups are analyzed, they must have the same variance.
4) Variables must be measured in an interval scale.

When all assumptions are met, a parametric tests is preferred over a nonparametric test. This is because parametric tests have more power, indicating that it is easier to reject H_0 when it is false.

Assumption 1: all observations between subjects are random, due to random assignation into treatments. Next, the order of the questions is randomized as well. However, it could still be the case that within subjects, the prior question influenced the answer for the next question due to anchoring or when subjects use it as a reference point.

Assumption 2: To test whether the data follows a normal distribution, the Shapiro-Wilk test is conducted. Under H_0, the data follows a normal distribution and under H_1, the data does not follow a normal distribution. The Shapiro-Wilk test is conducted for all variables and the results can be found in table 39. Column W gives the Shapiro-Wilk test statistic. A test statistic of 1 indicates that the variable is perfectly normally distributed. Column V gives another report of the test, but a more appealing index for departure from normality. As can be seen in table 38, all the dependent variables (*dmean, p1mean, p2mean, p3mean* and *p4mean)* do not follow a normal distribution. This is not surprisingly, due to the fact that the price ratios differ as well as the amount of money that subjects divide in each choice differs. For example, the variable *dmean* consists of all choices of the initial start amounts, varying between €8 and €20 euro. Moreover, all dependent variables have an outlier at the top, because there are a lot of subjects who chose to donate all the initial money to UNICEF. As an example, the distribution of the variable *dmean* is presented in figure 1. Next, the only control variable that does not follow a normal distribution is the variable *age*. This is not surprisingly either, due to the fact that most subjects within the sample are aged between 19-29 years old (62.95%). In figure 2 an histogram of the age distribution is presented.

Table 39: Results Shapiro-Wilk test.

Variable	N	W	V	z	Prob > z
Dmean	224	0.951	8.1	4.841	0.000
P1mean	224	0.983	2.748	2.339	0.010
P2mean	224	0.966	5.556	3.968	0.000
P3mean	224	0.974	4.305	3.378	0.000
P4mean	224	0.960	6.576	4.358	0.000
Female	224	1	0.057	-6.619	1.000
Age	224	0.776	36.87	8.347	0.000
University	224	0.992	1.339	0.676	0.25
Incomecat	224	0.997	0.546	-1.327	0.908
Student	209	1	0.099	-5.351	1.000
Economics	209	0.996	0.722	-0.754	0.952
Treatment	224	1	0.054	-6.766	1.000

Figure 2: Histogram of the dmean distribution.

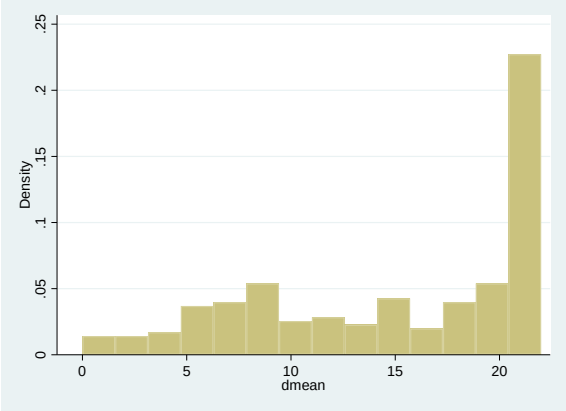
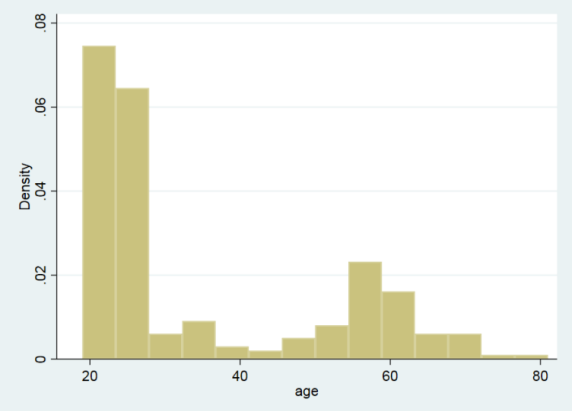


Figure 3: Histogram of the age distribution.



As an additional test, the Kolmogorov-Smirnoff test is conducted. According to the KS-test, the variable *university* does not follow a normal distribution on top of the prior variables. The results of the KS-test are presented in table 40. This is not surprisingly either, due to the fact that almost all subjects within the sample are attending or attended university (70.89%).

Table 40: Results Kolmogorov-Smirnoff test.

Variable	N	Pr(Skewness)	Pr(Kurtosis)	Adj. $\chi 2$	Prob > $\chi 2$
Dmean	224	0.001	0	50.75	0
P1mean	224	0.007	0	30.99	0
P2mean	224	0.002	0		0
P3mean	224	0	0		0
P4mean	224	0.001	0	66.36	0
Female	224	0.262			
Age	224	0	0	29.34	0
University	224	0	0		0
Incomecat	224	0.054			
Student	209	0.653			
Economics	209	0.003			
Treatment	224	0.878			

Assumption 3: To test whether the groups have the same variance, the Levene's test is used. Under H_0, the groups have the same variance and under H_1, the variances differ and the assumption of homogeneity is violated. The Levene's test results in a coefficient of the average of *dmean* of 1.623 and a *p*-value of 0.120. As a result, H_0 cannot be rejected at a significance level of $\alpha = 5\%$, so there is no evidence within the sample that the variances of the treatments are different.

Assumption 4: the dependent variable is measured in euro's, which is an interval scale. However, assuming that the dependent variable (y) is an interval scale, it also assumes that y is a continuous variable and subjects could choose any monetary outcome, but this is not true. Subjects had different choices in each question to divide money, with steps of €1,- between the choices. On the other hand, the steps are continuous, because giving €2,- is twice as much as giving €1,-. Although there are limits to the size of the dependent variable, it is still possible and allowed to treat y as a continuous variables measured at an interval scale.

To summarize, the observations of each subject are independent, almost all control variables follow a normal distribution, the variances are homogeneous and the variables are measured in interval scale, so parametric test can be used. The dependent variables do not follow a normal distribution, but this can be explained.

Appendix C – Additional tables testing hypotheses

Table 32: Regression results hypothesis 1 (one-sided).

This table shows the results of the regression to test hypothesis 1. The dependent variable is *dmean*. The *p*-values are in parentheses and significance level is denominated by * (p<0.1), ** (p<0.05), and *** (p<0.01). The hypothesis is tested one-sided.

Total sample	(1)	(2)	(3)	(4)	(5)
Female		2.054**	1.996**	2.076**	2.241***
		(0.011)	(0.013)	(0.011)	(0.009)
Income – medium		3.402***	3.197***	3.466***	3.486***
		(0.001)	(0.003)	(0.002)	(0.002)
Income – high		6.062***	5.364***	5.841***	5.793***
		(0.000)	(0.000)	(0.000)	(0.000)
Age			0.0382	0.048	0.051
			(0.153)	(0.112)	(0.102)
University			1.206	1.017	1.054
			(0.117)	(0.165)	(0.157)
Student				0.977	0.857
				(0.229)	(0.260)
Economics					0.636
					(0.250)
Emotional group	1.225	1.539*	1.310	1.276	**1.292**
	(0.137	(0.071)	(0.109)	(0.115)	**(0.112)**
Reference group	1.167	1.593*	1.460*	1.367	**1.333**
	(0.150)	(0.066)	(0.087)	(0.103)	**(0.109)**
Constant	14.42***	10.41***	8.640***	7.736***	7.370***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	224	224	224	224	224
R-squared	0.007	0.149	0.157	0.159	0.161
F-statistic	0.76	7.63***	5.73***	5.07***	4.55***

Table 33: Regression results average donation different price ratios (two-sided).

This table shows the results of the additional regression. The dependent variable differs in every regression. First, *dmean* is used. Next, the regressions are repeated at each different price ratio again. The *p*-values are in parentheses and significance level is denominated by * (p<0.1), ** (p<0.05), and *** (p<0.01). The hypothesis is tested two-sided.

Total sample	(1)	(2)	(3)	(4)	(5)
Price ratio	All	1:1	1:2	1:3	1:2/1:3
Dependent	*dmean*	*p1mean*	*p2mean*	*p3mean*	*p4mean*
Female	**2.241****	**1.608****	**2.808****	**2.372****	**2.663****
	(0.017)	**(0.018)**	**(0.024)**	**(0.045)**	**(0.026)**
Age	0.051	0.048*	0.046	0.066	0.053
	(0.204)	(0.096)	(0.381)	(0.193)	(0.298)
University	1.054	0.672	1.317	1.288	1.308
	(0.314)	(0.372)	(0.324)	(0.328)	(0.325)
Income – medium	3.486***	3.004***	4.353***	2.716*	3.807**
	(0.004)	(0.001)	(0.006)	(0.071)	(0.013)
Income – high	5.793***	4.554***	7.461***	4.936**	6.619***
	(0.000)	(0.000)	(0.000)	(0.013)	(0.001)
Student	0.857	0.947	1.058	0.273	0.796
	(0.520)	(0.323)	(0.548)	(0.870)	(0.637)
Economics	0.636	0.146	0.808	1.270	0.962
	(0.500)	(0.830)	(0.517)	(0.284)	(0.421)
Emotional	**1.292**	**1.119**	**1.295**	**1.635**	**1.408**
	(0.224)	**(0.144)**	**(0.358)**	**(0.222)**	**(0.297)**
Reference	**1.333**	**1.067**	**1.403**	**1.725**	**1.511**
	(0.217)	**(0.171)**	**(0.327)**	**(0.205)**	**(0.271)**
Constant	7.370***	4.254***	9.733***	8.878***	9.448***
	(0.001)	(0.006)	(0.001)	(0.001)	(0.001)
Observations	224	224	224	224	224
R-squared	0.161	0.195	0.135	0.110	0.132
F-statistic	4.55***	5.77***	3.72***	2.95***	3.61***

Table 34: Regression results hypothesis 2a (two-sided).

This table shows the results of the regression to test hypothesis 2a. The dependent variable is *p1mean*. The *p*-values are in parentheses and significance level is denominated by * (p<0.1), ** (p<0.05), and *** (p<0.01). The hypothesis is tested two-sided.

Control group	(1)	(2)	(3)	(4)	(5)
Female	-0.633	0.562	0.420	1.353	**1.477**
	(0.599)	(0.640)	(0.727)	(0.218)	**(0.204)**
Age		0.129***	0.141***	0.008	0.010
		(0.003)	(0.001)	(0.869)	(0.841)
University			1.587	1.639	1.577
			(0.212)	(0.145)	(0.192)
Income – medium				3.952***	3.916**
				(0.002)	(0.004)
Income – high				7.465***	7.551***
				(0.000)	(0.000)
Student					0.089
					(0.949)
Economics					0.484
					(0.666)
Constant	10.30***	5.428***	4.007*	4.358**	4.036*
	(0.000)	(0.004)	(0.062)	(0.026)	(0.065)
Observations	72	72	72	72	72
R-squared	0.004	0.125	0.145	0.357	0.359
F-statistic	0.28	4.94**	3.85**	7.33***	5.13***

Table 35: Regression results hypothesis 2b (two-sided).

This table shows the results of the regression to test hypothesis 2b. The dependent variable is *p4mean*. The *p*-values are in parentheses and significance level is denominated by * (p<0.1), ** (p<0.05), and *** (p<0.01). The hypothesis is tested two-sided.

Control group	(1)	(2)	(3)	(4)	(5)
Female	-1.465	0.0823	-0.158	1.305	**1.634**
	(0.502)	(0.971)	(0.944)	(0.539)	**(0.468)**
Age		0.167**	0.188**	-0.027	-0.031
		(0.036)	(0.022)	(0.776)	(0.749)
University			2.688	2.802	3.123
			(0.259)	(0.199)	(0.184)
Income – medium				6.885***	6.409**
				(0.005)	(0.014)
Income – high				12.11***	11.558***
				(0.000)	(0.002)
Student					-1.295
					(0.634)
Economics					0.906
					(0.677)
Constant	18.27***	11.96***	9.554**	9.942***	10.217
	(0.000)	(0.001)	(0.019)	(0.010)	(0.017)
Observations	72	72	72	72	72
R-squared	0.006	0.068	0.086	0.262	0.265
F-statistic	0.45	2.53*	2.12	4.68**	3.30**

Table 36: Regression results hypothesis 3a (two-sided).

This table shows the results of the regression to test hypothesis 3a. The dependent variable differs in every regression. First, *dmean* is used. Next, the regressions are repeated at each different price ratio again. The *p*-values are in parentheses and significance level is denominated by * (p<0.1), ** (p<0.05), and *** (p<0.01). The hypothesis is tested two-sided.

Emotional	(1)	(2)	(3)	(4)	(5)
Price Ratio	All	1:1	1:2	1:3	1:2/1:3
Dependent	*dmean*	*p1mean*	*p2mean*	*p3mean*	*p4mean*
Female	**2.047**	**1.411**	**2.446**	**2.522**	**2.471**
	(0.154)	**(0.185)**	**(0.193)**	**(0.188)**	**(0.176)**
Age	0.165**	0.102**	0.232***	0.159*	0.208**
	(0.013)	(0.039)	(0.008)	(0.072)	(0.015)
University	2.815	1.027	4.197*	3.628	4.008*
	(0.119)	(0.441)	(0.077)	(0.133)	(0.082)
Income – medium	2.982	2.298	3.764	2.787	3.439
	(0.159)	(0.145)	(0.175)	(0.323)	(0.202)
Income – high	4.546*	3.401*	5.972*	3.984	5.310
	(0.093)	(0.091)	(0.092)	(0.268)	(0.122)
Student	3.734	1.944	5.774*	3.235	4.928*
	(0.112)	(0.263)	(0.062)	(0.300)	(0.100)
Economics	0.210	-0.0874	0.0311	1.160	0.407
	(0.891)	(0.939)	(0.988)	(0.571)	(0.834)
Constant	2.581	3.392	0.973	4.173	2.040
	(0.489)	(0.222)	(0.842)	(0.403)	(0.667)
Observations	77	77	77	77	77
R-squared	0.216	0.210	0.220	0.130	0.198
F-statistic	2.71**	2.62**	2.78**	1.48	2.44**

Table 37: Regression results hypothesis 4a (two-sided).

This table shows the results of the regression to test hypothesis 4a. The dependent variable differs in every regression. First, *dmean* is used. Next, the regressions are repeated at each different price ratio again. The *p*-values are in parentheses and significance level is denominated by * (p<0.1), ** (p<0.05), and *** (p<0.01). The hypothesis is tested two-sided.

Females	(1)	(2)	(3)	(4)	(5)
Price ratio	All	1:1	1:2	1:3	1:2/1:3
Dependent	*dmean*	*p1mean*	*p2mean*	*p3mean*	*p4mean*
Age	0.008	0.032	-0.014	0.002	-0.009
	(0.874)	(0.353)	(0.827)	(0.978)	(0.886)
University	2.198*	1.108	3.177*	2.419	2.925*
	(0.088)	(0.231)	(0.065)	(0.142)	(0.076)
Income – medium	3.866***	2.964***	4.968***	3.464**	4.467***
	(0.004)	(0.002)	(0.005)	(0.040)	(0.008)
Income – high	7.471***	5.284***	9.673***	7.441***	8.929***
	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)
Student	-0.906	0.007	-1.580	-1.385	-1.515
	(0.513)	(0.994)	(0.394)	(0.436)	(0.393)
Economics	-1.003	-0.474	-1.463	-1.143	-1.357
	(0.406)	(0.586)	(0.366)	(0.461)	(0.381)
Emotional	**1.780**	**1.362**	1.773	**2.629**	**2.059**
	(0.158)	**(0.134)**	(0.292)	**(0.105)**	**(0.202)**
Reference	**3.040****	**1.978****	**3.637****	**3.972****	**3.748****
	(0.020)	**(0.036)**	**(0.038)**	**(0.018)**	**(0.025)**
Constant	10.42***	6.235***	13.66***	12.28***	13.20***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	122	122	122	122	122
R-squared	0.295	0.296	0.272	0.224	0.267
F-statistic	5.91***	5.94***	5.29***	4.08***	5.15***

Table 38: Regression results hypothesis 4b (two-sided).

This table shows the results of the regression to test hypothesis 4b. The dependent variable differs in every regression. First, *dmean* is used. Next, the regressions are repeated at each different price ratio again. The *p*-values are in parentheses and significance level is denominated by * (p<0.1), ** (p<0.05), and *** (p<0.01). The hypothesis is tested two-sided.

Males	(1)	(2)	(3)	(4)	(5)
Price ratio	All	1:1	1:2	1:3	1:2/1:3
Dependent	*dmean*	*p1mean*	*p2mean*	*p3mean*	*p4mean*
Age	0.116*	0.077	0.138	0.153*	0.143*
	(0.092)	(0.136)	(0.123)	(0.076)	(0.098)
University	-1.214	-0.368	-2.164	-1.004	-1.778
	(0.480)	(0.774)	(0.333)	(0.639)	(0.409)
Income – medium	4.007*	3.810**	4.963	2.489	4.139
	(0.093)	(0.033)	(0.109)	(0.400)	(0.165)
Income – high	6.108**	5.299**	8.005**	3.930	6.646*
	(0.049)	(0.022)	(0.047)	(0.305)	(0.086)
Student	5.993**	4.004*	8.504**	4.949	7.319**
	(0.044)	(0.070)	(0.028)	(0.179)	(0.049)
Economics	1.750	0.514	2.324	3.074*	2.574
	(0.233)	(0.637)	(0.223)	(0.094)	(0.161)
Emotional	**-0.074**	0.314	-0.342	-0.317	-0.334
	(0.967)	(0.814)	(0.883)	(0.887)	(0.882)
Reference	**-1.897**	-0.695	**-2.956**	-2.182	-2.698
	(0.298)	(0.608)	**(0.213)**	(0.337)	(0.237)
Constant	5.010	2.784	6.374	6.736	6.495
	(0.174)	(0.309)	(0.183)	(0.143)	(0.159)
Observations	102	102	102	102	102
R-squared	0.147	0.156	0.140	0.114	0.135
F-statistic	2.01*	2.15**	1.89*	1.50	1.81*

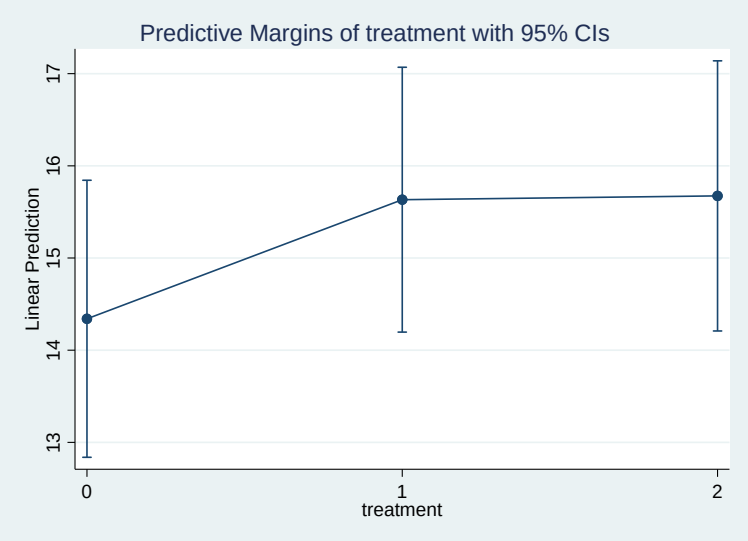
Appendix D – Additional robustness checks H1

First, to test whether there is an effect of the treatments on the average donation (*dmean*), the margins are conducted. Table 41 shows the estimated means per treatment based on the fitted model that has been used. Next, those margins are plotted, as can be seen in figure 4. To say whether there is an effect of the treatments on the average donation, it has been tested whether the means of the treatments are identical. The result of the contrast test show that the means are not different, the F-statistic is 0.99 and the *p*-value is 0.3737. So, based on this regression cannot be concluded that the treatments significantly increase the average amount of money donated. The contrast test for the margins of the regressions with the different dependent variables *p1mean, p2mean, p3mean* and *p4mean* are conducted as well, but the results are insignificant and therefore unreported.

Table 41: Margins treatments.

Treatment	Margin	St. Error	t	*p*-value	95% C.I.	
Control	14.341	0.762	18.81	0.000	12.838	15.844
Emotional	15.633	0.729	21.45	0.000	14.196	17.069
Reference	15.674	0.743	21.08	0.000	14.208	17.139

Figure 4: Plot of the margins of the effect of the treatments on the average donation per choice.



Next, to test whether the treatments have an effect at the different price ratios, an additional regression was conducted. Table 42 presents the results of the regression. In each column the dependent variable changes to the average amount donated within that choice. For example, in

regression 1 the dependent variable is the average amount each subject donated when they had to divide €12 against a price ratio of 1:1. As table 42 shows, at a price ratio of 1:1 the reference treatment (€20) is significant at a significance level of $\alpha = 10\%$. To interpret this result: a subject within the reference treatment that needs to divide €20,- between themselves and UNICEF donated on average €1.69 more to UNICEF compared to a subject within the control group. In contrary to the results of the average amount of money donated for all choices together (with dependent variable *dmean*), now the treatment becomes significant at a price ratio of 1:1. All significant treatment results are marked in red.

As hypothesis 1 states, it is expected that the average amount of money donated within the treatments is higher compared to the control group. This is a directional hypothesis, so the regression is also been tested one-sided. As can be seen in table 43, at a price ratio of 1:1 the emotional treatment (€12) becomes significant as well. Moreover, both treatment variables are close to significance at the price ratio of 1:3. In section 4.3 these results are discussed in more detail.

Table 42: Results additional regression on all control variables (two sided)

This table shows the results of the robustness check for hypothesis 1. The dependent variable differs in every regression, but is the average amount of money donated from the initial amount. The *p*-values are in parentheses and significance level is denominated by * (p<0.1), ** (p<0.05), and *** (p<0.01). The hypothesis is tested two-sided.

	(1)	(2)	(3)	(4)	(5)
Euros	€12	€20	€15	€12	€8
Price ratio	1:1	1:1	1:2	1:2	1:3
Female	1.227**	1.989**	3.566**	2.051*	2.372**
	(0.029)	(0.022)	(0.011)	(0.073)	(0.045)
Age	0.057**	0.039	0.038	0.055	0.066
	(0.017)	(0.294)	(0.521)	(0.263)	(0.193)
Income – medium	2.460***	3.547***	5.317***	3.389**	2.716*
	(0.001)	(0.002)	(0.003)	(0.021)	(0.071)
Income – high	3.362***	5.746***	8.923***	5.999***	4.936**
	(0.000)	(0.000)	(0.000)	(0.002)	(0.013)
University	0.970	0.374	0.832	1.803	1.288
	(0.122)	(0.699)	(0.594)	(0.158)	(0.328)
Student	1.021	0.873	1.312	0.804	0.273
	(0.200)	(0.479)	(0.509)	(0.620)	(0.870)
Economics	-0.097	0.389	0.908	0.709	1.270
	(0.863)	(0.656)	(0.518)	(0.537)	(0.284)
Emotional	1.017	1.221	1.803	0.786	1.635
	(0.110)	(0.215)	(0.256)	(0.544)	(0.222)
Reference	0.440	**1.694***	1.178	1.628	1.725
	(0.495)	**(0.091)**	(0.464)	(0.217)	(0.205)
Constant	2.473*	6.035***	10.88***	8.584***	8.878***
	(0.054)	(0.003)	(0.001)	(0.001)	(0.001)
Observations	224	224	224	224	224
R-squared	0.199	0.172	0.141	0.121	0.110
F-statistic	5.91***	4.93***	3.92***	3.29***	2.95**

Table 43: Results additional regression on all control variables (one-sided).

This table shows the results of the robustness check for hypothesis 1. The dependent variable differs in every regression, but is the average amount of money donated from the initial amount. The *p*-values are in parentheses and significance level is denominated by * (p<0.1), ** (p<0.05), and *** (p<0.01). The hypothesis is tested one-sided.					
	(1)	(2)	(3)	(4)	(5)
Euros	€12	€20	€15	€12	€8
Price ratio	1:1	1:1	1:2	1:2	1:3
Female	1.227**	1.989**	3.566***	2.051*	2.372**
	(0.015)	(0.011)	(0.006)	(0.037)	(0.023)
Age	0.057***	0.039	0.038	0.055	0.066*
	(0.009)	(0.147)	(0.261)	(0.132)	(0.097)
Income – medium	2.460***	3.547***	5.317***	3.389**	2.716*
	(0.000)	(0.001)	(0.002)	(0.011)	(0.036)
Income – high	3.362***	5.746***	8.923***	5.999***	4.936***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.007)
University	0.970*	0.374	0.832	1.803	1.288
	(0.061)	(0.350)	(0.297)	(0.079)	(0.164)
Student	1.021*	0.873	1.312	0.804	0.273
	(0.100)	(0.240)	(0.256)	(0.310)	(0.435)
Economics	-0.097	0.389	0.908	0.709	1.270
	(0.432)	(0.328)	(0.259)	(0.269)	(0.142)
Emotional	**1.017***	1.221	1.803	0.786	1.635
	(0.055)	(0.108)	(0.128)	(0.272)	(0.111)
Reference	0.440	**1.694****	1.178	1.628	1.725
	(0.248)	**(0.046)**	(0.232)	(0.109)	(0.103)
Constant	2.473**	6.035***	10.88***	8.584***	8.878***
	(0.027)	(0.002)	(0.000)	(0.000)	(0.000)
Observations	224	224	224	224	224
R-squared	0.199	0.172	0.141	0.121	0.110
F-statistic	5.91***	4.93***	3.92***	3.29***	2.95**

Appendix E – Additional moderation analysis

Table 44: Results moderation effect analysis (condition vs gender)

This table shows the results of the moderation effect analysis. The dependent variable in regression one and two is *dmean*, in regression three and four is *p1mean* and in regression five and six is *p4mean*. The variable 'Control indicates whether the subject was in the control group (1) or in one of the two treatments (0). The variable 'Treatment' is the reverse coded version and indicates whether the subject was in the treatment groups (1) or in the emotional group (0). The *p*-values are in parentheses and significance level is denominated by * (p<0.1), ** (p<0.05), and *** (p<0.01).

Total sample	(1)	(2)	(3)	(4)	(5)	(6)
Price ratio	All	All	1:1	1:1	1:2/1:3	1:2/1:3
Dependent	*dmean*	*dmean*	*p1mean*	*p1mean*	*p4mean*	*p4mean*
Female	**2.996*** **	0.620	**2.045** **	0.670	**3.630** **	0.587
	(0.007)	(0.693)	**(0.011)**	(0.555)	**(0.010)**	(0.769)
Age	0.051	0.051	0.048*	0.048*	0.053	0.053
	(0.203)	(0.203)	(0.096)	(0.096)	(0.297)	(0.297)
University	1.067	1.067	0.688	0.688	1.320	1.320
	(0.303)	(0.303)	(0.357)	(0.357)	(0.316)	(0.316)
Income – medium	3.559***	3.559***	3.048***	3.048***	3.900**	3.900**
	(0.003)	(0.003)	(0.000)	(0.000)	(0.010)	(0.010)
Income – high	5.885***	5.885***	4.606***	4.606***	6.738***	6.738***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
Student	1.068	1.068	1.063	1.063	1.071	1.071
	(0.423)	(0.423)	(0.269)	(0.269)	(0.527)	(0.527)
Economics	0.664	0.664	0.157	0.157	1.001	1.001
	(0.479)	(0.479)	(0.816)	(0.816)	(0.400)	(0.400)
Control	0.037	-	-0.313	-	0.270	-
	(0.979)		(0.757)		(0.880)	
Treatment	-	-0.0368	-	0.313	-	-0.270
		(0.979)		(0.757)		(0.880)
Fem * Control	-2.375	-	-1.374	-	-3.043	-
	(0.202)		(0.305)		(0.198)	
Fem * Treat	-	2.375	-	1.374	-	3.043
		(0.202)		(0.305)		(0.198)
Constant	8.120***	8.157***	5.024***	4.711***	10.18***	10.45***
	(0.000)	(0.000)	(0.002)	(0.004)	(0.000)	(0.000)
Observations	224	224	224	224	224	224
R-squared	0.167	0.167	0.199	0.199	0.138	0.138
F-statistic	4.76***	4.76***	5.91***	5.91***	3.82***	3.82***

Appendix F – Survey Design

Emotional information:

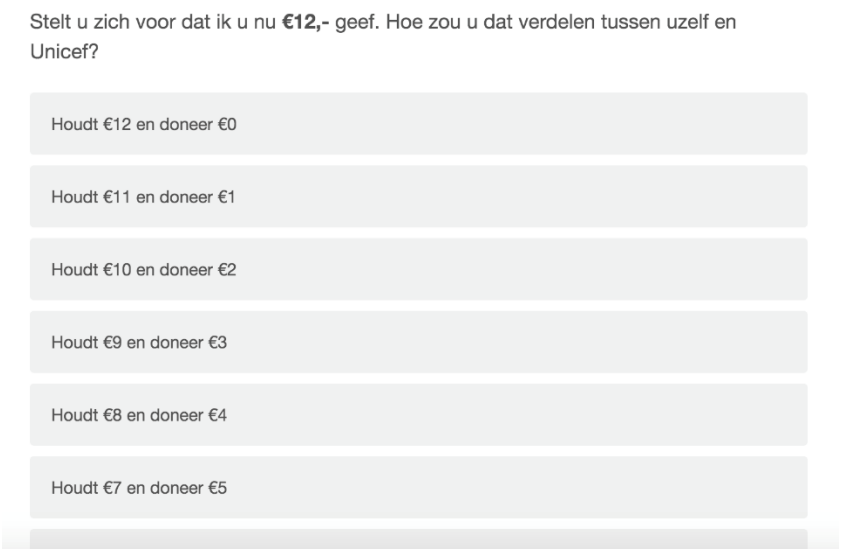
Reference information:

UNICEF werkt in 190 verschillende landen en gebieden om het leven van kinderen te redden, om hun rechten te verdedigen en om zete helpen hun talenten te ontwikkelen.

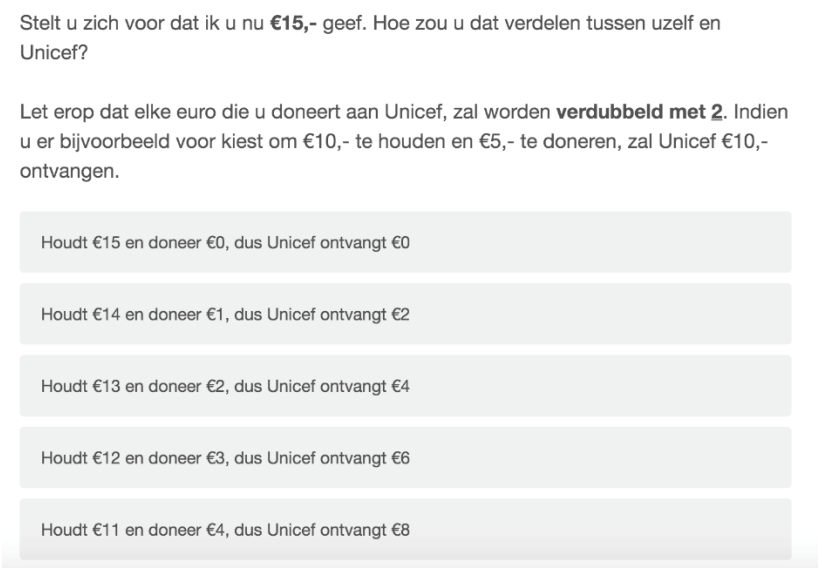
In 2018 heeft UNICEF ervoor gezorgd dat:

- 78,6 miljoen kinderen werden ingeënt tegen mazelen.
- 59 miljoen kinderen onderwijs kregen.
- 35 miljoen mensen veilig drinkwater hadden.
- 3,5 miljoen kinderen psychosociale steun kregen.
- 4 miljoen kinderen zijn behandeld tegen acute ondervoeding.

Choices to divide money:



Price ratio 1:1



Price ratio 1:2

Price ratio 1:3

Money distribution of all choices: