



Master Thesis

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**Does higher socioeconomic class predict increased  
altruistic behavior? Evidence from a modified  
dictator game**

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## **Abstract**

We study socioeconomic status (SES) differences in altruism by examining a modified dictator game. Although both the upper and the lower SES individuals display a high amount of giving behavior, we find that the upper-SES subjects are always more charitable than their lower SES counterparts. In all treatments, the mean donations of the upper-SES individuals are higher than that of the lower-SES individuals, and the difference is significant at a 5% significance level when we pool all data. The giving behaviors of the upper-SES subjects do not differ significantly between the fixed paid treatment and the performance paid treatment. Furthermore, we also find that family income and age play a role in the altruistic behavior.

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# 1 Introduction

Altruistic behavior refers to actions that enhance the welfare of others at a net welfare loss to oneself (Elster, 2006). Our daily life is filled with small acts of altruism, from the young boy who spends 10 hours per week to do volunteer work for his community to the man who donates thousand dollars to a charity aiming at helping the drop-out children in poor countries. Many people are intrigued with the basic motives underlying altruistic behavior. Basically, factors that lead to altruistic behavior can be divided into two categories: the evolutionary factors and the motivational factors. The evolutionary psychology attributes altruistic behavior to the principal of natural selection. According to the evolutionary psychology, three theories can be used to explain altruism. The Kinship Selection theory states that people enhance the survival chances of their genes by helping and even self-sacrificing their genetic kin (Shapiro & Gabbard, 1994). The Reciprocal Altruism theory states that people help others in the hope that they will be reciprocated when they need assistance, and in other words the survival rate of those who help others will be higher than those who do not (Trivers, 1971; Hamilton, 1970). Lastly, the Mutualism theory refers to the phenomenon that people increase their reproductive success by protecting their own self-interest in relation to other individuals and by protecting their group's interest in relation to other groups (Brehm, Kassin, & Fein, 2002). Motivational theory is an alternative approach to explain altruistic behavior. While the definition of altruism involves doing something for others without reward, there is still cognitive incentive that cannot be explicitly noticed. Cost-reward model is thus widely used as a motivational explanation. It views helping behavior as a weighing of cost and reward of helping someone else (Ray, 1998). Altruism in the long run is nothing but self-interest (Dawkins, 1989). Helping behavior helps to alleviate one's guilt and affirm one's morality and therefore makes people happier. This is also known as "warm-glow" theory (Andreoni, 1990). In addition, the empathy-altruism hypothesis views altruistic behavior as motivated purely by empathy and compassion for people in need (Batson C. , 1997).

Altruistic behavior is multi-determined, and both intrinsic and extrinsic factors can facilitate motives to help. People's altruistic personality, gender, mood and social status are all important determinates of altruistic behavior. People with more-altruistic personality are more pro-social than those with less-altruistic personality (Batson, Bolen, Cross, & Neuringer-Benefiel, 1986; Carlo, Eisenberg, Troyer, Switzer, & Speer, 1991). Gender is another factor to influence altruistic behavior, despite that the level of altruism and the way of helping often differ. According to Wilson (1978), women display higher concern within the family unit while men are interested in contributing to the well-being of the social unit as a whole (Wilson, 1978). Anderoni and Verserlund (2001) suggested that women are kinder when altruism is expensive and men are more altruistic when it is cheap, and men are more responsive to price changes (Anderoni & Vesterlund, 2001). Besides, one's cultural background also matters. For example, some researchers argued that people live in a more dependent environment tend to be more pro-social than those live in an independent culture (Kraus & Keltner, 2009).

In recent years, socioeconomic status (SES)—one of the important determinates of altruism—has been given much attention to. Accordingly, the number of studies on this topic is growing. The large body of studies in this topic basically can be split into two camps. Some researchers argued that people in a lower socioeconomic ladder behave more altruistic than those from a higher socioeconomic ladder. The reasoning underlying the phenomenon is that less well-off people depend more on the people surrounding them and the society they live; therefore they tend to act in a more altruistic fashion than well-off people who are more independent from the extrinsic environment (Kraus & Keltner, 2009; Kraus, Piff, & Keltner, 2009). Some other researchers, however, hold totally opposite views. Relative to their upper class counterparts, lower class people have less economic resources (Drentea, 2000; Oakes & Rossi, 2003), less educational opportunities (Snibbe & Markus, 2005), unsafe living environment (Stagges, Long, Mason, Krishnan, & Riger, 2007), and are more likely to be exposed to a stress close relationship (Gallo, Bogart, Vranceanu, & Matthews, 2005). Therefore, based on these concerns, these researchers argued that people at the bottom economic class should be disposed to be less altruistic than their counterparts in order to overcome their disadvantages.

From our point of view, study of the relationship between socioeconomic status and altruism is of importance, and it does contribute a lot to many areas. For instance, non-profit organizations and other charities can learn what kind of strategy is proper to attract rich people when promoting their charity event. If dig deeply, economists may solve the quasi-“egg or chicken” puzzle: people are rich because they are pro-social, or the other way round? In the present study, we study the relationship between socioeconomic status and altruism in a survey context based on a modified dictator game. Dictator game and charitable giving have been studied by many researchers who are interested in altruism. Survey, in which participants are often compensated by monetary rewards, is considered to be a good practice to run a dictator game. However, altruistic behavior observed in a normal dictator game is often criticized in terms of scrutiny and windfall endowment. Participants are more generous when playing with windfall endowment that they receive at the beginning of a dictator game than when playing with money that they earn by themselves (Cherry, Frykblom, & Shogren, 2002).

In our study, we invite a number of students to complete a questionnaire which contains a puzzle-solving game as well as a few demographic questions, and at the end ask them how much of their earnings in this experiment they would like to donate to the charity UNICEF. It is worth to mention that we do not give any endowment to the participants in the beginning of the game. Participants play the modified dictator game with the money they earn in the puzzle-solving game, and we believe that, compare with windfall endowment, when participants are playing with money they actually earn, their giving behavior would be much more in line with their actual behavior in real life. Our results show that no matter what socioeconomic background the participants come from, most of them (68.51%) are willing to donate to the charity. And on average, they are willing to donate 56% of the money they earn in the puzzle-solving game. Their giving behavior does not differ significantly between fixed paid treatment and performance paid treatment. Most importantly, we find that when we pool all data, the higher SES class participants donate more than the lower SES class participants and the difference is significant at a 5% significance level. In other words it means that rich people are actually more generous than the poor. Additionally, we also find that family income and age play a role in the giving behavior.

## 2 Literature review

### 2.1 Measurement of Socioeconomic Status

Although related, Socioeconomic Status (SES) is very distinct from social class. Social class focuses more on the conflictual relations, whereas SES focuses more on gradations such as prestige, income or education (Ossowski & Patterson, 1963). Social class can be predetermined by one's family status and movement between classes is very restricted. However, SES is more dynamic as individual movement from one level to another can be reached by changes in resources. Although SES is also influenced by original family status, it is more dynamic than social class, and its construct is more continuous in nature (Yip, 2003). Therefore, in this paper we investigate the relation between altruism and SES rather than social class.

Socioeconomic Status is commonly used as a variable to characterize the placement of persons, families, households, or other aggregates with respect to the capacity to create or to consume goods that are valued in the society (Hauser & Warren, 1997). Therefore, SES can be measured on many aspects, such as income, wealth, education attainment and occupational prestige, from tangible possessions to intangible wealth. Nowadays, it is mainly defined by occupation position, education, and income (Adler, Epel, Castellazzo, & Ickovics, 2000; Oakes & Rossi, 2003; Knesebeck, L.uschen, Cockerham, & Siegris, 2003). Sometimes, when it comes to older adults, asset and ownership can be two alternative indicators of SES other than occupation position, education and income, since they are better at accessing individual's economic advantage and disadvantage accumulated over life time (Knesebeck, L.uschen, Cockerham, & Siegris, 2003; Robert & House, 1996). Apart from the above objective SES indicators, some researchers also apply another way to capture the common sense of social status across the SES indicators—the MacArthur Scale of Subjective Social Status (Adler, Epel, Castellazzo, & Ickovics, 2000; Kraus, Piff, & Keltner, 2009). The intuition of the MacArthur Scale of subjective SES is that, subjects are shown an image of a ladder with 10 rungs representing where people stand socioeconomically in their country or in the community they live, and they are asked to place an "X" on the rung on which they feel they stand as

compared either to the people from the very top of the ladder—namely the best-off in the country, or those at the bottom of the ladder—namely the worst-off in the country or in the community. The higher they stand in the ladder, the better they are in terms of wealth, education and occupational prestige. The MacArthur Scale of Subjective Social Status(MASSS) is popular among researchers who attempt to manipulate people's perceived socioeconomic status.

In the present study, we use family income, education level and parents' education level as indicators of participant's objective socioeconomic status, and we use MASSS method to capture participant's subjective sense of their SES relative to the rest of the population in the Netherlands.

## **2.2 SES and Altruism**

Relative to their higher SES counterparts, people from lower socioeconomics have many disadvantages in the society. They usually have fewer financial and tangible resources (Drentea, 2000; Oakes & Rossi, 2003) and they may frequently experience losses or investments of effort that fail to generate resource gains in this domain (Gallo, Bogart, Vranceanu, & Matthews, 2005). They usually have fewer educational opportunities (Snibbe & Markus, 2005), higher stress in their close relationships (Gallo, Bogart, Vranceanu, & Matthews, 2005), and are more likely to face violence in their homes (Staggles, Long, Mason, Krishnan, & Riger, 2007). Except for the difficult external environment they live, the lower-SES individuals also suffer much from mental and physical health problems. No matter how the SES is measured or how health is measured, abundant evidences show that people of lower-SES consistently appear to have much worse health outcomes relative to their higher-SES counterparts (Smith J. P., 2004). The morbidity and mortality rates are highest among the individuals in the lower-SES groups with most human populations (Adler, et al., 1994). And they are more susceptible to mental problems since the bad environment often fosters greater exposure to stress and which in turn elicits more negative emotions and bad mental health (Gallo & Matthews, 2003). These healthy problems occur not only because they have less access to health care, but also because they are worse at self-management of disease due to poor



education (Goldman & Smith, 2002). They usually perceive and exercise less choice, control, self-efficacy, and self-direction than do people of higher SES (Lachman & Weaver, 1998; Reay, Davies, David, & Ball, 2001; Snibbe & Markus, 2005). Given these circumstances, lower SES individuals are supposed to be more focused on their own welfare, less altruistic and less pro-social than their higher SES counterparts, in order to overcome their disadvantages. And this expectation is not groundless, as many researchers have found evidence both in lab experiment and field experiment. Beneson et al(2007) recruited children aged 4, 6, and 9 years old from six British primary schools to play the dictator game using stickers as resources, and they found that children from higher SES environments act in a more altruistic manner than children from lower SES environments (Benensona, Pascoeb, & Radmore, 2007). By conducting experiments with German pupils of four different school types, Liebe and Tutic(2010) observed that the higher status pupils donate more than the lower status pupils in the one-shot dictator game (Liebe & Tutic, 2010). Using both cross-country and within-country data of the Holocaust during World War II, Hoffman (2011) found that richer countries had more rescuers than poor countries, and richer people were more likely to be rescuers than poor people. And his finding is in line with the view that altruism is increasing with income (Hoffman M. , 2011). Holland et al(2012) conducted a lost-letter field experiment across 20 neighborhoods with a wide range of income deprivation scores in London, and the results show that letters dropped in the poorest neighborhoods have 91% lower odds of being returned than letters dropped in the wealthiest neighborhoods (Holland, Silva, & Mace, 2012). And they further suggested that measures of altruism are strongly context dependent.

The second line of reasoning, however, suggests an opposite point of view. Some researchers find that there is a negative relation between individuals' SES and their altruistic behavior. In other words, they find that rich people are actually less generous and less altruistic while poor people are more generous and more altruistic. Evidences are also provided both in the lab and in the field. For example, across 4 studies, Piff et al(2010) found that those participants induced to experience a lower sense of social class rank proved to be more generous, more charitable, trusting, and helpful relative to the upper SES individuals (Piff, Kraus, Cote, Cheng, & Keltner, 2010). Two years later, Piff

et al also found that higher social class predicts increased unethical behavior. They are more likely to break the law when driving, more likely to exhibit unethical decision-making tendencies, take valued goods from others, lie in a negotiation, cheat to increase their chances of winning a prize and endorse unethical behavior at work, relative to their lower class counterparts (Piff, Stancato, Cote, Mendoza-Denton, & Keltner, 2012). Similarly, Galperin et al (2010) found that the higher SES organizational members are more likely to engage in unethical behavior as compared to their lower status colleagues. They further pointed out that high status group identity results in insensitivity to the needs of out-group members which in turn results in lessened motivation to self-regulate ethical decision making (Galperin, Bennett, & Aquino, 2011). So why the upper SES individuals seem to be less altruistic even if they have already been endowed many advantages relative to the lower SES individuals? Reasons are various. Higher SES individuals, who have ample resources, are often more independent on others to accomplish many tasks of social adaptation (Argyle, 1994). Therefore they care less about other's feelings and they often signal their relative dependence with displays of social disengagement (Kraus & Keltner, 2009; Kraus, Piff, & Keltner, 2009). On the other hand, lower-SES individuals, those often lack resources, depend more on the people around them and on the external environment to achieve their desired life outcomes, and therefore they appear to act in a more pro-social fashion and they are more likely to signal themselves by displaying social engagement (Kraus & Keltner, 2009; Kraus, Piff, & Keltner, 2009).

Our study is inspired by the work of Piff et al (2010). In a lab experiment, they manipulated participants' relative social class, and then ask them questions assessing their judgments about how much of people's annual salary should go to charity. Participants were instructed to indicate the percentage of their income that they think should spend annually on a number of expenses, including food, luxury items, recreation, clothing, gifts, bills, education, travel and charitable donations. Allocations of annual salary to each of these categories were required to equal 100% of total annual salary expenditures. Piff et al find that those participants induced to experience a lower sense of SES rank reported that a greater percentage of people's annual salary should be spent on charitable donations (M=5.65) compared with those participants induced to experience

upper class rank ( $M=2.95$ ) (Piff, Kraus, Cote, Cheng, & Keltner, 2010). Differing from Piff et al, we do not ask participants directly how much money they think should be spent on charitable donations, instead, we structure our experiment as a puzzle-solving game and ask the subjects if they would like to donate the money they earn in the experiment or not.

## **3 Experimental Design**

### **3.1 Basic ideas of the experiment**

In the first part of this section, we will discuss the ideal version of our experiment, in which we assume that we have neither budget constraint nor time constraint when executing the experiment, and people from different social classes are equally accessible. The ideal experiment will take place in a laboratory in Erasmus University. It is a conventional lab experiment in which we recruit 200 students in total. The experiment consists of 4 treatments, and for each treatment, 50 students will be randomly assigned.

The experiment would be a modified dictator game. In a traditional dictator game, participants are paired, and the first player (the proposer) determines how to allocate some endowment from the researcher between himself/herself and the second player (the responder). The role of the second player is totally passive, as he/she cannot influence the proposer's decision. It is a single-blind game, which means that both participants are anonymous to each other, and only the research can observe the results and procedure. From the perspective of traditional economics, if people are rational and purely selfish, then the proposer should allocate all the endowment to himself/herself and gives nothing to the responder. However, this point of view has been seriously questioned in previous studies. Previous studies find that most proposers will give something to the responder. The mean donation by participants in dictator games in the laboratory is about 20% of the endowment (Camerer C. F., 2003). However, the pro-social behavior observed under laboratory circumstance seems not that convincing, as people knowing that their behavior is being watched (Levitt & List, 2007). Besides, Levitt and list (2007) also

criticized that participants who play with windfall endowment, which is normal in many social preferences experiment, are more generous and risk-seeking than usual.

We structure our experiment in the form of a puzzle-solving game rather than an explicit dictator game. The basic procedure of our experiment goes as following. After participants walk into the laboratory and sit down, the experimenter assigns puzzle sheets to each of them, and reads loudly the instructions and the payment schemes. Then participants have 30 minutes to complete the puzzles, as well as a few demographic questions. The last question in the answer sheet is that if they would like to keep all the money they earn in the game or donate a small part of it to UNICEF (The United Nations Children's Fund, works for children's rights, their survival, development and protection). And if they do, what is the percentage of the total earnings they would like to donate? As you can see, instead of directly ask participants to allocate some money between themselves and their counterparts, we ask them to take part in a puzzle-solving game with aim to make them ignore the fact that they are involved in a dictator game. That is why we term our experiment as a "modified" dictator game.

In all of the four treatments, participants are going to solve 10 math and logic puzzles. Puzzles are exactly the same among the four treatments. Our pre-test proves that all these puzzles are doable for normal students. But still we rank them implicitly from easy, medium to difficult, in order to differentiate people's effort by observing how much correct answers they have. It is worth to mention that the contexts of the puzzles, and how people solve the puzzles, are not that important for us. We use the puzzle-solving game simply as a tool to distract participants' attention.

### **3.2 Details of each treatment**

Treatment 1 is designed to test the relationship between generosity and socioeconomic class. Socioeconomic class is measured objectively by subject's education, parents' education and estimated family income. The four indicators, subject's education level, his/her father's education level, his/her mother's education level and their estimated family income, will be ordinally presented. Education level is defined by six scales: 1=

Less than high school, 2= High school, 3= Bachelor degree, 4= Master degree, 5= PhD or similar doctor-level degree, 6= other. The estimated family income refers to the estimated number of annual household income from all sources before tax, which is defined to the following scales: 1=Less than €10.000, 2= €10,000-€19,999, 3= €20,000-€29,999, 4= €30,000-€39,999, 5= €40,000-€49,999, 6= €50,000-€59,000, 7= €60,000-€69,999, 8= €70,000-€79,999, 9= €80,000-€89,999, 10= €90,000-€99,999, 11= €100,000-€149,999, 12= Higher than €150,000. Sum of the scores of the four indicators represents one's objective SES. That is,

SES=Sum (education level of the subject, father's education level, mother's education level, family income)

The higher the sum of scores is the higher rank of objective SES he/she achieves. All subjects in treatment 1 will be compensated by a fixed amount of 10 euro, no matter their performance in solving the puzzles.

Unlike the fixed-paid Treatment 1, Treatment 2 is a saliency treatment (performance-pay scheme) in which people earn two euro for each correct answer. There is no base payment in this treatment, which means that subject's payoff is completely depend on their performance. According to the Labor Framework Theory, mental effort is costly to use, and the more effort one exert, the better performance one can achieve (Smith & Walker, 1993; Camerer & Hogarth, 1999). Treatment 2 therefore is a good way to differentiate how much effort the subjects use, in case that all puzzles are proved to be feasible for normal students. The results of treatment 2, comparing with the results of treatment 1, allow us to look at how rich people value their money when they have actually earned it. Therefore there could be a difference in giving behavior between the rich over the 10 euro treatment, and this saliency treatment. If the rich are more selfish in the saliency treatment, and not in the 10 euro treatment, then this nuances the view of how selfish the rich are.

Differing from treatment 1 and 2, in treatment 3 and treatment 4, we will not only measure people's objective social ranks by calculating the sum of scores of income and education indicators. But also will we employ the MacArthur Scale of Subjective Social

Status method to manipulate people’s perception of their socioeconomic status (Adler et al., 2000; Kraus et al, 2009; Bella et al, 2010). Subjects are shown an image of a ladder with 10 rungs representing where people stand socioeconomically in the Netherlands, and they are asked to place an “X” on the rung on which they feel they stand as compared either to the people from the very top of the ladder—namely the best-off in the country, or those at the bottom of the ladder—namely the worst-off in the country. The higher they stand in the ladder, the better they are in terms of wealth, education and occupational prestige.

In our experiment, subjects in treatment 3 will be induced to experience a lower sense of SES rank, as they are asked to compare themselves with people from the topmost rung of ladder. And subjects in treatment 4 are induced to experience a higher social rank by comparing themselves with people at the most bottom rung of the ladder. This way of comparison allows us to manipulate people’s subjective ranking of their socioeconomic status. Besides, treatment 3 and treatment 4 will again employ a fixed-pay scheme [Table 1].

**Table 1. Idealversion**

Treatment	Number of puzzles	Measurement of social class	PaymentScheme
Treatment 1	10	Objective	€10
Treatment 2	10	Objective	Performance pay.€2 for each correct answer
Treatment 3	10	Subjective, compare with highest social class	€10
Treatment 4	10	Subjective, compare with lowest social class	€10

### 3.3 Hypotheses

First of all, the main purpose of this study is to test whether the higher SES individuals are more generous than their lower SES counterparts. We expect that individuals of higher objective socioeconomic level will always donate more money than individuals of lower objective socioeconomic level, either when tested separately (in each treatment) or aggregately (pooled data of 4 treatments). Hence, our first hypothesis would be:

*Hypothesis 1: in all treatments, the donation of the higher-SES group does not differ from that of the lower-SES group, when SES is measured on an objective level.*

*Alternative hypothesis 1: at least in one treatment, the higher-SES group donates more money to the UNICEF than the lower-SES group, when SES is measured on an objective level.*

Secondly, we know that in real life, some people are rich because they work really hard for it. For instance, they may spend a lot of time to update their knowledge; they may put high effort to learn what the nature of money is and how the accumulation works; and they may sacrifice family time for more jobs. For most of the self-made wealthy people, they know how much time and effort they have spent in order to get success, therefore they may have a very cautious attitude on how to allocate the money they earn. To investigate whether this view is true or not, we form our second hypothesis. We expect that rich people will put more effort on solving the puzzles in the saliency treatment, and they will be more selfish with the money earned in this treatment, relative to the fixed-paid treatment.

*Hypothesis 2: On average, the higher SES subjects in treatment 1 (Fixed-paid treatment) donate same as the higher SES subjects in treatment 2 (Saliency treatment).*

*Alternative hypothesis 2: On average, the higher SES subjects in treatment 1 give more money to charity than the higher SES subjects in treatment 2.*

Our third and fourth hypotheses are related to Treatment 3 and Treatment 4. We expect that individuals who are induced to experience a lower socioeconomic rank will place themselves significantly lower in the ladder compared to individuals who are induced to experience a higher socioeconomic rank. And correspondingly, they will also donate less.

*Hypothesis 3: Subjects who compare themselves with people at the top of the ladder (treatment 3, the lower Subjective-SES subjects) and the subjects who compare themselves with people at the bottom of the ladder (treatment 4, the higher Subjective-SES subjects) do not place themselves significantly differently.*

*Alternative hypothesis 3: Subjects in treatment 3 place themselves significantly lower than those in treatment 4.*

*Hypothesis 4: Subjects in treatment 3 and treatment 4 do not donate significantly differently.*

*Alternative hypothesis 4: Subjects in treatment 4 will donate more than subjects in treatment 3.*

### **3.4 Actual version of the experiment**

Due to budget constraint, the actual version of experiment we execute is slightly different from the ideal version. The basic intuition is exactly the same as the ideal version, except for the following aspects. First of all, the actual version does not take place in a laboratory, but is conducted in C-hall in the Erasmus University. Secondly, as we do not have any funding for our experiment, the actual version uses a Random Lottery Incentive, which means that only one participant in each treatment eventually wins a prize. And all other participants receive no monetary compensations. Thirdly, participants have a chance to win 20 euro in the fixed payment treatments instead of 10 euro, and 5 euro for each correct answer instead of 2 euro in the saliency treatment. The possible payment is adjusted slightly higher in the actual version compared to the ideal version, with the aim to compensate for the losses of motivation caused by the Random Lottery Incentive. Fourthly, the actual version contains only 5 puzzles instead of 10. This is in the concern that it is unethical to waste students' time, and we have no means to attract volunteers



who are willing to spend half an hour to answer the puzzle-questionnaire. It is not hard to image, students may be willing to help filling out the puzzle-sheet if it takes only a few minutes. But if it takes half an hour or longer, most of them will refuse to do so, especially when there is no reward at all.

The detailed procedure is given as below. We spent 4 afternoons from 12:00am to 18:00 pm at C-hall in the Erasmus University to collect participants. When we reached a volunteer who was willing to help us, we handed out the puzzle-sheet to him/her. The instruction and lottery payment information was given on the sheet. Each participant had 15 minutes to finish the questionnaire. And they were required to write down their email address so that we can contact them in case they win the monetary prize. Participants knew that their behavior was being watched by us.

**Table 2. Actual Version**

	Number of puzzles	Measurement of social class	PaymentScheme
Treatment 1	5	Objective	Random Lottery Incentive, only one participants wins €20
Treatment 2	5	Objective	Random Lottery Incentive, only one participants wins up to €25 performance pay (€5 for each correct answer)
Treatment 3	5	Subjective, compare with highest social class	Random Lottery Incentive, only one participants wins €20
Treatment 4	5	Subjective, compare with lowest social class	Random Lottery Incentive, only one participants wins €20

## 4 Results

In total we have 200 students to help out with answering the questionnaires, and among them, the number of completed questionnaires for each treatment is 43, 48, 45 and 45 respectively [Table 3]. Since the data are not normal distributed and the size is not large enough, non-parametric tests are considered to be suitable in this study. The main method we use to analyze the data is Mann-Whitney U test. Mann-Whitney U test is often used to test whether two samples come from the same population, especially whether a particular sample tends to have a larger value than the other. In our study, we divide the population into two samples: the lower-SES group and the upper-SES group, and we would like to test if one group donates more than the other. The intuition of Mann-Whitney U test fits into our purpose well.

**Table 3. Respondents**

	Number of subjects	Number of completed questionnaires
Treatment 1	50	43
Treatment 2	50	48
Treatment 3	50	45
Treatment 4	50	45
Total	200	181

***Result 1:*** *When all subjects are tested (181 observations), the upper SES individuals donate statistically significantly more than the lower-SES individuals at a 5% significance level. However, their donations do not differ significantly at a 5% significance level when tested with small sample sizes ( $n < 50$ ).*

In treatment 1, we sort all the 43 participants in an ascending order based on SUM scores (family-income, father's education, mother's education, participants education), and we label the first 22 as the lower SES group and the remaining 21 as the higher SES group. We observe that on average subjects in Treatment 1 donate 51% of the money they earn in this puzzle-solving game, and the upper SES individuals donate 12% more than their lower-SES counterparts (57.14% > 44.55%). To test whether this observation is statistically

valid, we use SPSS to run a Mann-Whitney U test with “Donation” as the dependent variable and SES (which is the sum of the 4 indicators) as the independent variable. Results show that the mean-rank of the donation of the higher SES group is higher than the mean-rank of the lower SES group (23.67>20.41), and the sum of ranks of the donation of the higher SES individuals is also higher than that of the lower SES individuals (497>449). However, the difference between donations of the higher and that of the lower SES groups is not statistically significant at a 5% significance level, as the P-value is much larger than 5%(0.35>0.05). We do the same test for Treatment 2, 3 and 4, and similar results occur [Table 4]. Either the mean rank or the sum of ranks of higher SES group is always higher than that of lower SES group, for all the tests. However, Mann-Whitney U test is only statistically significant for Treatment 4(P=0.058). Therefore, the first null hypothesis that donations do not differ between the two classes of subjects is not rejected for Treatment 1, 2 and 3, and it is rejected only for treatment 4. In short, although we observe that on average the higher SES group donates more than the lower SES group, it is not a statistically significant conclusion for most small sized samples.

Based on these facts, we wonder if a larger sample size can overcome the insignificant problem. Hence a power test is taken to compute the sample size that is required to reject the null hypothesis with a 95% confidence. By varying the effect size from 0.1 to 0.8, we find that the sample size increases with a decreasing effect size [Table 5]. An effect size is a measure that describes the magnitude of the difference between two groups. An effect size of 0.25 indicates that the treatment group outperforms the control group by 0.25 of a pooled standard deviation. According to Cohen (1998), a “small” effect size is 0.20, a “medium” effect size is 0.50, and a “large” effect size is 0.80 (Cohen, 1998). For simplicity, we choose the medium effect size in our study. And the corresponding sample size required is 184 in total, which is quite close to the number of our total observations. Therefore we pool all the 181 observations we have and sort them in an ascending order by their objective SUM of SES scores. And as we did before, we label the first 91 subjects as the lower-SES group and the last 90 as the higher-SES group. This time the Mann-Whitney U test is significant with a p-value of 0.001[Table 4]. Hence, we can conclude

that, when we have a large sample, donations of the higher SES individuals are statistically significantly higher than donations of the lower SES individuals. Or in other words, rich people are more generous than poor people. In order to make sure that this finding is not made by accident, a regression is run to double-check the validity. Result shows that being an upper SES individual increases 21.91% chances to donate to the charity relative to being a lower SES individual, after controlling for age and gender. And this finding is statistically significant at a 5% confidence level (P=0.007). Once again, we show that the upper SES individuals are more likely to donate to the charity than the lower SES individuals.

**Table 4. Statistics Review**

		Treatment 1(43obs)	Treatment 2 (48obs)	Treatment 3(45obs)	Treatment 4(45obs)	All treatment(18 1 obs)
Mean donation	Total	50.70%	53.02%	58.67%	60.78%	56%
	Low SES	44.55%	44.17%	46.30%	51.09%	45.00%
	High SEs	57.14%	61.88%	71.59%	70.91%	66.00%
Mean Rank	Low SES	20.41	21.94	20.24	19.57	79.01
	High SES	23.67	27.06	25.89	26.59	103.13
Sum of Ranks	Low SES	449.00	526.50	465.50	450.00	7189.50
	High SES	497.00	649.50	569.50	585.00	9281.50
Mann-Whitney U		196.000	226.500	189.500	174.000	3003.500
Asymp. Sig. (2- tailed)		.350	.178	.118	.058	.001

**Table 5. Required Sample Size with Varying Effect Size**

Tails: One  
Parent Distribution: Normal  
 $\alpha$  err prob: 0.05  
Power (1- $\beta$  err prob): 0.95  
Allocation Ratio N2/N1: 1

<i>Effect Size</i>	<u>0.8</u>	<u>0.7</u>	<u>0.5</u>	<u>0.2</u>	<u>0.1</u>
Sample size group 1	37	47	92	568	2268
Sample size group 2	37	47	92	568	2268
Total sample size	74	94	184	1136	4536

**Result 2:** *The null hypothesis 2 that the higher SES subjects in treatment 1(Fixed-paid treatment) donate same as the higher SES subjects in treatment 2(saliency treatment) is not rejected at a 5% significant level.*

We compare the puzzle-solving performance and the donation behavior of the higher-SES groups in treatment 1 and treatment 2. Performance is measured by the number of correct answers. We find that the upper SES subjects in treatment 1 answer 2.67 puzzles correctly while the upper SES subjects in treatment 2 answer only 2.54 puzzles correctly. This is against our expectation. We expect that rich people will put more effort in the Saliency treatment than the Fixed-payment treatment. Our second finding is that the higher SES subjects in the Saliency treatment donate more than the higher SES subjects in the fixed-paid treatment (61.88%>57.14%). This finding is also not in line with what we expect, as we thought that rich people will be more reluctant to donate when performance-payment scheme is employed. The Mann-Whitney U test confirms that rich people in the saliency treatment are more generous than the rich people in the fixed payment treatment, as the Mean-rank of donations of saliency treatment is higher than that of the fixed payment treatment(23.44>22.5). Nevertheless, the null hypothesis 2 is again not rejected, and the difference is again not statistically significant (P=0.796) [Table 6].

**Table 6. Summary of Result 2 <Comparison of Treatment 1& 2>**

	<u>N</u>	<u>Mean Rank</u>	<u>Sum of Ranks</u>
Donation Higher SES T1	21	22.50	472.50
Higher SES T2	24	23.44	562.50

Mann-Whitney U	241.500
Asymp. Sig. (2-tailed)	0.796

**Result 3:** *The null hypothesis 3 that subjects in treatment 3 and treatment 4 do not place themselves differently is not rejected at a 5% significant level.*

The third hypothesis is whether subjects who are induced with a lower sense of SES will place themselves significantly lower on the ladder than the subjects who are induced with a higher sense of SES. Statistical analysis shows that the mean number of self-rank of the lower Subjective-SES subjects is 6.58 while the mean number of the higher Subjective-SES subjects is 6.47. This result is totally against our hypothesis. Therefore we use the Mann-Whitney U test again to double check this result. Unlike hypothesis 1 and hypothesis 2, this time the “Subjective-rank of SES” is regarded as the dependent variable. Test results show that both the mean rank and the sum of ranks of the subjective-rank of SES of treatment 3 are higher than that of treatment 4 (47.93 > 43.03, and 2158.50 > 1936.50). Although the result is not significant (P=0.357) [Table 7], and the third null hypothesis cannot be rejected, we are still able to inference that our manipulation of subject’s perceived SES ranking fails.

**Table 7. Placement on the ladder**

	<u>N</u>	<u>Mean Value</u>	<u>Mean Rank</u>	<u>Sum of Ranks</u>
Subjective SES Treatment 3	45	6.58	47.97	2158.50
Treatment 4	45	6.47	43.03	1936.50
Mann-Whitney U	901.500			
Asymp. Sig. (2-tailed)	0.357			

**Result 4:** *The null hypothesis 4 that subjects in treatment 3 and treatment 4 do not donate differently is not rejected at a 5% significant level.*

Despite the fact we did not manipulate participant’s feeling of SES successfully, we do not give up to see whether there would be difference of donating behavior between the subjects in treatment 3 and 4, as we planned in the beginning. Results show that both the

mean-rank and the sum of ranks of donation of the higher-subjective SES subjects are higher than that of the lower-subjective SES subjects (46.41>44.59 and 2088.50>2006.50). It implies that the self-perceived rich people are actually more generous than the self-perceived poor people. This seems in line with our fourth hypothesis. But the Mann-Whitney U test reveals that this is just another insignificant result(P= 0.723) [Table 8]. Our fourth null hypothesis that those who are induced to feel a higher sense of SES do not donate differently from those who are induced to feel a lower sense of SES cannot be rejected.

**Table 8. Summary of Result 4 <Comparison of Treatment 3& 4>**

		<u>N</u>	<u>Mean Rank</u>	<u>Sum of Ranks</u>
Donation	Treatment 3	45	44.59	2006.50
	Treatment 4	45	46.41	2088.50
Mann-Whitney U		971.500		
Asymp. Sig. (2-tailed)		0.723		

***Result 5.*** Family income and age affect donation positively, while gender does not have a significant impact on donation.

By running an OLS regression with all the 181 observations, we test if age, gender, education and income have an individual or joint effect on donation [Table 9]. We find that family income has a small but significantly positive effect on donation at a 10% significance level (magnitude=0.0177, P=0.0614), when controlled for age, gender and education. It means that subjects from rich families generally donate 1.7% more than subjects from less well-off families. When controlled gender and Low or High SES group, we find that age also positively affects donation at a 10% significance level(magnitude=0.0157, P=0.0996). It can be understood as that when people get one year older, on average they donate 1.57% more compare to last year. Besides, the dummy variable of socioeconomic status (L/H SES) also has a positive effect on donation at a 5% confidence level (magnitude=0.2155, P=0.0012), when age and gender are controlled. It means that higher SES subjects donate on average 21.55% more than lower SES subjects,

ceteris paribus. This finding is consistent with Result 1. Last but not the least, we find that gender plays no significant role in donation.

**Table 9. Summary of regression**

	Variable	Coefficient	Std. Error	t-Statistic	Prob.
Regression 1	C	0.197873	0.260883	0.758474	0.4492
	AGE	0.006117	0.013114	0.466437	0.6415
	GENDER*	0.070687	0.069451	1.017797	0.3102
	FINCOME	0.017689	0.009395	1.882750	0.0614**
	FEDU	-0.033299	0.038947	-0.854977	0.3937
	MEDU	-0.011883	0.044623	-0.266303	0.7903
	EDU	0.085564	0.061359	1.394495	0.1649
Regression 2	C	0.062481	0.226379	0.276004	0.7829
	AGE	0.015739	0.009506	1.655635	0.0996**
	GENDER*	0.048234	0.067515	0.714425	0.4759
	L/H SES*	0.215473	0.065220	3.303800	0.0012**

- a. Dependent Variable: Donation
- b. \*represents Dummy Variable
- c. \*\*represents Significant Result
- d. FINCOME represents Family Income
- e. FEDU/MEDU/EDU represents Father's Education/Mother's Education/Subject's Education
- f. L/H SES: Dummy of lower or higher SES group, with 0=lower SES and 1=higher SES

**Result 6.** *The four indicators are efficient and relevant. And our subjects indeed come from different social backgrounds.*

From Result 3 and 4 we see that the perceived SES does not differ significantly among our participants, neither their donation behavior. One possible explanation could be that the students we recruit are from homogenous background. That is the gap between the rich students and the poor students may not be notable. To this end, our last task is to test whether the four indicators we use are efficient and relevant to differentiate subjects' social backgrounds. Again, we take a Mann-Whitney U test with one's family income as



the dependent variable [Table 10]. We find that in all of the treatments, family income of subjects labeled as “lower-SES” and “upper-SES” differs significantly [Table 10]. Significant results are witnessed for father’s education level and mother’s education level as well. Only the education level of subject themselves’ does not differ significantly [Table 10]. These statistics show that our indicators are indeed efficient and relevant. Our subjects do come from different family backgrounds. Their family income and parents’ education level differ a lot. Yet, the education level of themselves does not differ much.

**Table 10. Does background differ?**

			Family income	Father’s education	Mother’s education	Subject’s education	
Treatment 1	MR	LowSES	13.20	14.25	14.64	24.52	
		HighSES	31.21	30.12	29.71	19.36	
	SR	LowSES	290.50	313.50	322.00	539.50	
		HighSES	655.50	632.50	624.00	406.50	
	Mann-Whitney U			37.500	60.500	69.000	175.500
	Asymp.Sig.(2-tailed)			.000*	.000*	.000*	.141
Treatment 2	MR	LowSES	15.69	19.19	18.00	24.31	
		HighSES	33.31	29.81	31.00	24.69	
	SR	LowSES	376.50	460.50	432.00	583.50	
		HighSES	799.50	715.50	744.00	592.50	
	Mann-Whitney U			76.500	160.500	132.000	283.500
	Asymp.Sig.(2-tailed)			.000*	.007*	.001*	.918
Treatment 3	MR	LowSES	13.50	20.26	19.41	21.43	
		HighSES	32.93	25.86	26.75	24.64	
	SR	LowSES	310.50	466.00	446.50	493.00	
		HighSES	724.50	569.00	588.50	542.00	
	Mann-Whitney U			34.500	190.000	170.500	217.000
	Asymp.Sig.(2-tailed)			.000*	.129	.048*	.344
Treatment 4	MR	LowSES	13.98	18.93	17.22	25.54	

		HighSES	32.43	27.25	29.05	20.34
	SR	LowSES	321.50	435.50	396.00	587.50
		HighSEs	713.50	599.50	639.00	447.50
		Mann-Whitney U	45.500	159.500	120.000	194.500
		Asymp.Sig.(2-tailed)	.000*	.029*	.001*	.129
	MR	LowSES	54.16	69.28	68.35	93.21
		HighSES	128.24	112.96	113.91	88.77
All obs.	SR	LowSES	4929.00	6304.50	6219.50	8482.00
		HighSES	11542.00	10166.50	10251.50	7989.00
		Mann-Whitney U	743.000	2118.500	2033.500	3894.000
		Asymp.Sig.(2-tailed)	.000*	.000*	.000*	.531
a. GroupingVariable: LHSES						
b. * represents Significant Results						
c. MR representsMean Rank						
d. SR represents Sum of Ranks						

## 5 Discussion

In the literature review section, we mention the experiment conducted by Piff et al in 2010, in which they found that people from a lower social class are more generous than people from upper social class, and people induced to experience a lower sense of social class rank are more charitable compared with people induced to experience upper class rank. We replicate their study; however, what we find is totally different. Either subjects are objectively well-off, or are induced to experience a higher sense of SES, they are always more generous and charitable than their lower SES counterparts. Besides, the average percentage of donation is more than 50%, which is abnormally high comparing to previous studies. In this section some possible explanations of the abnormal findings will be discussed.

The first reason that comes into our mind is the incentive scheme we used. Due to budget constraint, we employ a Random Lottery Incentive instead of a flat-rate show-up fee that all participants can receive. In our experiment, only 1 participant in each treatment eventually wins the cash prize. The donation decision in the survey therefore is based on a “hypothetical” condition: we ask the subjects how much they would like to donate if they win the monetary prize. Comparing to real money incentive, people may make a donation decision less seriously under hypothetical condition.

A second reason which may explain the abnormal donation is the comparison reference we use. In Piff’s study, they ask participants how much of their annual salary should go to charity. “Annual Salary” therefore is used as a reference in their study. Differently, in our experiment we ask participants how many percentages of the money they earn in the puzzle-solving game they would like to donate. Here the small cash prize is used as a reference. Subjects in our experiment earn only up to 25 euro, it is a very small amount of money relative to one’s annual income. A person donates 15 euro counts for 60% of his earnings in our experiment, but it could be much less than 1% of his annual income. Therefore, the percentage people would like to donate in our study will definitely be much higher than studies before.

Thirdly, according to Hoffman et al (1996), when it comes to measuring social preferences, anonymity does matter. Hoffman et al (1996) found that more strictly self-interested actions occurred when “complete isolation” were imposed in the double blind treatment (Hoffman, McCabe, & Smith, 1996). However, due to limit of experimental conditions, we conduct a single blind dictator game in which participants do not know the procedure while the experimenter does know it and can observe their actions. The single-blind trials may lead to biased results. For instance, the subjects know that their behavior are observed by the experimenter and therefore they behave in a more pro-socially manner. Besides, the place where we take the experiment in also matters. We execute our experiment in the hall of the university instead of an isolated laboratory. Although we always choose people alone to be our subjects and we always keep distance with them when they are answering the questionnaire, there are high possibilities that they will meet friends and classmates occasionally in the hall. Participants bear social pressure when doing the survey, and as a result, they may tend to act generously.

Fourthly, the scale we use may not be very proper to reveal one’s socioeconomic class. In our study, we use an ordinal scale. Take “education” for instance, we label “1” as less than high school, “2” as High school, and “3” as Bachelor degree and so on. Although there is a certain kind of ranked relation among each education levels, we cannot say that being labeled with a “2” is twice better than being labeled with a “1”. Despite the fact that statistics in Result 5 show that differences between social backgrounds of our subjects are statistically significant, we cannot tell how big the differences are, and conclusion drawn from such SES differences might be weak.

Apart from the abnormally high donation, we also fail to observe difference between effort in the fixed payment treatment and the saliency treatment. It could be due to the shrinkage of number of puzzles. As we mentioned in the experiment design part, the actual experiment version only contains 5 puzzles instead of 10. The reduction does enable us to control for survey time and attract more respondents. However, on the other hand, it is harder to differentiate people’s effort with a small number of puzzles comparing to a large number of puzzles. Besides, the small stake of 20 euro is not big enough to motivate subjects work hard and think seriously. As a result, we do not see any

significant differences of the puzzle-solving performance, or any differences of donation decisions between these two treatments.

Lastly, the effects of socioeconomic rank manipulation should be further strengthened. In Piff's study, they manipulated the perception of socioeconomic rank not only by the use of MacArthur Scale of subjective SES method, but also by a writing task in which participants are asked to write down sentences that describe how the differences between the subjects themselves and the people from the top or the bottom ladder will affect their interaction. Yet in our study we only employ the MacArthur Scale method and we do not ask our subjects to do the writing task, which turns out to be an unwise decision.

## **6 Conclusion**

The relation between altruism and socioeconomic status has been studied by many economists and psychologists. However for years there has been no consensus on this topic. In the present paper we study this topic in a survey context based on a modified dictator game. Unlike the conventional dictator game, we do not use prepaid windfall endowment. And instead of directly ask how much the participants would like to allocate between themselves and their unknown partners, we modify our dictator game into a puzzle-solving game. Our main finding is that people from an upper socioeconomic class are more generous and charitable relative to people from a lower socioeconomic class. Besides, family income and age affect one's altruistic behavior positively.

Our findings are of importance to behavioral economists, because it is the first time that the results drawn from a puzzle-liked dictator game. It is also of importance to non-profit organizations and other charities, because they can make use of our findings for their charity promotion. However, like other survey-based studies, we also suffer from problems such as anonymity, scrutiny, and small budget. Future studies can improve our study by executing a real money field experiment, by employing subjects of more varied socio-demographic characteristics, or by strengthening the effects of social rank manipulation.

## 7 Appendix A. Ideal Version of the Experiment

### A1. Treatment 1 of Ideal Version

Dear participants,

This is a simple puzzle-solving game. You have at most 30 minutes to complete it. You will be rewarded with 10 euro at the end of the experiment.

Note: The information is kept confidential and will be used only for research purposes!

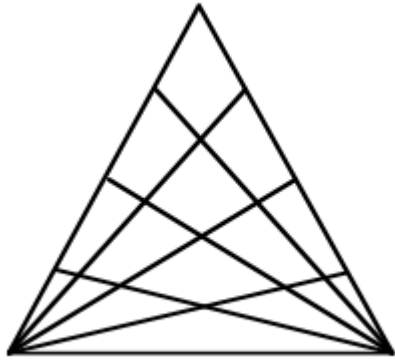
1. Please try to get the answer 24 by only use the number 6, 4, 8, 6. You can use +, -,  $\times$ ,  $\div$ , and ( ). *You are allowed to change the order of the 4 numbers.*

Tip: there are many alternative ways; you are only required to find out one of them. For example:  $6+6+4+8=24$

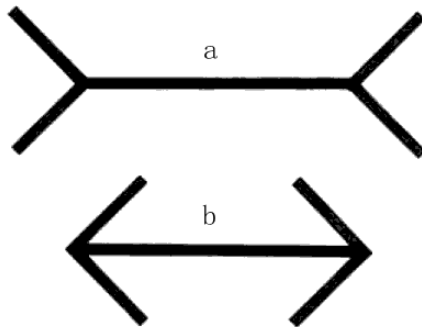
2. Sudoku: (Rules: Each of the nine blocks has to contain the numbers 1 to 9 in its squares. Each number can only appear once column, row or 3x3 boxes. Every sudoku puzzle has only one correct solution)

3	7	8	6	4	2	5		
6		5		7	1	2	3	8
2	9	1	8	3		4		7
	2	9	1	6		3	5	
5	1	4	3	2			7	9
7	3		4	5	9		1	2
4		2		9	3	1	8	
	6	7	5			9	2	3
9		3	2	1		7	4	

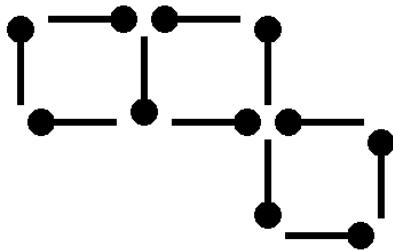
3. How many triangles are there in the diagram?



- a. 32
  - b. 48
  - c. 64
  - d. 72
4. Which line is longer: line A or line B?



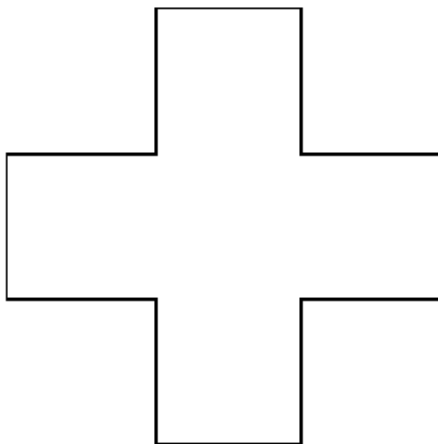
- a. Line a
  - b. Line b
5. In this diagram 11 matches make 3 squares, your challenge is to move 3 matches to show 2 squares.



6. You have a basket containing ten apples. You have ten friends, who each desire an apple. You give each of your friends one apple.

After a few minutes each of your friends has one apple each, yet there is an apple remaining in the basket. How?

7. Here is an ordinary cross. You are allowed to make two straight cuts across it. How can you make it into six pieces with only two straight cuts?



8. Four people are traveling to different places on different types of transport. Their names are: Rachel, John, Mr. Jones and Cindy. They either went on train, car, plane or ship.

- \* Mr. Jones hates flying
- \* Cindy has to rent her vehicle
- \* John gets seasick

Please answer which type of transport each of them is travelling on?

Tip: there are 3 possibilities; you are only required to find out one of them.



9. There are five gears connected in a row, the first one is connected to the second one, the second one is connected to the third one, and so on. If the first gear is rotating clockwise, what direction is the fifth gear turning?



- a. Clockwise  
b. Anticlockwise
10. The box below is a Magic Square. This means that the numbers add up to the same total in every direction. Every row, column and diagonal adds up to 111. But there are some numbers missing! Fill in the missing numbers. They are all different.

		7
13	37	

Demographic questions:

- How old are you? \_\_\_\_\_
- What is your gender?
  - Male
  - Female
- What is your annual household's income from all sources *before tax*? (Note: if you do not know the exact number of your family income, please pick the one that most close to your estimation)
  - Less than €10,000
  - €10,000-€19,999
  - €20,000-€29,999
  - €30,000-€39,999
  - €40,000-€49,999
  - €50,000-€59,000
  - €60,000-€69,999

- €70,000-€79,999
- €80,000-€89,999
- €90,000-€99,999
- €100,000-€149,999
- Higher than €150,000

4. What is the education background of your father?

- Less than high school
- High school
- Bachelor degree
- Master degree
- PhD or similar doctor-level degree
- Other

5. What is the education background of your mother?

- Less than high school
- High school
- Bachelor degree
- Master degree
- PhD or similar doctor-level degree
- Other

6. What is the highest level of education you have completed by far? *Check only one.*

- Less than high school
- High school
- Bachelor degree
- Master degree
- PhD or similar doctor-level degree
- Other

Thanks for your participation! We will transfer 10 euro to your bank account. Would you like to keep all the 10 euro, or donate a part of it to “UNICEF” (The United Nations Children’s Fund, works for children’s rights, their survival, development and protection)?

- Keep all the 10 euro
- Donate € \_\_\_\_\_

Your bank account:

Name on your bank card:

**A2. Treatment 2 of Ideal Version**

Dear participants,

This is a simple puzzle-solving game. You have at most 30 minutes to complete it. Please keep in mind, your performance (how many correct answers you have) will affect your possible payoff. For each correct answer you have, you have a chance to win 2 euro in cash. Specifically, if you answer all the 10 puzzles correctly, it means that you have a chance to win 20 euro in total; and if you answer 9 puzzles correctly, then you have a chance to win 18 euro, and so on.

Note: The information is kept confidential and will be used only for research purposes!

-----Same puzzles as Treatment 1-----

-----Same demographic questions as Treatment 1-----

Thanks for your participation! We will transfer the money you earn (based on how many correct answers you have) to your bank account. Would you like to keep all the money you earn, or donate a part of it to “UNICEF” (The United Nations Children’s Fund, works for children’s rights, their survival, development and protection)?

- Keep all the money I earn
- Donate \_\_\_\_\_%

Your bank account:

Name on your bank card:

### A3. Treatment 3 of Ideal Version

Dear participants,

This is a simple puzzle-solving game. You have at most 30 minutes to complete it. You will be rewarded with 10 euro at the end of the experiment.

Note: The information is kept confidential and will be used only for research purposes!

-----Same puzzles as Treatment 1-----

-----Same demographic questions as Treatment 1-----

7. Think of this ladder as representing where people stand in the Netherlands. At the top of the ladder (labeled as “10”) are those people who are best-off, those who have the most money, most education and most respected jobs. The higher you are, the closer you are to the people at the very top. Where will you place yourself in the ladder as compared to those people in the very top?



- 10<sup>th</sup>rung
- 9<sup>th</sup>rung
- 8<sup>th</sup>rung
- 7<sup>th</sup>rung
- 6<sup>th</sup>rung
- 5<sup>th</sup>rung
- 4<sup>th</sup>rung
- 3<sup>rd</sup>rung
- 2<sup>nd</sup>rung

1<sup>st</sup> rung

Thanks for your participation! We will transfer 10 euro to your bank account. Would you like to keep all the 10 euro, or donate a part of it to “UNICEF” (The United Nations Children’s Fund, works for children’s rights, their survival, development and protection)?

Keep all the 10 euro

Donate€\_\_\_\_\_

Your bank account:

Name on your bank card:

#### A4. Treatment 4 of Ideal Version

Dear participants,

This is a simple puzzle-solving game. You have at most 30 minutes to complete it. You will be rewarded with 10 euro at the end of the experiment.

Note: The information is kept confidential and will be used only for research purposes!

-----Same puzzles as Treatment 1-----

-----Same demographic questions as Treatment 1-----

8. Think of this ladder as representing where people stand in the Netherlands. At the bottom of the ladder (labeled as “1”) are those people who are worst-off, those who have the least money, least education and least respected jobs or no jobs. The lower you are, the closer you are to the people at the very bottom. Where will you place yourself in the ladder as compared to those people in the very bottom?



- 10<sup>th</sup> rung
- 9<sup>th</sup> rung
- 8<sup>th</sup> rung
- 7<sup>th</sup> rung
- 6<sup>th</sup> rung
- 5<sup>th</sup> rung
- 4<sup>th</sup> rung
- 3<sup>rd</sup> rung
- 2<sup>nd</sup> rung

- 1<sup>st</sup> rung

Thanks for your participation! We will transfer 10 euro to your bank account. Would you like to keep all the 10 euro, or donate a part of it to “UNICEF” (The United Nations Children’s Fund, works for children’s rights, their survival, development and protection)?

- Keep all the 10 euro
- Donate€\_\_\_\_\_

Your bank account:

Name on your bank card:

## Appendix B. Actual Version of the Experiment

### B1. Treatment 1 of Actual Version

Dear participants,

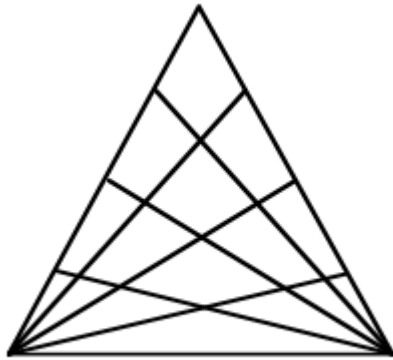
This is a simple puzzle-solving game. You have at most 15 minutes to complete it. And you have a chance to win 20 euro after the experiment.

Note: The information is kept confidential and will be used only for research purposes!

1. Please try to get the answer 24 by only use the number 6, 4, 8, 6. You can use +, -,  $\times$ ,  $\div$ , and (). *You are allowed to change the order of the 4 numbers.*

Tip: there are many alternative ways; you are only required to find out one of them. For example:  $6+6+4+8=24$

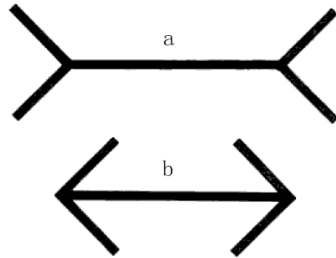
2. How many triangles are there in the diagram?



- e. 32
- f. 48
- g. 64
- h. 72



3. Which line is longer: line A or line B?



- c. Line a
  - d. Line b
  - e. They are equal
4. There are five gears connected in a row, the first one is connected to the second one, the second one is connected to the third one, and so on. If the first gear is rotating clockwise, what direction is the fifth gear turning?



- c. Clockwise
  - d. Anticlockwise
5. The box below is a Magic Square. This means that the numbers add up to the same total in every direction. Every row, column and diagonal adds up to 111. But there are some numbers missing! Fill in the missing numbers. They are all different.

		7
13	37	

Demographic questions:

6. How old are you? \_\_\_\_\_
7. What is your gender?
  - Male
  - Female
8. What is your **annual household's income** from all sources *before tax*? (Note: if you do not know the exact number of your family income, please pick the one that most close to your estimation)
  - Less than €10,000
  - €10,000-€19,999
  - €20,000-€29,999
  - €30,000-€39,999
  - €40,000-€49,999
  - €50,000-€59,000
  - €60,000-€69,999
  - €70,000-€79,999
  - €80,000-€89,999
  - €90,000-€99,999
  - €100,000-€149,999
  - Higher than €150,000
9. What is the education background of your father?
  - Less than high school
  - High school
  - Bachelor degree
  - Master degree
  - PhD or similar doctor-level degree
  - Other, \_\_\_\_\_
10. What is the education background of your mother?
  - Less than high school
  - High school
  - Bachelor degree
  - Master degree
  - PhD or similar doctor-level degree
  - Other, \_\_\_\_\_
11. What is the highest level of education you have completed so far? *Check only one.*
  - Less than high school
  - High school

- Bachelor degree
- Master degree
- PhD or similar doctor-level degree
- Other, \_\_\_\_\_

Thanks for your participation! One of you will be randomly chosen to win 20 euro in cash. If you won the 20 euro, would you like to keep all of the 20 euro, or donate a part of it to “UNICEF” (The United Nations Children’s Fund, works for children’s rights, their survival, development and protection)?

- Keep all the 20 euro
- Donate \_\_\_\_\_%

We will inform you if you win the 20 euro by email. Please indicate your email address \_\_\_\_\_

The end! Thanks!

## B2. Treatment 2 of Actual Version

Dear participants,

This is a simple puzzle-solving game. You have at most 15 minutes to complete it. Please keep in mind, your performance (how many correct answers you have) will affect your possible payoff. For each correct answer you have, you have a chance to win 5 euro in cash. Specifically, if you answer all the 5 puzzles correctly, it means that you have a chance to win 25 euro in total; and if you answer 4 puzzles correctly, then you have a chance to win 20 euro, and so on.

Note: The information is kept confidential and will be used only for research purposes!

-----Same puzzles as Treatment 1-----

-----Same demographic questions as Treatment 1-----

Thanks for your participation! One of you will be randomly chosen to win 0-25 euro (depend on your performance of the puzzle-solving game) after the experiment. Would you like to keep all the money you win, or donate a part of it to “UNICEF” (The United Nations Children’s Fund, works for children’s rights, their survival, development and protection)?

- Keep all the money I win
- Donate \_\_\_\_%

We will inform you if you win the cash prize by email. Please indicate your email address \_\_\_\_\_

The end! Thanks!

### B3. Treatment 3 of Actual Version

Dear participants,

This is a simple puzzle-solving game. You have at most 15 minutes to complete it. And you have a chance to win 20 euro after the experiment.

Note: The information is kept confidential and will be used only for research purposes!

-----Same puzzles as Treatment 1-----

-----Same demographic questions as Treatment 1-----

7. Think of this ladder as representing where people stand in the Netherlands. At the top of the ladder (labeled as “10”) are those people who are best-off, those who have the most money, most education and most respected jobs. The higher you are, the closer you are to the people at the very top. Where will you place yourself in the ladder as compared to those people in the very top?



- 10<sup>th</sup> rung
- 9<sup>th</sup> rung
- 8<sup>th</sup> rung
- 7<sup>th</sup> rung
- 6<sup>th</sup> rung
- 5<sup>th</sup> rung

- 4<sup>th</sup> rung
- 3<sup>rd</sup> rung
- 2<sup>nd</sup> rung
- 1<sup>st</sup> rung

Thanks for your participation! One of you will be randomly chosen to win 20 euro in cash. If you win the 20 euro, would you like to keep all the 20 euro, or donate a part of it to “UNICEF” (The United Nations Children’s Fund, works for children’s rights, their survival, development and protection)?

- Keep all the 20 euro
- Donate \_\_\_\_\_%

We will inform you if you win the 20 euro by email. Please indicate your email address \_\_\_\_\_

The end! Thanks!

#### B4. Treatment 4 of Actual Version

Dear participants,

This is a simple puzzle-solving game. You have at most 15 minutes to complete it. And you have a chance to win 20 euro after the experiment.

Note: The information is kept confidential and will be used only for research purposes!

-----Same puzzles as Treatment 1-----

-----Same demographic questions as Treatment 1-----

7. Think of this ladder as representing where people stand in the Netherlands. At the bottom of the ladder (labeled as “1”) are those people who are worst-off, those who have the least money, least education and least respected jobs or no jobs. The lower you are, the closer you are to the people at the very bottom. Where will you place yourself in the ladder as compared to those people in the very bottom?



- 10<sup>th</sup> rung
- 9<sup>th</sup> rung
- 8<sup>th</sup> rung
- 7<sup>th</sup> rung
- 6<sup>th</sup> rung
- 5<sup>th</sup> rung
- 4<sup>th</sup> rung

- 3<sup>rd</sup> rung
- 2<sup>nd</sup> rung
- 1<sup>st</sup> rung

Thanks for your participation! One of you will be randomly chosen to win 20 euro in cash. If you win the 20 euro, would you like to keep all the 20 euro, or donate a part of it to “UNICEF” (The United Nations Children’s Fund, works for children’s rights, their survival, development and protection)?

- Keep all the 20 euro
- Donate \_\_\_\_\_%

We will inform you if you win the 20 euro by email. Please indicate your email address \_\_\_\_\_

The end! Thanks!



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