ERASMUS UNIVERSITY ROTTERDAM

Erasmus School of Economics

Master Thesis Behavioural Economics

Trusting a stranger if you are ambiguity averse:

The relationship between ambiguity attitude and trusting behaviour

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1. Introduction

As a child, we have often been told not trust strangers and warned against chances of getting mislead, robbed, kidnapped and many more dangers. But what is the chance that this happens with every stranger you meet in your life? Encounters with strangers, however, is an inevitable part of our daily lives. People meet strangers every day: on the street, at the subway, work, school and so on. Stolle (2002) refers to trust in strangers as *generalized trust*: trusting someone (in this research seen as a behaviour) in a setting where you do not know the person from prior cooperation experience or repeated face-to-face interactions. Generalized trust differs greatly across individuals. This thesis investigates how people's attitudes towards *ambiguity*, uncertain situations with unknown probabilities of events happening (Fox & Tversky, 1995), affect their trust in strangers. One thing that makes trusting strangers is the ambiguity about the stranger's trustworthiness. People have been found to be *ambiguity averse* (Ellsberg, 1961), exhibiting dislike of ambiguous situations. The central research question address in this thesis is: do more ambiguity averse people trust strangers less?

This research will contribute to the existing literature because the extent of what this particular topic is researched in is rather small. The topic 'Trust' and 'Ambiguity' are researched extensively separate from each other, it has not been researched in combination many times. Usually, trust in combination with uncertainty is researched. This new combination and this research question might come in handy for example companies that want to promote their products to people, but they are new in the market and so they are 'strangers'. Also, trust plays an important role in trading for example. Besides this, the topic is socially relevant because if ambiguity attitude is a factor that influences trust, relationships between people and how people behave, can be better explained.

The structure of this research proposal is as follows: first, the research question and the hypotheses will be explained. Secondly, the methodology for this research will be presented, followed by the results, the discussion, the conclusion of this paper, references and finally the appendix.

1.1 Research Question

Fehr (2009) examined trust-taking behaviour towards strangers involving risks. He found that trust behaviour differs from behaviour towards non-socially constituted risks. Dimmock, Kouwenberg, and Wakker (2015) found that more ambiguity averse people trusted other participants less. Also, Seanor and Meaton (2008) and Tidd, Mclntyre, and Friedman (2004) found that ambiguity is linked to trust, but in both studies, they did not research this in combination with people who do not know each other.

The research question that will be examined is therefore:

Do more ambiguity averse people trust strangers less?

1.2 Hypotheses

Women have been found to be more risk-averse than men (Borghans, Heckman, Golsteyn, & Meijers, 2009; Levin, Snyder, & Chapman, 1988; Holt & Laury, 2002). But whether women are also more ambiguity averse is not yet clear. According to the study of Borghans, Golsteyn, Heckman, and Meijers (2009) men tend to be more ambiguity averse than women, but the more a situation is ambiguous the more men and women will react in the same way. But in the studies of Moore and Eckel (2003) and Schubert, Gysler, Brown and Brachinger (2000) women are the ones who are more ambiguity averse than men. That is why the following hypothesis will be tested.

Hypothesis 1: Women are more ambiguity averse

According to the research of Croson and Gneezy (2009) women in a trust game send the same amount of money or less money to another person than men do. This means that they trust others less. Also, in the study of Bohnet and Zeckhauser (2004) and in the study of Buchan, Croson and Solnick (2008) women trust other people less than men do. But in the paper of Ashraf, Bohnet and Piankov (2006) they actually found a contradicting result: women trust more than men. Therefore, it is interesting to test if women really do trust strangers less.

Hypothesis 2: Women trust strangers less.

In several experiments, it appears that men trust strangers more if the stranger is a male and women trust a stranger more if the stranger is a female instead of a male (King, Miles, & Kniska, 1991; Bohnet & Zeckhauser, 2004). That is why the following hypotheses will be tested.

Hypothesis 3: Men are more likely to trust a stranger if the stranger is a male.

Hypothesis 4: Women are more likely to trust a stranger if the stranger is a female.

Finally, the last hypothesis will be tested to make a complete answer to the research question stated.

Hypothesis 5: More ambiguity averse people trust strangers less.

2. Methodology

The data for this research will be gathered with an online experiment, with the use of the program Qualtrics. A survey will be distributed amongst students of several universities in the Netherlands. In the survey the following data will be gathered: Gender, Age, Nationality, Education, Ambiguity Aversion Index and Trust Decisions. Participants will receive a questionnaire with them being a trustor. The questionnaire will consist of six parts: demographic questions, elicitation of risk attitude, elicitation of the ambiguity aversion index, three one shot trust games and a dictator game.

2.1 Trust Game

In part 1, each participant plays a trust game with one randomly selected participant, who is referred to as the partner. The identity of the partner remains anonymous throughout the survey. Participants will play the role of trustor, so their answers can be compared with the second trust game that will be explained later on and the risk and ambiguity attitude can be measured. The trustor receives ten euros and decides how much of these ten euros (amount €x) he or she wants to give to the trustee. The part the trustor gives away gets tripled (3€x) before it goes to the trustee. The trustee gets to decide if he wants to give back to the first mover and share equally (€10 + 0.5€x , 1.5€x) or give nothing back to the trustor (€10 - €x , 3€x), as showed in Figure 1. This will show if someone trusts a stranger by sending him money to maximize the payoff of both persons or not sending money at all and therefore do not trust a stranger. The players are anonymous to each other, but also to the experimenter to guarantee that there is no social pressure and the participants only play with their own behavioural norms. If the trustors send money to the trustee, they are willing to take some risk in placing trust in the trustee. The trustee can then reciprocate, act in self-interest or do not think that the money send by the trustor is because of the trust in placed in them and so reciprocation is not an issue (Berg, Dickhaut, & McCabe, 1995).

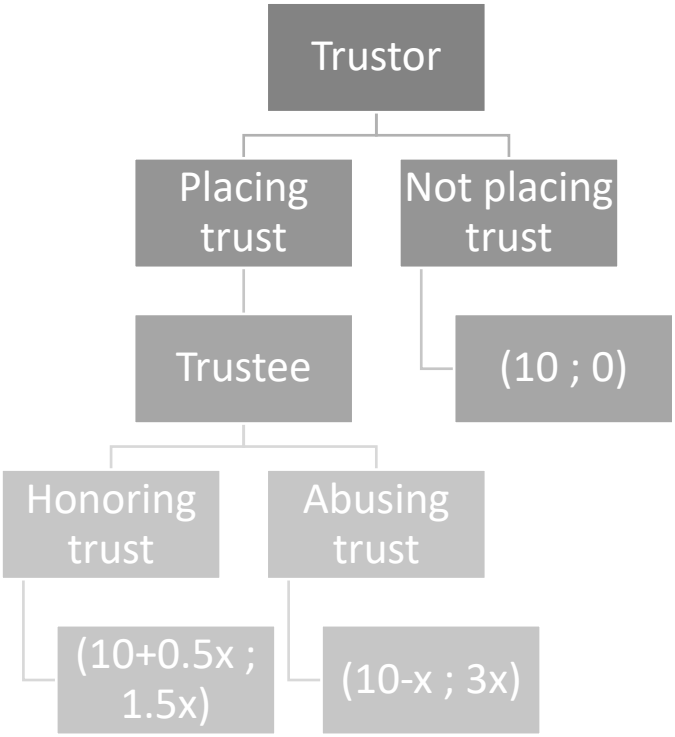

Figure 1. Trust Game with Payoffs

2.2 Measuring Ambiguity Attitude

Part 2 elicits participants' risk and ambiguity attitude. Figure 2 presents a typical decision situation they will face in this part. The participants will be asked:

Consider the following options. Which one do you prefer?

Option A: Win 6 euros if your partner chose the trustworthy option (divides the money equally with you) in the trust game you just played.

Option B: Win 3 euros for sure.

In this situation, they could choose between two options. Option A is an ambiguous lottery that pays them 6 euros if the partner chose the trustworthy option and 0 otherwise. Option B is a sure amount of 3 euros.

A bisection method will be used to elicit the certainty equivalent of the lottery in option A. Depending on participants' choices in this situation, the sure amount in option B will be varied in the next decision situations until indifference is reached with pre-defined precision. Figure 2 presents how the sure amount in option B is varied depending on participants' choices. For instance, in the first decision situation, if option A is selected, the sure amount in option B in the next decision situation will be increased to 4.5 euros; if option B is selected, then the sure

amount will be decreased to 1.5 euros. The iteration will be repeated 5 times, and after the last question the certainty equivalent can then be determined by taking the midpoint of the outcomes of the last question and the question before that (Figure 2). The bisection method is simple for the participants to understand, and a relatively precise certainty equivalent can be determined.

The certainty equivalent of the ambiguous bet depends on participants' subjective belief about the trustworthiness of their partners. To control for that, the following question is asked:

What do you think is the probability that your partner chose the trustworthy option (shared the money equally with you)? Please indicate the probability using a number between 0 and 100: _____%

For the elicitation of the risk attitude the following question will be asked:

Consider the following options. Which one do you prefer?

Option A: Win 6 euros if your partner chose the trustworthy option (divides the money equally with you) with a chance of _____%, in the trust game you just played.

Option B: Win 3 euros for sure.

In this situation they also could choose between two options. This time option A is a risky lottery that pays them 6 euros if their partner chose the trustworthy option and 0 euro otherwise, but with the probability the participant think that the partner chose the trustworthy option. Option B is also in this case a sure amount of 3 euros.

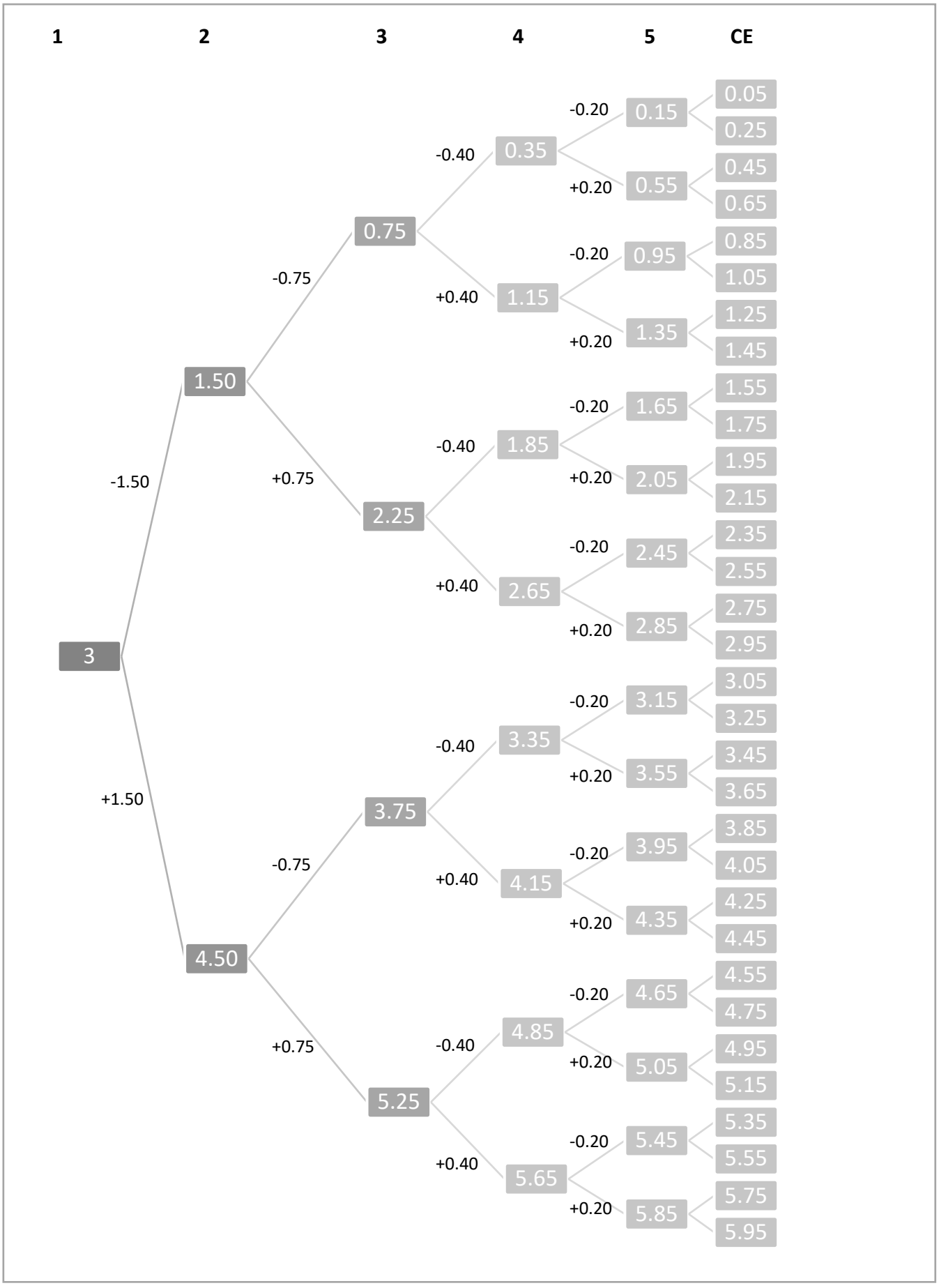

Figure 2. Bisection Method With Gamble (0.5 , 6 ; 0.5 , 0)

notes: Every question someone chooses Option A (Option B) the lower (upper) bound in used to determine the new sure amount in the new question (Option B). After five questions the Certainty Equivalent can be determined.

From both question lists, the certainty equivalents can then be used to calculate the ambiguity aversion index. The way of calculating the ambiguity aversion index will be used from the paper of Sutter, Kocher, Glätzle-Rützler, & Trautmann (2013).

$$\text{Ambiguity Aversion Index} = (CE_R - CE_A) / (CE_R + CE_A) \quad (1)$$

Where CE_R stands for the certainty equivalent of the risky prospect and CE_A stands for the certainty equivalent of the ambiguous prospect. An ambiguity aversion index measure above zero means that a person is ambiguity averse, an index of zero means that a person is ambiguity neutral and an index below zero means that a person is ambiguity seeking.

To test hypothesis 1 the Mann-Whitney U test will be used. It will be tested if one of two variables is stochastically larger than the other and the independent samples come from the same distribution, namely the ambiguity aversion index of women will be compared to the ambiguity aversion index of men (Mann & Whitney, 1947). The assumption that the observations are independent hold and it is a between-subjects design.

2.3 General Trust Survey questions

After the two question lists, the participants play a one-shot trust game, based on Berg, Dickhaut, and McCabe (1995) and face three questions based on the questions from the World Values Survey to measure beliefs about trust. The questions are as follows: (1) “In general, one can trust people”, (2) “Nowadays, you can’t rely on anybody” and (3) “When dealing with strangers, it is better to be cautious before trusting them”. The questions can then be answered with the following possibilities: “disagree strongly”, “disagree somewhat”, “neither agree nor disagree”, “agree somewhat”, and “agree strongly” (Fehr, 2009). The answers will be valued 1 to 5 respectively.

2.4 Dictator Game

To control for other-regarding preferences in the trust game, participant will also play a modified dictator game. This game is the same as the trust game, but the one difference is that the trustee (second mover) has no choice in sending money back to the trustor (first mover) or not. So, the first mover gets ten euros and gets to decide how much of this money he or she wants to send to the second mover and that money gets tripled. Then the game is ended. The difference between the standard dictator game and the modified dictator game is that the money the second mover receives gets tripled. This will show if a 'trustor' in the trust game sends money because he or she trust the trustee (by not sending money in the dictator game) or that there are other reasons for sending the money, like altruism and care for fairness (if the trustor do send money in the dictator game). The difference in money sent in the trust game and dictator game can then be explained by trust of the trustor.

According to Cox (2004) preferences of the participant can be self-regarding or other-regarding. If the preferences of the participant are self-regarding, then the utility function is a constant function of the payoff that the other participant (second mover) has. If the amount of money sent in the trust game is larger than the money sent in the dictator game, then the first mover is exposed to the risk that the second mover might return nothing or that little money to the first mover, that the utility will be lower than the first mover had initially. The amount sent by the first mover in the trust game is then too large to only be explained by other-regarding preferences (Cox, 2004). With the Mean Comparison T Test can then be determined if the amounts sent in the trust game are significantly larger than in the dictator game and behavior in the trust game can be explained by trust.

2.5 Incentives

The games will be played hypothetically because it is not possible to pay everyone their final payoff. If it was possible to pay participants, to incentivize participants to put effort in the task and reveal their true preferences, a percentage of the games played in couples would be paid out. This means that the final payoffs of the trustor and the trustee, who are paired to each other, will be fully paid out in money.

2.6 Effect of Gender on Trust Decisions

For hypothesis 2 a Mann-Whitney U test will be used to test if the independent samples come from the same distribution. This means that this test tests if the amount given by a man differs from the amount given by a woman, in the trust game. The assumption that the observations are independent holds and it is a between-subjects design.

As robustness check for hypothesis 2 a regression will be conducted with Trust Decisions as a dependent variable and gender (Female) as an independent variable. Demographics will be included as control variables as well as the control questions for believes and the dictator game. This way it can be checked if the amount of money given by men differs from the amount given by women in the trust game. So, if women trust strangers less than men do or not. The equation will be as follows:

$$TrustDecisions_i = \beta_0 + \beta_1 \cdot Female_i + \beta_2 \cdot Age_i + \beta_3 \cdot ProbabilityTrustworthy_i + \beta_4 \cdot Education_i + \beta_5 \cdot TrustSurvey_i + \beta_6 \cdot CannotRely_i + \beta_7 \cdot CautiousBeforeTrusting_i + \beta_8 \cdot Dictatorgame_i + \varepsilon_i \quad (2)$$

$TrustDecisions_i$	How much money someone gives to another person in the trust game of person i
β_I	Parameter for the variables
ε_i	Error term

2.7 Effect of Gender with Known Gender on Trust Decisions

To test hypothesis 3 and 4 the trust game will also be played, but in addition, the gender of the other unknown player will be shown. The Mann-Whitney U test will be used to test if the independent samples come from the same distribution. So, if the amount given by a man differs from the amount given by a woman in the trust game, where the gender is shown. The assumption that the observations are independent holds and it is a between-subjects design.

As robustness check for hypotheses 3 and 4, regressions will be made with Trust Decisions Male or Trust Decisions Female as a dependent variable and gender (Female) as an independent variable. Demographics will be included as control variables as well as the control questions for believes and the dictator game. This way it can be checked if the amount of money given by men differs from the amount given by women in the trust game, where the gender is shown. The equations will be as follows:

$$TrustDecisionsMale_i = \beta_0 + \beta_1 \cdot Female_i + \beta_2 \cdot Age_i + \beta_3 \cdot ProbabilityTrustworthy_i + \beta_4 \cdot Education_i + \beta_5 \cdot TrustSurvey_i + \beta_6 \cdot CannotRely_i + \beta_7 \cdot CautiousBeforeTrusting_i + \beta_8 \cdot Dictatorgame_i + \varepsilon_i \quad (3)$$

$$TrustDecisionsFemale_i = \beta_0 + \beta_1 \cdot Female_i + \beta_2 \cdot Age_i + \beta_3 \cdot ProbabilityTrustworthy_i + \beta_4 \cdot Education_i + \beta_5 \cdot TrustSurvey_i + \beta_6 \cdot CannotRely_i + \beta_7 \cdot CautiousBeforeTrusting_i + \beta_8 \cdot Dictatorgame_i + \varepsilon_i \quad (4)$$

2.8 Effect of Ambiguity Attitude on Trust Decisions

To test hypothesis 5, a regression will be made with Trust Decisions as the dependent variable and Ambiguity Attitude as the independent variable and the demographic variables and control variables as shown in Equation 5.

$$TrustDecisions_i = \beta_0 + \beta_1 \cdot AmbiguityAversion_i + \beta_2 \cdot Age_i + \beta_3 \cdot Female_i + \beta_4 \cdot ProbabilityTrustworthy_i + \beta_5 \cdot Education_i + \beta_6 \cdot TrustSurvey_i + \beta_7 \cdot CannotRely_i + \beta_8 \cdot CautiousBeforeTrusting_i + \beta_9 \cdot Dictatorgame_i + \varepsilon_i \quad (5)$$

3. Results

There were 133 participants registered for the experiment. Of these participants, fourteen were not a student, so deleted from the dataset. There were also 30 answers which were incomplete and therefore these participants were also deleted from the dataset. Finally, 89 subjects can be used for the analysis of this research.

3.1 Summary Statistics

Table 6 (in the appendix) presents the summary statistics of variables collected in the survey. 48.3 percent of the participants is currently a master student, about 40.5 percent is an undergraduate student and the remaining 11.2 percent is a PhD student. In total about 59.6 percent (53 subjects) of the participants is female. The average age is 23.3 years, with a minimum of eighteen and a maximum of 45 years. There are seventeen different countries where the participants originally are from, but most of them come from the Netherlands. Namely, 69.7 percent. Some other main countries are the United Kingdom, Germany and the United States, all with 4.5 percent.

In the trust game the participants gave an average amount of 6.17 euros to the trustee. 85 participants who gave a positive amount in the trust game, gave an average probability of trustworthiness of 53.9 percent. Minimum was fifteen and maximum was 89 percent. The four people who gave zero in the trust game had to imagine what the probability would be if they gave a positive amount. Their average probability was ten percent with a minimum of zero and a maximum of 30.

In the second trust game, where the gender was known, participants gave an average amount of 6.26 euros to a female stranger and 5.58 euros to a male stranger. In the dictator game the average amount given to a stranger was 3.57 euros.

With the three questions based on the World Values Survey to measure beliefs about trust the statistics were as follows: 55.1 percent agrees somewhat with the statement “In general, one can trust people”. 25.8 percent neither agree nor disagree with the statement and eighteen percent disagrees somewhat. 38.2 percent of the participants disagrees somewhat with the statement “Nowadays, you can’t rely on anybody”. 21.3 percent agrees somewhat, 15.7 percent neither agree nor disagree and 2.2 percent agrees strongly. For the last statement “When dealing with strangers, it is better to be cautious before trusting them”, 42.7 percent agrees somewhat,

20.2 percent neither agree nor disagree, 21.3 percent agrees strongly, and 13.5 percent disagrees somewhat with this statement.

The average certainty equivalent for the ambiguous prospect was 4.09 euros and in the risky prospect it was 3.85 euros. According to Formula 1 of Sutter, Kocher, Glätzle-Rützler, & Trautmann (2013) the average ambiguity aversion index is -0.04. From the participants 32 are ambiguity seeking, twelve participants are ambiguity averse and the other 45 participants are ambiguity neutral.

3.2 Analysis

To test the hypotheses, the Mann-Whitney U test is used for the first four hypotheses and an OLS regression for the fifth hypothesis as stated in the Methodology section. Also, in the Appendix the Robustness checks are included for the first four hypotheses.

For the first hypothesis the difference between men and women and their ambiguity aversion is tested. As can be seen in Table 1, women are not more ambiguity averse than men are because the p-value of the test is bigger than the significance level of five percent ($p>0.05$). In Table 8 model 1 (in the appendix) this is also the result. The variable Female is not significant in the OLS regression with ambiguity aversion as the dependent variable ($p>0.05$). Therefore, Hypothesis 1 should not be rejected.

Table 1 –Ambiguity Aversion Between Different Genders (Mann-Whitney U Test)

Variable tested	Gender	Observations	Rank sum	z	Prob > |z|
Ambiguity	Male	36	1643	0.206	0.8367
Aversion	Female	53	2362		

P{Tru~Male(Gender==Female) > Tru~Male(Gender==Male)} = 0.488

For the second hypothesis the difference between men and women and their trust decisions is tested. According to Table 2 there is also no difference between the two genders in risk attitude. In this case the p-value is also bigger than a five percent significance level ($p>0.05$). This result is confirmed in the OLS regression in Table 8 model 2 (in the appendix) with Trust Decisions as the dependent variable. The variable Female is not significant ($p>0.05$). Therefore, Hypothesis 2 should not be rejected.

Table 2 – Trust Attitude Between Different Genders (Mann-Whitney U Test)

Variable tested	Gender	Observations	Rank sum	z	Prob > |z|
Trust Decisions	Male	36	1656	0.310	0.7566
	Female	53	2349		

P{Tru~Male(Gender==Male) > Tru~Male(Gender==Female)} = 0.519

In Table 3 the results for hypothesis 3 are showed. Here, the difference in gender and their trust decisions is tested when the trustee in the trust game appeared to be a male. The table shows that there is no difference between men and women with a significance level of five percent (p>0.05). This result is the same as in the OLS regression in Table 8 model 3 (in the appendix). In this regression, with Trust Decisions Male as dependent variable, the variable Female is not significant (p>0.05). Hypothesis 3 should therefore not be rejected.

Table 3 – Trust Attitude When Trustee Is Male Between Gender (Mann-Whitney U Test)

Variable tested	Gender	Observations	Rank sum	z	Prob > |z|
Trust Decisions	Male	36	1661.5	0.356	0.7219
(Trustee = Male)	Female	53	2343.5		

P{Tru~Male(Gender==Male) > Tru~Male(Gender==Female)} = 0.522

For hypothesis 4 the same effect is tested, but instead of the trustee being a male, in this case the trustee was a female. So, the difference in gender and their trust decisions is tested when the trustee in the trust game appeared to be a female. The results are shown in Table 4. Here, the results are also not significant with a significance level of five percent (p>0.05). This result is confirmed in Table 8 model 4 (in the appendix) with Trust Decisions Female as dependent variable in the OLS regression. The independent variable Female is not significant at a five percent significance level (p>0.05). Therefore, hypothesis 4 should also not be rejected.

Table 4 – Trust Decisions When Trustee is Female Between Gender (Mann-Whitney U Test)

Variable tested	Gender	Observations	Rank sum	z	Prob > |z|
Trust Decisions	Male	36	1589.5	-0.259	0.7956
(Trustee = Female)	Female	53	2415.5		

P{Tru~male(Gender==Female) > Tru~male(Gender==Male)} = 0.516

For the last hypothesis an OLS regression was made with Trust Decisions as dependent variable and Ambiguity Aversion as independent variable. The results are shown in Table 5. Ambiguity Aversion has a significant effect on Trust Decisions with a significance level of one percent ($p<0.01$). For a person that is ambiguity averse and thus has an index above zero gives, on average, a higher amount in the trust game than someone with a negative index and is ambiguity seeking and gives a higher amount than someone with an index of zero and is ambiguity neutral, ceteris paribus. This means that someone who is more ambiguity averse, trust strangers more and someone who is ambiguity seeking, trust strangers less.

There are also two other variables that appeared to be significant in Table 5, these are the variables Dictator Game and Probability Trustworthy. Dictator Game has a significant effect on Trust Decisions with a significance level of five percent ($p<0.05$). This means that if someone gives a higher amount in the dictator game, that person also trust a stranger more than someone who gives a lower amount or even nothing, ceteris paribus. The variable Probability Trustworthy has a significant effect on Trust Decisions with a significance level of one percent ($p<0.01$). This means that if someone gives a higher percentage to what he or she thinks the probability is that their partner (the trustee) chose the trustworthy option (shared the money equally) in the trust game, that person also trust a stranger more than someone who gives a lower percentage or a zero percentage, ceteris paribus.

It could be the case that since the amounts in the gambles are small, used in this experiment, participants tend to be more ambiguity seeking than when the amounts in the gambles would be much higher. As the stakes are small, there are no incentives, so the participants have nothing to lose. This could also be the cause for the results to be different than in the literature.

It can also be the case that variables are highly correlated in this model and the results suffer from multicollinearity. In Table 9 (in the appendix) the correlations between the variables and in Table 10 (in the appendix) the results of the variance inflation factor (VIF) test is shown.

The test does not show a value higher than four for any of the variables. So, the results in Table 5 are not due to multicollinearity.

Table 5 – Effect of Ambiguity Aversion on Trust Decisions

Variables	Trust Decisions (5)
Ambiguity Aversion	3.5383227***
	(0.0067)
Female	.05934639
	(0.9089)
Age	.06408394
	(0.4496)
Student	
Master Student	-.75602729
	(0.2356)
PhD Student	-.2863141
	(0.8184)
Trust Survey	.13880195
	(0.6704)
Cannot Rely	-.07997821
	(0.7355)
Cautious Before Trusting	-.01963841
	(0.9453)
Dictator Game	.24258925**
	(0.0225)
Probability Trustworthy	.07561297***
	(0.0000)
_cons	.17226168
	(0.9460)
N	89

Notes: Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

4. Discussion

In this research the ambiguity attitude measure of Sutter, Kocher, Glätzle-Rützler, & Trautmann (2013) is used to determine the ambiguity aversion index of the participants. The certainty equivalent of the risky prospect and the certainty equivalent of the ambiguous prospect determines someone's ambiguity aversion index. The ambiguity aversion index becomes stronger, the larger the difference between the two certainty equivalents is. Besides this measure there are also other measures to determine the ambiguity aversion index that for example do not include the certainty equivalent for risky prospects (Ghirardato, Maccheroni, & Marinacci, 2004). This could give different results in this study conducted with the measure of Sutter, Kocher, Glätzle-Rützler, & Trautmann (2013).

There were no effects found of gender on trust decisions with unknown gender. In the study of Croson and Gneezy (2009) they also found that women gave as much as men do to strangers in the trust game. And in the study of Croson and Buchan (1999) there were also no significant gender differences found in their trust experiment. In other studies they find that men trust strangers more or that women trust strangers more, the results are very different on this subject in the literature. In the study of Buchan, Croson and Solnick (2008) they found that males expect to be trusted back more if they trust others more initially. So, men trust others more than females do. In the paper of Bohnet and Zeckhauser (2004) they show that both men and women trust women more. But men trust strangers more in general than women do. According to the study of Ashraf, Bohnet and Piankov (2006) women are motivated by their expectations of return and therefore give larger amounts in the trust games than men do.

There were no significant effects found of gender on ambiguity aversion as well, contrary to the literature where they did found effects of ambiguity aversion between men and women (Moore & Eckel, 2003; Schubert, Gysler, Brown, & Brachinger, 2000). Contrary to the literature there was also no effect found of the difference in gender on trust decisions with known gender (King, Miles, & Kniska, 1991; Bohnet & Zeckhauser, 2004).

The research question of this study was: "*Do more ambiguity averse people trust strangers less?"* In this study was found that ambiguity averse people trust strangers more and ambiguity seeking people trust strangers less. This result is not in line what is found in the literature so far (Dimmock, Kouwenberg, & Wakker, 2015; Corcos, Pannequin, & Bourgeois-Gironde, 2012; Fairley, Sanfey, Vyrastekova, & Weitzel, 2012). This could be due to limitations in this research, the sample size was rather small and the amounts in the gambles

were low, also there were no incentives used. This might have caused participants to act in a different way.

5. Conclusion

In this paper, the effect of ambiguity aversion on trust decisions was analysed. In many other studies the effect of risk aversion on trust decisions were researched, instead of the effect of ambiguity aversion as done in this research. The experiment was run amongst students studying in the Netherlands, with different nationalities, aged between eighteen and 45 years old.

There is no evidence found that there is difference in gender on ambiguity aversion. Women and men did not differ in ambiguity aversion or trust decisions. There was no evidence that women trust strangers less if the stranger is completely anonymous nor was found that women are more likely to trust a stranger if the stranger is a female and that men are more likely to trust a stranger if the stranger is a male. There was significant evidence found that participants who are ambiguity averse, trust strangers with unknown gender more than participants who are ambiguity seeking.

For future research I would suggest that a larger sample and the use of incentives would improve the study. The results of this study were not in line with existing literature, so it would be interesting to conduct this experiment on a larger scale in the Netherlands to see if the results still hold.

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7. Appendix

7.1 Summary Statistics

Table 6 – Summary Statistics

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Gender					
Female	89	.60	.49	0	1
Age	89	23.35	4.52	18	45
Country					
Germany	89	.04	.21	0	1
United States	89	.04	.21	0	1
Romania	89	.01	.11		
United Kingdom	89	.04	.21	0	1
Italy	89	.01	.11	0	1
China	89	.02	.15		
Armenia	89	.01	.11	0	1
Colombia	89	.01	.11	0	1
Bulgaria	89	.01	.11		
Bolivia	89	.01	.11	0	1
Greece	89	.02	.15	0	1
Lebanon	89	.01	.11	0	1
Austria	89	.01	.11	0	1
Poland	89	.01	.11	0	1
Indonesia	89	.02	.15	0	1
Trust Survey					
Disagree Somewhat	89	.18	.39	0	1
Neither Agree nor Disagree	89	.26	.44	0	1
Agree Somewhat	89	.55	.50	0	1
Cannot rely					
Disagree Somewhat	89	.38	.49	0	1
Neither Agree nor Disagree	89	.16	.37	0	1
Agree Somewhat	89	.21	.41	0	1
Agree Strongly	89	.02	.15	0	1
Cautious before Trusting					
Disagree Somewhat	89	.13	.34	0	1
Neither Agree nor Disagree	89	.20	.40	0	1
Agree Somewhat	89	.43	.50	0	1
Agree Strongly	89	.21	.41	0	1
Trust game Female	89	6.26	2.81	0	10
Trust game Male	89	5.58	2.78	0	10

Dictator game	89	3.57	2.81	0	10
Ambiguity Attitude	89	-.04	.18	-.86	.91
Trust game	89	6.17	3.01	0	10
Student					
Master Student	89	.48	.50	0	1
PhD Student	89	.11	.32	0	1
CEa	89	4.09	1.46	0.25	5.95
CEr	89	3.85	1.47	0.25	5.95

7.2 Mean-Comparison T Test

Table 7 – Mean-Comparison T Test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95%Conf.	Interval]
Trust Game	89	6.168539	.319296	3.012232	5.534006	6.803073
Dictator Game	89	3.573034	.2976275	2.807812	2.981562	4.164506
diff	89	2.595506	.3369935	3.179191	1.925802	3.265209

mean(diff) = mean(TrustGame - DictatorGame) t = 7.7019
Ho: mean(diff) = 0 degrees of freedom = 88

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 1.0000 Pr(|T| > |t|) = 0.0000 Pr(T > t) = 0.0000

7.3 Robustness Checks

Table 8 – Robustness Checks

Variables	Ambiguity Attitude (1)	Trust Decisions Gender (2)	Trust Decisions Male (3)	Trust Decisions Female (4)
Female	.01883805	.12600149	.43135481	.75968486*
	(0.6460)	(0.8132)	(0.3585)	(0.0987)
Age	.01893355*	.13107695*	.09424098	.09624886
	(0.0520)	(0.0986)	(0.2601)	(0.1944)
Student				
Master Student	-.05520152	-.95134807	-.69731568	-.84071495
	(0.2150)	(0.1263)	(0.2452)	(0.1483)
PhD Student	-.14841651**	-.81145963	-.5584255	-1.0763362
	(0.0231)	(0.5358)	(0.6819)	(0.4174)
Trust Survey	-.02084276	.06505353	.30399848	.53228776*
	(0.4667)	(0.8517)	(0.3537)	(0.0736)
Cannot Rely	-.00310939	-.09098024	-.36588787*	-.23768151
	(0.8633)	(0.7143)	(0.0985)	(0.2727)
Cautious Before Trusting	.00358762	-.00694426	-.05892368	.01423739
	(0.8188)	(0.9818)	(0.8172)	(0.9547)
Dictator Game	.01161652**	.28369225***	.34322693***	.35994552***
	(0.0345)	(0.0064)	(0.0014)	(0.0002)
Probability Trustworthy	.00225596 **	.08359529***	.05986805 ***	.06119267***
	(0.0408)	(0.0000)	(0.0000)	(0.0000)
_cons	-.5401065**	-1.7388094	-.71948618	-1.6330663
	(0.0112)	(0.4969)	(0.7710)	(0.4928)
N	89	89	89	89

Notes: Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

Table 9 – Correlations

Variables	Ambiguity Aversion	Probability Trust-worthy	Trust Decision	Age	Gender	Student	Dictator Game	Trust Survey	Cautious Before Trusting	Cannot Rely
Ambiguity Attitude	1.00									
Probability Trustworthy	0.26	1.00								
Trust Decisions	0.41	0.58	1.00							
Age	0.29	-0.08	0.05	1.00						
Gender	0.00	0.00	-0.02	0.00	1.00					
Student	-0.01	-0.02	-0.08	0.58	0.15	1.00				
Dictator Game	0.23	0.27	0.40	-0.11	-0.03	-0.20	1.00			
Trust Survey	-0.09	0.12	0.10	-0.06	0.01	0.06	0.11	1.00		
Cautious Before Trusting	0.00	-0.31	-0.21	0.24	0.03	0.11	-0.24	-0.21	1.00	
Cannot Rely	0.00	-0.13	-0.11	0.06	0.31	0.08	0.00	-0.21	0.09	1.00

Table 10 – VIF Test

Variables	VIF	1/VIF
Ambiguity Aversion	1.36	0.73
Female	1.16	0.86
Age	2.01	0.50
Student		
Master Student	1.53	0.66
PhD Student	2.02	0.49
Trust Survey	1.14	0.88
Cannot Rely	1.23	0.81
Cautious Before Trusting	1.25	0.80
Dictator Game	1.23	0.81
Probability Trustworthy	1.35	0.74
Mean VIF	1.43	

7.4 Questionnaire Participants

The following two explanations were given to the participants to play the trust and the dictator games.

Trust game

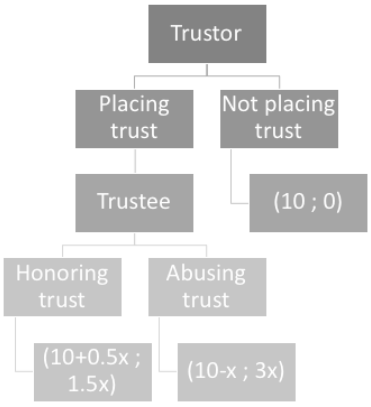
Please read the following text carefully.

In this part, you will play a trust game. You will be paired with another anonymous participant. The identity of the partner remains anonymous throughout the survey. You will be randomly assigned to the role of trustor or trustee.

In the next game, you will play the role of the trustor. You will get ten euros (€10) and get to decide how much of these ten euros you want to give to the trustee (€0 till €10), the other unknown player. The money that you give to the trustee will get tripled. The trustee then gets to decide if he or she wants to share the tripled money equally with you or if he or she keeps the money to him or herself. You will get nothing back in this case.

For example, you give an amount somewhere between 0 and 10 to the trustee. Let's take €X in this example. The trustee then receives 3 x €X. The trustee gets to decide if he will share equally with you or give nothing back to you. In this example, you will earn €10 + 0.5 x €X if the trustee decides to share equally or €10 - €X if the trustee decides to give nothing back. The trustee will earn 1.5 x €X if he or she decides to share equally or 3 x €X if he or she decides to not share the money. As showed in the figure below.

You play this game one time.



You receive €10, how much are you willing to give to the trustee? (€0-€10)

Dictator game

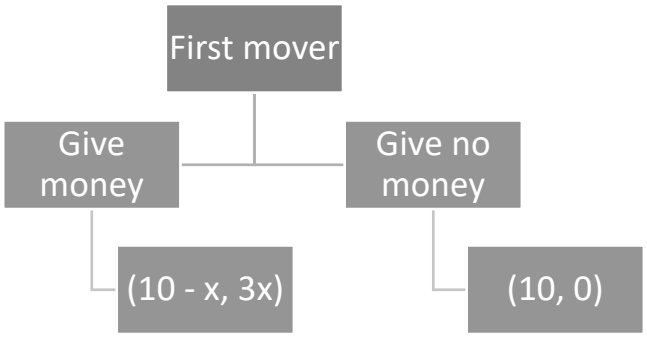
Please read the following text carefully.

In this part, you will play a dictator game. You will be paired with another anonymous participant. The identity of the partner remains anonymous throughout the survey.

In the next game, you will play the role of the first mover. You will get ten euros (€10) and gets to decide how much of these ten euros you want to give to the second mover (€0 to €10), the other unknown player. The part that you give to the second mover will get tripled. The second mover will get no action after that. The game ends after you decide how much money you want to give to the second mover.

For example, you give amount €X to the second mover. The second mover then receives 3 x €X. The second mover has to do nothing. In this example, you will earn €10 - €X and the second mover also receives 3 x €X. As shown in the figure below.

You will play this game one time.



You receive €10, how much are you willing to give to the second mover? (€0-€10)