The impact of childhood memories on cheating behavior
An experimental analysis

A Master's Thesis
By

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Abstract

This study examines the effect of childhood memories on misreporting behavior in the strategic context of an ultimatum game with asymmetric information. It employs an online experiment in which individuals are given the opportunity to misreport a sum of money. Findings indicate that, when positive childhood memories are evoked compared to recent neutral memories, people are less likely to misreport the sum of money they were given. However, the magnitude of the effect does not appear to have a difference across genders and different age categories. Overall, the results emphasize the need for exploring the influence of childhood memories in more contexts.

Keywords: cheating behavior, misreporting, childhood memories, ultimatum asymmetric information

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1. Introduction

"All grown-ups were once children... but only few of them remember it."

- Antoine de Saint-Exupéry, The Little Prince, 1998

People can behave dishonestly in their everyday, ordinary life. They may misrepresent their performance, lie about their achievements in their résumé when applying for a job, cheat on their partner etc. Many may strategically misreport their sources of income to evade taxes. This kind of frequent ordinary unethical behavior has a huge negative impact in society when considered cumulatively. For instance, a recent estimate indicates that internal theft is responsible for 24% of shrinkage in the European retail sector (Beck, & Bilby, 2001).

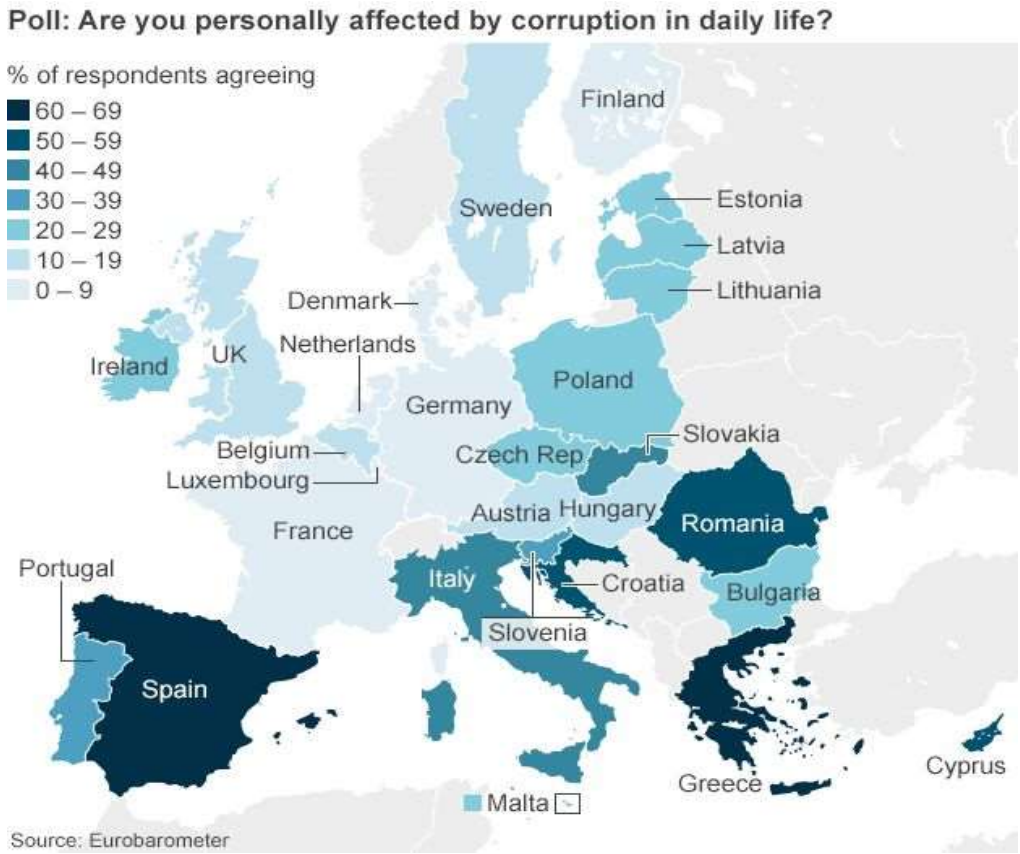
Unfortunately, in real life situations this kind of unethical behavior comes at the expense of other people in our society. In many social situations, pursuing self-interest results comes at the expense of the interest of a third party (Van Lange, Balliet, Parks, & Van Vugt, 2014). Subsequently, dishonesty, cheating or unethical behavior can damage other fellow people. One profound example is the Ponzi scheme, operated by the former chairman of NASDAQ stock market Bernard Madoff, which is responsible for a huge loss of life savings for many people (Sander, 2009).

Additionally, corruption is another example that torments society. It is known to be one major barrier to economic advance, especially in developing countries. Difference on level of information amongst economic agents, also known as asymmetric[1] information, may provoke incidents of market or government failure, like corruption. More than frequently, the existence of asymmetric information leads to

[1] Throughout this paper the terms "asymmetric information" and "incomplete information" will be used interchangeably.

opportunism in economic transactions, leading people to exploit any asymmetric information in their best interest. Those kinds of incidents of dishonesty have a major impact in the deterioration of public trust, provoking sub-optimal behavior amongst people. For instance, recent report from the European commission notes that the corruption in Europe is thriving, and it causes losses of approximately 120 billion euros annually (European Commission, 2014). Consider Figure 1 on the following page, which represents the results of a poll on whether people think they are personally affected by corruption in their daily life, conducted in European Union (European Commission, 2014). Many people all over the EU, think that they are personally affected by corruption in their daily life. Undoubtedly, cheating is an intrinsic part of human nature, it is impactful to our lives and can be found in many layers in society.

Figure 1: EU poll on how corruption affect daily life



Research question

Scientists have long researched what drives people to behave unethically as well as, what factors may alter (upwards or downwards) this kind of behavior. Even though there is a constantly expanding literature as far as this topic is concerned, many aspects remain unexplored and therefore worth investigating. Considering the fact that people are the driving force behind the economy, it is crucial to comprehend how people think and act in many presented situations and what elements may alter their behavior.

This paper attempts to identify whether and to what extent memories and, by extension, childhood memories affects people's misreporting[2] behavior. Several studies of, inter alia, Harris, Mussen and Rutherford (1976), Bandura (1991,1999), Mazar, Amir and Ariely (2008) suggest that people have an honest self-concept of themselves and they try to maintain that perception. Gino and Desai (2012) elaborate on this notion and show how past memories of people can influence their prosocial behavior. In their research Gino and Desai (2012), found significant results that people behave more prosocially when they are asked to recall childhood memories, however, there are no studies to the best of my knowledge, that examine the impact of childhood memories on unethical behavior in an environment that consists of strategic decisions such as the ultimatum game. Consequently, this paper attempts to contribute in this research area by providing concrete answers regarding the following question. Does honesty in reporting shifts depending on memories that one has recently recalled, and do these memories alter your behavior? Put differently,

What is the effect of provoking childhood memories on cheating behavior?

[2] Throughout this paper the terms "unethical", "cheating" and "misreporting" behavior will be used interchangeably.

Will people behave differently when childhood memories are provoked than when neutral recent memories are provoked? Furthermore, is this change in behavior influenced by other factors such as gender or age? Thus, the purpose of this study is to discover what the effect of childhood memories is on cheating behavior, and more specifically on misreporting within the context of an ultimatum game with imperfect information. An ultimatum game with imperfect information is chosen since it replicates real life situations where private information can be exploited by an economic agent to shape outcomes and beliefs. Furthermore, in this experimental setup both the incidence of misreporting, and the extend of it can be measured, allowing for a better and deeper understanding of the cheating behavior of the participants. By shedding some light on these subjects, we might explore new ways on how to encourage people to avoid unethical behavior.

The remaining of this paper is divided in six sections. In Section 2, the relevant literature on unethical behavior is presented, from the earliest findings on the topic to different approaches on unethical behavior, with an aim to find theoretical links with self-perception and self-memories. Elaborating on past literature, the hypotheses of this study are formed. In Section 3, a detailed review of this paper's experimental design is provided, presenting the participants, conditions and procedure of the conducted experiment. In Section 4, the data of this study's experiment is presented and statistical analysis is conducted on the obtained data. Finally, in Section 5, a discussion on the findings is introduced along with conclusions and suggestions for future research.

2. Literature Review

In our contemporary society, the economic consequences of cheating are huge and thus, understanding the motivative factors that lead humans to exhibit unethical behavior is crucial as they may help to better understand many economic behaviors. Unethical behavior is specified as an act with harmful effects on others or the society and is "either illegal or morally unacceptable to the larger community" (Jones, 1991, p. 367; Gino, Schweitzer, Mead, & Ariely, 2011). Based on this explanation, violations of laws, ethical norms or standards, cheating, stealing, misreporting and other forms of dishonesty are qualified as unethical behaviors.

According to the standard economic model of rational human behavior, people act with dishonesty only when the anticipated benefit of their action overcomes the cost of the dishonest act (Becker, 1968; Lewicki, 1983). In this rational cost-benefit view, people's decision to act dishonestly simply derives from the analysis of three facts; the weight of the expected gain, the weight of the probability of being caught and the weight of punishment (Hechter, 1990). However, this model cannot explain certain economic behavior, such as forgoing as much as three quarters of the potential gains from lying, according to a meta-study by Abeler, Nosenzo and Raymond (2016). Behavioral and phycological studies have since added a new scope on why people behave unethically and inconsistently to what the rational way of thinking suggests.

Researchers claim that as people become part of the society they incorporate within themselves the norms, rules and principles of the society, creating a benchmark against which they correlate their behavior (Campbell, 1964; Henrich, Boyd, Bowles, Camerer, Fehr, Gintis, & McElreath, 2001; Mazar et al., 2008). Similar to the cost-benefit analysis, behaviors and actions in accordance with people's internal reference point provide positive rewards; on the other hand, behaviors and actions in conflict with

people's internal reference point provide negative rewards to one's inner self (Mazar et al., 2008). Interestingly, from this perspective it derives that people may prefer to forfeit a financial gain or any kind of benefit in order to adhere to their internal code (Aronson, & Carlsmith, 1962; Harris, Mussen, & Rutherford, 1976; Sullivan, 1953).

Hence, from a behavioral and psychological point of view, unethical behavior is often a dilemma between gaining from the dishonest act and maintaining a positive self-concept (Harris et al., 1976; Bandura, 1989). Elaborating on this notion, researchers claim that when people are placed in a situation where they can benefit from acting immorally, they try to balance their eagerness to gain from this action and their willingness to maintain a positive self-concept (Mazar et al., 2008). For instance, if people decide to misreport their sources of income in their tax report they would gain some financial benefit, but on the other hand, they will confront themselves with the guilt of a dishonest self-concept.

What procedure of thinking would allow humans to deviate from the societal norms and individual ethical code to act immorally? Research has shown that people can maintain an ethical code while still behaving in inconsistent ways; this is called the moral disengagement theory (Bandura, 1991; Bandura, 1999). In line with this view, people regularly search for ways to diverge from the moral and ethical rules they hold, for the purpose of alleviating the impact of consequences to their honest self-concept. For instance, people could lie in their resume while downgrading or completely neglecting the fact that this is considered an unethical action which comes in contrast to their beliefs. Often, people actively belittle the costs of using deception to themselves through frivolous justifications of their own unethical behavior (Schweitzer, Ordóñez, & Douma, 2004). Justification is one of the core elements of unethical behavior, as it diminishes the cognitive dissonance that people may experience when challenged with

an ethical decision (Messick, & Sentis, 1983; Tenbrunsel, 1998). More specifically, people may base their decision solely on the degree to which they can justify this decision (Diekmann, 1997). Notably, these findings introduce the idea that perchance people's behavior can be influenced by strengthening or weakening their self-perception.

Moreover, scholars underline the importance of our own memories and have shown that autobiographical memories have a dominant effect on how we consider ourselves in one specific moment (Markus, & Nurius, 1986; Sanitioso, Kunda, & Fong, 1990). Thus, in relation to this perspective, our memories shape the image that we have of our own selves accordingly (Fazio, Effrein, & Falender, 1981). Building on this, further research has shown that past memories which focus on the ethical codes and the honest conception of one's self can guide his/her behavior (Gino & Desai, 2012). The idea of associations stems from Plato and Aristotle, particularly regarding the succession of memories, and it was endured by many philosophers such as John Locke, David Hume, David Hartley, and James Mill (Boring, 1950). For instance, people regularly associate the sound of an ambulance siren with an unfortunate incident and as a result, anxiety is also likely to be stimulated in their minds. Childhood memories are autobiographical memories and are likely to lead to such associations. This is anticipated to occur through the fact that childhood memories develop a notion of moral purity to people's minds (Gino & Desai, 2012). As noted by Gino and Desai (2012, p.755) "When moral purity is activated, people's moral self-concept is likely to be salient as well as their desire to remain morally clean. One way to realize this desire is to behave prosocially if given the opportunity. Thus, we expect moral purity triggered by childhood memories to lead to prosocial behavior". Hence, it is expected that evoking childhood memories will induce to the participant a feeling of moral purity and

as a result, people will behave more prosocially and therefore more honestly, and more ethically (Gino & Desai, 2012). In conclusion, forming the first two hypotheses, it is anticipated that in this study, subjects who are asked to recall childhood memories will cheat less in any given opportunity.

Hypothesis 1: People are less likely to cheat when personal childhood memories are evoked than when neutral recent memories are evoked.

Hypothesis 2: People on average will cheat less when personal childhood memories are evoked than when neutral recent memories are evoked.

In the experiment of this study, subjects are rewarded for the height of their allocation to themselves whereby they have the incentive to misrepresent the true endowment level. Besides that, the experiment is conducted anonymously so participants do not have to be afraid for the fact that they will be caught when reporting dishonestly. The design and content of the experiment in this study, with concepts as allocation and endowment will be further explained in the chapter on research methodology.

Ultimatum Game

As mentioned in the introduction, people often lie strategically. In the era of information, a major component of interactions in marketplace is based on asymmetric information. Moreover, bargaining and negotiation are ordinary tools people use in many everyday situations. In our ordinary life, we make economic decisions based on varying levels of information. Examples include shareholders deciding whether to hold or sell a number of shares, consumers evaluating the quality of newly developed products before their decision to purchase them, customers looking for e-products

having to assess an estimate of their value. Consequently, people are often enticed to use private information that they may possess to their advantage. Researcher support this idea, claiming that people often use dishonesty, cheating and other types of unethical behavior to obtain leverage on negotiations (Lewicki, 1983; Shapiro, & Bies, 1994). Likewise, research suggests that when it comes to examining human behavior, strategic compounds cannot be disregarded (Binmore, Shaked, & Sutton, 1985). There are several strategies that individuals may display when it comes to negotiations. Amongst them are misrepresentation, the act of faking (bluffing) and lying, whilst all of them are used from one party to gain an unfair advantage in the bargain which they otherwise would not have (Boles, Croson, & Murnighan, 2000).

There is a growing body of behavioral and experimental economics literature that focuses on how people may use methods like cheating and deception in various alternatives of the ultimatum game (Güth, Schmittberger, & Schwarze, 1982). Ultimatum game consists of two players the proposer and the responder. The proposer is given an endowment by the experimenter and must make an offer as how to allocate this endowment between himself and the responder. The responder can then accept the offer, in which case the endowment is divided as the proposer suggested, or reject the offer, in which case neither of them receive anything. According to standard economic way of thinking, the subgame perfect Nash equilibrium assumes that responders should accept any kind of offers if they exceed zero; namely, as long as the utility of the amount for the responder surpass the utility of zero. However, there are numerous studies that reject this, as on average proposers offer around 40% of the endowment and 16% of the offers are rejected (Oosterbeek, Sloof, & Van De Kuilen, 2004). In contract to the Nash equilibrium assumption, people often exhibit cooperation, sharing, punishment, reciprocity and altruism (Mitzkewitz, & Nagel, 1993).

Gender

There is limited literature that focuses on gender differences within an economic setting (i.e. an ultimatum game). Nevertheless, scholars have found that females behave in general more altruistically, less competitively and are more risk averse than males (Eckel, & Grossman, 1998; Byrnes, Miller, & Schafer, 1999; Gneezy, Niederle, & Rustichini, 2003; Croson, & Gneezy, 2004). In addition, it appears that those gender differences persist across different cultures (Croson, & Gneezy, 2004). Finally, it is implied that social norms and suggestions have a higher impact for women than men, suggesting that females may have higher volatility in their behavior than males; namely females are more responsive than males to different settings of an experiment (Croson, & Gneezy, 2004). Consequently, it is expected that evoking childhood memories will have a relatively stronger effect for women than men. Therefore, the following hypothesis is postulated.

Hypothesis 3: Evoking childhood memories will reduce cheating behavior relatively more for females than males.

Age

Apart from the fact that childhood memories elicit a feeling of moral purity, they can also promote nostalgia (Sedikides, Wildschut, Arndt, & Routledge, 2008). Nostalgia has a positive affect (Wildschut, Sedikides, Arndt, & Routledge, 2006), that itself promotes prosocial behavior (e.g., Berkowitz, 1987; Carlson, Charlin, & Miller, 1988; Eisenberg & Fabes, 1991). In addition, nostalgia stimulates positive self-concept attributes in the subject (Vess, Arndt, Routledge, Sedikides, & Wildschut, 2008). Lastly, distant past memories have a higher effect on stimulating nostalgia than closer

events (Sedikides et al., 2008; Wildschut et al., 2006). Even though moral purity is the mediator of prosocial behavior and not nostalgia (Gino & Desai, 2012), it is expected that moral purity will have a higher impact in older than younger people, as the memories recalled are more likely to stimulate an emotion of nostalgia to the older subjects. Thus, recalling childhood memories is anticipated to increase prosocial behavior more to people of greater age.

Hypothesis 4: Evoking childhood memories will reduce cheating behavior relatively more to older than to younger people.

3. Research Methodology

As mentioned before, this study elaborates on the findings of Gino and Desai (2012) on childhood memories and their effect on prosocial behavior. Similar to their experiment, two treatments are implemented; subjects in the first treatment are asked to recall positive childhood memories, whereas subjects in the control treatment are asked to recall neutral recent memories. However, in this study, an ultimatum game setup with incomplete information is employed. Below the task and design of the experiment will be presented along with the selection of the participants, the incentive system, the sample size and the variables.

Participants

The number of subjects participated in the experiment are 126. Subjects were recruited online through university Facebook groups in the Netherlands, Greece and other European countries like the United Kingdom and they were randomly assigned to a condition after they entered the online experiment using Qualtrics differentiation. Any incomplete answers from the experiment were considered erroneous and were excluded from the analysis. The incentive system implemented was a random incentive system; extensive description can be found in the subsection Incentive system.

Experimental task

In this section, the online experiment is reported where I asked subjects to play an altered version of the ultimatum game. The task as mentioned before was a modified version of the ultimatum game, chosen due to its success in studying misreporting in many studies (Forsythe, Kennan, & Sopher, 1991; Boles et al., 2000; Croson, Boles, & Murnighan, 2003). Moreover, as it is mentioned before, within the context of an ultimatum game both the incidence and the extent of cheating can be measured. In addition, subjects in an ultimatum game cheat their paired participant and not the

experimenter, which is convenient, since no dubious tricks need to be employed in order to make subjects feel that their cheating behavior is not observed.

Furthermore, the ultimatum game is used instead of the dictator game, since the addition of the responder acts as an implied motivation for the subjects to misreport the true endowment size, since participants recognize that their allocation has a decent chance to be rejected. It may be appealing for the proposer to misreport the endowment size in order to make a seemingly fairer allocation, giving their proposition a higher chance to be accepted while still having an unrevealed reward (the difference between the true endowment size and the reported one).

In this paper's experimental setup, the proposer receives a hypothetical endowment of €25 and is informed that (a) the actual size of the endowment is €25, but the responder only knows that the endowment size is somewhere between €5 and €30, and will never know the actual size of the endowment; (b) the responder can accept the offer, and both are paid according to the proposer's proposition or reject the offer and both get nothing; (c) all interactions will be anonymous and confidential. Participants are then asked to (a) report a number to the responder as the received endowment size and (b) propose an allocation of the reported endowment between him/her and the responder.

The experiment has a between-subjects design and consists of an online questionnaire, performed on the Qualtrics platform, with two different treatments, the control and the treatment group. Participants were randomly assigned to either the control or the treatment group automatically as they entered the experiment. Subjects in the control group were asked, right before the ultimatum game, to recall a recent neutral memory, namely their usual morning routine. Participants placed in the

treatment group were asked to recall and write a positive childhood memory that they have experienced. The two conditions were identical apart from that.

The online experiment consisted of six pages. The first page included a welcome message along with some basic instructions. The second page consisted of explicit instructions regarding the game, the reward system and the role of the subject in the experiment. On the third page subjects were introduced in the control or the treatment group. Next, on the fourth and fifth page, participants were asked to report an endowment size and to allocate this amount respectively. At the very last page of the experiment, participants were asked to fill four questions regarding their demographics, namely their age, gender, current education level and yearly perceived income. Finally, participants were offered with the opportunity to fill in their e-mail address, if they wished to take part in the lottery for the winner. This feature was added to enhance the effect of anonymity in this study, as it is considered to be crucial for the credibility of the experiment's results. As experimental research claim, people may only avoid cheating behavior as to maintain their honest self-concept idea, although they might shift from ethical to unethical behavior if the latter is concealed or hidden (Hao, & Houser, 2010). Participants were informed that their e-mail address will not be used for anything apart from contacting the winner of the lottery. For a full review of the online experiment, see Appendix I.

Responder

Subjects that participated in the Qualtrics' questionnaire were assigned to the role of the proposer. I chose not to provide extensive details as to how the responder is selected in order to maintain the instructions of the task simple and short. There was only one responder, whose role was randomly assigned to a subject drawn from the subject pool of a colleague's thesis. The experiment was designed this way for several reasons.

Firstly, the core analysis of this study is the cheating behavior of people, more specifically, the choice to misreport the true given endowment and the magnitude of the misreporting, and how this behavior is influenced by childhood memories. Secondly, the allocation is part of the ultimatum game, and was implemented to disguise from the participants the true purpose of the study which was the analysis of their cheating behavior. Last but not least, due to the finite amount of resources, time and software limitations, the implementation of a paired participant in the role of the responder was adjudged redundant. Nonetheless, the responder's actions are irrelevant to the focus of this study and are only implemented to perform the ultimatum game in reality for the winners of the monetary rewards.

After the completion of the experiment and the collection of the data, a lottery was conducted to select the subject who would be the winner. Note that only participants who had willingly filled in their e-mail addresses participated in the lottery for the winner. Participants were clearly informed of this condition. The winner was contacted by an e-mail to their specified e-mail address. Then, the response of this participant was included in a new survey that was handed in a random person of another study, to act the part of the responder and run this ultimatum game in real. Finally, the money was transferred to the bank account of the winners (see Appendix I for details).

Incentive system

Participants in my experiment had an incentive to misreport the endowment size to the responder, as it would increase the payoff of their task. Given the asymmetric information condition in the ultimatum game, proposers were confronted with an implied dilemma. They could either inform the responder of the full endowment size and then propose the desired allocation of it, or misinform the responder by not reporting the true endowment size and then propose the desired allocation. The latter

would give them the possibility to propose a seemingly fairer allocation to the responder, while securing part of their reward unbeknownst to the responder.

According to prior literature, the endowment size in the ultimatum games is irrelevant to the offer distribution, as long as it is within the interval $0 to $5 and $5 to $10 (Forsythe, Horowitz, Savin, & Sefton, 1994; Hoffman, McCabe, Shachat, & Smith, 1994). In line with this observation, scholars have found that there is no significant difference in the offer distributions between $10 and $100 endowment size, although there is a decrease in the rejection rates as the endowment increases in magnitude (Hoffman, McCabe, Shachat, & Smith, 1994). However, the acceptance and rejection rates of the proposed allocation, are of less importance to this study; the core of the analysis, as mentioned before, is the misreporting behavior of the subjects. Hence, the endowment size of the experiment was €25, which is in line with the evidence indicated by past literature.

The experiment of this paper consisted only of one task. That is, the participation in the ultimatum game. As far as the incentive system is concerned, due to finite amount of resources, this study uses a random incentive system. Each participant performed a single task, after which only one of the participants was randomly selected for whom the outcome of the task was fully compensated. According to Bolle (1990), behavior in experiments under this type of random incentive system should not differ from that of experiments with rewards for all subjects, since certain conditions hold. These conditions include small decision costs and anonymous choices, both of which are met in this experiment. However, Baltussen, Post, Van den Assem, and Wakker (2012) suggest that the random selection of subjects to be paid is likely to result in less risk-averse behavior on behalf of the subjects. Subjects are aware of the fact that there is only a small probability that they are rewarded for their choices, which

might lead in exhibiting a more aggressive behavior in misreporting and allocation of the endowment. However, since this study's experiment randomly assigns subjects to the control or the treatment group, this issue would not be of much concern.

Sample size

Sample size is a crucial factor for the credibility of the study's results, as it is correlated with the power of the tests to be conducted. According to research, most tests require at least a power of 0.80 (Noordzij, Tripepi, Dekker, Zoccali, Tanck, & Jager, 2010). That is, there is a maximum chance of 80% that the H_0 or hypothesis zero is correctly rejected. Put differently, there is an 20% chance (typed II error or beta) that the H_0 is falsely failed to be rejected in any give test. Moreover, a significance level of 5% is most commonly used in statistics and is a value for which a p-value less than or equal to 5% is recognized as statistically significant. Thus, when a hypothesis is tested, the significance level in conjunction with the p-value determine if the null hypothesis it to be rejected.

Before the experiment was conducted an *a priori* power analysis (Cohen, 1988) was computed in order to identify the ideal sample size N, given the required power level $(1 - b = 0.2)$, the predetermined significance level a (5%) and the effect size that is expected to be detected. In this study, the intervention is applied in the concept of recalling childhood memories, which lead to moral purity, which itself lead to prosocial behavior (Gino & Desai, 2012). According to the results of Gino and Desai the participants who recalled childhood memories donated more money to charity than did participants in the control group with effect size $d = 0.44$. Consequently, this paper assumes a medium level of effect size, namely, $d = 0.5$.

Moreover, the incentives price ratio and the variance ratio of the two treatments are needed to compute the sample size of the two treatments, hence, the sample size N.

Starting with incentives, it is derived from the design of this project that there are the same in both the control and the treatment group. Along with the assumption that the variances of the two treatments are equal, it is implied that the sample size should be equally divided among all treatments. Nevertheless, the sample size in the treatment group should be proportional to its variance relative to the variance in the control group (given that incentives/prices are equal in both treatments). Considering this, the *a priori* analysis was conducted to determine the optimal sample size, using the G*Power software (Faul, Erdfelder, Lang, & Buchner, 2007). The desired total sample size was calculated to be $N = 128$ (see Appendix II). During the distribution of the online experiment, I aimed for this number of subjects in order to obtain the desired power. Thereby, the actual number of participants in this study reached the number of $N = 126$. Nonetheless, a *post hoc* analysis has been conducted to calculate the total power of the tests used (see 4. Results).

Variables

In this subchapter, the definition of the concepts concerning the variables collected from the online experiment will be described, to provide a better understanding of the experimental setup and the analysis of the results. The variables collected are the following:

i. Condition

The independent variable of this study, is the childhood memories condition. It is a nominal and dichotomous variable taking values of 0 when the control condition has taken place (neutral recent memories were provoked), or 1 when the treatment condition was applied (positive childhood memories were provoked).

ii. Reported Endowment Size

The "Reported Endowment Size" variable, hereafter RES, is the main variable of this study's analysis and is used to test whether participants misreported the endowment size and in what degree. Higher values of RES indicate smaller degree of misreporting. RES is a continuous variable and can take values from 5 to 25, where 5 indicates the highest degree of misreporting, whereas 25 no misreporting whatsoever. Participants were asked to report an endowment to the responder, generating the RES variable.

iii. Responder's Share

The "Responder's Share" variable, hereafter RS, is a continuous variable and indicates the allocation made by the proposer to the responder. Higher values of RS indicate higher levels of allocation offered to the responder.

iv. Age

Age is a continuous, ratio variable. Subjects were asked to self-report their age in the last page of the experiment.

v. Gender

Gender is a dichotomous, nominal variable. Male is expressed with the numerical value 1, while female with the numerical value 2.

vi. Current Education - Occupation

Education - Occupation is a nominal variable classified as follows: "high school student", "Bachelor student", "Master's student (MSc)", "Doctorate student (PhD)" and "Professional". Those categories are expressed with numerical values 1 to 5 respectively.

vii. Perceived Income

Perceived Income is an ordinal variable, scaling as follows: "Far below average", "Somewhat below average", "Average", "Somewhat above average" and "Far above average". Those categories are expressed with numerical values 1 to 5 respectively.

4. Results

Preliminary analysis

The experiment of this study focuses on two conditions, the control and the treatment group. The number of subjects participated in the control group was 62, while the treatment group consisted of 64 subjects. That completes the 126 subjects that participated in the online experiment, that is 126 independent observations at the individual level. The participants were evenly distributed across gender, with slightly more male subject (51%), while the age ranged between 16 and 54, with an average of 25 years. Most participants were 24 and 27 years old (34 observations). In addition, most participants were master's degree students (55%) and reported an 'average' yearly income (33%). Interestingly, there were no participants that reported a 'far above average' yearly income. See Table 1 for the means and standard deviation of the variables across the two conditions.

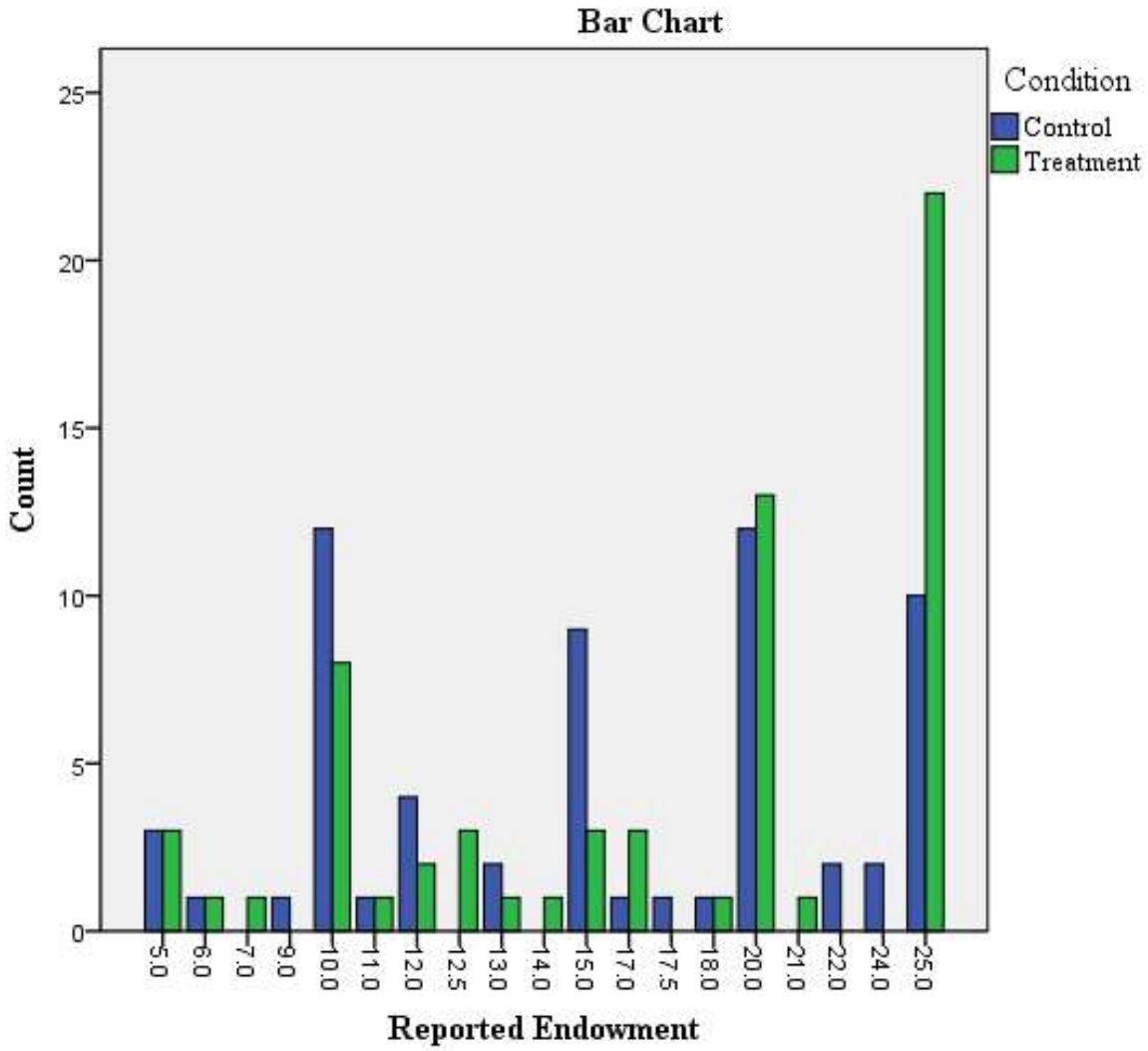
Table 1: Distribution of subjects

Descriptive statistics

			Gender	Age	Education	Perceived income
		N	*M*	*M*	*M*	*M*
Total sample		126	1.49 (.502)	25.64 (5.703)	2.68 (.816)	2.37 (1.002)
Condition	Control	62	1.5 (.504)	25.56 (5.609)	2.68 (.672)	2.42 (.984)
	Treatment	64	1.48 (.504)	25.72 (5.835)	2.69 (.941)	2.33 (1.024)

The histogram in Figure 2 below, illustrates the distribution of the RES across conditions. It can be observed that the control condition has several peaks along the horizontal axis, whereas the treatment group appears to have two peaks at the right end of the horizontal axis. This implies that there is a probable change in the subjects' behavior towards a more honest reporting, when the childhood memories where introduced.

Figure 2: Distribution of RES amongst conditions



Statistical tests were conducted to test the hypotheses of this study. To begin with, it is mandatory to determine whether parametric or non-parametric tests are appropriate for the data of this paper. In general, parametric testes are often preferred over non-parametric ones, given that the underlying assumptions are met. For a more detailed synopsis of the assumptions of parametric tests, see Appendix III. Given that parametric tests have more power than non-parametric tests, my primary concern is to check if these assumptions are satisfied. Independence of observations, homogeneity of variance and 'interval' scale of variables were met, however, the normality assumption was violated. To test for normality, the Shapiro-Wilk test of normality was conducted. The null hypothesis of this test is that the distribution of the data is equal to a normal distribution. Hence, the distribution of the data is not normally distributed if the null hypothesis is rejected ($p < .05$). Table 2 below, shows that the null hypothesis was rejected, suggesting that the normality condition was violated (for graph of the distribution see Appendix IV).

Table 2: Tests of Normality

Tests of Normality

		Kolmogorov-Smirnov			*Shapiro-Wilk*		
	Condition	*Statistic*	*df*	*Sig.*	*Statistic*	*df*	*Sig.*
RES	Control	.153	62	.001	.923	62	.001
	Treatment	.201	64	.000	.871	64	.000

Since the assumption of normality for the RES variable do not hold, non-parametric tests were preferred in many steps of the analysis. However, there are some parametric tests, like ANOVA that are considered quite reliable, even when the normality condition does not hold (Maxwell, & Delaney, 2004).

Hypothesis 1, 2

Indeed, there was more misrepresentation in the treatment condition than in the control condition, supporting my primary hypothesis. In control condition, only 10 out of 62 participants (16.12%) fully reported the endowment size, whereas in the treatment condition 22 out of 64 participants (34.37%) fully reported the endowment size. Results of a cross-tabulation suggest that subjects in the control condition relative to those in the treatment condition were significantly more likely to misreport the endowment size, $\chi^2(1, N = 126) = 5.533,\ p = .019$. This suggests that there is a statistically significant association between the condition (control and treatment) and misreporting behavior; that is, the condition of my experiment is not independent from misreporting (see Table 3 and Figure 3 below). In addition, the Phi and Cramer's V tests, both test the strength of association. It can be seen in the Table 4, that the strength of association between the RES and the condition is quite strong ($Phi = .210, p = .019$). Moreover, results of a two-sided Fisher's exact test suggest that the condition (control, treatment) of the experiment does have a statistically significant effect on people's misreporting behavior ($p = .024,\ Fisher's\ exact\ test$). This implicates that I cannot reject the first hypothesis, people are less likely to cheat when childhood memories are evoked. Note here that in order to conduct these series of tests, the RES variable was transformed into a dichotomous one, taking the numerical value of 1 whenever a subject misreports the endowment size and the numerical value of 2 whenever a subject fully reports the endowment size that it was given.

Table 3: Chi-Square test, Fisher's Exact test

Chi-Square Tests

	Value	*df*	*Asymptotic Significance (2-sided)*	*Exact Sig. (2-sided)*	*Exact Sig. (1-sided)*
Pearson Chi- Square	5.533[a]	1	.019		
Likelihood Ratio	5.646	1	.017		
Fisher's Exact Test				.024	.015
N of Valid Cases	126				

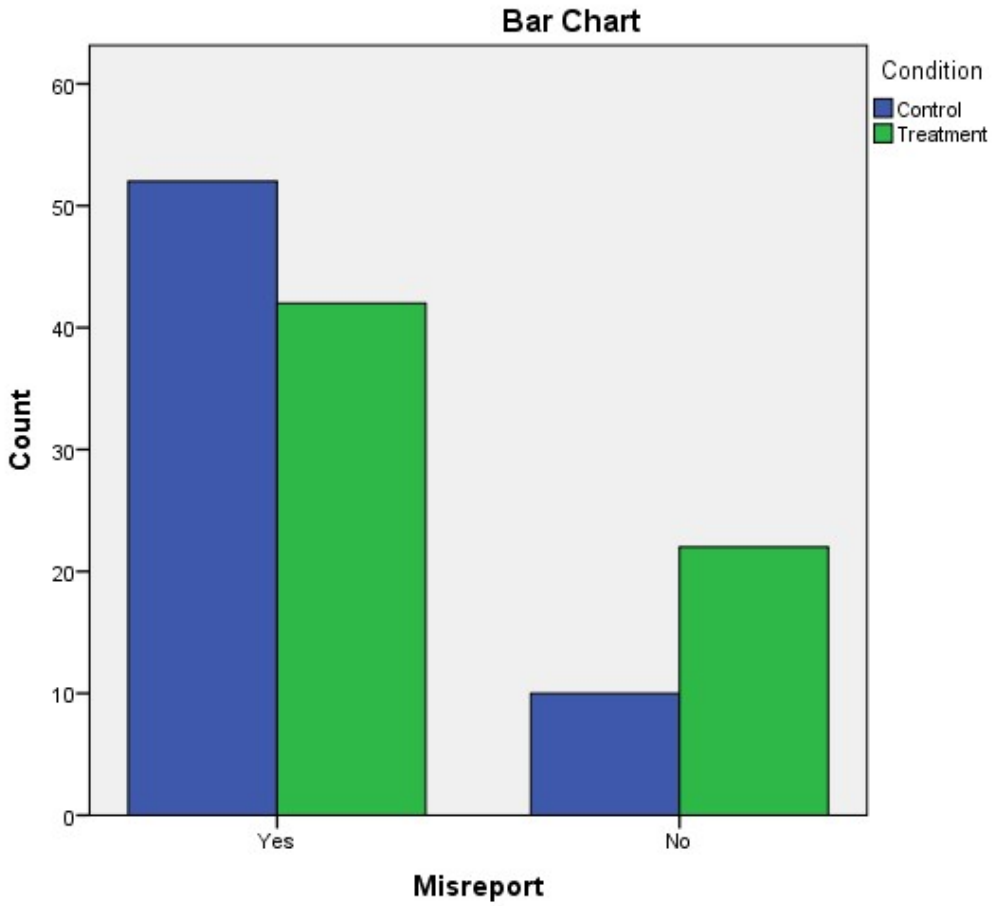
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 15.75.
b. Computed only for a 2x2 table.

Table 4: Phi and Cramer's V tests

Symmetric Measures

		Value	*Approximate Significance*
Nominal by Nominal	Phi	.210	.019
	Cramer's V	.210	.019
N of Valid Cases		126	

Figure 3: Distribution of Misreport in Conditions



Furthermore, there was a marginally significant difference (at the 10%, but not at 5% significance level) in the size of the endowment that was reported. Those in the control condition reported the total endowment size as smaller ($M = 16.2$, $SD = 6.1$) than did those in the treatment condition ($M = 18.0$, $SD = 6.6$). The test employed to compare the differences between the two independent groups was the Mann-Whitney U test ($U = 1628$, $p = .078$), because of the violation of the normality assumption (see Table 5 and 6 for details). From this data, it can be concluded that the RES in the treatment group was statistically significant higher than the control group at 10% significance level but not at 5% significance level. In other words, this implies that there is not enough evidence at the 5% significance level that support the second hypothesis. That is, the RES mean difference between the control and the

treatment group was marginally significantly different (at the 10% level). Note that despite the non-normality, one-way ANOVA is quite robust to violations of normality (Maxwell, & Delaney, 2004), therefore results of the one-way ANOVA are displayed in the Appendix V. For a post hoc power analysis of the Mann-Whitney U test see Appendix VI.

Table 5: Ranks Mann-Whitney U test (RES)

Ranks

	Condition	*N*	*Mean*	*Mean Rank*	*Sum of Rans*
Reported Endowment Size	Control	62	16.2 (6.1)	57.76	3581.00
	Treatment	64	18.0 (6.6)	69.06	4420.00
	Total	126			

Table 6: Mann-Whitney U test on RES

Test Statistics[a]

	Reported Endowment Size (RES)
Mann-Whitney U	1628.000
Wilcoxon W	3581.000
Z	-1.763
Asymp. Sig (2-tailed)	.078

a. *Grouping Variable: Condition (Control, Treatment)*

Moreover, subjects appeared to be more self-centered in the control condition, namely they offered less to the responder ($M = 7.60,\ SD = 3.29$) compared to the treatment condition ($M = 8.54,\ SD = 4.16$), although the difference is not statistically significant ($U = 1684,\ p = .136$). See Table 7, 8 and Figure 4 below for further details.

Table 7: Ranks Mann-Whitney U test (RS)

Ranks

	Condition	*N*	*Mean*	*Mean Rank*	*Sum of Rans*
Responder's share	Control	62	7.60 (3.29)	58.66	3637.00
	Treatment	64	8.54 (4.16)	68.19	4364.00
	Total	126			

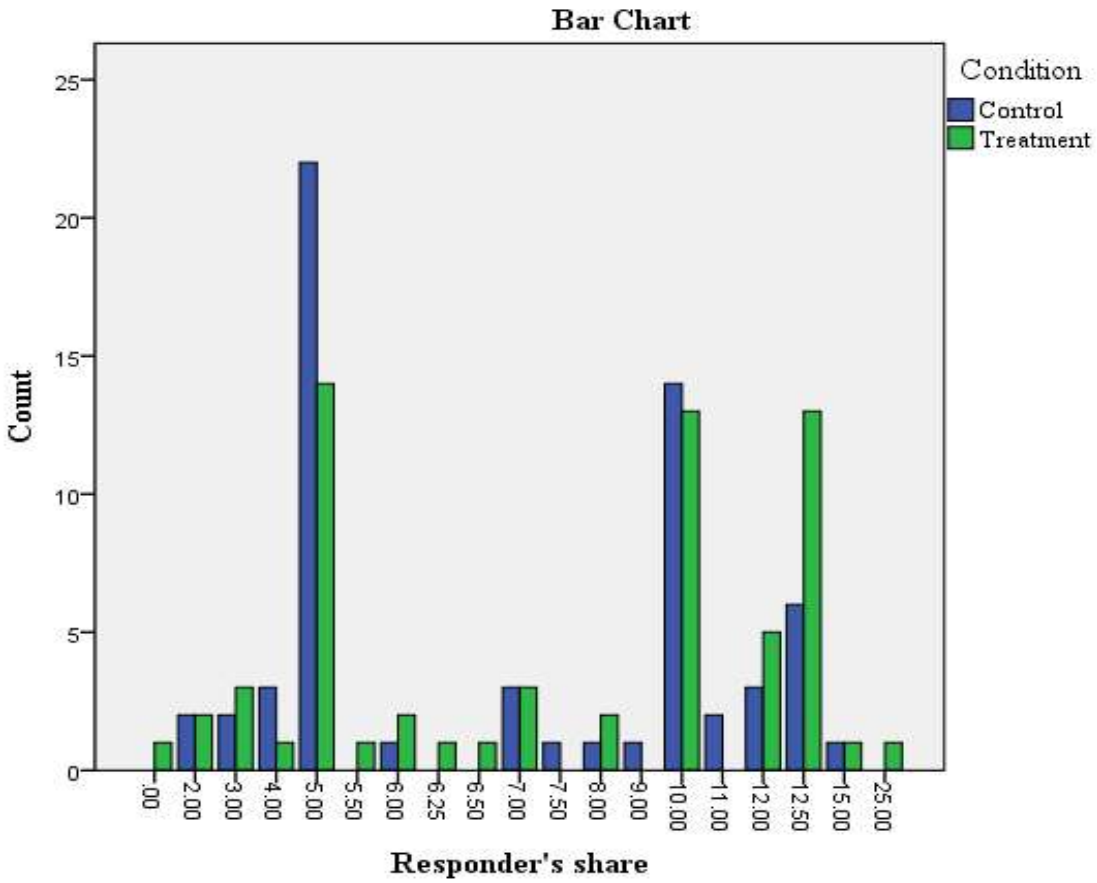
Table 8: Mann-Whitney U test on RS

Test Statistics[a]

	Responder's Share (RS)
Mann-Whitney U	1684.000
Wilcoxon W	3637.000
Z	-1.492
Asymp. Sig (2-tailed)	.136

a. Grouping Variable: Condition (Control, Treatment)

Figure 4: RS distribution in conditions



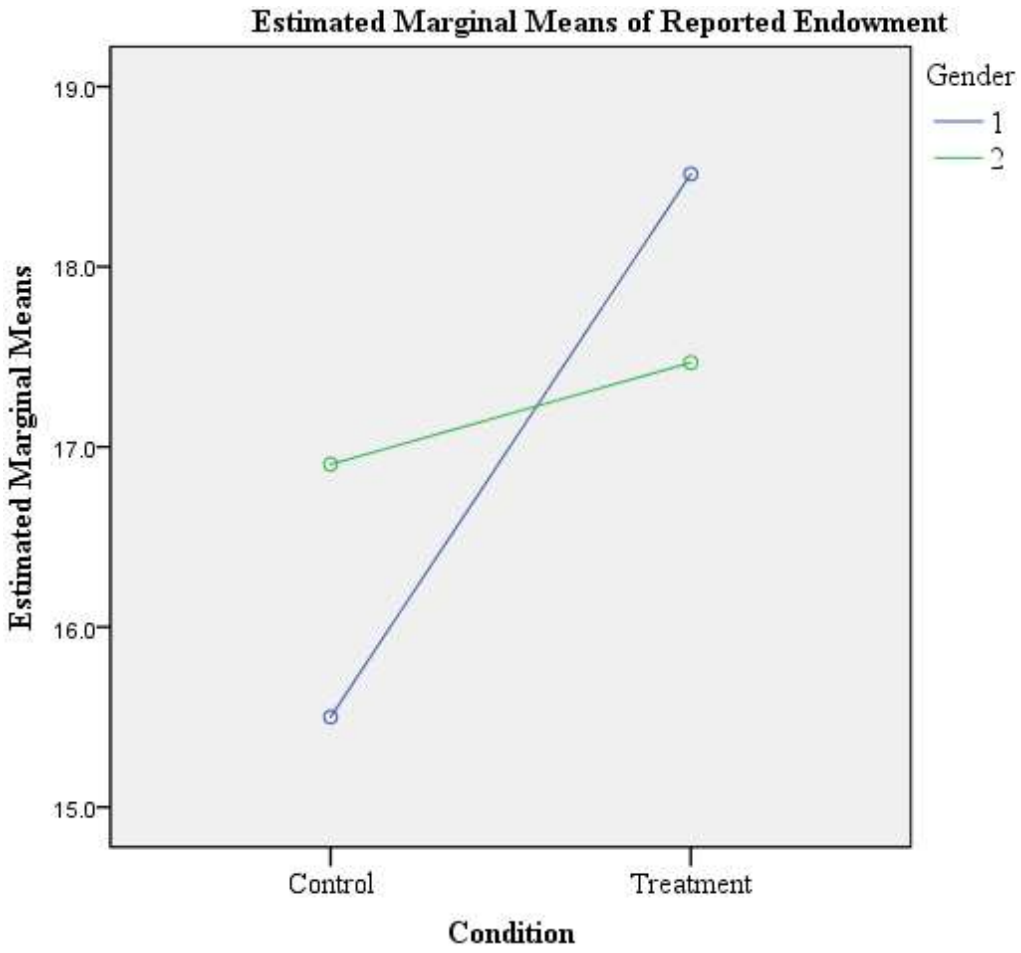
Hypothesis 3

For hypothesis 3, it is necessary to test whether the treatment has a different effect on males than females. According to hypothesis 3, childhood memories should have a greater effect on females' misreporting behavior. In order to check for interaction effects between the condition and the gender a two-way ANOVA was conducted. As it is mentioned above, according to the literature there is strong support for the robustness of the ANOVA family under application of non-normally distributed data (Schmider, Ziegler, Danay, Beyer, & Bühner, 2010).

Firstly, a plot is employed to obtain an insight of the interaction. The means/interaction plot (Figure 5) implies that there might be a difference between males and females in the way that condition affects RES, since the lines are not parallel and

males' line crosses females' line. The differences between the mean RES on each condition appears to be bigger for males than for females.

Figure 5: Interaction plot between type of condition and gender



Next the assumption of equality of variances is tested; Levene's test indicates that the null hypothesis of equal variances of RES across groups cannot be rejected (see Appendix VII). Contrary to the plot above, results of the two-way ANOVA indicate that there was no significant interaction between the effects of gender and condition on RES, $F(2, 126) = 1.171,\ p = .281$. Thereby, I do not find evidence that the magnitude of the difference between average RES by condition type depends on the gender of the subjects. On top of that, it can be observed that neither the condition nor

the gender are statistically significant at 5% significance level in this model. Results are reported in Table 9, below. Therefore, no evidence has been found for the third hypothesis, which states that evoking childhood memories should reduce cheating behavior relatively more to females than males.

Table 9: Two-way ANOVA test results (RES - Condition, Gender)

Tests of Between-Subjects Effects

Dependent Variable: Reported Endowment Size

Source	*Type III Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Corrected Model	150.794[a]	3	50.265	1.245	.296
Intercept	36801.727	1	36801.727	911.744	.000
Condition	100.836	1	100.836	2.498	.117
Gender	.996	1	.996	.025	.875
Condition*Gender	47.260	1	47.260	1.171	.281
Error	4924.420	122	40.364		
Total	42001.000	126			
Corrected Total	5075.214	125			

a. R Squared = .030 (Adjusted R Squared = .006)

Furthermore, the pairwise comparisons between gender and condition may be analyzed (Table 10). In the table, it is observed that the mean difference between the two conditions is marginally statistically significant for males ($p = .060$) at 10% significance level. Note that the effect has the desired direction, since the RES mean is higher for the treatment group and it implies that male subjects cheated on average less in the treatment than in the control condition. However, the mean difference for female participants is far from being statistically significant.

Table 10: Pairwise comparisons Gender-Condition

Pairwise Comparisons
Dependent Variable: Reported Endowment Size

Gender	(I)Condition	(J)Condition	*Mean Difference (I-J)*	*Std.Error*	*Sig[b].*
Male	Control	Treatment	-3.015	1.589	.060
	Treatment	Control	3.015	1.589	.060
Female	Control	Treatment	-.565	1.614	.727
	Treatment	Control	.565	1.614	.727

**. The mean difference is significant at the .05 level*
b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

In conclusion, it appears in Figure 5 that the effect of the treatment had a greater impact on males than on females; however, after the two-way ANOVA test, no statistically significant evidence was found that the magnitude of the difference between the RES means for each condition depend in part upon the gender category.

Hypothesis 4

Besides gender, age is also an attribute that could affect a person's honesty in reporting. As past research indicates, it was expected that the treatment condition would have a greater effect on older people. In pursuance of any interaction between age and condition, the participants were classified into four groups according to their age. The first group contained participants ranging from 15 to 20, the second from 20 to 25, the third from 25 to 30 and the last group from 30 thru the highest age of the sample (World Health Organization, 1982). Below in Table 11, the distribution of participants over the four groups is presented.

Table 11: Distribution of subjects over age categories

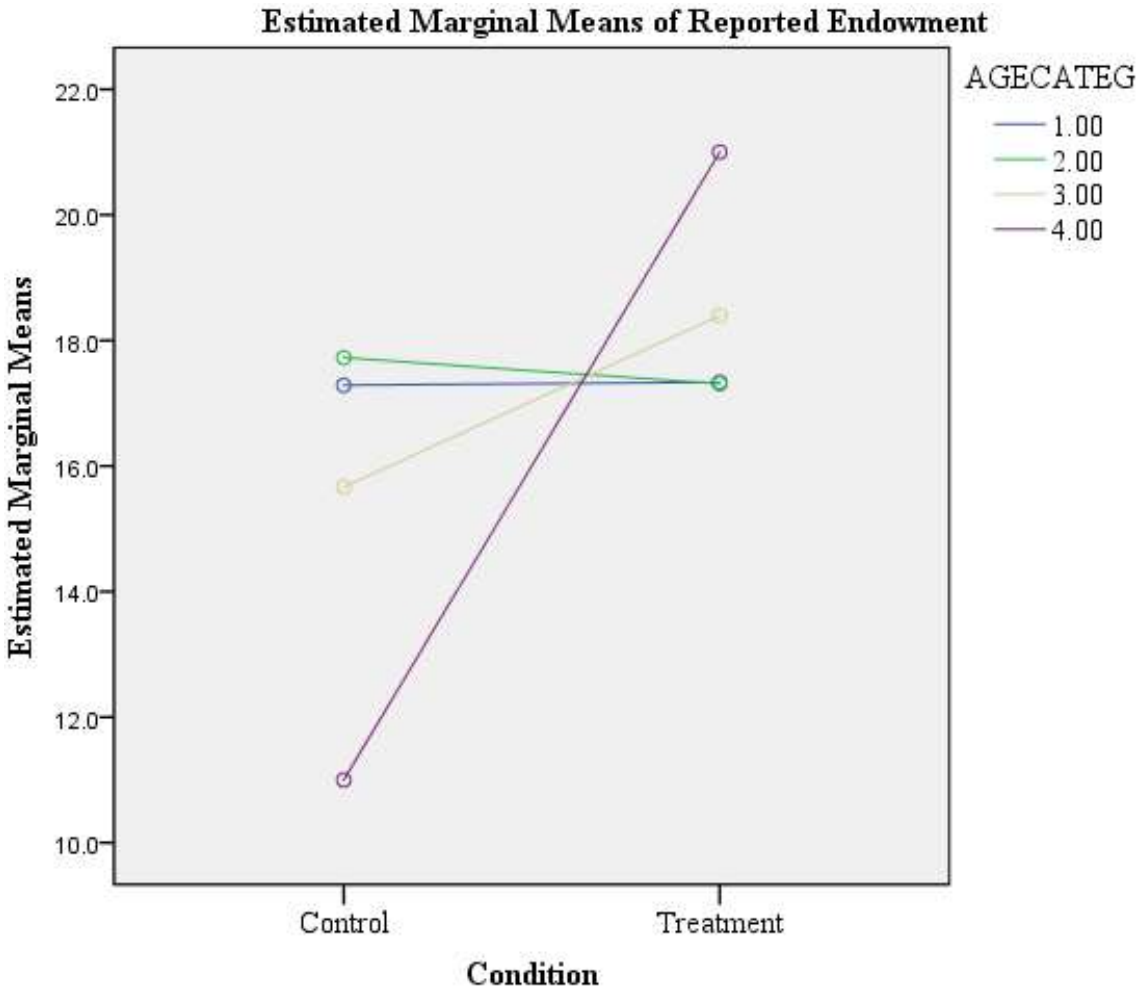
Agecateg

		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	1	13	10.3	10.3	10.3
	2	60	47.6	47.6	57.9
	3	39	31.0	31.0	88.9
	4	14	11.1	11.1	100.0
	Total	126	100.0	100.0	

An interaction plot is employed to observe the different dynamics between age and type of condition (see Figure 6). The first impression of the graph supports the hypothesis concerning treatment condition having a greater effect on older people. The biggest change in the misreporting behavior belongs to the fourth group of the age

classifications. The magnitude of the difference in the treatment condition for the oldest participants appears to be bigger than any other age category.

Figure 6: Interaction plot between type of condition and age



Next step in the analysis is the execution of a two-way ANOVA test in order to check for any interaction terms, and their statistical significance; namely, to test the hypothesis that the magnitude of the difference of the RES means between control and treatment condition is equal across all levels of age category. Firstly, in order to test the homogeneity of variances assumption, the Levene's test for of equality of variances is employed. It derives that the null hypothesis cannot be rejected; that is, the error variance of the RES is equal across groups (see Appendix VIII). Next, the test's output

is analyzed (see Table 12). The two-way ANOVA informs us that there is a marginally statistically significant interaction term between the treatment condition and the age category, ($p = .53$). We can also see from the table below that there was a statistically significant difference in mean RES between control and treatment group ($p = .028$) but there were no statistically significant differences in mean RES between age levels ($p = .881$). Consequently, no evidence was found that evoking childhood memories has a greater effect on older than younger people at 5% significance level.

Table 12: Two-way ANOVA test results (RES - Condition, Agecateg)

Tests of Between-Subjects Effects

Dependent Variable: Reported Endowment Size

Source	*Type III Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Corrected Model	496.003[a]	7	70.858	1.826	.088
Intercept	23148.277	1	23148.277	596.499	.000
Condition	192.033	1	192.033	4.948	.028
Agecateg	25.773	3	8.591	.221	.881
Condition*Agecateg	307.060	3	102.353	2.638	.053
Error	4579.211	118	38.807		
Total	42001.000	126			
Corrected Total	5075.214	125			

a. R Squared = .098 (Adjusted R Squared = .044)

Moreover, the pairwise comparisons may be examined, for further analysis (Table 13). It is observed that the mean difference is statistically significant for age group 4 ($p = .005$) across the control and the treatment group. Moreover, the effect has the appropriate direction, that is the RES mean is bigger in the treatment group and it indicates that people in the fourth age category reported on average more honestly in the treatment than in the control condition. The mean difference for every other age category is far from being statistically significant.

Table 13: Pairwise Comparisons Agecateg-Condition

Pairwise Comparisons
Dependent Variable: Reported Endowment Size

Agecateg	(I)Condition	(J)Condition	*Mean Difference (I-J)*	*Std.Error*	*Sig[b].*
1	Control	Treatment	-.048	3.466	.989
	Treatment	Control	.048	3.466	.989
2	Control	Treatment	.415	1.609	.797
	Treatment	Control	-.415	1.609	.797
3	Control	Treatment	-2.729	2.050	.186
	Treatment	Control	2.729	2.050	.186
4	Control	Treatment	-10.000*	3.475	.005
	Treatment	Control	10.000*	3.475	.005

**. The mean difference is significant at the .05 level*

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

5. Discussion and Conclusions

General Discussion

The main goal of this study was to investigate the effect of positive childhood memories on people's misreporting behavior. Regarding the impact of childhood memories, I find results that support the first hypothesis; that is, people in the control condition are more likely to misreport the endowment size, than people in the treatment condition. However, the second hypothesis did not fully support the first one, since results indicate that the average misreporting on the control condition was not statistically significantly different from the average misreporting on the treatment condition. Moreover, I do not find evidence that subjects exposed to the control condition exhibit higher levels of self-centered behavior. As far as the third hypothesis is concerned, I did not find evidence that support the fact that childhood memories have a greater impact to female than to male individuals. Furthermore, I failed to find proof that would confirm the last hypothesis; namely, childhood memories do not appear to have a greater impact on different levels of age.

This research adds to the literature by empirically exploring the behavioral influences of childhood memories on misrepresenting behavior. Although prior research has indicated some decisive results of childhood memories on prosocial behavior (Gino & Desai, 2012), this paper's uniqueness is that it tries to explore misreporting behavior in a strategic context, that is an ultimatum game with asymmetric information. As mentioned before, in such environment, people often lie strategically in order to gain a competitive advantage. However, it is intriguing that the effect of childhood memories persists in such conditions, altering people's behavior, leading them to misreport less. This finding can be used in many real life situations, where

people economically interact with each other in strategic contexts where asymmetric information thrives, nudging people towards a more honest and altruistic behavior.

Limitations and Recommendations

As with most experiments, this study is subject to several possible limitations. While in the previous section the interesting findings were discussed, it is also crucial to reflect on some limitations of the current research and to recommend some further research needed on this topic.

Firstly, the experiment of this paper focuses on the short run, as the action of the misreporting was asked by participants right after their exposure to the treatment. Further research might be needed to test the long-term effects of recalling childhood memories on cheating behavior, as it would be intriguing to explore if the effect of such treatment persists. The findings of this study are limited mainly through the online experimental design, which excludes some of the real-world context and elements that people are exposed to in their everyday life. Dishonesty itself is likely to be more complex and more integrated in ongoing exchanges, than what this study could monitor.

In addition, the internal validity of the experiment could be enhanced by conducting a similar type of experiment in a better controlled environment, namely a laboratory. This way any confounding factors would be minimized. Especially, in this study's experimental setup (ultimatum game), subjects should act in a more controlled environment. In addition, the external validity of the experiment may not be optimal because of the relatively small sample size. Besides that, most participants were students, probably intrinsically motivated to take part in any kind of experiment. Moreover, many participants were friends or acquaintances and may have only participated in the experiment in order to help this study finalize. To get a better reflection of the population and to generate more valid results, a larger sample is

needed. Possibly, a larger sample might also have resulted in more reliable and robust findings along with resulting in higher levels of achieved power for the tests.

Furthermore, there is a compromise between the experiment system and the provided anonymity which is crucial for this kind of study (cheating behavior). The experiment was distributed online, thus e-mail addresses were asked from the participants to contact them in case they had won the lottery. However, participants may have considered this as a partial loss of anonymity, leading to many normative mechanisms like social desirability (Carini, Hayek, Kuh, Kennedy, & Ouimet, 2003). This effect is greater in this kind of anonymity-sensitive topic such as cheating behavior.

Finally, the incentive system could be altered into a more complete one (given the absence of finite resources), compensating every participant of the experiment. This could lead to more reliable and concentrated results (Camerer, Hogarth, Budescu, & Eckel, 1999).

Conclusion

This thesis is building on the study by Gino and Desai (2012), and examines the relationship between childhood memories and cheating behavior. More specifically, it attempts to find differences in misreporting behavior between individuals who were asked to recall positive childhood memories and individuals who were asked to recall recent neutral memories. Moreover, it investigates whether there are differences in the magnitude of the effect across gender and age different levels.

Concluding, evidence has been found that support the main hypothesis of the study, that people are less likely to misreport the endowment size when they are evoked with childhood memories. Interestingly enough, the feelings of moral purity that experience the participants after recalling childhood memories appear to be quite robust

in a strategic context. This finding can be used in various alterations and in many strategic environments, where people often exhibit cheating, in order to diminish this kind of behavior. On the other hand, the weight of the effect does not change across gender and different age categories. That is either because the hypotheses stated are false, or because the experiment conducted has failed to capture these kinds of effects. Further research could find new ways to assert whether childhood memories have an effect on cheating behavior and to explore the different magnitude of the effect across various demographic attributes.

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7. Appendix

Appendix I – Online experiment

Welcome to my experiment in the economics of decision-making.

The experiment consists of 5 pages and will take you no more than 5 minutes. It contains 2 stages. In the first stage, you have to answer one general question. In the second stage, you will participate in a task.

The task requires two participants, the *proposer* and the *responder*, and a provided endowment (an amount of money) given by the experimenter. Each participant has a unique role in the task. More detailed instructions on the next page.

One pair of participants (a proposer, and a responder) will be randomly selected and will get fully paid according to their earnings in the experiment (up to **€25**).

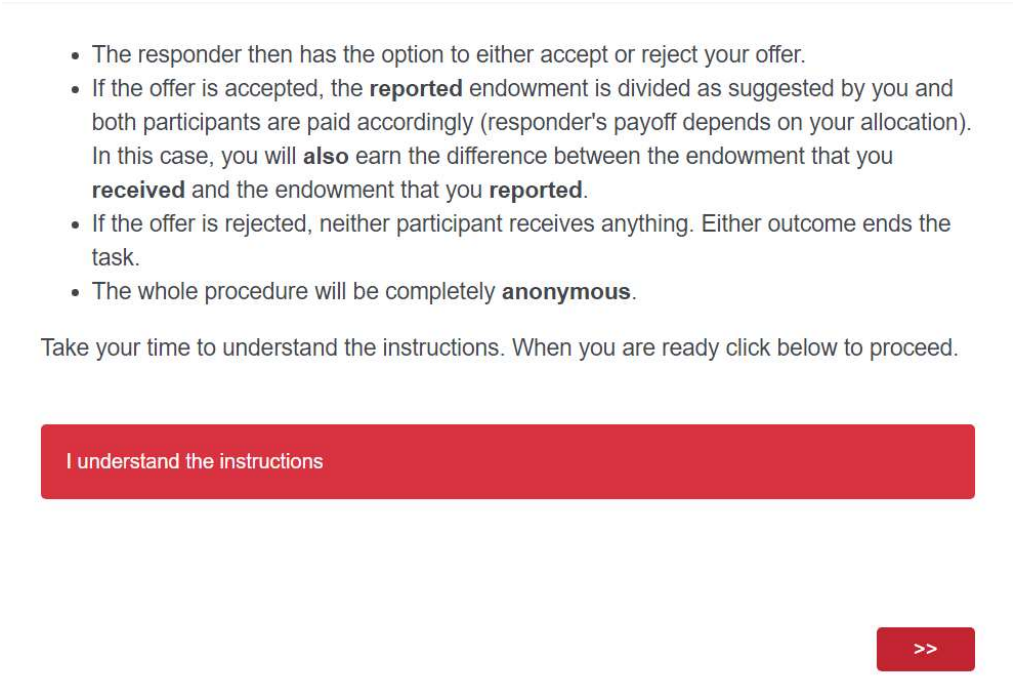
Good luck!

>>

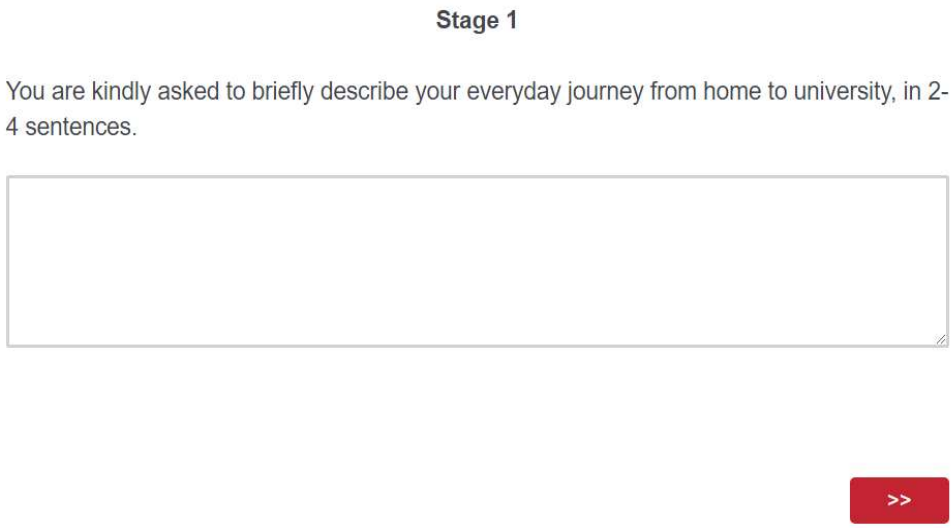
You are the *proposer*. Please read carefully the specific instructions for your role.

- You are randomly paired with another participant (he/she is the responder). Then you receive the endowment and the responder receives nothing.
- The actual size of the endowment is €25. You are the **only** participant in the task who knows the total size of the endowment. The responder **only** knows that the endowment size is somewhere between €5 and €30 and will **never** know the actual size of the endowment. The responder will **only** know what you decide to report as the endowment size.
- As a result, you (after receiving the endowment) act first by:

1. reporting a number that you wish as the total endowment size to the responder,
2. proposing an allocation (between you and the responder) of the **reported** endowment to the responder.



Stage 1 in our experiment was the condition (control or treatment). Subjects were randomly assigned to one condition as soon as they entered the online questionnaire.



Stage 1

You are kindly asked to briefly describe a positive childhood memory of yours, in 2-4 sentences.

>>

Stage 2

You receive a €25 endowment and you are randomly paired with a responder. The responder **only** knows that the endowment size is between €5 - €30.

Choose what to report to the responder as the received endowment size (must be equal to or more than 5 and equal to or less than 25).

0 € Reported Endowment

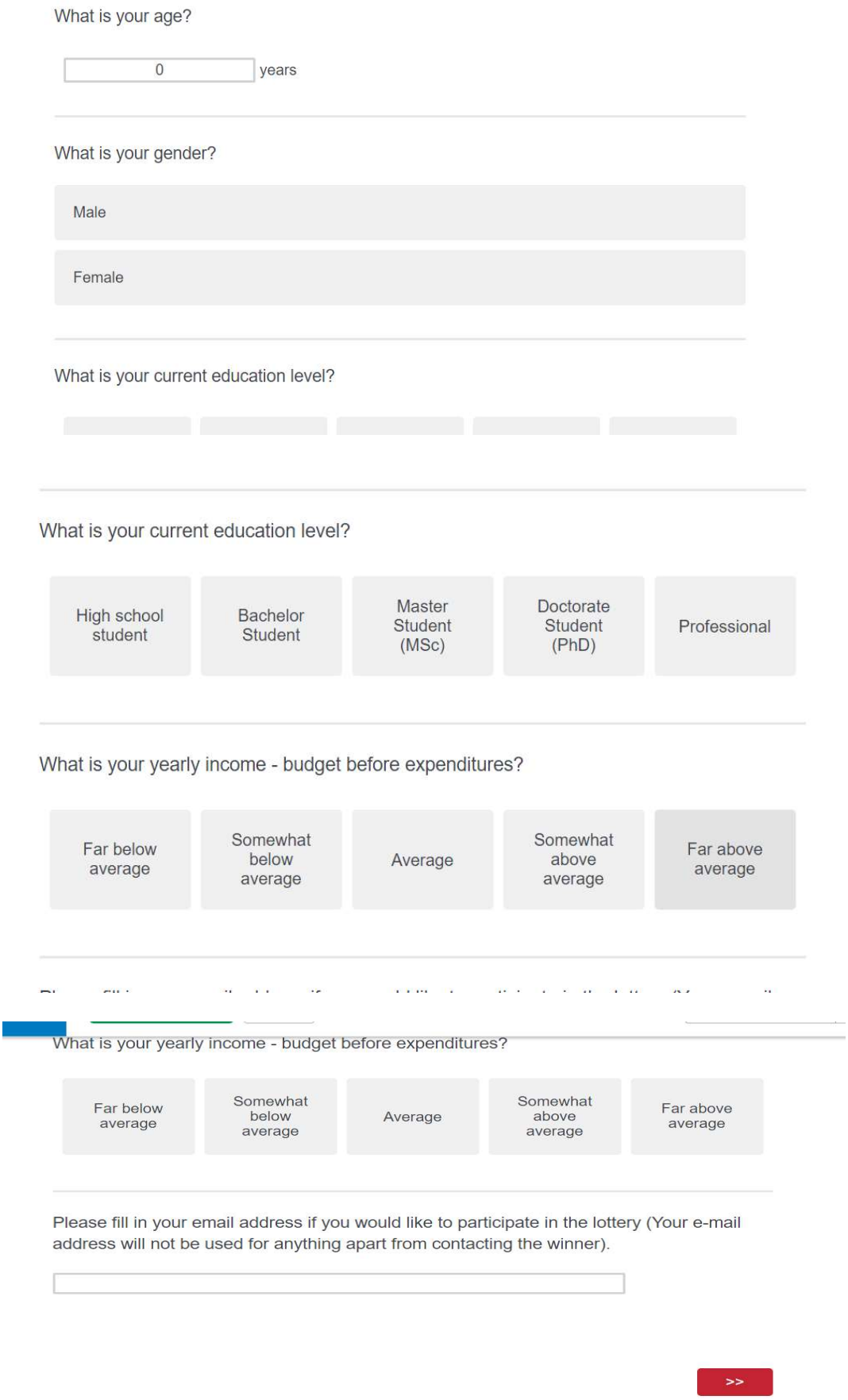
Note that on the next page you will be asked to allocate the amount that you reported above between you and the responder.

>>

Now propose an allocation of the 23€ (total amount should equal 23€)

How much will you keep	0 €
How much will you give to responder	0 €
Total	0 €

>>



What is your age?

0 years

What is your gender?

Male

Female

What is your current education level?

What is your current education level?

High school student | Bachelor Student | Master Student (MSc) | Doctorate Student (PhD) | Professional

What is your yearly income - budget before expenditures?

Far below average | Somewhat below average | Average | Somewhat above average | Far above average

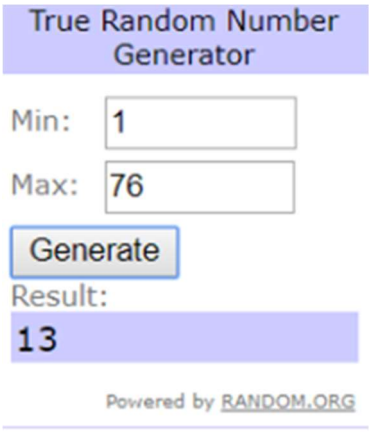
What is your yearly income - budget before expenditures?

Far below average | Somewhat below average | Average | Somewhat above average | Far above average

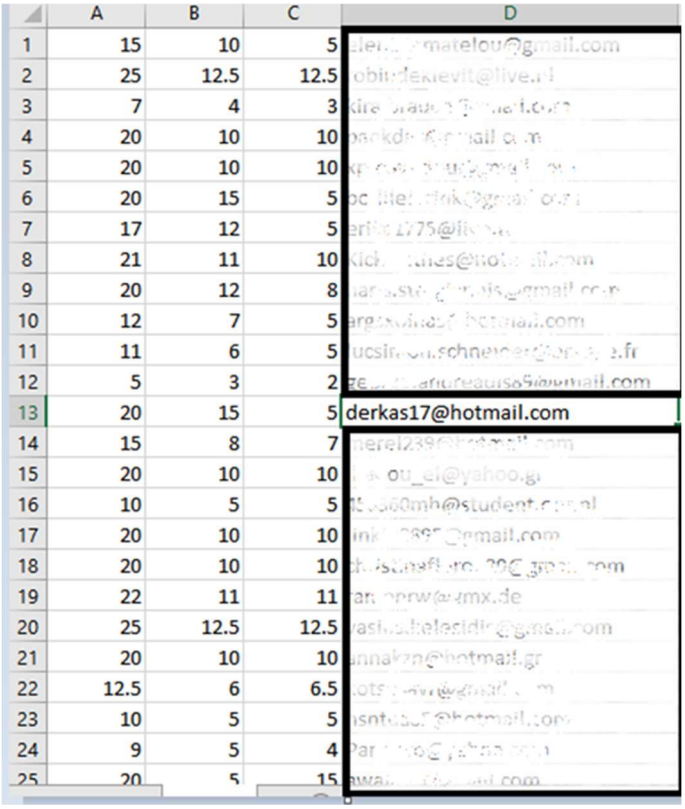
Please fill in your email address if you would like to participate in the lottery (Your e-mail address will not be used for anything apart from contacting the winner).

>>

Every participant that had filled in its email, was included in the lottery for the winner. The total amount was 76 participants. In order to conduct the lottery, we randomly selected a number (using the website: www.random.org).



After the number was obtained, we pick the 13th participant of the list in Excel dataset (classified by order of survey completion).



	A	B	C	D
1	15	10	5	
2	25	12.5	12.5	
3	7	4	3	
4	20	10	10	
5	20	10	10	
6	20	15	5	
7	17	12	5	
8	21	11	10	
9	20	12	8	
10	12	7	5	
11	11	6	5	
12	5	3	2	
13	20	15	5	derkas17@hotmail.com
14	15	8	7	
15	20	10	10	
16	10	5	5	
17	20	10	10	
18	20	10	10	
19	22	11	11	
20	25	12.5	12.5	
21	20	10	10	
22	12.5	6	6.5	
23	10	5	5	
24	9	5	4	
25	20	5	15	

Then the winner's proposition was transformed into a Qualtrics' survey.

Welcome to my experiment in the economics of decision-making.

The experiment consists of 3 pages and will take you no more than 3 minutes.

The task requires two participants, the *proposer* and the *responder*, and a provided endowment (an amount of money) given by the experimenter. Each participant has a unique role in the task. More detailed instructions on the next page.

One pair of participants (a proposer, and a responder) will be randomly selected and will get fully paid according to their earnings in the experiment.

Good luck!

>>

You are the *responder*. Please read carefully the specific instructions for your role.

- You are randomly paired with another participant (he/she is the proposer). Then the proposer receives the endowment and you receive nothing.
- Next, the proposer offers an allocation of the endowment between him/her and you.

You then have the option to either accept or reject your offer.

- If the offer is accepted, the endowment is divided as suggested by the proposer and both participants are paid accordingly.
- If the offer is rejected, neither participant receives anything. Either outcome ends the task.
- The whole procedure will be completely **anonymous**.

Take your time to understand the instructions. When you are ready click below to proceed.

I understand the instructions

>>

The proposer has received the endowment and offers the following allocation:

Proposer	15
Responder (You)	5
Total Endowment size	20

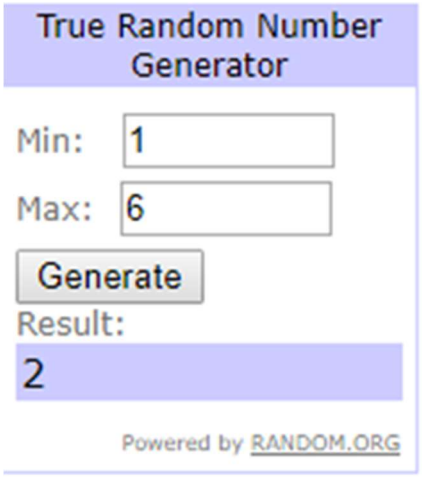
- If you accept the offer you will get €5 and the proposer will get €15.
- If you decline the offer **neither** of you receives anything.

Accept the offered allocation.

Reject the offered allocation

>>

Afterwards, the survey was sent to a randomly selected participant of another student's thesis.

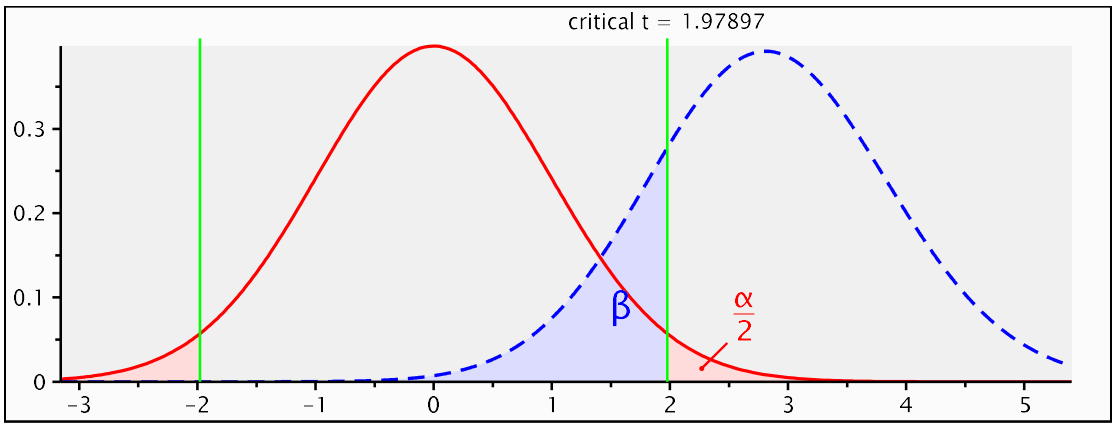


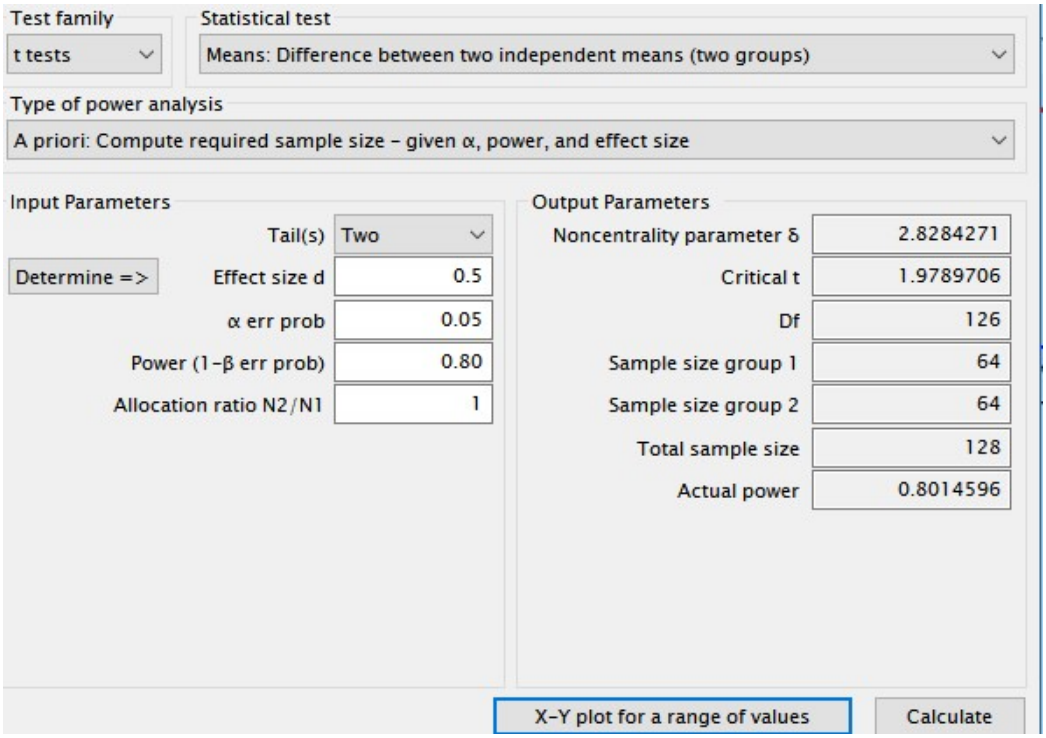
	A	B	C
1	Control Group's Winners		Treatment Group's Winners
2	[redacted]	1|4	[redacted]
3	ramonrw@gmx.de	2|5	[redacted]
4	[redacted]	3|6	[redacted]
5			
6			

The randomly selected proposer reported €20 and allocated €15 to himself and €5 to the proposer. Finally, the randomly selected responder accepted the offer and the money were transferred into both winners' bank accounts.

Appendix II – Power calculations

For determining the optimal sample size, power calculations are necessary. First, we take the commonly used values of significance with $a = 0.05$ and $b = 0.2$ which translates to a power of 80%. Then we assume that the variance remains constant across treatment and control condition. Assuming an effect size of $d = 0.5$, we can compute the optimal sample size. In this study, we used the software GPower*3.1.9.2. It is important to note that this is only an approximation since it has been calculated using a prediction that a student t-test will be employed which is not the case in the present study.



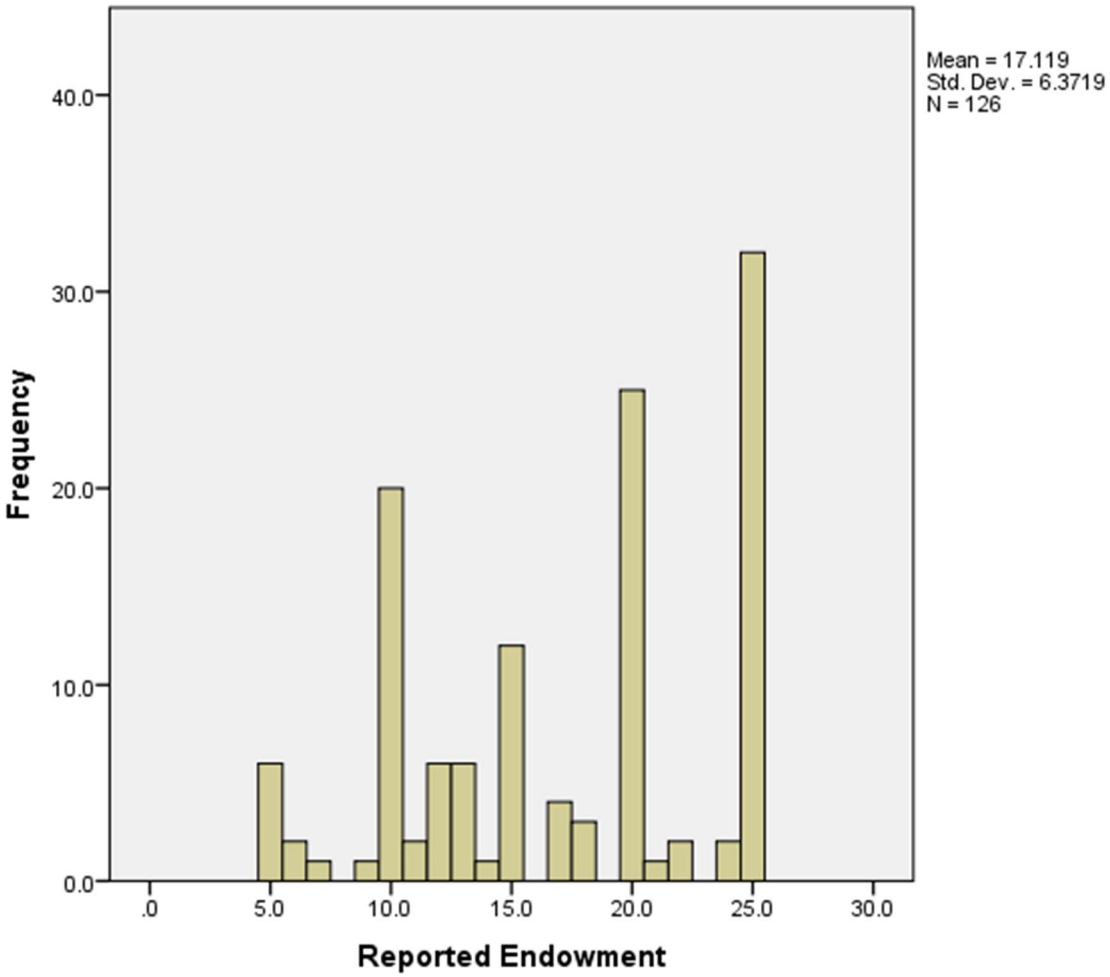


Appendix III – Parametric assumptions

- The observations are independent, that is that the selection of one observation must not influence the selection of another observation.
- The observations must be drawn from a normally distributed population.
- Same variance across groups (in case two groups are to be examined)
- Variables must be measured at least in an 'interval scale', in order to interpret results.

Appendix IV – Graphs of Distributions

RES histogram



Appendix V – Oneway ANOVA

Test of Homogeneity of Variances

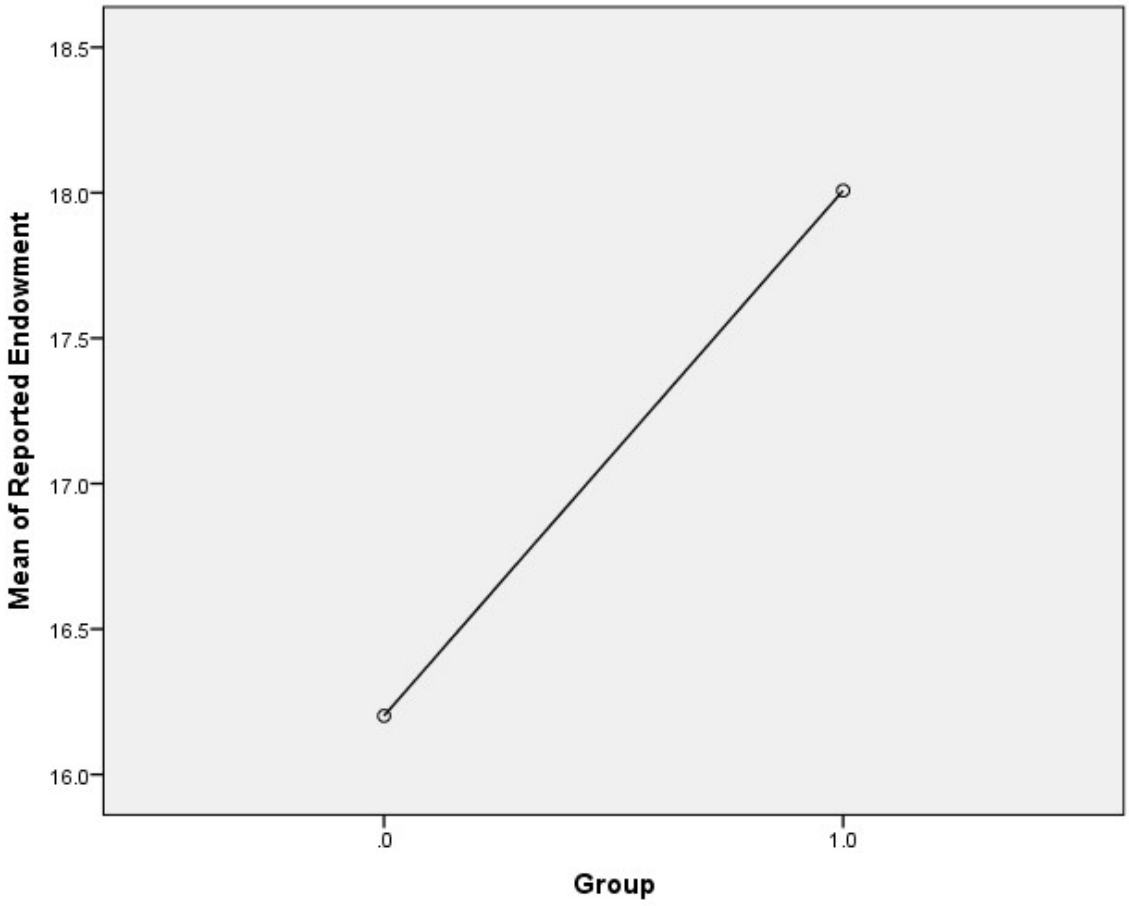
Reported Endowment

Levene Statistic	*df1*	*df2*	*Sig.*
.546	1	124	.461

ANOVA

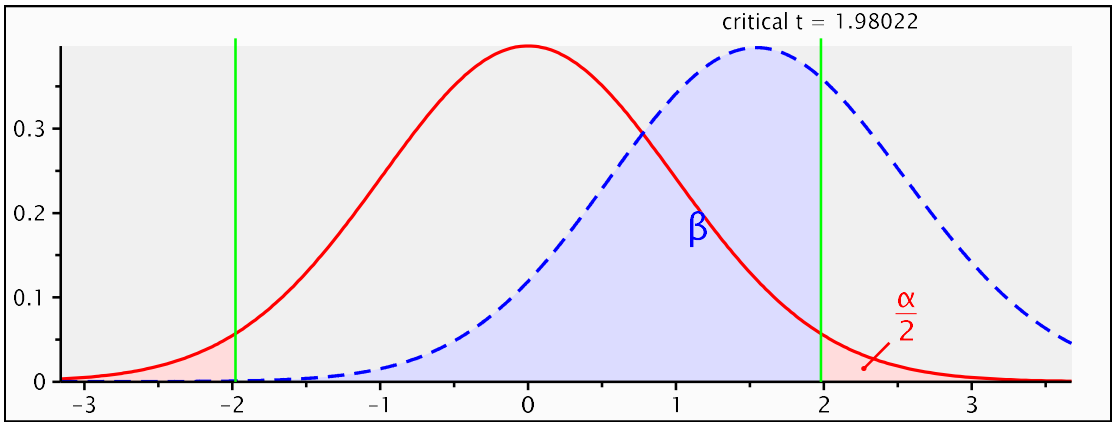
Reported Endowment

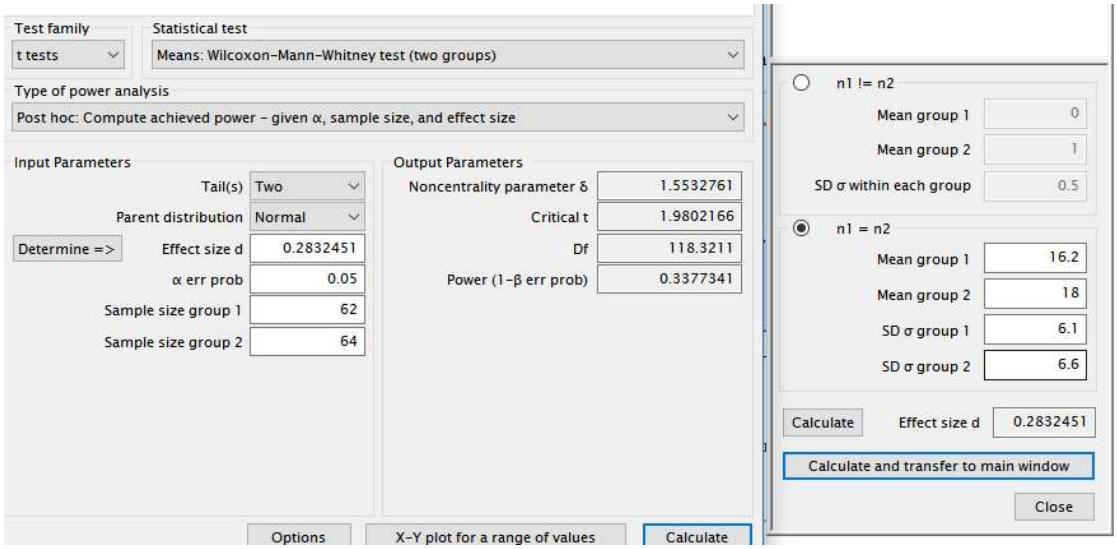
	Sum of Squares	*df*	*Mean Square*	*F*	*Sig.*
Between Groups	102.738	1	102.738	2.562	.112
Within Groups	4972.476	124	40.101		
Total	5075.214	125			



A one-way ANOVA was conducted to determine if the misreport of the RES was different for the two conditions of the experiment. The two conditions were control and treatment group. There were no significant outliers, the data was not normally distributed according to the Shapiro-Wilk test for normality, and the variances were homogenous, as assessed by Levene's test of homogeneity of variances. The RES was statistically insignificantly different for the two conditions, $F(1, 124) = 2.562,\ p = .112$.

Appendix VI – Post hoc analysis for Mann-Whitney U test





From the figures above, it derives that the achieved power of the Mann-Whitney U test is $(1 - \beta\ err\ prob) = 0.3377341$. This can be interpreted as the type 2 error, or the probability to falsely fail to reject the null hypothesis.

Appendix VII – Levene's test of equal variances Condition*Gender

Levene's Test of Equality of Error Variances [a]

Dependent Variable: Repc

F	*df1*	*df2*	*Sig.*
1.264	3	122	.290

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

*a. Design: Intercept + Group + Gender + Group * Gender*

Since $p > .05$, I cannot reject the null hypothesis of this test and it is concluded that the variances are not significantly different.

Appendix VIII – Levene's test of equal variances Condition*Agecategory

Levene's Test of Equality of Error Variances [a]

Dependent Variable: Repc

F	*df1*	*df2*	*Sig.*
1.720	7	118	.111

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

*a. Design: Intercept + Group + AgecatDUM + Group * AgecatDUM*

Since $p > .05$, the null hypothesis cannot be rejected and it is assumed that the variances are not significantly different.