Theory of Mind and Strategic Decision Making

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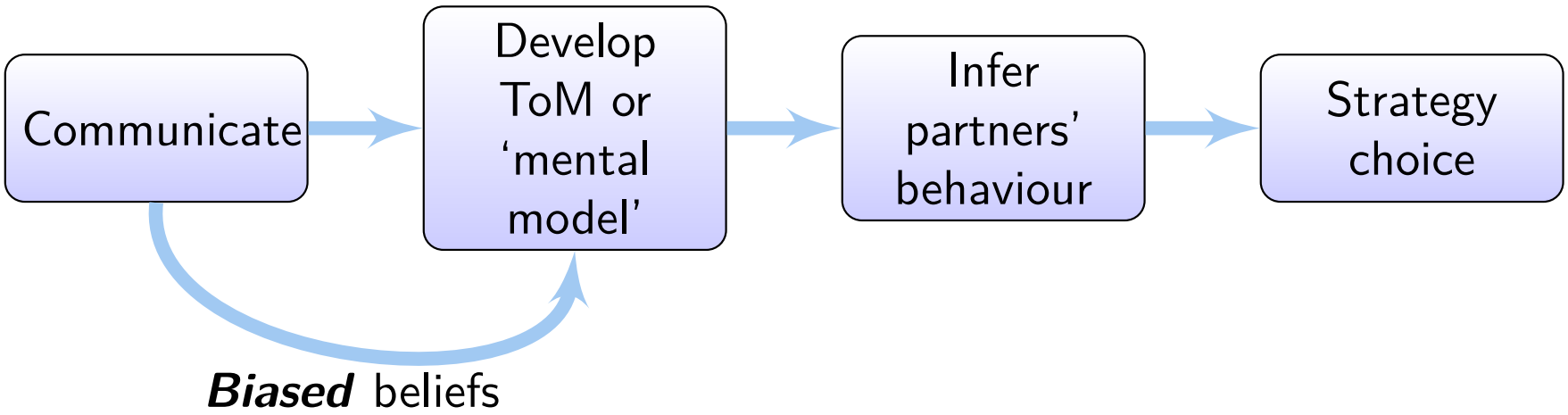
Theory of Mind

- Can seemingly irrelevant communication ("small talk") play an important role in economic behaviour? Contrast with cheap talk.
- Theory of mind (ToM) is the ability to think about others' thoughts and mental states to predict their intentions and actions.
- Building mental models of others is something we all do, possibly subconsciously and it can happen after the briefest of meetings and through the most trivial conversation.



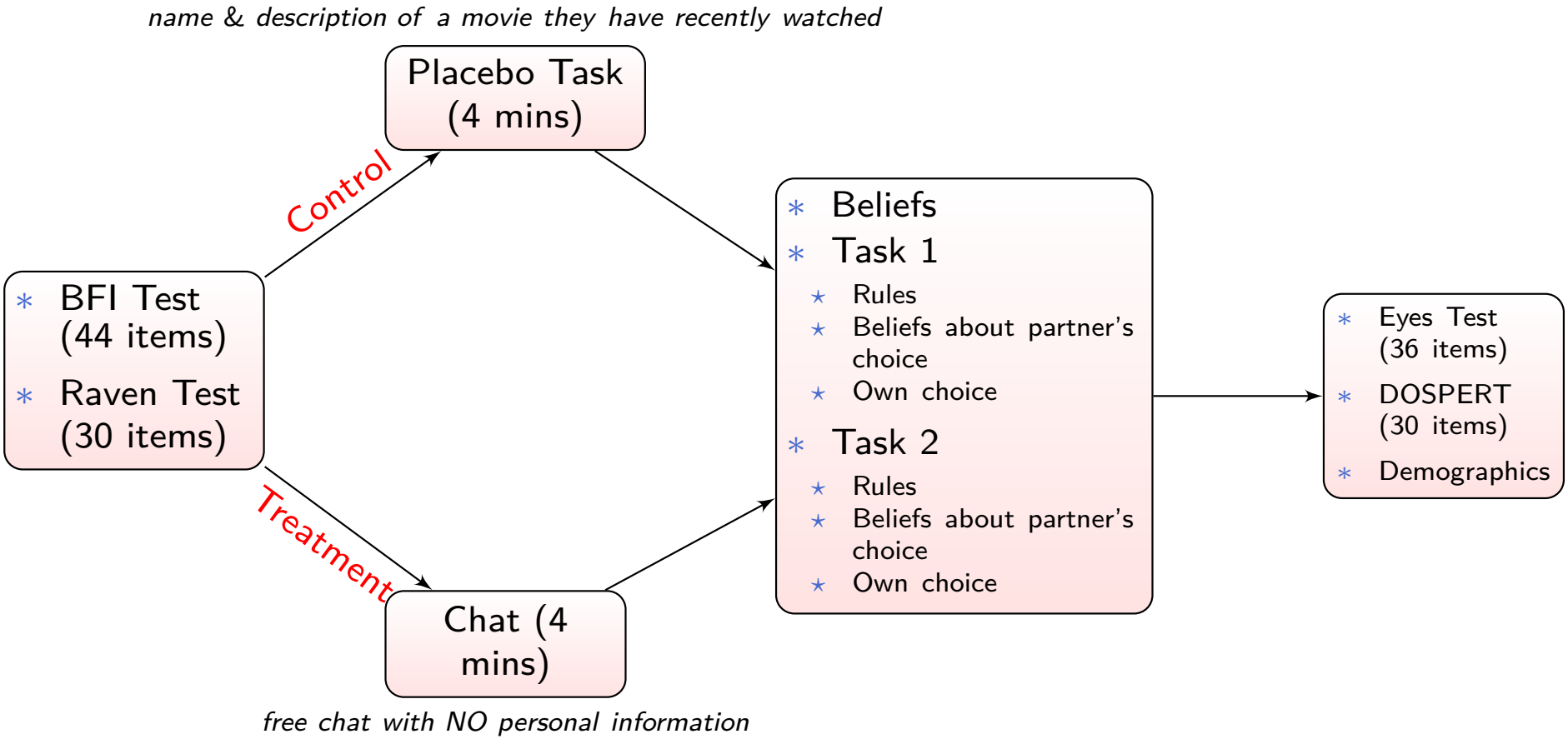
- ToM is generally measured using psychometric tests but we propose an alternative way of measuring ToM - through *belief elicitation*.

Personality Theory

* In order to build a mental model we need sensible characteristics for people to use.
* One way to differentiate between types is through personalities: psychologists have argued that an individual's personality can be explained with regards to 5 traits - the so-called "Big Five" - Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness.
* But can you really gain insight into how open or agreeable someone is after a brief conversation? Extraversion and maybe neuroticism seem more reasonable and are known as the two fundamental traits (AEA RCT to minimize spurious findings).
* Typically measured by the BFI and has become increasingly important in Economics and the real world (in the labour market).

BFI

Experiment Design



Appendix

Task Descriptions

- Public goods game: Each subject was allocated 20 Experimental Pounds (EP) and were simultaneously asked to choose how much to contribute (c_i) to a joint project. c_i can be any integer between 0 and 20. Payoffs were determined as follows: $\pi_i = (20 - c_i) + 3/4(c_i + c_j)$
- 11-20 money request game: Both players will be asked to request an amount of money between 11 and 20 EP. Each player will receive the amount she requests and an additional amount of 20 EP if she asks for exactly one less than the other player.
- Subjects: 338 participants (170 treatment, 168 control) across 17 sessions, using students recruited via the Warwick SONA system.

Summary of Findings

- Small talk matters: despite communication not being about anything linked to game-play, communication matters. In every regression significance comes when interacted with the treatment or when restricted ot the treatment sessions.
- Moreover, direct analysis of the text used during communication explains belief formation about partner. Language analysis
- Extraversion is key: no other personality trait has any impact. Extraverts suffer from *self projection bias*. They project their extraversion or positive emotions onto their partners and overlook the partners' negativity or neuroticism. Beliefs results
- The results are subtle but important and shed new light on issues we thought we understood.

Some Key Results

- Public goods game: decisions are affected by own personality as well as beliefs about partner's personality.
  - Existing paradox in the literature: extraversion is seen as likely to lower rates of cooperation, but extraverts often contribute more in PGGs.
  - In our results the direct effect of player's own extraversion is negative in the Treatment group. However, beliefs about the extraversion of others (which is highly correlated with being extravert yourself) has a direct positive impact on contribution beliefs and own contribution.
  - Therefore, the overall effect is positive. This highlights the importance of disentangling the two effects and solves the paradox. PGG results
- 11-20 money game: in the treatment condition, smaller the perceived difference between own extraversion and partner's extraversion, higher the beliefs about the level chosen by the partner. Also, higher the level chosen by the player herself. This is consistent with the *perceived similarity hypothesis*. 11-20 results

Appendix - Personality Test (**john1999**)

I see myself as someone who...

	Disagree strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree Strongly
Is talkative	○	○	○	○	○
Tends to find fault with others	○	○	○	○	○
Does a thorough job	○	○	○	○	○
Is depressed, blue	○	○	○	○	○
Is original, comes up with new ideas	○	○	○	○	○
Is reserved	○	○	○	○	○
Is helpful and unselfish with others	○	○	○	○	○
Can be somewhat careless	○	○	○	○	○
Is relaxed, handles stress well	○	○	○	○	○

OK

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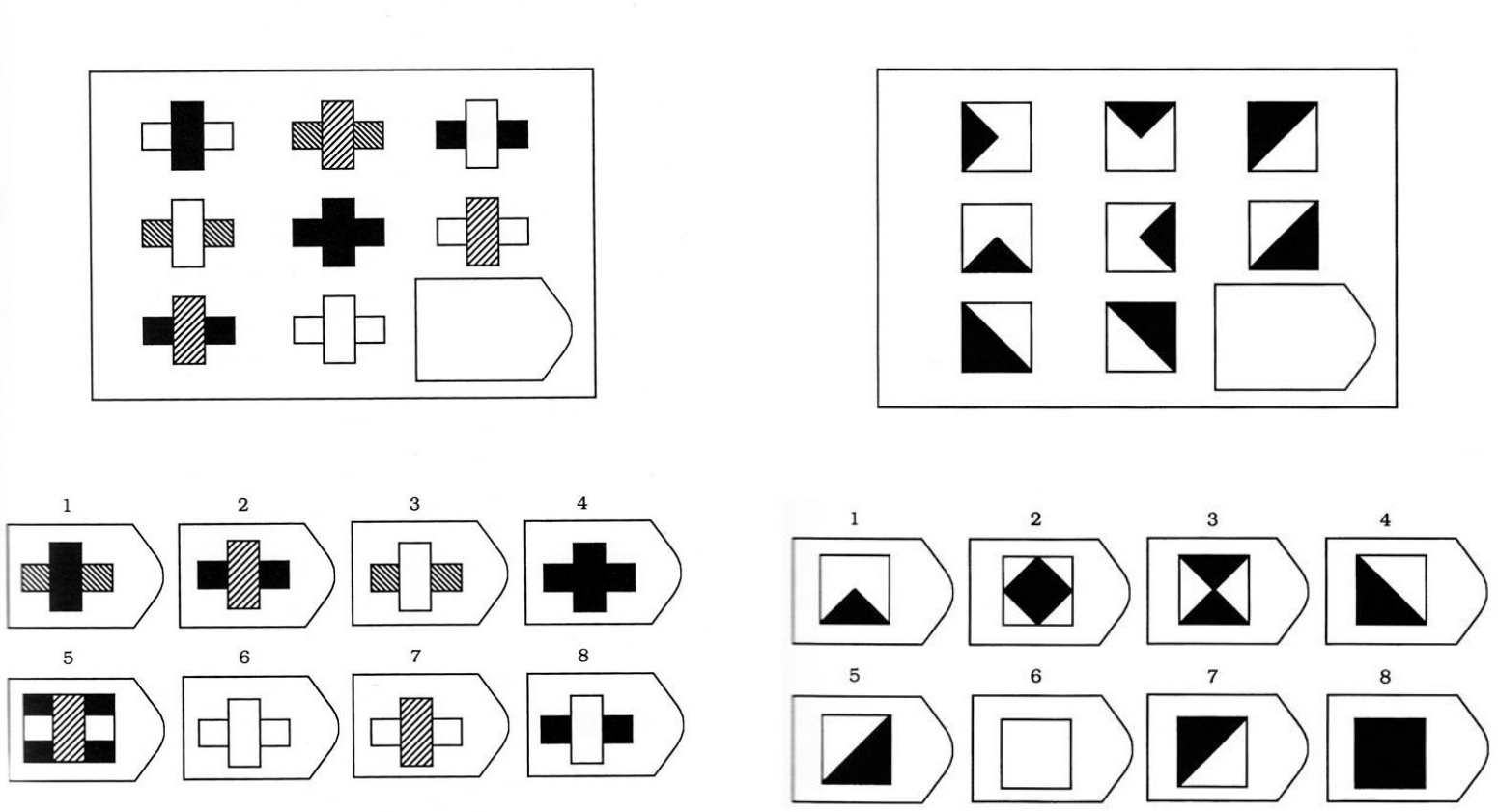
Appendix - Raven Test



(a) (b)

Figure 1: Raven Progressive Matrices

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Appendix - Placebo and Chat

Placebo Task Instructions

Can you please indicate the title and summarize the story of the last movie you have seen? Please be as specific as possible and include as many details as possible. Please use a minimum of 250 characters. You will have 4 minutes to write the summary. Please write the summary in the box provided on the next screen.

Chat Instructions

You have been randomly and anonymously matched with another person in this room who is participating in the experiment. Before you proceed with the tasks, you are allowed to chat with the other player for 4 minutes. You can type in the box provided at the bottom of the screen and press Enter on your keyboard to send your messages. Your message should not contain any personal information such as your name or your computer ID. The purpose is to preserve anonymity throughout the experiment. You are allowed to chat freely in English and in a non-abusive manner.

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Appendix - Personality Beliefs (**Rammstedt2007**)

Please pick an option next to each statement to indicate the extent to which you agree or disagree with the statement **regarding the other player.**

	Disagree strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree Strongly
1. The other player is reserved	○	○	○	○	○
2. The other player is generally trusting	○	○	○	○	○
3. The other player tends to be lazy	○	○	○	○	○
4. The other player is relaxed, handles stress well	○	○	○	○	○
5. The other player has few artistic interests	○	○	○	○	○
6. The other player is outgoing, sociable	○	○	○	○	○

OK

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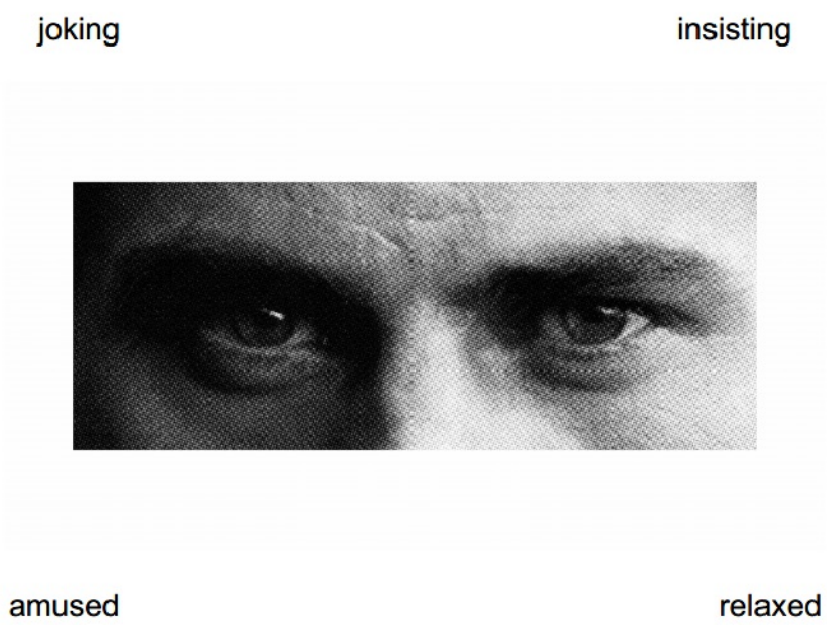
Appendix - Eyes Test (**Baron-Cohen2001**)

(a)



(b)

Figure 2: Adult Eyes Test

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Appendix - Belief Formation

Table 1: Impact of beliefs about own cognitive ability on beliefs about partner's cognitive ability

	IQ Belief		Inaccuracy of IQ Belief		Inaccuracy of IQ Belief (absolute values)	
	(1)	(2)	(3)	(4)	(5)	(6)
Own IQ Belief × Treatment	-0.0586	-0.0624	0.0136	0.0181	-0.2038*	-0.3135**
	(0.086)	(0.116)	(0.095)	(0.122)	(0.112)	(0.143)
Partner's IQ × Treatment	-0.0345	-0.0186				
	(0.081)	(0.082)				
Own IQ belief	0.6686***	0.7297***	0.4902***	0.5443***	-0.0848	0.0204
	(0.060)	(0.078)	(0.062)	(0.081)	(0.078)	(0.106)
Partner's IQ	0.0937*	0.0895*				
	(0.050)	(0.050)				
Treatment	-0.0866	0.4422	-0.1811*	0.2953	0.0656	0.4072
	(0.083)	(0.514)	(0.096)	(0.567)	(0.110)	(0.621)
Own IQ × Treatment		-0.0172		-0.0036		0.1465
		(0.110)		(0.132)		(0.121)
Eyes Test Score × Treatment		0.0279	0.0908	0.0977	0.1729	0.1705
		(0.100)	(0.101)	(0.100)	(0.124)	(0.126)
Own IQ		-0.0714		-0.0783		-0.1223
		(0.069)		(0.092)		(0.087)
Eyes Test Score		0.0196	-0.0258	-0.0228	-0.1709**	-0.1915**
		(0.078)	(0.073)	(0.068)	(0.086)	(0.085)
Controls	No	Yes	No	Yes	No	Yes
N	338	338	338	338	338	338

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

⋆ Players project beliefs about their own IQ onto beliefs about partner's IQ and overestimate partner's IQ, irrespective of group. An increase in the player's beliefs about own IQ leads to more accurate predictions about partner's IQ in the Treatment group.

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Appendix - 11-20 money request game

Table 2: Impact of (absolute) difference between own personality and predicted on probability of best responding - Linear Probability Model

	Level Belief		
	(1)	(2)	(3)
DiffExtraversion × Treatment	0.1333***	0.1444***	0.1068*
	(0.049)	(0.051)	(0.056)
DiffNeuroticism × Treatment	-0.0431	-0.0285	-0.0250
	(0.043)	(0.047)	(0.047)
Treatment	0.0581	0.1340	0.0592
	(0.042)	(0.281)	(0.291)
DiffExtraversion	-0.0441	-0.0437	-0.0175
	(0.036)	(0.035)	(0.040)
DiffNeuroticism	-0.0009	-0.0146	-0.0232
	(0.031)	(0.033)	(0.032)
Own Extraversion × Treatment		0.0232	-0.0867
		(0.059)	(0.113)
Own Extraversion		-0.0077	0.0233
		(0.030)	(0.081)
Own IQ × Treatment		-0.0091	-0.0088
		(0.053)	(0.055)
IQ Belief × Treatment		0.0328	0.0281
		(0.047)	(0.047)
Eyes Test Score × Treatment		-0.0063	-0.0160
		(0.052)	(0.052)
Own IQ		0.0591	0.0595
		(0.036)	(0.037)
IQ Belief		-0.0379	-0.0332
		(0.028)	(0.027)
Eyes Test Score		0.0422	0.0456
		(0.041)	(0.041)
Extraversion × Extraversion Quartile	No	No	Yes
Controls	No	Yes	Yes
N	338	338	338

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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Appendix - Public Goods Game

Table 3: First Stage

	Control		Treatment	
	(1) Extraversion Belief	(2) Extraversion Belief	(3) Extraversion Belief	(4) Extraversion Belief
Own Extraversion	0.0298	0.0332	0.2141**	0.2607**
	(0.086)	(0.102)	(0.106)	(0.103)
Partner's Extraversion	-0.1013	-0.0975	0.3532***	0.3638***
	(0.081)	(0.092)	(0.093)	(0.094)
Own IQ		-0.1016		0.0119
		(0.101)		(0.100)
IQ Belief		-0.0549		0.0163
		(0.144)		(0.093)
Eyes Test Score		-0.0466		0.1186
		(0.106)		(0.073)
Control	No	Yes	No	Yes
N	110	110	106	106

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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Appendix - Public Goods Game

Table 4: Impact of beliefs about partner's personality on beliefs about partner's contribution and own contribution in Public Goods Game (IV approach)

	Contribution Belief			Own Contribution		
	(1)	(2)	(3)	(4)	(5)	(6)
ExtraversionBelief × Treatment = 0	-0.8772	-0.4840	-0.4512	-0.8951	-0.8391	-0.9892
	(1.153)	(0.959)	(1.018)	(1.207)	(1.189)	(1.346)
ExtraversionBelief × Treatment = 1	0.5162*	0.5603**	0.6273**	0.4575	0.4822*	0.5385*
	(0.294)	(0.279)	(0.273)	(0.283)	(0.288)	(0.286)
OwnExtraversion × Treatment		-0.2481	-0.2550		-0.0096	-0.0252
		(0.153)	(0.183)		(0.189)	(0.233)
OwnExtraversion	-0.1461	-0.0574	-0.0570	-0.2001**	-0.1844	-0.1741
	(0.089)	(0.112)	(0.124)	(0.097)	(0.149)	(0.178)
Treatment	0.4467	0.3399	1.0694	0.5528*	0.5071*	1.6976
	(0.283)	(0.243)	(1.213)	(0.288)	(0.303)	(1.681)
Controls	No	Yes	Yes	No	Yes	Yes
Controls × Treatment	No	No	Yes	No	No	Yes
N	216	216	216	216	216	216

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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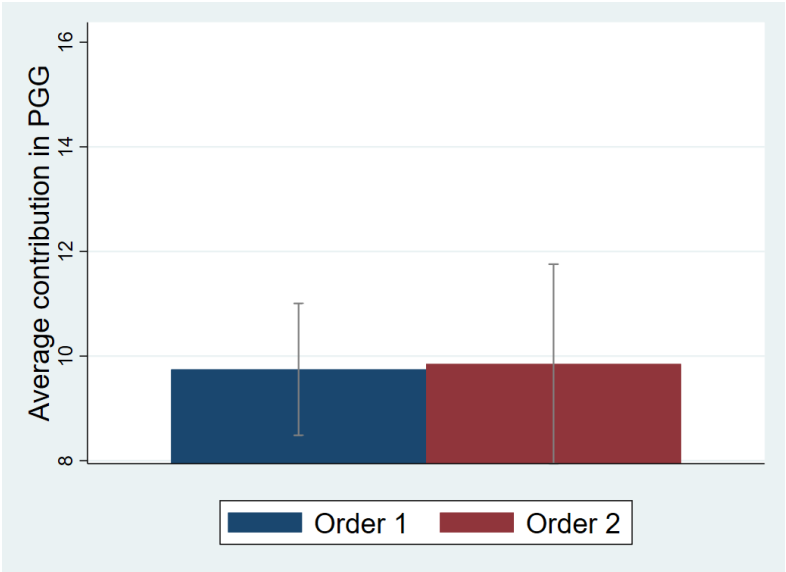
Appendix - Public Goods game (Order effect)



(a) Control

(b) Treatment

Figure 3: Average contribution in PGG

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Appendix - Public Goods game (Order effect)

Table 5: Impact of beliefs about partner's personality on beliefs about partner's contribution and own contribution in Public Goods Game(IV approach)

	Contribution Belief			Own Contribution		
	(1)	(2)	(3)	(4)	(5)	(6)
ExtraversionBelief × Treatment = 0	0.5611	0.6669	0.6036	0.7876	1.0902	1.6583
	(0.776)	(0.993)	(1.196)	(0.980)	(1.394)	(2.215)
ExtraversionBelief × Treatment = 1	0.3791	0.2311	0.0489	1.2760	0.8334	1.0936
	(0.943)	(0.819)	(0.964)	(1.763)	(1.430)	(1.714)
OwnExtraversion × Treatment		-0.0408	-0.0570		-0.0813	-0.2138
		(0.198)	(0.240)		(0.277)	(0.398)
OwnExtraversion	0.0457	0.1380	0.1862	-0.0841	0.0160	0.1058
	(0.097)	(0.164)	(0.154)	(0.150)	(0.231)	(0.271)
Treatment	0.3436	0.2814	0.9234	0.1213	0.0826	4.4746
	(0.265)	(0.285)	(3.619)	(0.332)	(0.362)	(6.016)
Controls	No	Yes	Yes	No	Yes	Yes
Controls × Treatment	No	No	Yes	No	No	Yes
N	122	122	122	122	122	122

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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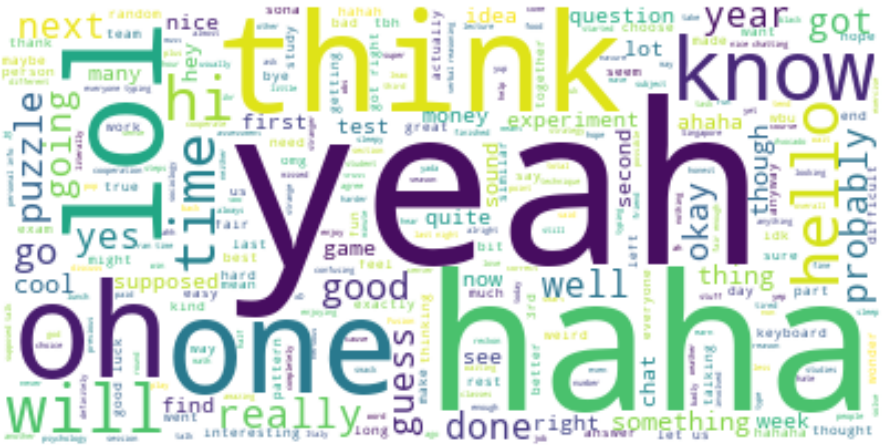
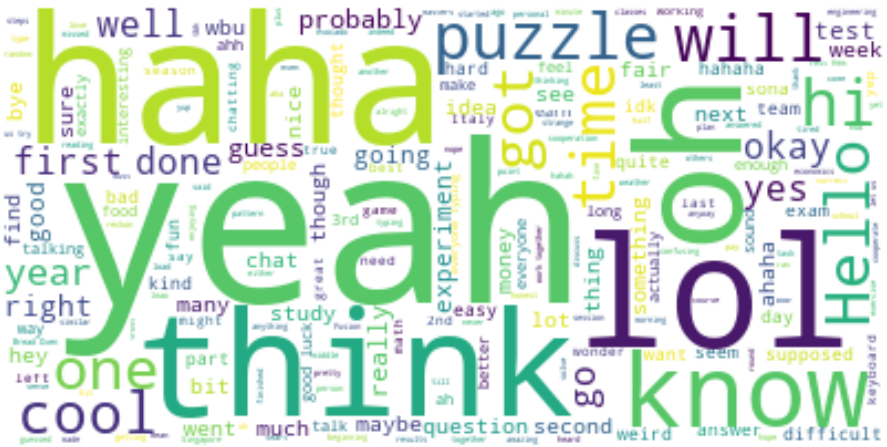
Appendix - Language Analysis



(a) Highly Extraverted

(b) Less Extraverted

(c) Highly Neurotic



(d) Less Neurotic

Figure 4: Most frequently used words by subjects believed to have different personalities

Appendix - Language Analysis

Table 6: Impact of number of words spoken by the partner on beliefs about partner's personality

	(1) Extraversion Belief	(2) Extraversion Belief	(3) Neuroticism Belief	(4) Neuroticism Belief
Number of Words	0.0094***	0.0088***	-0.0020	-0.0024
	(0.003)	(0.003)	(0.002)	(0.002)
Own IQ		-0.0739		0.0960
		(0.087)		(0.077)
Eyes Test Score		0.0643		0.0307
		(0.060)		(0.095)
Age		0.0266		-0.0453**
		(0.021)		(0.020)
Female		-0.0798		-0.1667
		(0.160)		(0.157)
IQ Belief		0.0976		-0.0672
		(0.082)		(0.083)
Non-Native Speaker		0.3460**		-0.2244
		(0.152)		(0.159)
First Speaker		-0.0143		-0.3160**
		(0.142)		(0.153)
N	168	168	168	168

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix - Language Analysis

Table 7: Impact of Valence rating of the text used by the partner on beliefs about partner's personality

	(1) Extraversion Belief	(2) Extraversion Belief	(3) Neuroticism Belief	(4) Neuroticism Belief
Valence	0.1029	0.0850	-0.0932**	-0.1047**
	(0.074)	(0.066)	(0.037)	(0.048)
Number of Words		0.0082***		-0.0017
		(0.003)		(0.002)
Own IQ		-0.0858		0.1108
		(0.089)		(0.077)
Eyes Test Score		0.0725		0.0206
		(0.060)		(0.097)
Age		0.0263		-0.0449**
		(0.021)		(0.020)
Female		-0.0824		-0.1635
		(0.161)		(0.156)
IQ Belief		0.1130		-0.0861
		(0.082)		(0.086)
Non-Native Speaker		0.3560**		-0.2367
		(0.150)		(0.156)
First Speaker		-0.0167		-0.3131**
		(0.142)		(0.152)
N	168	168	168	168

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix - Language Analysis

Table 8: Impact of Arousal rating of the text used by the partner on beliefs about partner's personality

	(1) Extraversion Belief	(2) Extraversion Belief	(3) Neuroticism Belief	(4) Neuroticism Belief
Arousal	0.1579**	0.1528***	-0.1016***	-0.1308***
	(0.061)	(0.052)	(0.037)	(0.045)
Number of Words		0.0077***		-0.0015
		(0.003)		(0.002)
Own IQ		-0.1109		0.1278
		(0.087)		(0.078)
Eyes Test Score		0.0672		0.0282
		(0.058)		(0.095)
Age		0.0237		-0.0428**
		(0.021)		(0.020)
Female		-0.0865		-0.1609
		(0.159)		(0.155)
IQ Belief		0.1344*		-0.0986
		(0.080)		(0.085)
Non-Native Speaker		0.3751**		-0.2493
		(0.149)		(0.157)
First Speaker		-0.0098		-0.3198**
		(0.141)		(0.151)
N	168	168	168	168

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix - Language Analysis

Table 9: Impact of Dominance rating of the text used by the partner on beliefs about partner's personality

	(1) Extraversion Belief	(2) Extraversion Belief	(3) Neuroticism Belief	(4) Neuroticism Belief
Dominance	0.1177**	0.1051**	-0.0881***	-0.1082***
	(0.059)	(0.051)	(0.029)	(0.039)
Number of Words		0.0081***		-0.0018
		(0.003)		(0.002)
Own IQ		-0.0901		0.1128
		(0.089)		(0.076)
Eyes Test Score		0.0742		0.0205
		(0.060)		(0.096)
Age		0.0262		-0.0449**
		(0.021)		(0.020)
Female		-0.0702		-0.1766
		(0.162)		(0.155)
IQ Belief		0.1149		-0.0850
		(0.082)		(0.085)
Non-Native Speaker		0.3588**		-0.2375
		(0.149)		(0.156)
First Speaker		-0.0160		-0.3142**
		(0.142)		(0.153)
N	168	168	168	168

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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Results - Belief Formation

Table 10: Impact of own personality on beliefs about partner's personality

	Extraversion Belief				Neuroticism Belief			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
OwnExtraversion × Treatment	0.2342**	0.2134*	0.2151*	0.2955**	-0.1949**	-0.1117	-0.1255	-0.0581
	(0.091)	(0.117)	(0.119)	(0.125)	(0.092)	(0.118)	(0.131)	(0.123)
OwnNeuroticism × Treatment	0.1406	0.1481	0.1512	0.1527	-0.0008	-0.0475	-0.0423	-0.0450
	(0.091)	(0.124)	(0.124)	(0.131)	(0.074)	(0.111)	(0.110)	(0.111)
PartnerExtraversion × Treatment	0.2820***	0.4097***	0.4010***	0.4188***				
	(0.081)	(0.108)	(0.110)	(0.110)				
PartnerNeuroticism × Treatment					0.1148	0.0272	-0.0005	0.0195
					(0.075)	(0.104)	(0.103)	(0.101)
Own Extraversion		0.0208	0.0606	0.0247		-0.0832	-0.0726	-0.0890
		(0.073)	(0.079)	(0.080)		(0.074)	(0.076)	(0.074)
Own Neuroticism		-0.0075	0.0078	0.0008		0.0468	0.0607	0.0705
		(0.085)	(0.086)	(0.087)		(0.084)	(0.081)	(0.082)
Partner's Extraversion		-0.1277*	-0.1242*	-0.1336*				
		(0.070)	(0.074)	(0.075)				
Partner's Neuroticism						0.0876	0.1081	0.0960
						(0.072)	(0.071)	(0.070)
Treatment	0.3768***	0.3768***	0.3490***	-0.2838	-0.5214***	-0.5214***	-0.1973	-0.5138***
	(0.098)	(0.098)	(0.100)	(0.631)	(0.104)	(0.104)	(0.558)	(0.103)
Controls	No	No	Yes	Yes	No	No	Yes	Yes
Controls × Treatment	No	No	No	Yes	No	No	Yes	No
N	338	338	338	338	338	338	338	338

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

* Extraverted individuals suffer from self projection bias i.e. they project their positive emotions onto their partners. Also, partner's true extraversion significantly enhances extraversion beliefs.

IQbelief

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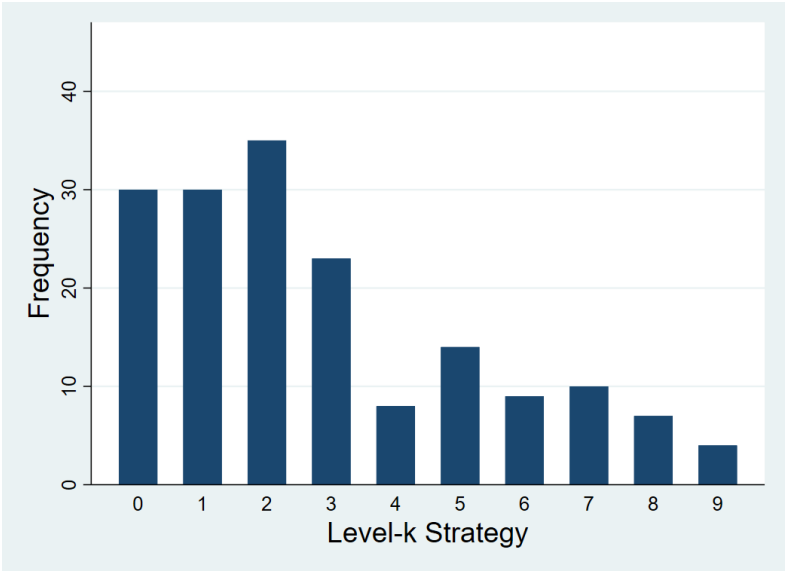
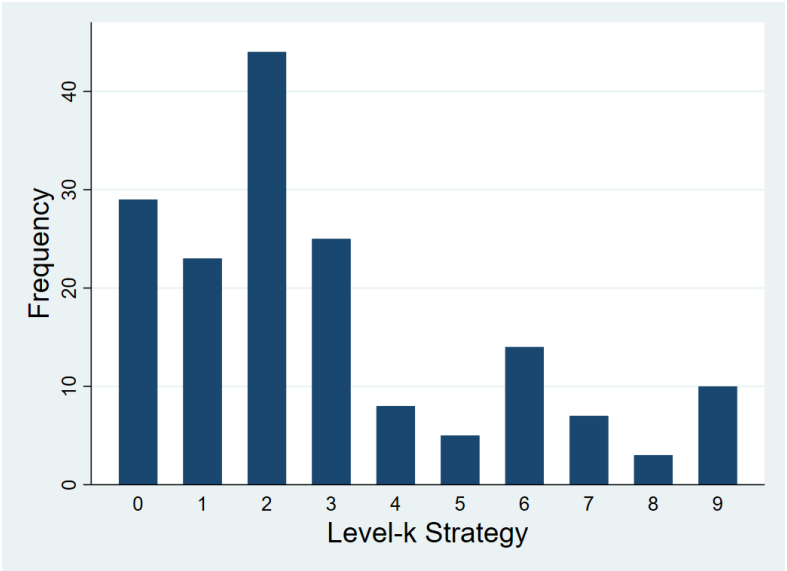
Results - 11-20 money request game



(a) Control



(b) Treatment

Figure 5: The distribution of level-k strategies

* Level-2 is played most often among both treatment and control group players.
* There is no statistical difference between the distribution of level-k strategies played by both conditions.

Results - 11-20 money request game

Table 11: Impact of (absolute) difference between own personality and predicted on level-k strategy chosen

	Level Belief			Level Chosen		
	(1)	(2)	(3)	(4)	(5)	(6)
DiffExtraversion × Treatment	-0.5241*	-0.4891*	-0.3765	-0.6521***	-0.5991**	-0.4846*
	(0.266)	(0.286)	(0.311)	(0.234)	(0.251)	(0.280)
DiffNeuroticism × Treatment	0.1920	0.2798	0.2936	-0.0424	0.0810	0.0718
	(0.254)	(0.278)	(0.286)	(0.254)	(0.274)	(0.276)
Treatment	0.1704	-2.7390	-2.1611	0.0705	-2.0793	-1.4173
	(0.267)	(2.047)	(2.125)	(0.278)	(1.831)	(1.871)
DiffExtraversion	0.1453	0.0989	0.1128	0.2022	0.1342	0.0330
	(0.196)	(0.194)	(0.205)	(0.175)	(0.174)	(0.190)
DiffNeuroticism	-0.1614	-0.2511	-0.2677	-0.1640	-0.3098*	-0.2928
	(0.187)	(0.203)	(0.209)	(0.178)	(0.182)	(0.186)
Eyes Test Score × Treatment		0.4923*	0.4997		0.5358*	0.5383*
		(0.294)	(0.303)		(0.302)	(0.307)
Female × Treatment		-0.7721	-0.7485		-0.9905*	-0.9761*
		(0.594)	(0.606)		(0.546)	(0.561)
Order × Treatment		1.1342**	1.1671**		1.0958*	1.1291*
		(0.572)	(0.581)		(0.584)	(0.589)
Own IQ		0.1853	0.1610		0.2278	0.1672
		(0.199)	(0.206)		(0.207)	(0.217)
IQ Belief		-0.3371*	-0.3416*		-0.3130	-0.3238
		(0.200)	(0.201)		(0.190)	(0.197)
Eyes Test Score		-0.4134*	-0.3986		-0.4390*	-0.4334*
		(0.242)	(0.247)		(0.243)	(0.245)
Female		1.0815***	1.0931***		1.4610***	1.4770***
		(0.408)	(0.414)		(0.364)	(0.375)
Order		-0.7868**	-0.8241**		-1.0018**	-1.0161**
		(0.390)	(0.399)		(0.408)	(0.411)
Extraversion × Extraversion quartile	No	No	Yes	No	No	Yes
Controls	No	Yes	Yes	No	Yes	Yes
N	338	338	338	338	338	338

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Results - 11-20 money request game

Table 12: Distribution of Level-k beliefs

Level	0	1	2	3	4	5	6	7	8	9
Equilibrium (%)	5	10	15	20	25	25				
Treatment (%)	12.50	32.14	17.26	5.95	4.17	11.31	4.17	2.38	3.57	6.55
Control (%)	17.06	25.88	18.82	5.29	7.06	10.00	7.06	3.53	1.76	3.53

Table 13: Expected Payoffs

Level	0	1	2	3	4	5	6	7	8	9
Treatment (EP)	20.00	21.50	24.43	20.45	17.19	15.83	16.26	13.83	12.48	11.71
Control (EP)	20.00	22.41	23.18	20.76	17.06	16.41	16.00	14.41	12.71	11.35

- Majority of players (32% in Treatment and 26% in Control) believe their partners will choose level-1 (i.e. 19).
- Given this distribution of beliefs, level-2 (i.e. 18) has the maximum expected payoffs in both conditions.

Results - 11-20 money request game

Table 14: Impact of (absolute) difference between own personality and predicted on the probability of choosing the best response - Probit Model

	Control		Treatment	
	(1) Pr(Level=2)	(2) Pr(Level=2)	(3) Pr(Level=2)	(4) Pr(Level=2)
DiffExtraversion	-0.0448	-0.0499	0.0837***	0.0909***
	(0.037)	(0.036)	(0.029)	(0.029)
DiffNeuroticism	-0.0008	-0.0138	-0.0469	-0.0461
	(0.031)	(0.032)	(0.033)	(0.033)
Own IQ		0.0612*		0.0551
		(0.036)		(0.036)
IQ Belief		-0.0438		-0.0053
		(0.029)		(0.036)
Eyes Test Score		0.0474		0.0419
		(0.038)		(0.032)
Controls	No	Yes	No	Yes
N	170	170	168	168

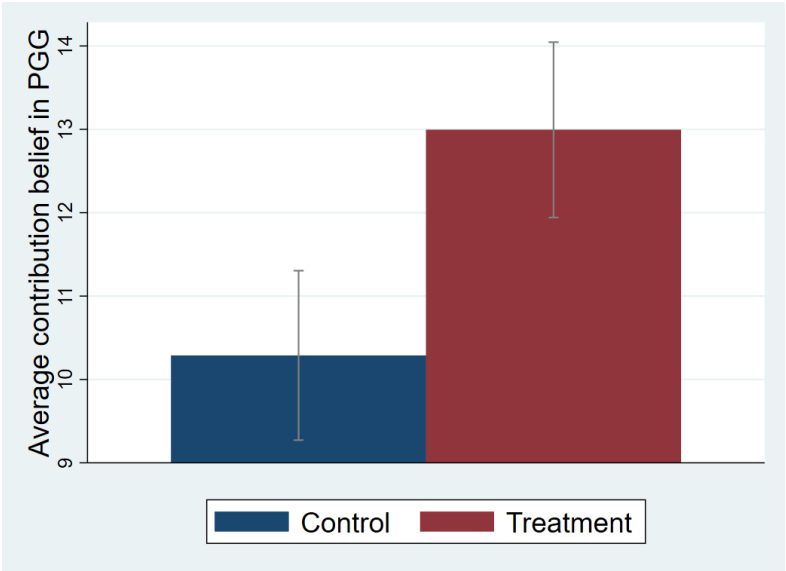
Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

LPM

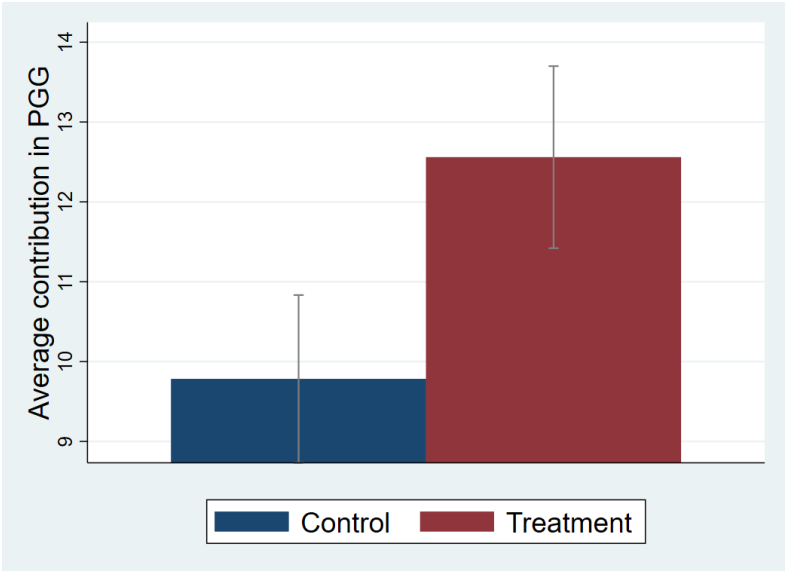
* The greater the perceived difference between own and partner's extraversion, the greater the probability of best responding to the distribution of beliefs in the treatment condition.

Back

Results - Public Goods Game



(a) Contribution belief



(b) Own Contribution

Figure 6: Average contribution and beliefs about partner's contribution in PGG

Order Effect

Results - Public Goods Game

* Impact of extraversion beliefs *and* own extraversion on cooperation:

$$Choice_i = \beta_1 personality_i + \beta_2 E_i(personality_j) + \gamma z_i + \varepsilon_i \quad (1)$$

$$E_i(personality_j) = \lambda_1 personality_j + \lambda_2 personality_i + \epsilon_i \quad (2)$$

* Endogeneity issue.
  - Estimation requires valid instruments to correct bias.
  - Use partner's true personality to instrument beliefs about her personality.
  - First stage shows that partner's true extraversion is a valid instrument for extraversion beliefs *only* in the Treatment group.

First Stage

Results - Public Goods Game

Table 15: Impact of beliefs about partner's personality and own personality on beliefs about partner's contribution and own contribution in Public Goods Game

	Control OLS		Control IV		Treatment IV	
	(1) Contribution Belief	(2) Own Contribution	(3) Contribution Belief	(4) Own Contribution	(5) Contribution Belief	(6) Own Contribution
ExtraversionBelief	0.0617	0.1140	-0.4136	-0.9698	0.6251**	0.5325**
	(0.084)	(0.095)	(1.043)	(1.353)	(0.271)	(0.269)
OwnExtraversion	-0.0751	-0.2091**	-0.0605	-0.1759	-0.3147**	-0.2067
	(0.097)	(0.090)	(0.126)	(0.178)	(0.137)	(0.141)
Own IQ	-0.0588	-0.0421	-0.1052	-0.1478	0.0864	0.1564
	(0.097)	(0.085)	(0.162)	(0.216)	(0.094)	(0.104)
IQ Belief	0.1261	0.1151	0.0977	0.0504	0.0879	0.2425***
	(0.092)	(0.100)	(0.135)	(0.201)	(0.086)	(0.089)
Eyes Test Score	-0.0439	-0.0015	-0.0619	-0.0426	0.1062	0.1531
	(0.097)	(0.121)	(0.093)	(0.186)	(0.119)	(0.142)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	110	110	110	110	106	106

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Combined Back