Trust and age:
An experiment with current and former students

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Abstract

We examine differences in trust and trustworthiness across age groups by running a trust game experiment with current students and alumni of a large Austrian university. We find linear age effects, in that older adults are more trusting and more trustworthy than younger participants. We detect no gender effect in terms of trustingness, but observe that females are more trustworthy than males.

Keywords: trust, age, social preferences, experiment

JEL Classification: C91, D91, J14

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1 Introduction

Trust and Trustworthiness are important elements of a society's cohesion and productiveness. As many countries are facing an ageing population, an important question that has not been yet conclusively answered is the relationship of age and trust over the life span. In this paper, we provide new evidence in this regard.

In experimental economics, the Trust Game (originally proposed by Berg et al., 1995) has been used as a behavioral measure of trust and trustworthiness. Two players are endowed with a fixed amount of money. The 'trustor' can keep her money or 'invest' an amount x, which is then tripled by the experimenter. The 'trustee' receives the tripled amount, and decides how much of the money to return to the 'trustor'.

There is a small but growing literature that has utilized the trust game to study the development of trust with age.[1] Trust seems to develop in early years of childhood and adolescence (Evans et al., 2013; Harbaugh et al., 2003; Sutter and Kocher, 2007). For adult life, results are mixed. In a representative survey of the German population, Fehr et al. (2003) only find a difference for people above 65 who send less than other age groups, while Sutter and Kocher (2007) and Naef et al. (2008) find no age effects with respect to trustingness within adult populations, and Holm and Nystedt (2005), Holm and Danielson (2005), and Bailey et al. (2015) observe that older people were more trusting. For their representative sample of the Dutch population, Bellemare and Kröger (2007) report an inverted U-shape relationship of age and sending amounts, with a peak at about age 37.

For trustworthiness, Naef et al. (2008) and Ermisch et al. (2009) find no age effect, while Fehr et al. (2003), Sutter and Kocher (2007), and Bailey et al. (2015) report higher return amounts of old people (aged 65 and above) compared to younger people. Bellemare and Kröger (2007) here find a non-linear U-shaped effect of age on trustworthiness, with a minimum point at an age of 37.

Our study contributes to this literature on the development of social preferences over the life span. We conduct a newspaper/online trust game experiment with a subject pool of university alumni and students. We find a positive effect of age on both trust and trustworthiness, and cannot detect any non-linearity in these effects. We also test for gender effects and find females to behave more trustworthy than men but similar in terms of trustingness.

2 Experimental Design and Procedures

We conducted a trust game experiment with readers of the 'Alumni news' of the Vienna University of Economics and Business, a quarterly magazine sent out to about 41,000 alumni of the university. On half a page in the November 2017 issue, we provided a description as well as a visual representation of the trust game (see Figure 3 in the online appendix). In addition, we also invited current students at the university via e-mails to participate in the experiment. Thus, our total sample consists of

[1] Kocher (2015) provides a more comprehensive review of the literature.

former and current students of the Vienna University of Business and Economics, and therefore is more educated and likely wealthier than the general Austrian population.

In the trust game, both players were endowed with high stake sizes of €300. Participants were asked for their decisions in both roles, as trustor and as trustee. As a trustor, they stated how much of their €300 they would like to send to the trustee. The amount was tripled on the way. In the role of trustee, participants indicated what percent of the amount received by the trustor they return. To ease understanding, the decision form asked for the trustee's decision first and for the trustor's decision second. After the experimental choices we also asked for participants' gender, age and their profession.

Participants could either cut out the relevant part of the newspaper and send their answers via snail mail, or participate in the experiment online (at www.wu-experiment.at). The experiment was online from 29 November to 31 December 2017. Two out of all participants were randomly drawn and paid out according to their decisions in the game.

3 Results

3.1 Trust

In total, 322 people participated in the experiment, 136 readers of the WU Alumni News (only 5 sent the newspaper cut-out, all others participated online) and 186 WU students from the mailing list.[2] As trustors, participants were free to send any amount between €0 and €300. The dark grey bars in Figure 1 shows the percent (out of the €300) sent as trustor, split by age group.[3] Table 1 shows results from Tobit regressions of percentage of €300 sent on age and gender. Models (1) and (2) are estimated with both subject pools (students and alumni) combined, and we include a dummy for the subject pool. Models (3) and (4) are estimated with the more age-diverse alumni pool only. We find a significant linear effect of age on amount sent. For every year of age, the average amount sent increases by about €2, and the effect is similar when we use participants from the Alumni pool only. Models (2) and (4) include a quadratic age term to allow for potential non-linearity, in which case however both age coefficients become insignificant. We find no gender differences in behavior as trustor. Participants from the student pool sent on average 12% less than Alumni News readers.[4]

3.2 Trustworthiness

For return decisions, we asked participants for the percentage of the received (tripled) amount they return to the trustor, in steps of 10% from 0% to 100%. The light grey bars in Figure 1 show the average percent returned as trustee, split by age group. As trustees get older, we observe a consistent

[2] Table 3 in the Appendix shows descriptive statistics for the two separate samples.

[3] We do not have sufficient observations to further split the age group above 50.

[4] Including occupation dummies in the regression models does not affect the other results and does not yield interesting insights (for send as well as for return decisions). We observe a similar positive age effect when considering the proportion of participants who sent the full amount of €300. Table 4 in the Appendix shows results of respective Probit regressions.

FIGURE 1: Average percent of €300 sent as trustor (dark grey) and average percent returned as trustee (light grey), split by age group

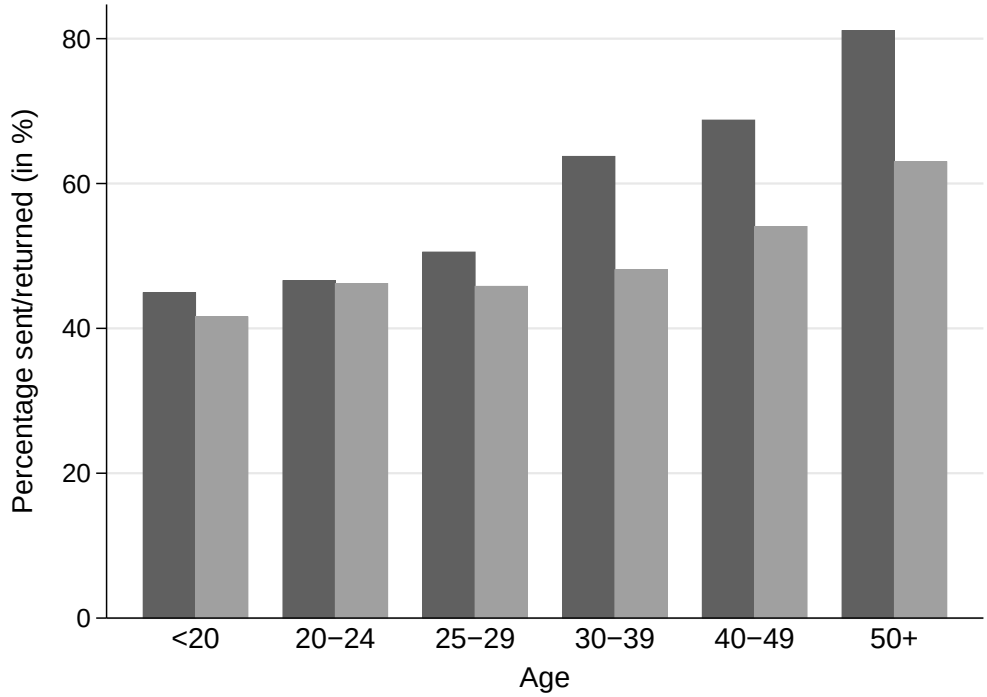

TABLE 1: Tobit regressions of percentage of EUR 300 sent as trustor

	All participants		Alumni only	
	Model (1)	Model (2)	Model (3)	Model (4)
Constant	41.76***	41.60*	37.02**	11.49
	(10.30)	(22.52)	(12.16)	(29.01)
Age	0.63**	0.64	0.72**	2.06
	(0.22)	(1.08)	(0.24)	(1.39)
Age^2		-0.00		-0.02
		(0.01)		(0.02)
Female	0.60	0.60	3.06	2.23
	(3.98)	(4.01)	(6.57)	(6.67)
WU Students pool	-12.03**	-12.01**		
	(5.68)	(6.26)		
LogLikelihood	-1515.5	-1515.5	-644.8	-644.4
N	322	322	136	136

Notes: Standard errors in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

TABLE 2: Tobit regressions of percentage returned as trustee

	All participants		Alumni only	
	Model (1)	Model (2)	Model (3)	Model (4)
Constant	34.11***	56.63***	27.45***	36.71*
	-6.39	-15.05	-7.39	-20.19
Age	0.40**	-0.82	0.52**	0.03
	(0.15)	(0.75)	(0.17)	(1.00)
Age^2		0.02		0.01
		(0.01)		(0.01)
Female	6.29**	6.52**	11.13**	11.43**
	(2.76)	(2.75)	(4.42)	(4.45)
WU Students pool	-2.94	-5.50		
	(3.61)	(3.92)		
LogLikelihood	-1402.7	-1401.4	-587.0	-586.9
N	322	322	136	136

Notes: Standard errors in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

incline in percent returned, though less steep than for trustingness.[5] Table 2 displays results of Tobit regressions of percent returned as trustee on age, gender and a subject pool dummy. Again we find a positive linear age effect; for every year of age, the percent returned increases on average by 0.4%. Once again, there is no evidence that the age effect would be non-linear (Models 2 and 4). There is no significant difference between the two subject pools, and we do find a substantial gender effect.

4 Conclusion

We conduct an experimental online/newspaper study of the canonical trust game with current and former students of an Austrian university. We find generally linear and positive effects of age on both trustingness and trustworthiness. In addition, we find that females behave more trustworthy but are not more trusting.

A positive relationship between trust and age has been observed in children. For adults, the existing literature has reported mixed evidence. Our results strengthen the case for a positive relationship (both in terms of trustingness and trustworthiness) also during adulthood. Contrary to Bellemare and Kröger (2007), we find no evidence for non-linearities in the effect of age on trust until an age of about 50. However, due to lack of observations above 50 years of age, we cannot make conclusions about potential non-linearities at a higher age, in particular a trend change towards less trust or trustworthiness. This is left for further research.

[5] The individual percentages of money sent and money returned are highly correlated (r=0.52, p=0.000).

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Online Appendix

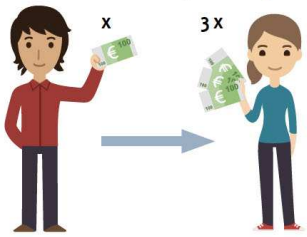
A Additional figures and tables

FIGURE 2: The experiment as presented in the WU Alumni News, in German

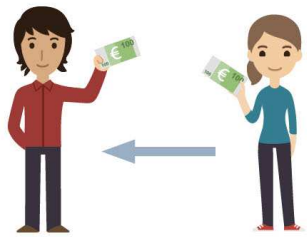
Ein wirtschaftliches Experiment zum Teilnehmen

Hier können Sie an einem Experiment teilnehmen. Sie können Ihre Entscheidungen per Post einschicken oder einfach das Online-Formular unter www.wu-experiment.at ausfüllen. Ihre Antworten sind anonym und werden vertraulich behandelt. In der nächsten Ausgabe der WU.Alumni.News werden wir über die Ergebnisse des Experiments berichten. Unter allen Teilnehmern werden per Zufallsprinzip zwei Teilnehmer bestimmt, deren Entscheidungen tatsächlich von uns ausbezahlt werden – und zwar genau so, wie Sie sich entschieden haben.

In diesem Experiment gibt es zwei Personen, nennen wir sie **Anton** und **Berta**. Sowohl Anton als auch Berta erhalten 300 Euro. Anton kann nun entscheiden, wieviel seiner 300 Euro er an Berta schickt. Der Betrag, den Anton an Berta schickt, wird von uns auf dem Weg verdreifacht. Das heißt, Berta erhält das Dreifache von dem Betrag, den Anton geschickt hat.



Berta hat jetzt ihre 300 Euro plus den verdreifachten Betrag, den Anton geschickt hat. Jetzt entscheidet Berta, wieviel von dieser Summe sie an Anton zurückschickt. Dieser Betrag wird jedoch nicht verdreifacht.



Sie übernehmen die Rolle von Anton oder Berta. Aus allen Einsendungen werden wir einen Teilnehmer für die Rolle des Anton und einen Teilnehmer für die Rolle der Berta auswählen. Für diese beiden Teilnehmer werden die getroffenen Entscheidungen dann genau so implementiert, wie oben beschrieben. Die beiden Teilnehmer erhalten dann von uns die entsprechenden Eurosummen, entweder in bar oder per Überweisung.

Entscheidung 1:

Wenn Sie als Teilnehmer in der Rolle der Berta ausgewählt werden: Wieviel Prozent des von Anton erhaltenen Betrags (3x den Betrag, den Anton geschickt hat) schicken Sie an den Teilnehmer in der Rolle des Anton zurück? Bitte kreuzen Sie Zutreffendes an.

☐ 0 % ☐ 10 % ☐ 20 % ☐ 30 % ☐ 40 % ☐ 50 %
☐ 60 % ☐ 70 % ☐ 80 % ☐ 90 % ☐ 100 %

Entscheidung 2:

Wenn Sie als Teilnehmer in der Rolle des Anton ausgewählt werden: Von Ihren anfänglichen 300 Euro: Welchen Betrag senden Sie an den Teilnehmer in der Rolle der Berta? Bitte tragen Sie den Betrag in das vorgesehene Feld ein.

€ _____

Bitte geben Sie uns noch ein paar Informationen über sich selbst:

Sie sind: ☐ männlich ☐ weiblich

Alter: _____

Beruf und Position: _____

Wie kann die WU Sie kontaktieren, falls Sie für die Auszahlung Ihrer Entscheidungen ausgewählt werden? Bitte geben Sie eine **E-Mail-Adresse** oder **Telefonnummer** an.

_____

Möchten Sie auch für zukünftige ökonomische Experimente an der WU eingeladen werden?

☐ Ja ☐ Nein

Dieses Experiment ist auch online verfügbar unter wwww.u-experiment.at. Falls Sie keinen Internetzugang haben, schneiden Sie bitte Ihre Antworten aus und schicken sie an das Institute for Markets and Strategy, Welthandelsplatz 1, Gebäude D5, 1020 Wien.

TABLE 3: Socio-demographics of the sample

	Alumni	Students
Age		
Mean	39.19	23.37
SD	12.81	4.41
Median	37	23
Min	18	18
Max	75	59
Female	39%	64%
Occupation		
Student	9%	87%
Employee	44%	8%
Manager	20%	2%
Company owner/Entrepreneur	12%	1%
Teacher / Researcher	7%	1%
No or other work	8%	2%
N	136	186

FIGURE 3: Distribution of amount sent by trustors

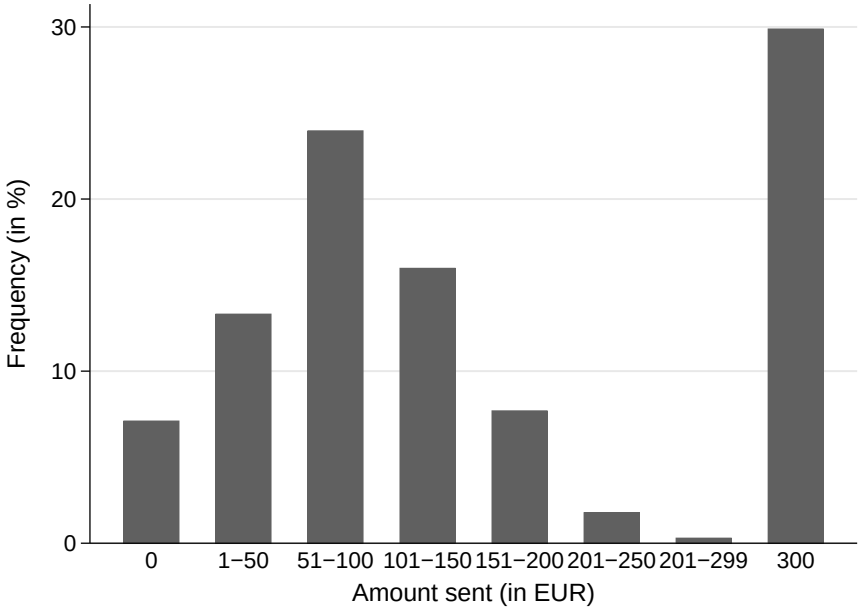


FIGURE 4: Distribution of percentage returned by trustees

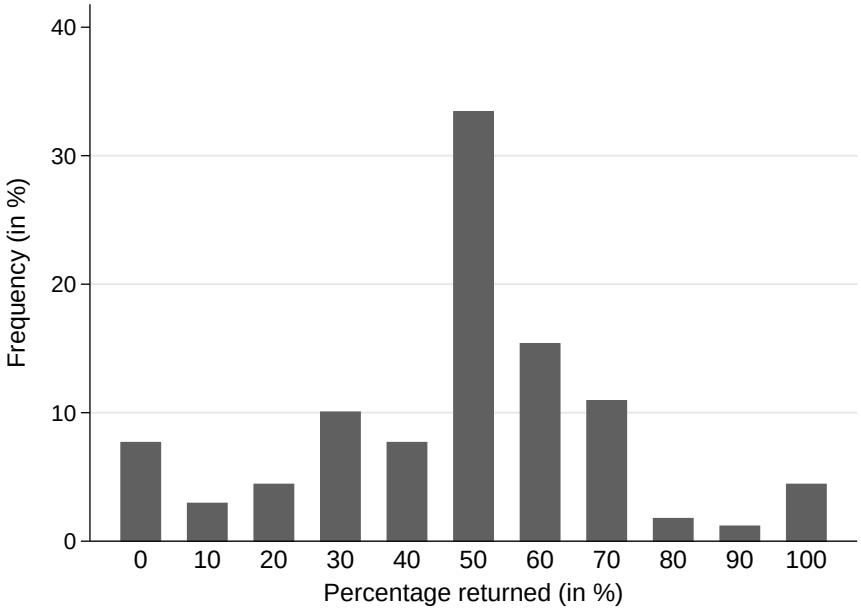


TABLE 4: Results of Probit regressions of the likelihood to send the full amount (€300) in the role of trustor

	All participants		Alumni only	
	Model (1)	Model (2)	Model (3)	Model (4)
Age	0.005**	0.005	0.007**	0.025
	(0.002)	(0.014)	(0.003)	(0.019)
Age^2		0.000		0.000
		(0.000)		(0.000)
Female	-0.043	-0.043	-0.093	-0.104
	(0.049)	(0.049)	(0.086)	(0.086)
WU Students pool	-0.189**	-0.190**		
	(0.060)	(0.065)		
N	322	322	136	136

Notes: The table reports average marginal effects (dy/dx). Standard errors in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.