Inducing Cooperation with Emotion – Who Is Affected?

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Inducing cooperation with emotion – who is affected?

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Abstract

We study the effects of dual processing differences that arise from the state level (through experimental manipulation of the decision mode), the trait level (using individual difference measures of the decision mode), and their interaction on cooperative behavior. In a survey experiment with a representative sample of the Swedish population (N = 1,828), we elicited the individuals' primary decision mode and experimentally varied whether individuals could rely on their preferred mode or were induced to rely either on emotion or reason. Cooperation was measured across a series of commonly used and incentivized games (prisoner's dilemma game, public goods game, trust game, dictator game). At the state level, our results show that average cooperation rates increased when emotions were induced rather than reason. At the trait level, our results show that individual decision modes and cooperation rates were not correlated when subjects could rely on their primary mode, but traits interacted with our processing manipulation: Experimentally inducing emotions increased cooperation among individuals who otherwise rely primarily on reason, but not among individuals who already rely primarily on emotion. These findings suggest that individuals integrate their traits with emotion-based states by substituting their trait rather than enhancing it. Thus, who is affected by emotions in their decision to cooperate crucially depends on state-trait interactions at the point of decision.

Keywords: cooperation; intuition; emotion; reason; experiment

JEL: C71; C91; D91

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1. Introduction

The hypothesis that intuition promotes cooperation has attracted considerable interest across disciplines (Rand 2012, Tinghög 2013). According to this notion, a first, intuitive response to social dilemmas is linked to cooperation, while reason and deliberation is linked to self-interest. The empirical evidence in support of this hypothesis is mixed (Rand et al. 2014, Bouwmeester et al. 2017) and recent meta-analyses have revealed considerable between-study heterogeneity depending on the type of manipulation that is used to induce intuition (Rand 2016, Kvarven et al. 2020).[1] Accordingly, intervening in decision processing by directly asking people to either rely on their emotion or reason seems to be an effective way to alter cooperation in social dilemmas.

However, how people process decisions is not only determined at the state-level. Individuals also exhibit trait-like variations in how much they prefer to rely on intuition and deliberation when making decisions. Such traits describe a disposition of the individual (Allport and Odbert 1936, Spielberger and Sydeman 1994) and can interact with exogenously induced states (Block 2005, Hammond et al. 1987, Betsch and Kunz 2008). Such interaction effects can contribute to our understanding of how individuals integrate their personal processing mode with the processing mode favored by the situation in the realm of cooperative behavior. These effects are also potentially policy relevant, since studying state-trait interactions in decision processing can help us predict *who* would be affected by which type of intervention. Nevertheless, such state-trait interactions receive little attention in the literature that studies the link between dual processing and cooperation. This paper provides an experimental test of state-trait interactions in emotion/reason-based decision making on cooperation in a wide range of incentivized games using a large, representative sample of the Swedish population.

State-trait interactions could occur, if intuitive (deliberative) decision makers react differently to emotion- and reason-inducing states. The most prominent theory generating hypotheses for these cases is regulatory fit theory (Higgins 2005), which suggests that individuals react more strongly to a state if it matches their trait. Accordingly, we would expect that an intuitive state increases cooperation more among individuals who prefer to rely on intuition when making decisions than individuals who prefer to rely on deliberation. Opposite to regulatory fit theory, one may hypothesize that highly deliberative individuals have more scope to raise the focus on their intuition than already intuitive decision makers. Accordingly, we would expect an intuitive state to have a larger positive effect on cooperation among individuals with a more deliberative trait than individuals with a more intuitive trait.

[1] The data of this study was made available to Kvarven et al. (2020).

Our experiment randomized individuals into one of three treatments. We chose to implement the intervention producing the largest, positive effect on cooperation as reported in meta-studies (Rand 2016, Kvarven et al. 2020), which was to induce emotion and reason using a direct instructions intervention (Levine et al. 2018, Horstmann et al. 2010). Accordingly, our treatments either directly instructed subjects to rely on either their emotion or their reason when making decisions, or provided no such instructions. Individual decision-making traits were elicited with the Unified Scale to Assess Individual Differences in Intuition and Deliberation (USID, Pachur and Spaar 2015). Cooperative behavior is measured within-subject across a set of incentivized games, including the prisoner's dilemma game, public goods game, trust game, dictator game, and charitable giving. Thus, we, first, provide a test of whether the causal effects of emotion- and reason-inducing treatments on cooperation (Levine et al. 2018) generalize to a more comprehensive, cross-game measure of cooperation as well as a measure of consistency across games, or "cooperative phenotype" (Peysakhovich et al. 2014). Second, we provide a test of the relation between the individuals' preferred decision mode, i.e. a psychological trait measure, and their cooperative behavior. And, third, measuring traits and the effect of states in one sample allowed us to explore whether the causal effects of inducing emotion and reason on cooperation vary across individuals with intuitive and deliberative decision-making traits.

Our results show that inducing emotion, rather than reason, increased average cooperation rates in the set of games, suggesting that instructing people to rely on their emotion/reason affects cooperation in a broader sense. Inducing emotion, compared to inducing reason, also increased the correlation of behavior across games, suggesting that the instructions interventions affect the number of motives subjects considered. Individual decision-making traits, if uninfluenced as in our baseline treatment, were not correlated with cooperation rates. However, we find evidence of an interaction between traits and states. Experimentally inducing emotion-based decision making, compared to the baseline treatment, increased cooperation rates among subjects who prefer a deliberative decision-making mode, but not among primarily intuitive decision makers. This suggests that individuals integrate their traits with emotion-inducing states by substituting their mode rather than enhancing it. Experimentally inducing reason-based decision making, on the other hand, decreased cooperation rates among both decision-making types, suggesting that the use of reason can be enhanced. Lastly, we show that deliberative and intuitive decision makers also differed in their observable socioeconomic characteristics but that these differences were not driving the differential effects of the emotion-inducing treatment.

The remainder of the paper is organized as follows. Section 2 describes the experimental design and procedure. Section 3 presents the results of manipulation checks. Section 4 presents the results of our experiment. Section 5 discusses the results and draws conclusions.

2. Methods

2.1. Sample

A survey was sent to a representative sample of the Swedish population above 18 years old through the survey company CMA Research in April and May of 2017.[2] The company collects data from their nation-wide panel of about 20,000 adults who were selected to be representative of the Swedish population in terms of socio-demographic characteristics. Quota sampling was provided to make sure that the recruited sample had approximately the same proportion of individuals in terms of different age groups, gender, and geographical regions as the population. Table A1 in the appendix reports descriptive statistics of our sample and compares these to Swedish population statistics. Data was collected until about 1800 participants completed our survey. We documented attrition from the survey at a rate of 20.6 percent. Overall, we have data of 1,828 individuals, after excluding subjects with incomplete responses and missing values in key variables. Our results are robust to including incomplete responses, however, we focus our main analysis on complete data for better comparability. The robustness of our results to including incomplete survey responses are reported in Appendix C. Our sample of about 600 subjects per treatment allows us to detect the full size of the main effect reported in Levine et al. (2018) with more than 99 percent power and up-to small interaction effects with at least 80 percent power.[3]

2.2. Procedure

We designed an online survey that allows us to causally identify the effect of emotion- and reason-inducing states on cooperation across different decision-making traits in a (3 X 1)-between-subject design. Subjects were randomized into one of three treatments that induced subjects to make their decisions either based on emotion or reason using a direct instructions intervention (Horstmann et al. 2010), or gave no such instructions. The details of the treatment conditions are outlined in section 2.3. Each subject made cooperation choices in a number of social dilemmas, which were incentivized and presented in random order. This allows us to construct a within-subject measure of cooperation across commonly used games, the details of which are outlined in section 2.4. Individual differences in decision-making traits were elicited with the Unified Scale to Assess

[2] Data from the same experiment is also described and analyzed in Gärtner et al. (2019).
[3] These estimates are based on Models 2a and 3a of Experiment 3 reported in Levine et al. (2018), from which we derive Cohen's $d = 0.45$, and assuming $\alpha = 0.05$.

Individual Differences in Intuition and Deliberation (USID, Pachur and Spaar 2015). The USID is described in more detail in section 2.5. The order of the games, which were subject to our treatment conditions, and the trait elicitation was randomized. We find no effects of the order of trait elicitation and economic decisions on the average traits scores or of the treatment conditions on subsequent traits scores. Finally, our survey asked subjects to answer questions about their socioeconomic characteristics, real-world cooperative behavior and self-reported altruism (Rushton et al. 1981).

Subjects received a fixed participation payment and were paid for one, randomly chosen decision. The experiment followed the ethical guidelines of the Swedish research council concerning the Ethical Review of Research Involving Humans (SFS 2003:460). The experimental instructions can be found in Appendix D, translated from Swedish into English.

2.3. Experimental design

Subjects were randomly assigned to one of three treatments. Based on the wording in Levine et al. (2018, study 3), the *emotion treatment* instructed subjects to rely on their emotions when making their choices in the games, while the *reason treatment* instructed subjects to rely on their reason. Subjects in the emotion [reason] treatment read the following;

> *Sometimes people make decisions by using reason and relying on their brains. Other times, people make decisions by using emotion and relying on their hearts.*
>
> *Many people believe that the heart [brain] is the part of our body that is most connected with good decision-making. When we feel with our hearts [think with our brains], rather than think with our brains [feel with our hearts], we make emotionally [rationally] satisfying decisions.*
>
> *In this part of the experiment,* ***please make your decisions by relying on your heart [brain],*** *rather than your brain [heart].*

The last sentence of the instructions was repeated for each game. A third treatment condition, the *baseline treatment*, gave no additional instructions. In the baseline treatment, subjects could follow their "regular" decision-making mode, which allows us to separate the contributions of inducing emotion and inducing reason to the total effect of the emotion/reason-distinction.

We conducted a number of manipulation checks to corroborate whether the instructions actually affected decision processing. Four questions elicited how subjects themselves judged their decision-making process, asking them to rate on 5-point Likert scales how much they relied on deliberation, intuition and emotions as well as how much the instructions made them think more about their decisions. Two additional measure tested the effect of instructions on behavioral

outcomes that have previously been associated with decision processing. First, we measured the likelihood with which subjects choose the dominated option in the Jellybean task (Denes-Raj and Epstein 1994; Kirkpatrick and Epstein 1992; Peters et al. 2006) and, second, we elicited actual response times in the cooperation decisions.

2.4. Measures of cooperation

Cooperative behavior was elicited within-subject in a series of incentivized choices: Cooperation in the prisoner's dilemma game (PDG), cooperation in the public goods game (PGG), trust, trustworthiness, dictator game (DG) giving and charitable giving. The PDG followed the instructions and trade-offs in payoffs used in Levine et al. (2018). Subjects were paired with another, randomly chosen participant. Each subject was endowed with 30 SEK (about $3.4) and subjects simultaneously chose to either keep or transfer their endowment to the other participant. Transferred money was multiplied by two. Subjects received the money they chose to keep plus twice the money that was transferred to them by the other participant. The PGG followed the instructions and trade-offs in payoffs used in Rand et al. (2012). Four randomly grouped subjects simultaneously chose to either keep their endowment of 40 SEK (about $4.6) or to give it to the group. Contributions were pooled, multiplied by two, and equally distributed among all members of the group. Thus, subjects received the amount they kept and one-fourth of the money pooled in their group. Our measure of trust behavior was a sequential version of the PDG, which is equivalent to a binary trust game. The first-mover choice in the sequential PDG measures trust, while the second-mover choice (conditional on the other player having contributed) measures trustworthiness.[4] In the DG, subjects chose how much of 60 SEK (about $6.9) to give to another, randomly selected player. In the charitable giving decisions, subjects had two opportunities to give any amount of 60 SEK to a charity (Red Cross, Unicef). The order of the PDGs, the PGG, the DG and charitable giving was randomized across subjects. No feedback about the outcomes of the games was given before the end of the experiment. Table 1 gives an overview of the cooperation choices we elicited.

For the main analysis, we constructed a composite measure of cooperation that is the individual average share of cooperative choices across games. In particular, the *average cooperation rate* is the average over the indicators for whether the individual made a contribution in the PDG, made a contribution in the PGG, contributed in the trust decision, contributed in the trustworthiness decision (given the other player chooses to trust), shared (at least) equally in the

[4] To allow for the matching of all possible cases, we also elicited the second-mover choice conditional on the other player having defected.

dictator game and shared (at least) equally with (at least) one of the charities. Robustness checks consider the games separately and other subsets of games. In particular, we also look at the subset of "pure" cooperation choices (excluding trust), "strategic" choices (PDG, PGG, and trust) as well as "non-strategic" choices (trustworthiness, DG, and charitable giving). Moreover, our within-subject measures of cooperation allowed us to estimate how predictive cooperation of one game is for cooperation in another game across all pairs of games, i.e. we could test whether treatments or traits also affect the strength of the individuals' "cooperative phenotype" (Peysakhovich et al. 2014).

We checked understanding in the PDG and the PGG with two control questions each, which are elicited after each game and not incentivized. We devote Appendix B to discussing the robustness of our results to excluding subjects without proven understanding. Overall, we find that effect sizes are robust to excluding these subjects.

Table 1. Measures of cooperative behavior in experiment

Prisoner's dilemma game (PDG)	Two players made simultaneous, binary choice whether to contribute money or not
Public goods game (PGG)	Four players made simultaneous, binary choice whether to contribute money or not
Trust game	First-mover choice in a sequential PDG (trust) Second-mover choice in sequential PDG conditional on contribution by other player (trustworthiness)
Dictator game (DG)	Choice to share any amount of fixed endowment with another player
Charitable giving	Choice to share any amount of fixed endowment with a charitable organization

2.5. Elicitation of decision-making traits

Decision-making traits were elicited with the Unified Scale to Assess Individual Differences in Intuition and Deliberation (USID, Pachur and Spaar 2015), which addresses weaknesses of previously used trait measures and unifies them, such as the Preference for Intuition and Deliberation scale (PID, Betsch 2004) and the Rational-Experiential Inventory (REI, Pacini and Epstein 1999). Subjects rated 32 statements according to how well they describe their own decision-making style in life in general on 5-point Likert scales. One half of the statements described intuitive and spontaneous decision making, the other half of the statements described

decision making that is based on reason and knowledge. Taking the mean of all statement ratings in the USID for each individual, we constructed three measures of decision-making traits: (i) a score that measures the individual tendency to rely on intuition in decision making, (ii) a score that measures the individual tendency to rely on deliberation in decision making, and (iii) an indicator for whether an individual relies primarily on intuition (intuition score > deliberation score) or primarily on deliberation (deliberation score ≥ intuition score) when making decisions. Thus, we could test the independent effect of each trait as well as the importance of their relative strengths. Figure A1 in the appendix illustrates the distribution of traits.

3. Manipulation checks

Table 2 presents the results of our manipulation checks. We find that subjects reported lower reliance on deliberation and higher reliance on their emotions and intuition in the emotion treatment, compared to the reason treatment. There was no significant difference in how much the instructions made subjects think about their decisions across treatments. The share of rational choices in the Jellybean task was lower in the emotion treatment than the reason treatment. Response times across the games were faster in the emotion treatment than the reason treatment. Thus, our manipulation checks suggest that the instruction treatments in fact manipulated decision processing.

Table 2. Manipulation checks

	Treatments			Difference
	Baseline	Emotion	Reason	Emotion vs. Reason
Relied on intuition (mean rating)	3.23	3.51	3.02	<0.001
Relied on emotions (mean rating)	3.10	3.53	2.69	<0.001
Relied on deliberation (mean rating)	3.84	3.66	3.95	<0.001
Instructions: thought more (mean rating)	3.46	3.42	3.50	0.215
Jellybean task: rational choices (in percent)	0.67	0.63	0.70	0.010
Average response times (log)	2.45	2.43	2.49	0.023

Notes: Averages were estimated using full sample. The last columns presents *p*-values of two-sided *t*-tests and $\chi 2$-tests, respectively. *Relied on intuition* measures the answer to "I relied on my intuition when making the decisions in this experiment.", *Relied on emotions* measures the answer to "I relied on my emotions when making decisions in this experiment.", *Relied on deliberation* measures the answer to "I relied on my deliberation when making the decisions in this experiment.", and *Instructions: thought more* measures the answer to "The instructions in this experiment made me think more about my decisions." on 5-point Likert scales. *Jellybean task* reports the share of rational (non-dominated) choices in the jellybean task. *Average response times (log)* is the average of the natural logarithm of response times across the cooperation decisions.

4. Results

4.1. State-level effects of the decision mode on cooperation

Figure 1 shows the effects of our treatments on cooperation rates. We find that inducing emotion, rather than reason, increased average cooperation rates (0.59 vs. 0.69, $t = 5.602$, $p < 0.001$, $d = 0.32$).[5] The effect was significant for five out of the six decisions. We find the largest increase in the decision to trust, with 24.38 percent, and the smallest increase in the decision to cooperate in the public good game, with 6.06 percent (see Table A2 in the appendix for the results for each game). The effect is robust in different subsets of the six decisions, including when looking only at "pure" cooperation choices (excluding trust), "strategic" choices (PDG, PGG, and trust), and "non-strategic" choices (trustworthiness, DG, and charitable giving; see Figure A2 in the appendix). Thus, the positive effect of inducing emotions, rather than reason, on cooperation in the prisoner's dilemma game, as previously found in Levine et al. (2018), extends to our cross-game measure of cooperation.

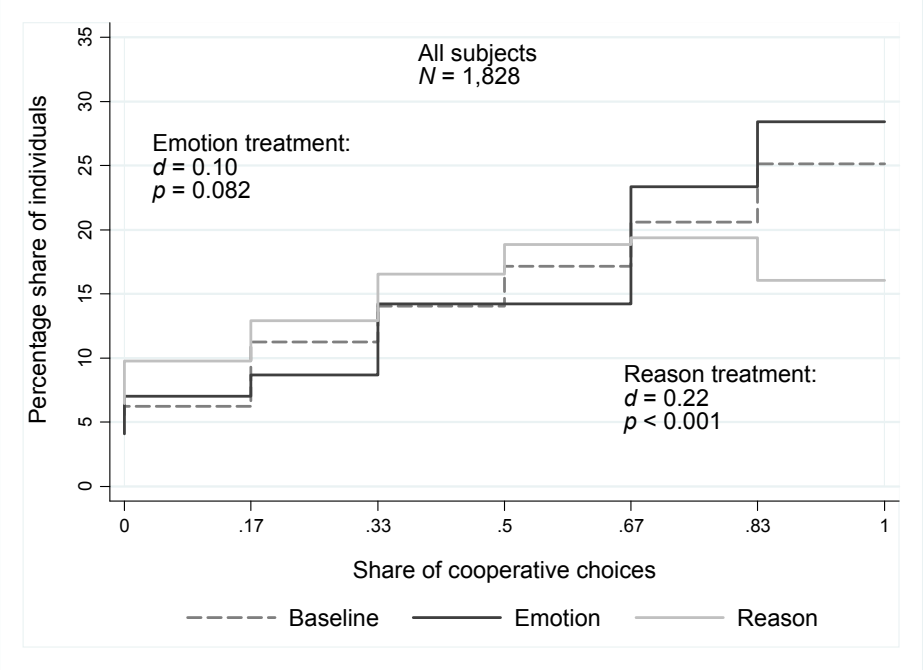
Compared to the baseline treatment, the emotion treatment had a positive effect on cooperation rates (0.66 vs. 0.69, $t = -1.743$, $p = 0.082$, $d = 0.10$), while the reason treatment had a negative effect (0.66 vs. 0.59, $t = 3.826$, $p < 0.001$, $d = 0.22$). Inducing reason made up the majority (75.21 percent) of the total emotion/reason-treatment effect on cooperation. In line with this, the reason treatment affected cooperation in a larger number of games than the emotion treatment (see Table A2 in the appendix). The effect of the emotion treatment was smaller in the set of pure cooperation choices ($p = 0.040$; Figure A2), suggesting that the effect on the decision to trust is a strong driver of the overall effect. The effect of the emotion treatment was not significantly different across the subsets of strategic and non-strategic choices ($p = 0.137$; Figure A2). The effect of the reason treatment was not significantly different for the subset of pure cooperation choices ($p = 0.924$) but is larger for strategic than non-strategic choices ($p = 0.063$).

Inducing emotion rather than reason increased the average correlation of cooperation decisions across pairs of games ($\rho = 0.296$ vs. $\rho = 0.247$, $z = 2.275$, $p = 0.023$). Compared to the baseline treatment ($\rho = 0.285$), a majority of the change in the correlation coefficient (or, 77.6

[5] We find that the average cooperation rate was predictive of self-reported real-world cooperation. The cooperation rate measure positively correlated with subjects' ratings of 5-point scales on how often they have given money to a charity in the last 12 months ($\beta = 1.127$, $p < 0.001$), how often they have given money to a stranger in the last 12 months ($\beta = 0.543$, $p < 0.001$), how often they have donated clothes in the last 12 months ($\beta = 0.659$, $p < 0.001$), how often they have donated blood in the last 12 months ($\beta = 0.309$, $p < 0.001$), how often they have made active contributions to the environment in the last 12 months ($\beta = 0.591$, $p = 0.001$), as well as whether they would like to donate their organs after death ($\beta = 0.264$, $p < 0.001$) and whether they have registered as an organ donor ($\beta = 0.270$, $p < 0.001$). The average cooperation rate was not significantly correlated with how often subjects had volunteered in the last 12 months ($\beta = 0.043$, $p = 0.785$) or their stated demand for income redistribution in society ($\beta = -0.239$, $p = 0.449$).

percent) was due to inducing reason. These results hold for a majority of the pairwise comparison of games and other subsets (see Table A3 in the appendix). Thus, we find some evidence that choices across games were more consistent in the emotion than the reason treatment, suggesting that individuals consider fewer (more) motives in the emotion (reason treatment) and are more (less) likely to be of a "cooperative phenotype" (Peysakhovich et al. 2014).

Figure 1. Cooperation across treatments



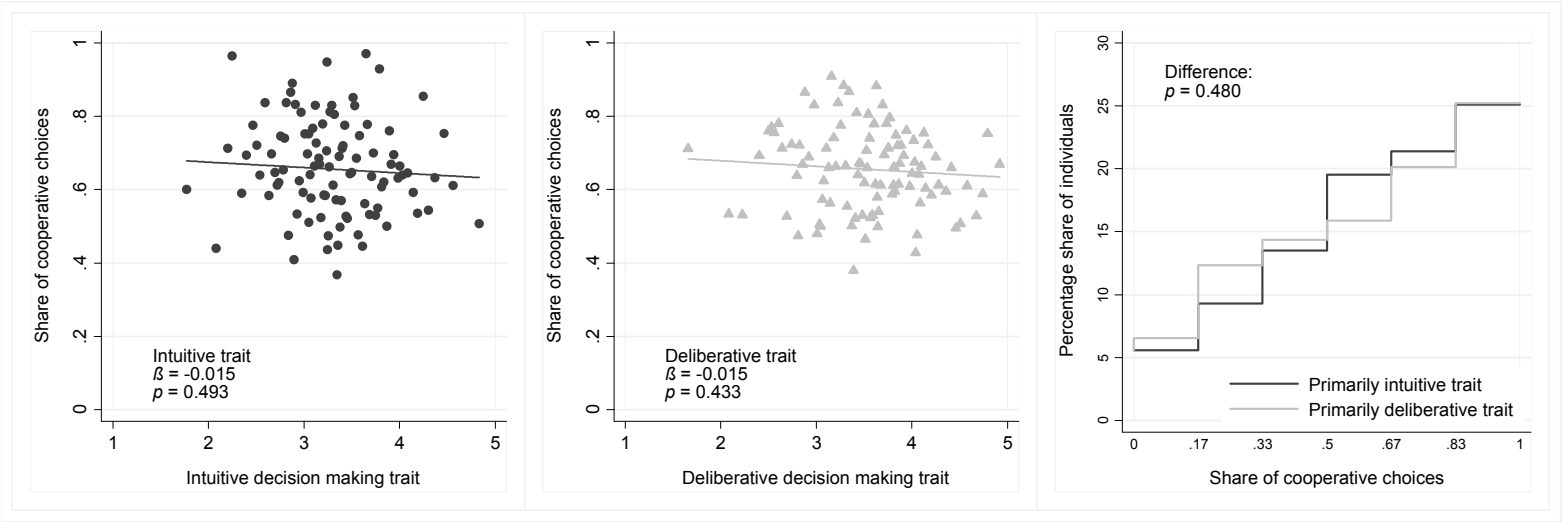
Notes: The figure shows the frequency distribution of cooperation rates across treatments. The share of cooperative choices includes choices in the prisoner's dilemma game, public goods game, trust game (trust and trustworthiness), dictator game and charitable giving. Estimates of Cohen's *d* and *p*-values of two-sided *t*-tests refer to effect sizes when compared to the baseline treatment.

4.2. Trait-level association between decision mode and cooperation

Figure 2 shows the relation between decision-making traits and cooperative choices in the baseline condition. Cooperation rates are not significantly correlated with the strength of each individual decision-making trait (panels 1 and 2) or the relative strength of traits (0.67 vs. 0.65, $t = 0.706$, $p = 0.480$, $d = 0.06$, panel 3; see Figure A3 for distributions). This result holds for each game (Table A4 in the appendix), for different subsets of games (Figure A4) and when controlling for socioeconomic characteristics (columns 1-4 of Table A5). The correlation of choices across games is not significantly different across primarily intuitive and primarily deliberative subjects on average ($\rho = 0.271$ vs. $\rho = 0.294$, $z = 0.722$, $p = 0.470$), in most binary comparisons and in different subsets of games (Table A6). Overall, these results suggest that individual differences in decision-

making traits do not affect average cooperation behavior when decision makers can follow their preferred decision-making mode.

Figure 2. Cooperation across decision-making traits in the baseline treatment (n = 612)



Notes: Panel 1 and 2 show scatters over 100 equally-sized bins of each trait and regression lines from OLS regressions controlling for the respective other trait. The p-value for the difference shown in panel 3 is based on a two-sided t-test.

4.3. State-trait interactions: State-level effects across decision-making traits

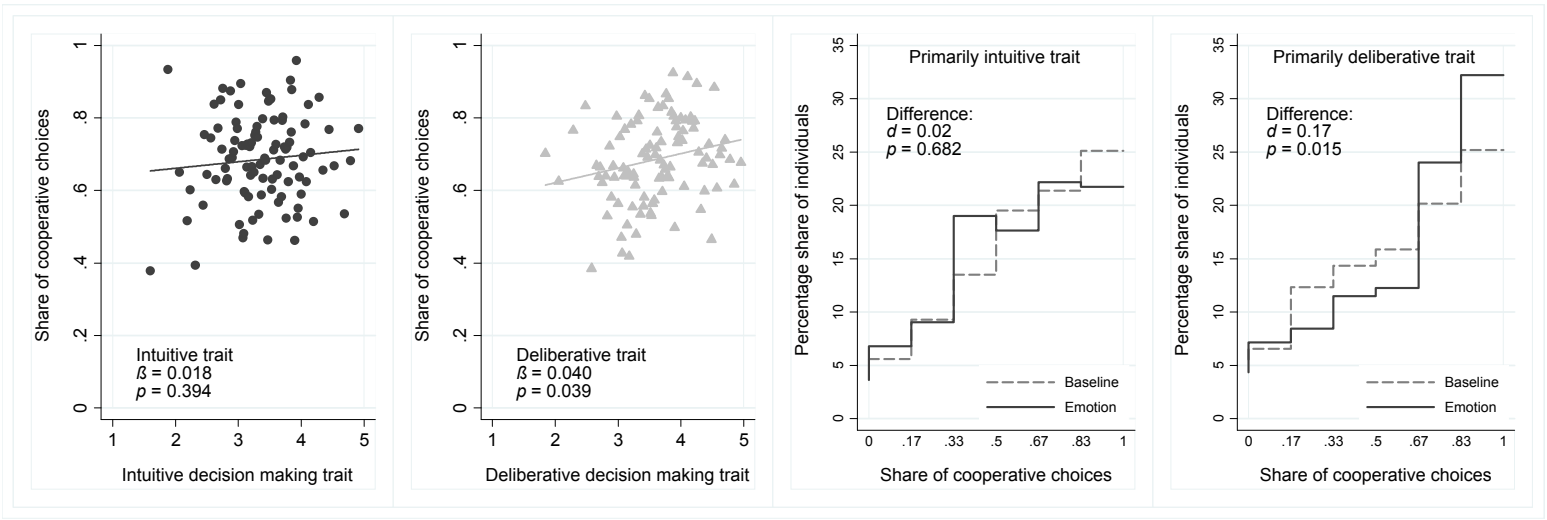
Next, we test whether individual decision-making traits interacted with the effects of treatments at the state level, i.e. whether the effects of inducing emotion and reason varied across the individually preferred decision modes. Figure 3a shows the effect of the emotion treatment across decision-making traits. Cooperation rates in the emotion treatment were not significantly related to the strength of the intuitive decision-making trait (panel 1, difference to baseline: p = 0.278), but increased in the strength of the deliberative trait (panel 2, difference to baseline: p = 0.043). Inducing emotion had no significant effect on individuals with a primarily intuitive trait (panel 3), while it increased cooperation of primarily deliberative individuals (panel 4, difference-in-difference: p = 0.068). Table A7 in the appendix shows the results for each game. The results are robust to looking at "pure" cooperation choices (see Figure A5a in the appendix), when comparing strategic vs. non-strategic choices (Figure A5b-c), and to controlling for socioeconomic characteristics (see columns 5-8 of Table A5 and columns 1-6 in Table A8). Thus, our results suggest that only individuals who primarily rely on deliberation when making decisions increase their cooperation when emotion is induced.

Figure 3b shows the effect of the reason treatment across decision-making traits. There was no significant relation between cooperation rates and the strength of each decision-making trait (panels 1 and 2, differences to baseline treatment: $ps > 0.5$). Both primarily intuitive and primarily

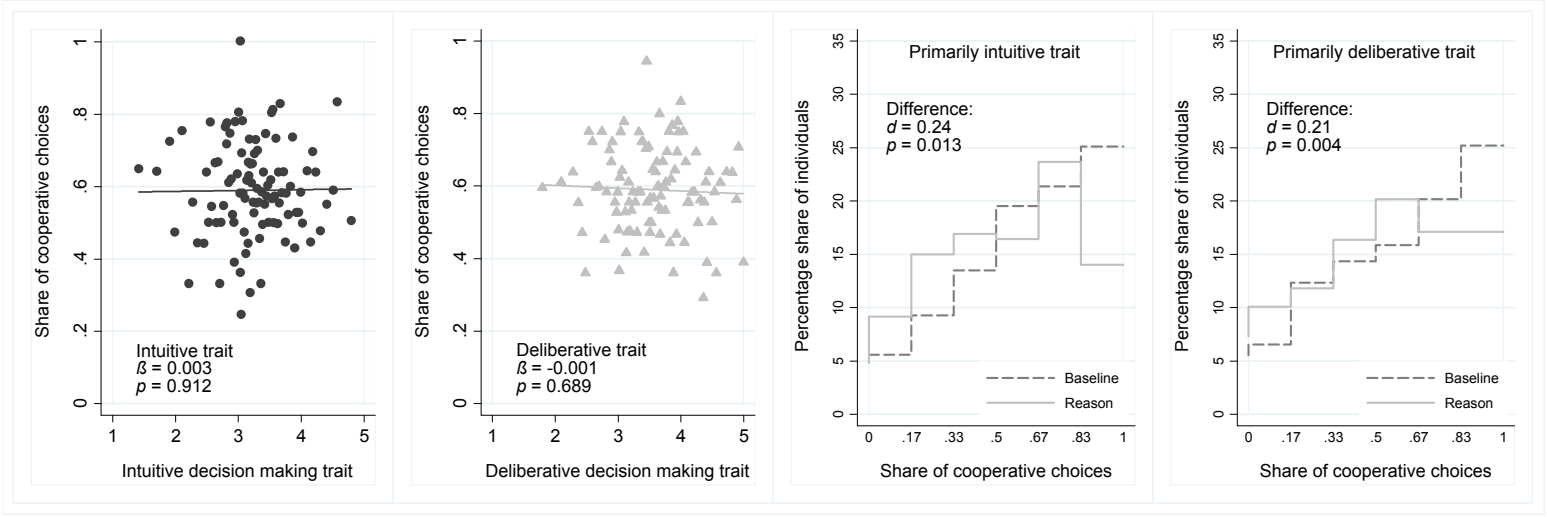
deliberative decision makers decreased their cooperation rates in the reason treatment compared to the baseline treatment (difference-in-difference: $p = 0.826$; see columns 9-12 of Table A5 and columns 7-12 in Table A8 for regression results). The results are robust when looking at only the subset of pure cooperation choices (Figure A5a). The negative effect of inducing reason was larger for non-strategic choices than strategic choices among primarily deliberative subjects ($p = 0.094$), but not among primarily intuitive subjects ($p = 0.386$; Figure A5b-c). Overall, these results suggest that, other than the emotion treatment, the reason treatment lowers the cooperation rates of individuals independent of their own preferred decision-making mode.

Figure 3. Interactions effects on cooperative behavior

(a) Emotion treatment ($n = 612$)



(b) Reason treatment ($n = 604$)



Notes: Panels 1 and 2 show scatters over 100 equally sized bins of the trait and regression lines from OLS regressions controlling for the respective other trait. The differences reported in panels 3 and 4 is based on a two-sided *t*-test.

We find no significant effects of the treatments on the correlation of choices among each decision-making type (emotion: del. $\rho = 0.294$ vs. $\rho = 0.332$, $z = -1.460$, $p = 0.144$; int. $\rho = 0.271$ vs. $\rho = 0.233$, $z = 1.035$, $p = 0.301$; reason: del. $\rho = 0.294$ vs. $\rho = 0.263$, $z = 1.156$, $p = 0.248$, int. $\rho = 0.271$ vs. $\rho = 0.217$, $z = 1.440$, $p = 0.150$; see Tables A9 and A10 for each pair of games and subsamples). The directions of effects suggest that deliberative subjects considered fewer motives in the emotion treatment and more motives in the reason treatment, while intuitive subjects considered more motives whenever a frame was introduced.

4.4. Socioeconomic differences

Since we collected data on socioeconomic characteristics of the individuals, we also conducted an explorative analysis on whether the observed differential treatment effects across primary traits translate into differences in these observable individual characteristics. We could show that the observed differences in treatment effects on cooperation across primary decision-making traits were not due to decision-making traits merely picking up differences in socioeconomic variables affecting cooperation (see Table A8 in the appendix). However, primarily intuitive individuals may still differ from primarily deliberative individuals in terms of observable characteristics. Table 3 shows the relation between an individual's primary decision-making trait and their gender, age and educational level. We find that a primarily intuitive trait was more common among individuals who are female, older and have lower education levels, though, the latter relation may be endogenous. These results are robust to using linear measures of decision-making traits (see Table A11 in the appendix). Thus, since our results showed that inducing emotion on average only positively affected the cooperation rates of primarily deliberative decision makers, these results suggest that inducing emotion treats a subpopulation that is more likely to be male, younger and more educated.

Lastly, we explore how using student samples, a common sample selection in the literature, may affect whether we observe positive effects of inducing emotion on cooperation. We find that the students in our sample (7.49 percent) were more likely to exhibit a primarily deliberative decision-making trait than other individuals (75.91 percent vs. 63.93 percent, $\chi^2 = 7.984$, $p = 0.005$). This suggests that studies using student samples may overestimate the effect of inducing emotion on cooperation compared to studies using the general population.

Table 3. Socioeconomic characteristics across decision-making traits

OLS regressions. Dependent variable: Primarily intuitive trait.				
	(1)	(2)	(3)	(4)
Female	0.117***			0.120***
	(0.022)			(0.022)
Age		0.003***		0.003***
		(0.001)		(0.001)
High school			-0.146***	-0.124***
			(0.044)	(0.044)
Tertiary education			-0.272***	-0.254***
			(0.044)	(0.044)
Income Q2				-0.013
				(0.035)
Income Q3				-0.026
				(0.036)
Income Q4				0.015
				(0.035)
Income Q5				-0.020
				(0.036)
Constant	0.292***	0.228***	0.544***	0.336***
	(0.015)	(0.034)	(0.041)	(0.057)
Observations	1,828	1,828	1,828	1,828
Adjusted R-squared	0.014	0.007	0.029	0.049

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. *Female* is an indicator of gender. *Age* is a linear measure of age. Educational levels *High School* and *Tertiary education* indicate the individual's highest level of education, while the reference is an indicator for Primary Education. *Income* indicators are constructed according to quintiles of the sample.

5. Discussion and Conclusion

The conflict between emotions and reason has traditionally been a focus of the research on prosocial behavior. Less attention has been paid, however, to the state-trait interactions in dual processing in the realm of cooperative behavior. In this paper, we provide results from a carefully designed test of state-trait interactions in dual processing in a series of cooperation games using a large-scale survey experiment. We find that the positive effect of inducing emotion on cooperation was driven by otherwise deliberative decision makers. This result is robust to considering socioeconomic differences as well as differences in the understanding of games.

Our results suggest that individuals change their behavior when their primary decision-making trait *mismatches* the emotion-inducing state. These results are opposite to what we would have predicted following regulatory fit theory (Higgins 2005), which suggests that traits are fostered if they match the state. Instead, our results on the integration of traits and exogenously induced emotions suggest that individuals substitute their trait (individuals rely on emotions even though they prefer to rely on reason). Inducing reason, on the other hand, was found to affect

individuals of both types, suggesting that asking people to rely on reason leads to both substitution with their trait (individuals rely on reason even though they prefer to rely on emotions) and enhancement (individuals reason more even though this is already their preferred mode). It could also be argued that subjects use the direct instructions strategically, instead, serving as a signal when forming expectation of what the other player will choose (Levine et al. 2018). This could explain our results on state-trait interaction effect of inducing emotions on cooperation if only deliberative players updated their expectations. However, we also found state-trait interaction effects in the set of non-strategic decisions, which should not be affected by this mechanism.

Our study finds a main effect of an emotion/reason-intervention using direct instructions on cooperation behavior in line with Rand (2016) and Levine et al. (2018). We can show that this effect extends to a more comprehensive, cross-game measure of cooperation and that we observe a stronger "cooperative phenotype" (Peysakhovich et al. 2014, Reigstad et al. 2017) when decisions are based on emotion rather than reason. This suggests that individuals consider more motives when reason is induced than when emotion is induced. Noticeably, we find that the negative effect of inducing reason on cooperation makes up a larger share of the total effect of the emotion/reason-distinction than the positive effect of inducing reason. Thus, future research should focus more on the impacts of (degrees of) deliberation on cooperative behavior.

Recent meta-studies find no evidence of an effect of manipulating dual processing on cooperation games other than through direct instructions (Kvarven et al. 2020), or when studying altruistic behavior (Fromell et al. 2020). We find a positive effect of inducing emotion rather than reason through direct instructions on prosociality in a number of games, including the prisoner's dilemma game, the trust game, the dictator game and charitable giving. The only social dilemma that did not show an effect in our experiment is the public goods game. Thus, it is possible that the public goods game has features, such as the larger number of players or its complexity, that affect the possibilities with which decision processing in this game can be manipulated.

Finally, we show that deliberative decision makers differ from intuitive decision makers also in terms of their socioeconomics: They are more likely to be male, younger, have higher educational levels and are overrepresented among students. This result can be informative to stakeholders aiming to predict both who will be reached by an intervention and which target groups can be reached most cost-effectively. It is also informative to experimental researchers, suggesting that samples with more deliberative subjects (e.g., student samples) inflate the effects of inducing emotion on behavior.

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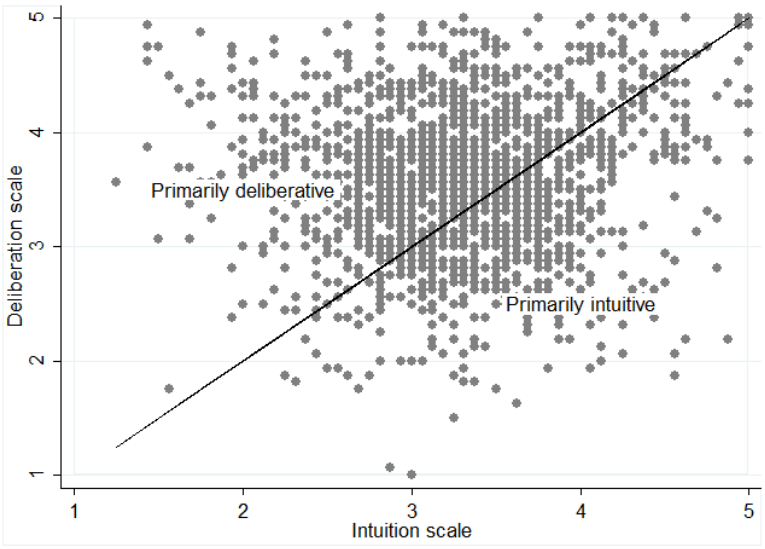
Appendix A

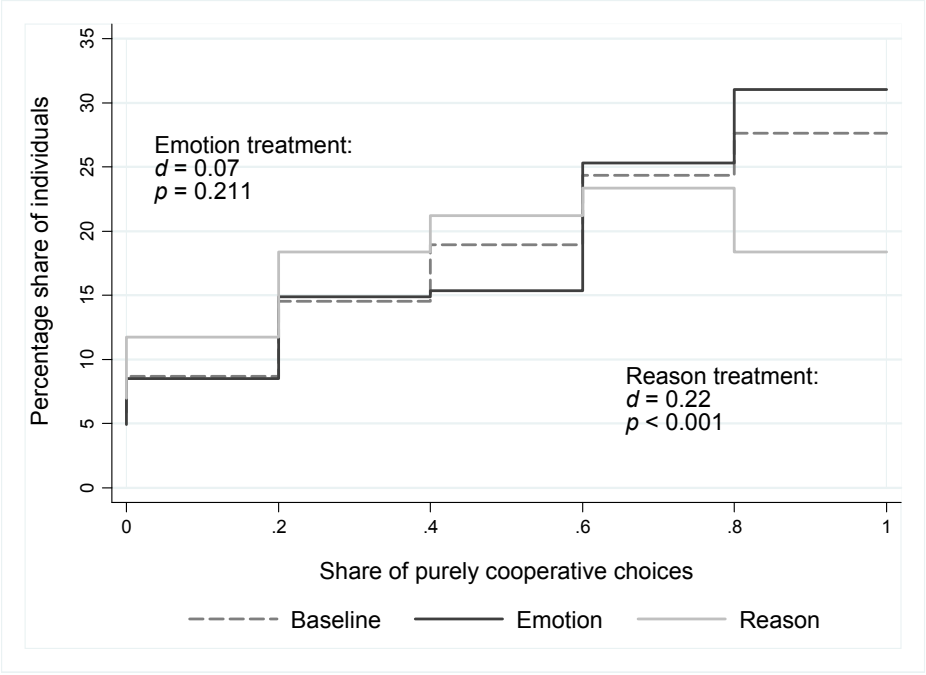
Figure A1. Scatter plot of decision-making traits (N = 1,828)



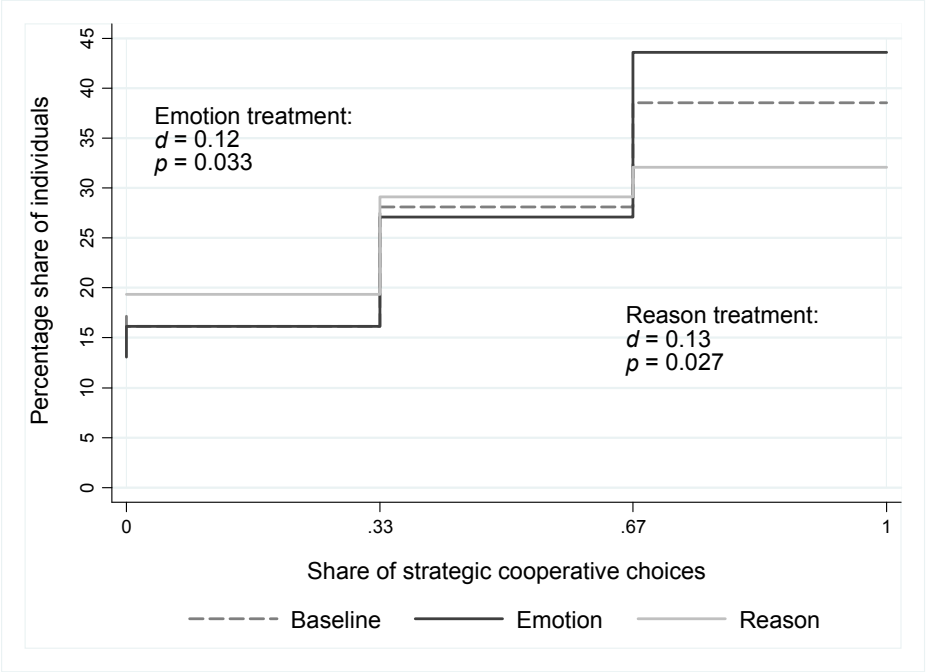
Notes: The figure shows a scatter plot of the relation between the intuitive decision-making trait scores (M = 3.30, SD = 0.61, Cronbach's α = 0.88) and deliberative decision-making trait scores (M = 3.55, SD = 0.64, Cronbach's α = 0.91). 35.18 percent of subjects are relying primarily on intuition when making decision (intuition score > deliberation score) while 64.82 percent of subjects are relying primarily on deliberation (deliberation score ≥ intuition score).

Figure A2. Cooperation rates in different subsets of games (N = 1,828)

a. "Pure" cooperation (excl. *Trust*)



b. Strategic decisions (incl. *PDG*, *PGG* and *Trust*)



c. Non-strategic decisions (incl. *Trustworthiness*, *DG* and *Charity*)

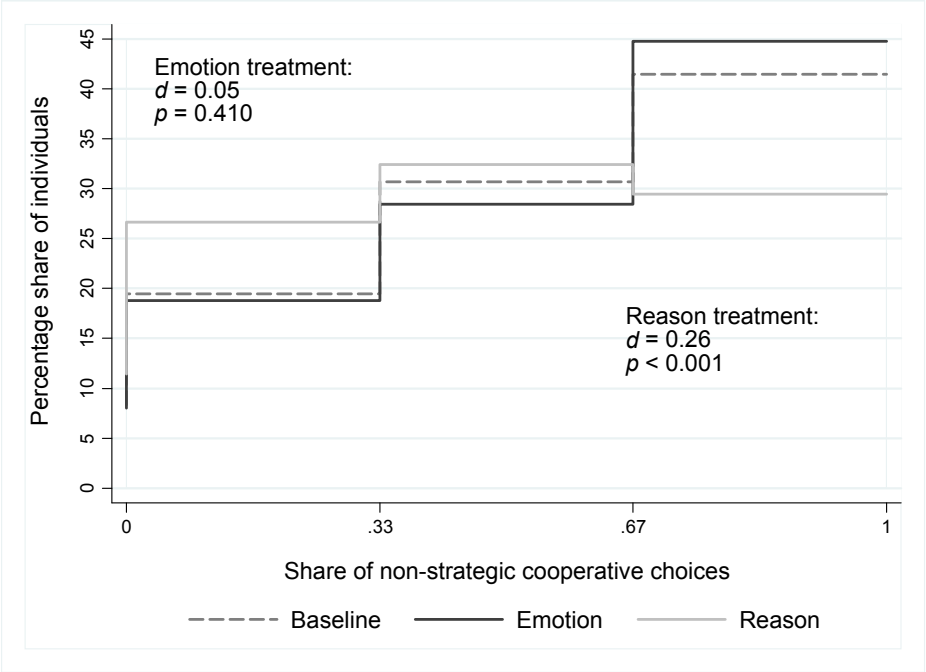


Figure A3. Distribution of cooperation rates by primary trait in baseline treatment ($n_1 = 215$, $n_2 = 397$)

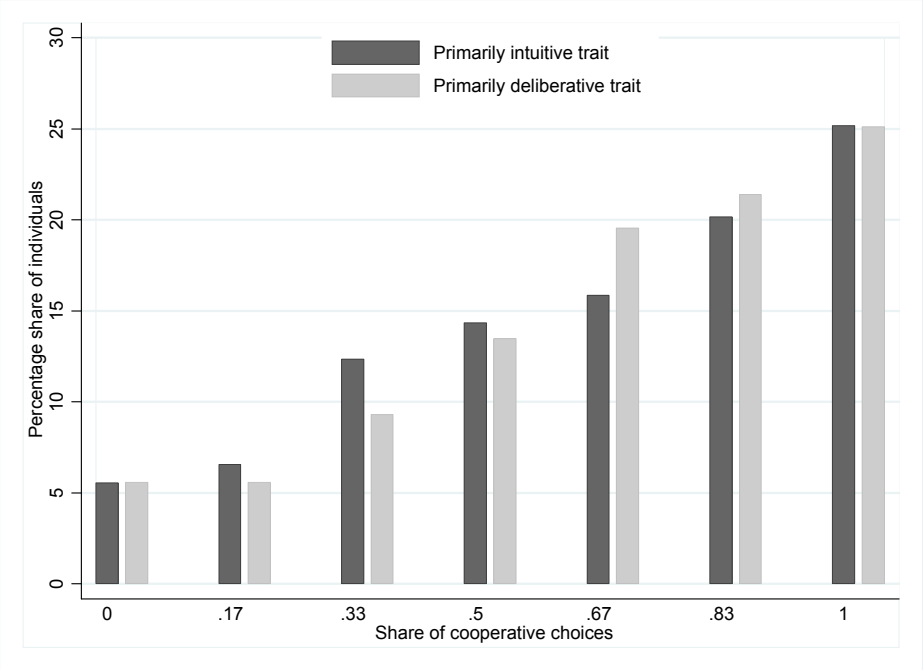
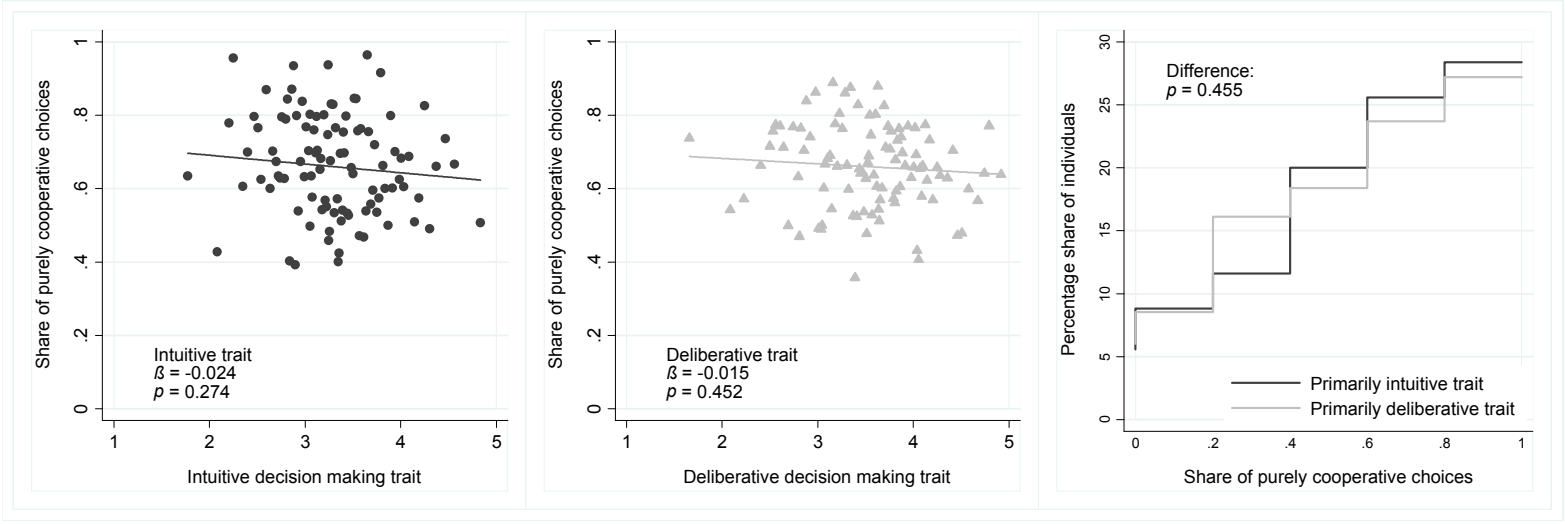
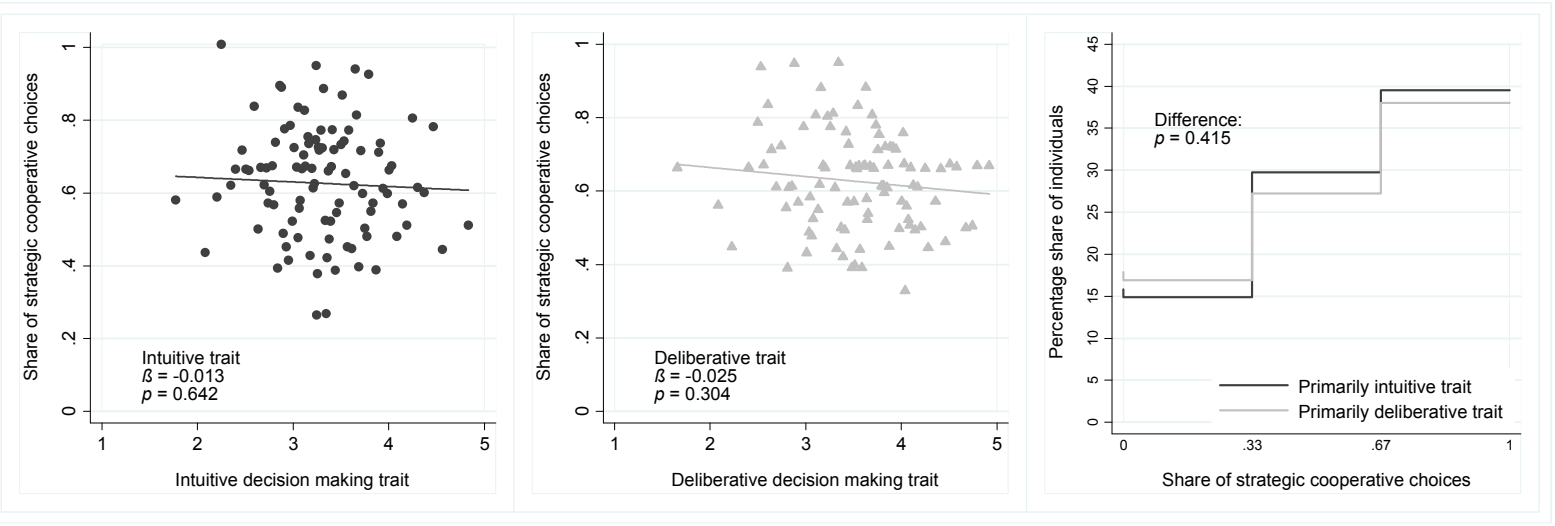


Figure A4. Cooperation rates across traits in baseline treatment with different subsets of games ($n = 612$)

a. "Pure" cooperation (excl. *Trust*)



b. Strategic decisions (incl. *PDG*, *PGG* and *Trust*)



c. Non-strategic decisions (incl. *Trustworthiness*, *DG* and *Charity*)

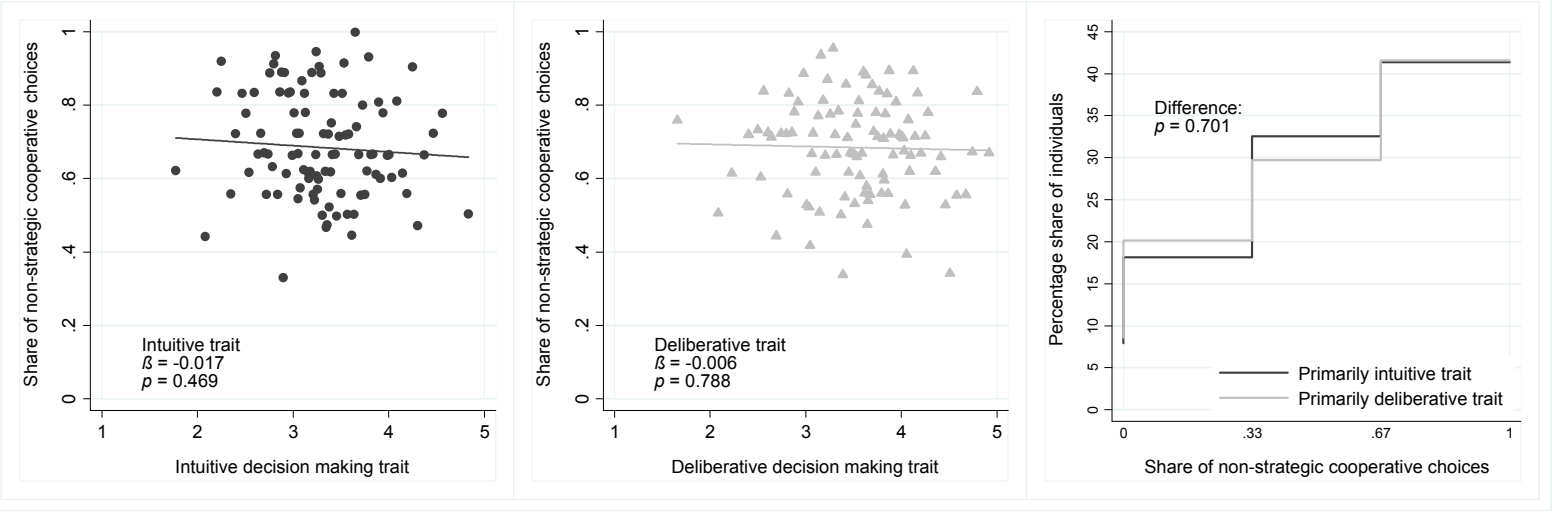
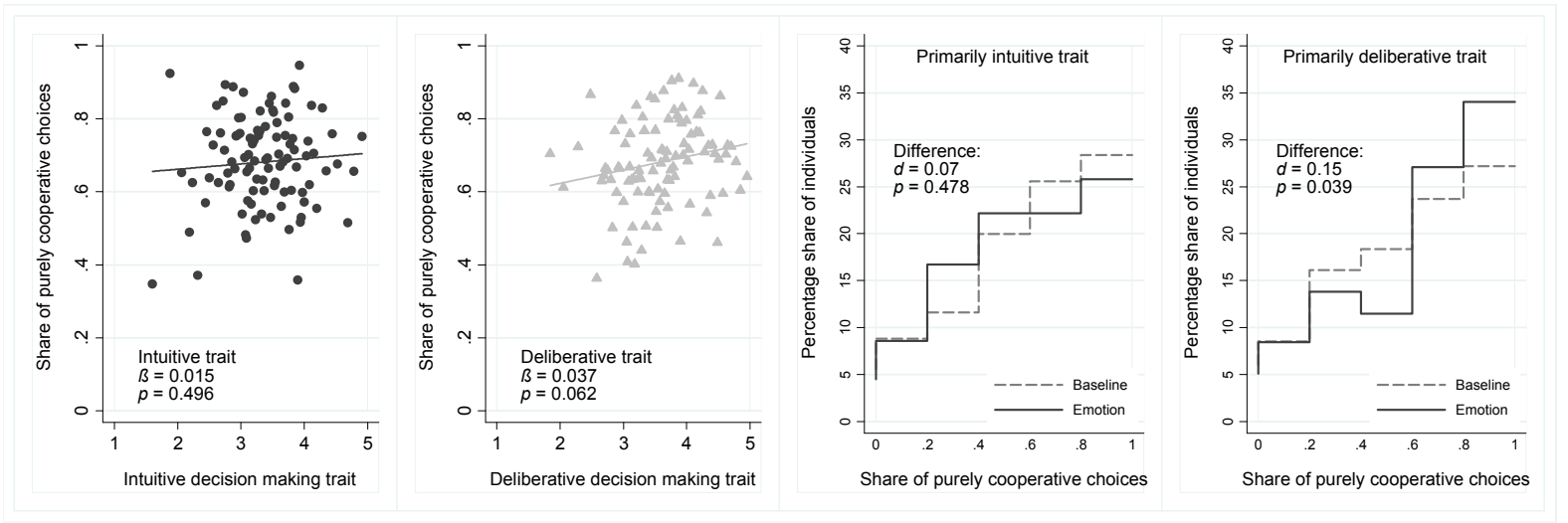


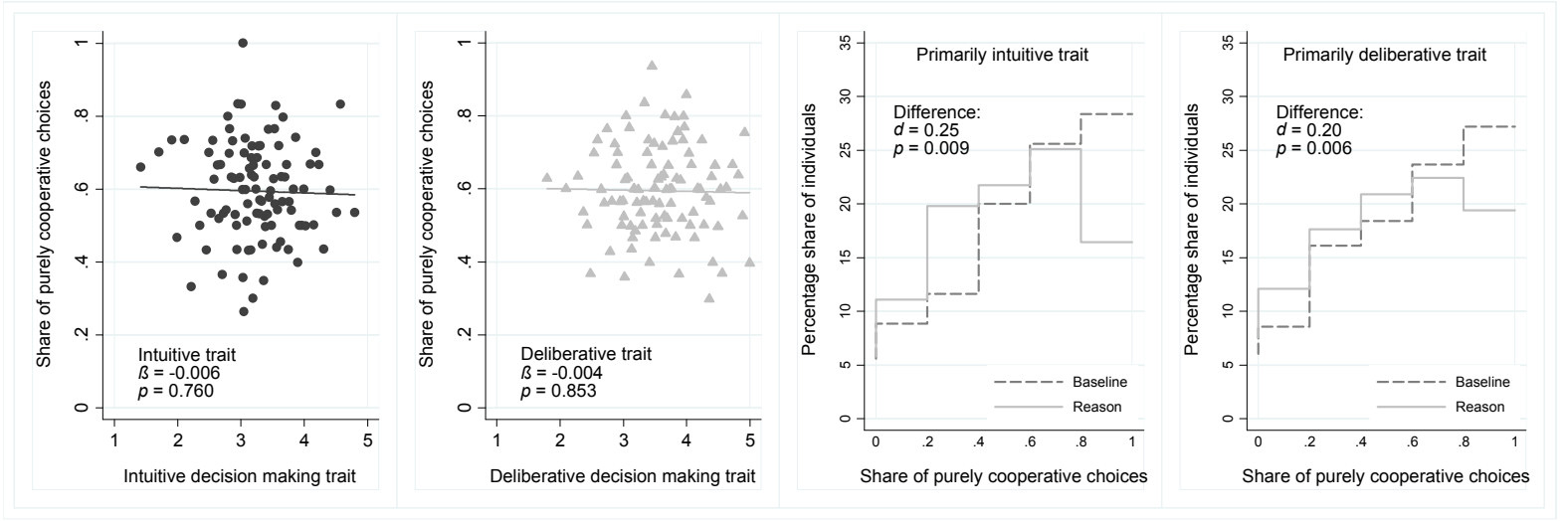
Figure A5. Cooperation rates in different subsets of games and by primary trait (N = 1,828)

a. "Pure" cooperation (excl. *Trust*)

Emotion treatment

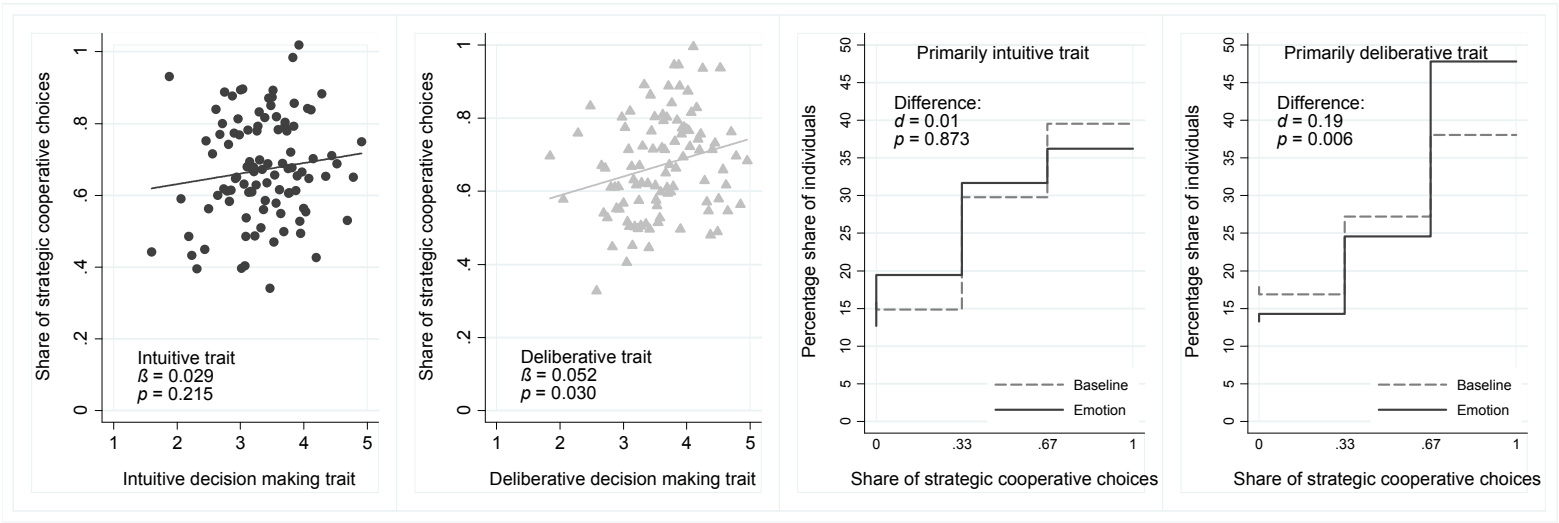


Reason treatment

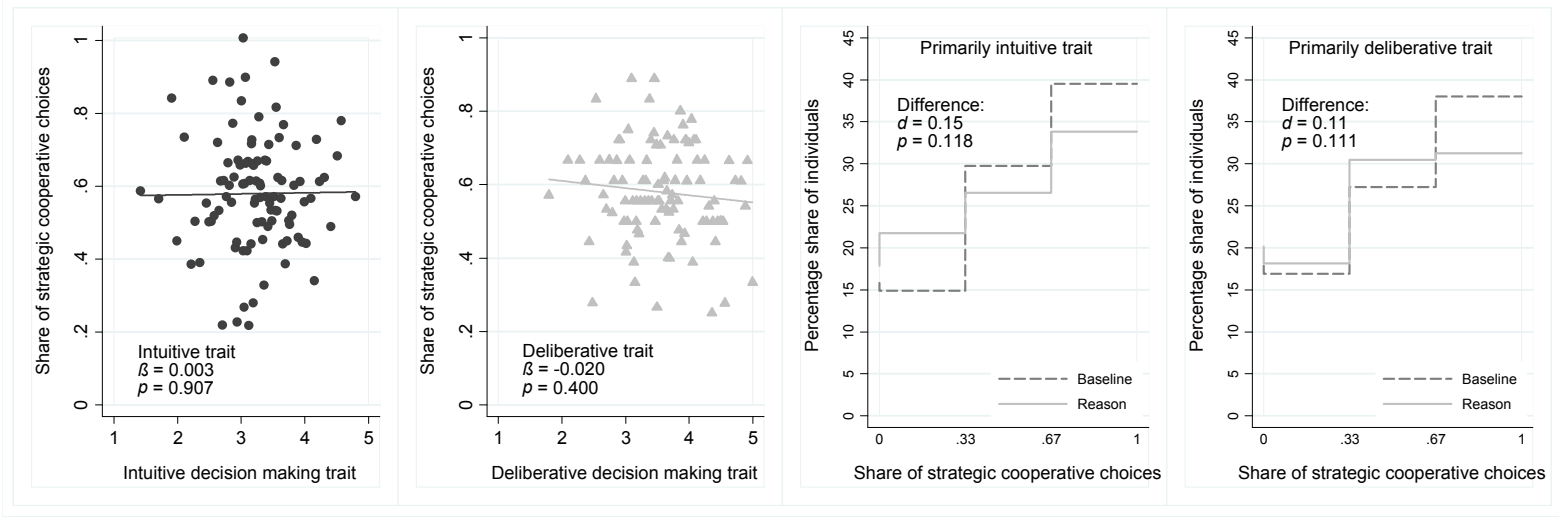


b. Strategic decisions (incl. *PDG*, *PGG* and *Trust*)

Emotion treatment

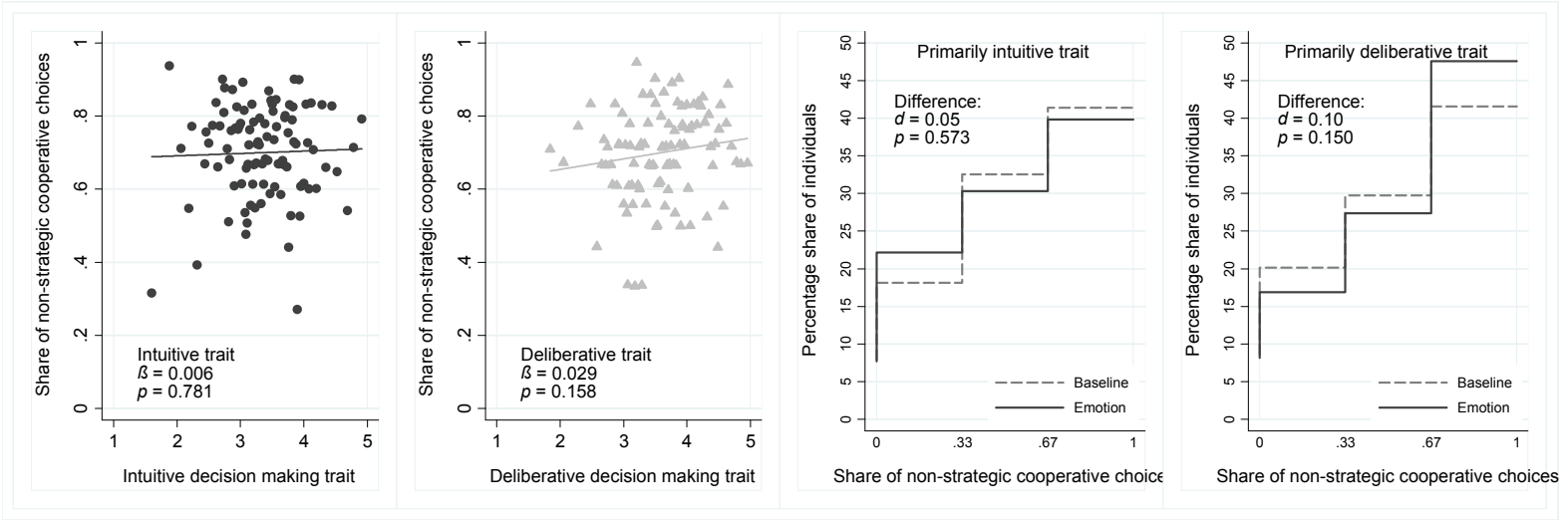


Reason treatment



c. Non-strategic decisions (incl. *Trustworthiness*, *DG* and *Charity*)

Emotion treatment



Reason treatment

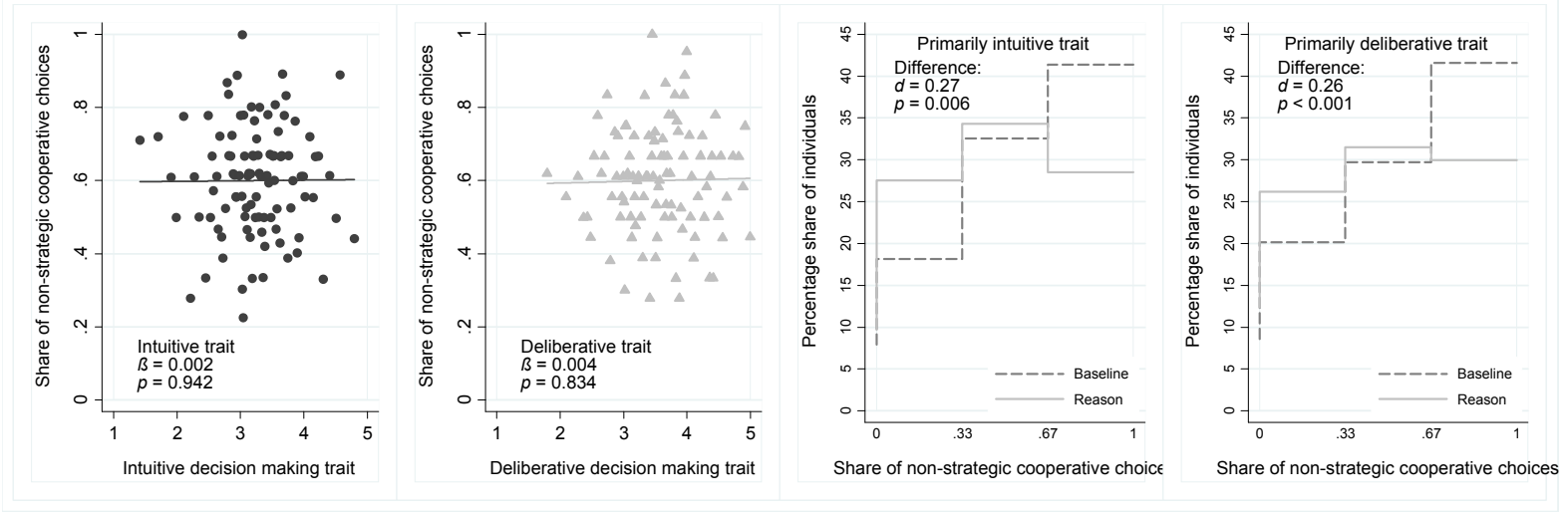


Table A1. Descriptive statistics and representativeness of sample

	Sample		Population		X^2-test/ t-test	
	M	*SD*	*M*	*SD*	X^2/ t	*p*
Age	47.33	47.33	46.31	15.98	2.751	0.006
Female	0.52	0.52	0.49	0.50	4.892	0.027
Primary School	0.08	0.08	0.15	0.27	67.243	< 0.001
High School	0.46	0.46	0.46	0.50	0.058	0.810
Tertiary education	0.46	0.46	0.39	0.50	33.147	< 0.001
Income (log)	11.11	3.81	11.48	2.94	-5.409	< 0.001

Notes: N = 1,828. Sample exclusions due to attrition and missing values are outlined in Appendix C. Population values (except for income) are obtained from Statistics Sweden for the year 2016. The average age and share of women refer to all individuals 20-75 years old (N = 6,840,654). Educational levels are averages for the population ages 20-74 years old (N = 6,642,823). Individual labor income elicited in the survey is compared to the population values of the logarithm of labor and capital income in 2010 (N=6,684,887). The same table is part of the appendix of Gärtner et al. (2019).

Table A2. Cooperation across games

	Baseline treatment	Emotion treatment	Reason treatment	Emotion vs. Reason	Baseline vs. Emotion	Baseline vs. Reason
PDG	0.652	0.714	0.613	0.001	0.117	0.927
PGG	0.595	0.595	0.561	1.000	1.000	1.000
Trust	0.634	0.704	0.566	<0.001	0.054	0.095
Trustworthiness	0.765	0.797	0.669	<0.001	1.000	0.001
DG	0.618	0.639	0.545	0.005	1.000	0.060
Charity	0.672	0.663	0.586	0.032	1.000	0.012

Notes: N = 1,828. Columns 1-3 report average cooperation rates across treatments. Columns 4-6 report p-values of *Chi-squared* tests, Bonferroni adjusted for six tests. All variables are binary. *PDG* is an indicator for the choice to cooperate in the simultaneous prisoner's dilemma game. *PGG* is an indicator for the choice to cooperate in a 4-player public goods game. *Trust* is an indicator for the choice to cooperate as first player in a sequential prisoner's dilemma game. *Trustworthiness* is an indicator for the choice to cooperate as second player in a sequential prisoner's dilemma game. *DG* is an indicator for the dictator choice to at least divide the pie in the dictator game equally. *Charity* is an indicator for the choice to divide the pie at least equally between the player and a charity for at least one of two charities.

Table A3. Correlations across games and treatments

	PDG	PGG	Trust	Trust-worthiness	DG	Charity
Baseline treatment						
PDG	1					
PGG	0.312***	1				
Trust	0.485***	0.319***	1			
Trustworthiness	0.355***	0.248***	0.386***	1		
DG	0.258***	0.357***	0.254***	0.221***	1	
Charity	0.154***	0.259***	0.191***	0.129**	0.352***	1
All choices	0.285					
Pure cooperation	0.294					
Strategic choices	0.305					
Non-strategic choices	0.266					
Emotion treatment						
PDG	1					
PGG	0.303***	1				
Trust	0.493***	0.289***	1			
Trustworthiness	0.365***	0.271***	0.413***	1		
DG	0.239***	0.370***	0.191***	0.247***	1	
Charity	0.215***	0.264***	0.228***	0.235***	0.321***	1
All choices	0.296					
Pure cooperation	0.291					
Strategic choices	0.313					
Non-strategic choices	0.247					
Reason treatment						
PDG	1					
PGG	0.283***	1				
Trust	0.442***	0.290***	1			
Trustworthiness	0.343***	0.250***	0.435***	1		
DG	0.194***	0.304***	0.219***	0.197***	1	
Charity	0.111*	0.158***	0.119*	0.0801	0.278***	1
All choices	0.247					
Pure cooperation	0.240					
Strategic choices	0.292					
Non-strategic choices	0.205					

Notes: $N = 1{,}828$. The table reports Pearson' correlation coefficients. Stars mark p-values of correlation coefficients with $^{*}\ p < 0.10$, $^{**}\ p < 0.05$, $^{***}\ p < 0.01$ and p-values for comparisons of each pair of games are Bonferroni-adjusted. Grey fields highlight cases in which the correlation coefficient is numerically larger (Emotion treatment) or smaller (Reason treatment) than in the Baseline treatment. *PDG* is an indicator for the choice to cooperate in the simultaneous prisoner's dilemma game. *PGG* is an indicator for the choice to cooperate in a 4-player public goods game. *Trust* is an indicator for the choice to cooperate as first player in a sequential prisoner's dilemma game. *Trustworthiness* is an indicator for the choice to cooperate as second player in a sequential prisoner's dilemma game. *DG* is an indicator for the dictator choice to at least divide the pie in the dictator game equally. *Charity* is an indicator for the choice to divide the pie at least equally between the player and a charity for at least one of two charities. *Pure cooperation* is the average choice over all choices, excl. *Trust*. *Strategic choices* is the average over *PDG*, *PGG* and *Trust*. *Non-strategic choices* is the average over *Trustworthiness*, *DG* and *Charity*.

Table A4. Cooperation across games and traits in baseline treatment

	Correlation with cooperation rate		Cooperation rate across primary traits		
	Intuition scale	Deliberation scale	Primarily intuitive	Primarily deliberative	Intuitive vs. deliberative
PDG	0.007	-0.016	0.679	0.637	1.000
PGG	-0.075	-0.041	0.609	0.587	1.000
Trust	0.030	-0.017	0.642	0.630	1.000
Trustworthiness	-0.050	0.044	0.730	0.783	0.834
DG	0.008	-0.056	0.670	0.589	0.305
Charity	-0.010	-0.005	0.674	0.670	1.000

Notes: Sample size is $n = 612$. Columns 1-2 report the correlation coefficients of OLS regressions of the cooperation rate on the linear traits, none of which is significantly different from zero after Bonferroni adjustment for six tests. Columns 3-4 report average cooperation rates across primary decision-making trait. Column 5 reports p-values of $\chi 2$-tests, Bonferroni adjusted for six tests. All cooperation variables are binary. *PDG* is an indicator for the choice to cooperate in the simultaneous prisoner's dilemma game. *PGG* is an indicator for the choice to cooperate in a 4-player public goods game. *Trust* is an indicator for the choice to cooperate as first player in a sequential prisoner's dilemma game. *Trustworthiness* is an indicator for the choice to cooperate as second player in a sequential prisoner's dilemma game. *DG* is an indicator for the dictator choice to at least divide the pie in the dictator game equally. *Charity* is an indicator for the choice to divide the pie at least equally between the player and a charity for at least one of two charities.

Table A5. Cooperation and decision-making traits

OLS regressions. Dependent variable: Average cooperation rate.

	Baseline treatment				Emotion treatment				Reason treatment			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Intuition scale	-0.015	0.000			0.018	0.012			0.002	0.003		
	(0.022)	(0.022)			(0.021)	(0.022)			(0.021)	(0.021)		
Deliberation scale	-0.015	-0.026			0.040**	0.034*			-0.008	-0.010		
	(0.019)	(0.019)			(0.019)	(0.020)			(0.019)	(0.019)		
Primarily intuitive			0.018	0.037			-0.046*	-0.044*			0.010	0.013
			(0.025)	(0.026)			(0.024)	(0.025)			(0.025)	(0.026)
Female		0.035		0.034		0.046*		0.054**		0.023		0.022
		(0.026)		(0.026)		(0.024)		(0.024)		(0.025)		(0.025)
Age		0.000		0.000		0.001*		0.002**		0.001		0.001
		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)
High School		0.072		0.076		0.040		0.038		0.152***		0.152***
		(0.050)		(0.049)		(0.045)		(0.045)		(0.046)		(0.046)
Tertiary education		0.156***		0.161***		0.060		0.058		0.146***		0.146***
		(0.050)		(0.049)		(0.046)		(0.046)		(0.048)		(0.048)
Income Q2		-0.019		-0.022		-0.033		-0.026		0.092**		0.093**
		(0.039)		(0.039)		(0.039)		(0.039)		(0.041)		(0.041)
Income Q3		-0.021		-0.021		-0.011		-0.011		0.091**		0.091**
		(0.039)		(0.039)		(0.040)		(0.040)		(0.042)		(0.042)
Income Q4		0.005		0.002		0.028		0.033		0.105**		0.105**
		(0.038)		(0.038)		(0.039)		(0.038)		(0.042)		(0.042)
Income Q5		0.005		0.003		0.038		0.040		0.101**		0.100**
		(0.040)		(0.039)		(0.040)		(0.040)		(0.046)		(0.046)
Constant	0.758***	0.605***	0.649***	0.505***	0.481***	0.378***	0.702***	0.547***	0.610***	0.349***	0.586***	0.318***
	(0.095)	(0.118)	(0.015)	(0.063)	(0.092)	(0.107)	(0.015)	(0.061)	(0.090)	(0.106)	(0.015)	(0.063)
Observations	612	612	612	612	612	612	612	612	604	604	604	604
Adjusted R-squared	-0.001	0.019	-0.001	0.021	0.007	0.017	0.004	0.017	-0.003	0.020	-0.001	0.022

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. *Female* is an indicator of gender. *Age* is a linear measure of age. Educational levels *High School* and *Tertiary education* indicate the individual's highest level of education, while the reference is an indicator for Primary Education. *Income* indicators are constructed according to quintiles of the sample.

Table A6. Correlations across games and primary trait in baseline treatment

	PDG	PGG	Trust	Trust-worthiness	DG	Charity
Primarily intuitive						
PDG	1					
PGG	0.328***	1				
Trust	0.463***	0.277***	1			
Trustworthiness	0.345***	0.308***	0.377***	1		
DG	0.216**	0.370***	0.177	0.219**	1	
Charity	0.139	0.257***	0.185*	0.0697	0.335***	1
All choices	0.271					
Pure cooperation	0.275					
Strategic choices	0.327					
Non-strategic choices	0.232					
Primarily deliberative						
PDG	1					
PGG	0.303***	1				
Trust	0.496***	0.342***	1			
Trustworthiness	0.366***	0.217***	0.395***	1		
DG	0.276***	0.350***	0.293***	0.232***	1	
Charity	0.161**	0.260***	0.194***	0.164**	0.362***	1
All choices	0.294					
Pure cooperation	0.304					
Strategic choices	0.296					
Non-strategic choices	0.283					

Notes: Baseline treatment only. Sample size is $n = 612$. Stars mark p-values with $^{*}\ p < 0.10$, $^{**}\ p < 0.05$, $^{***}\ p < 0.01$ and p-values for comparisons of each pair of games are Bonferroni-adjusted. Grey fields mark the *larger* coefficient when comparing across primary traits.

Table A7. Cooperation across games and primary trait

	Baseline treatment	Emotion treatment	Reason treatment	Emotion vs. Reason	Baseline vs. Emotion	Baseline vs. Reason
Primarily intuitive						
PDG	0.679	0.697	0.628	0.793	1.000	1.000
PGG	0.609	0.543	0.541	1.000	0.968	0.937
Trust	0.642	0.674	0.594	0.514	1.000	1.000
Trustworthiness	0.730	0.792	0.657	0.011	0.787	0.616
DG	0.670	0.593	0.531	1.000	0.575	0.022
Charity	0.674	0.638	0.628	1.000	1.000	1.000
Primarily deliberative						
PDG	0.637	0.724	0.605	0.002	0.055	1.000
PGG	0.587	0.624	0.572	0.809	1.000	1.000
Trust	0.630	0.721	0.552	0.000	0.037	0.152
Trustworthiness	0.783	0.801	0.675	0.000	1.000	0.004
DG	0.589	0.665	0.552	0.007	0.170	1.000
Charity	0.670	0.678	0.564	0.006	1.000	0.013

Table A8. Treatment effects by primary decision-making trait

OLS regressions. Dependent variable: Average cooperation rate.

	Effect of emotion treatment						Effect of reason treatment					
	Prim. intuitive		Prim. deliberative		Difference		Prim. intuitive		Prim. deliberative		Difference	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Emotion	-0.011	-0.010	0.053**	0.054**	0.053**	0.047						
	(0.028)	(0.027)	(0.022)	(0.022)	(0.022)	(0.088)						
Primarily intuitive					0.018	-0.042					0.018	0.042
					(0.025)	(0.089)					(0.025)	(0.090)
Emotion X Primarily intuitive					-0.064*	-0.081**						
					(0.035)	(0.036)						
Reason							-0.071**	-0.077***	-0.063***	-0.061***	-0.063***	-0.179**
							(0.028)	(0.029)	(0.022)	(0.022)	(0.022)	(0.089)
Reason X Primarily intuitive											-0.008	-0.027
											(0.036)	(0.037)
Constant	0.667***	0.477***	0.649***	0.532***	0.649***	0.534***	0.667***	0.469***	0.649***	0.430***	0.649***	0.485***
	(0.020)	(0.066)	(0.015)	(0.060)	(0.015)	(0.074)	(0.020)	(0.071)	(0.015)	(0.059)	(0.015)	(0.074)
Controls included	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes
Observations	436	436	788	788	1,224	1,224	422	422	794	794	1,216	1,216
Adjusted R-squared	-0.002	0.016	0.006	0.020	0.003	0.016	0.012	0.035	0.009	0.026	0.010	0.032

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. The dependent variable is the average cooperation rate in the six cooperation decisions. Regressions (1)-(2) and (7)-(8) look only at the subsample of individuals with primarily intuitive trait. Regressions (3)-(4) and (8)-(10) look only at the subsample of individuals with primarily deliberative trait. Control variables include an indicator for female, age, indicators for education and income quintiles as levels (all regressions with controls), as interactions with trait and treatment indicators (regressions 5-6 and 11-12).

Table A9. Correlations across games and primary trait in emotion treatment

	PDG	PGG	Trust	Trust-worthiness	DG	Charity
Primarily intuitive						
PDG	1					
PGG	0.205**	1				
Trust	0.466***	0.176	1			
Trustworthiness	0.317***	0.223**	0.357***	1		
DG	0.155	0.330***	0.0526	0.210**	1	
Charity	0.138	0.254***	0.139	0.217**	0.257***	1
All choices	0.233					
Pure cooperation	0.217					
Strategic choices	0.248					
Non-strategic choices	0.150					
Primarily deliberative						
PDG	1					
PGG	0.359***	1				
Trust	0.509***	0.354***	1			
Trustworthiness	0.393***	0.300***	0.446***	1		
DG	0.289***	0.389***	0.272***	0.269***	1	
Charity	0.259***	0.267***	0.279***	0.245***	0.357***	1
All choices	0.332					
Pure cooperation	0.333					
Strategic choices	0.351					
Non-strategic choices	0.303					

Notes: Emotion treatment only. Sample size is $n = 612$. Stars mark p-values with * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ and p-values for comparisons of each pair of games are Bonferroni-adjusted. Grey fields mark the *larger* coefficient when comparing with the baseline treatment (Table A5).

Table A10. Correlations across games and primary trait in reason treatment

	PDG	PGG	Trust	Trust-worthiness	DG	Charity
Primarily intuitive						
PDG	1					
PGG	0.254***	1				
Trust	0.483***	0.285***	1			
Trustworthiness	0.349***	0.172	0.356***	1		
DG	0.0985	0.281***	0.210**	0.158	1	
Charity	0.0281	0.234**	0.0764	0.0335	0.239***	1
All choices	0.217					
Pure cooperation	0.219					
Strategic choices	0.258					
Non-strategic choices	0.175					
Primarily deliberative						
PDG	1					
PGG	0.300***	1				
Trust	0.421***	0.295***	1			
Trustworthiness	0.341***	0.291***	0.478***	1		
DG	0.245***	0.315***	0.226***	0.218***	1	
Charity	0.152**	0.122	0.137*	0.106	0.301***	1
All choices	0.263					
Pure cooperation	0.251					
Strategic choices	0.310					
Non-strategic choices	0.221					

Notes: Reason treatment only. Sample size is $n = 604$. Stars mark p-values with * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ and p-values for comparisons of each pair of games are Bonferroni-adjusted. Grey fields mark the *smaller* coefficient when comparing with the baseline treatment (Table A5).

Table A11. Linear measures of traits and socioeconomic characteristics

OLS regressions. Dependent variables: Decision-making trait score.

	Intuition scale				Deliberation scale			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female	0.192***			0.202***	-0.076**			-0.077**
	(0.028)			(0.028)	(0.030)			(0.030)
Age		0.004***		0.004***		-0.002**		-0.003***
		(0.001)		(0.001)		(0.001)		(0.001)
High School			-0.175***	-0.147***			0.136**	0.116*
			(0.058)	(0.056)			(0.063)	(0.064)
Tertiary education			-0.331***	-0.312***			0.325***	0.305***
			(0.058)	(0.057)			(0.063)	(0.065)
Income Q2				0.064				0.074
				(0.044)				(0.050)
Income Q3				0.034				0.033
				(0.043)				(0.047)
Income Q4				0.089**				0.034
				(0.045)				(0.050)
Income Q5				0.029				0.087*
				(0.048)				(0.050)
Constant	2.792***	2.703***	3.060***	2.659***	3.161***	3.234***	2.856***	2.946***
	(0.089)	(0.096)	(0.102)	(0.110)	(0.097)	(0.102)	(0.119)	(0.126)
Observations	1,828	1,828	1,828	1,828	1,828	1,828	1,828	1,828
Adjusted R-squared	0.037	0.024	0.039	0.077	0.015	0.015	0.040	0.046

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. All regressions control for the respective other, linear trait measure. The dependent variable in regressions (1)-(4) is the linear measure of the intuitive trait. The dependent variable in regressions (5)-(8) is the linear measure of the deliberative trait. *Female* is an indicator of gender. *Age* is a linear measure of age. Educational levels *High School* and *Tertiary education* indicate the individual's highest level of education, while the reference is an indicator for Primary Education. *Income* indicators are constructed according to quintiles of the sample.

Appendix B – Robustness: Proven understanding of games

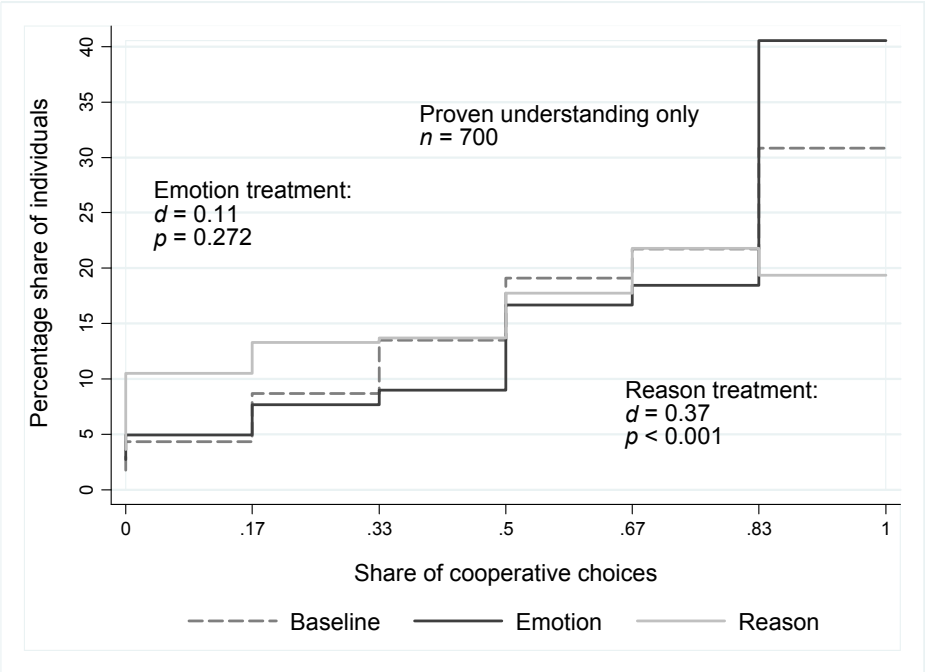
A recent literature highlights potential issues of misunderstanding of cooperation games in experiments (Burton-Chellew et al. 2016, Isler et al. 2018). We measured understanding of the PDG and the PGG in two control questions, respectively, which were elicited after each game and were not incentivized. Therefore, our measure of understanding is likely to provide a lower bound of how well subjects understand cooperation games in survey experiments and may pick up other relevant factors, such as motivation and attention. We find that 46.50 percent of subjects failed to give the correct answer to at least one of the control questions for the PDG and 41.90 percent of subjects failed to give the correct answer to at least one of the control questions for the PGG (61.71 percent of subjects fail in at least one of the games). Treatments had no significant effect on understanding, except in the PGG, where inducing reason, rather than emotion, increases understanding rates (55.23 percent vs. 60.43 percent, $X^2 = 3.372$, $p = 0.066$). The exclusion of subjects due to understanding may lead to selection bias and the mis-estimation of treatment effect sizes, while not accounting for understanding may lead to omitted variable bias. Here, we test the robustness of results to excluding subjects that did not prove understanding.

Figure B1 illustrates the main treatment effects when excluding subjects that did not prove their understanding of the PDG or the PGG, or both. Also when controlling for understanding, we find that subjects who were instructed to rely on their emotions rather than their reason were more likely to cooperate across games and the overall effect size was larger (0.62 vs. 0.75, $t = 4.711$, $p < 0.001$, $d = 0.43$). The effect of the emotion treatment, compared to the baseline treatment, was of similar size as in the full sample (0.72 vs. 0.75, $t = -1.101$, $p = 0.272$, $d = 0.11$). The effect of the reason treatment was larger than in the full sample (0.72 vs. 0.62, $t = 3.792$, $p < 0.001$, $d = 0.37$). Table B1 lists the treatment effects across games and different exclusions for understanding. In particular, it shows that the results for the prisoner's dilemma game with proven understanding replicated the findings of Levine et al. (2019; Experiment 3): We find a positive effect of the emotion/reason-distinction in the PDG (77.54 percent vs. 64.24 percent, $X^2 = 14.013$, $p < 0.001$, $d = 0.28$, $n = 978$), which was primarily driven by a positive effect of the emotion treatment compared to the baseline treatment (68.42 percent vs. 77.54 percent, $X^2 = 6.831$, $p = 0.009$).

Also for the subsample of individuals with proven understanding, the choices across games were more correlated in the emotion treatment than the reason treatment ($\rho = 0.312$ vs. $\rho =$

0.243, $z = 1.963$, $p = 0.050$), but only about 38.7 percent of the change is accounted for by the effect of the reason treatment when comparing to the baseline treatment ($\rho = 0.217$).

Figure B1. Treatment effects on cooperation when understanding proven



Notes: The figure shows the frequency distribution of cooperation rates across treatments. The share of cooperative choices includes choices in the prisoner's dilemma game, public goods game, trust game (trust and trustworthiness), dictator game and charitable giving. The difference reported are based on two-sided *t*-tests.

Table B1. Cooperation across games when understanding proven

	Baseline treatment	Emotion treatment	Reason treatment	Emotion vs. Reason	Baseline vs. Emotion	Baseline vs. Reason
Understanding in PDG and PGG (n = 700)						
PDG	0.683	0.752	0.613	0.007	0.602	0.667
PGG	0.696	0.676	0.617	1.000	1.000	0.423
Trust	0.678	0.779	0.593	0.000	0.095	0.315
Trustworthiness	0.852	0.860	0.661	0.000	1.000	0.000
DG	0.683	0.694	0.613	0.399	1.000	0.667
Charity	0.735	0.734	0.645	0.225	1.000	0.207
Understanding in PDG (n = 978)						
PDG	0.684	0.775	0.642	0.001	0.054	1.000
PGG	0.681	0.683	0.618	0.490	1.000	0.552
Trust	0.663	0.766	0.597	0.000	0.021	0.497
Trustworthiness	0.827	0.865	0.679	0.000	1.000	0.000
DG	0.690	0.689	0.609	0.190	1.000	0.177
Charity	0.724	0.745	0.630	0.010	1.000	0.061
Understanding in PGG (n = 1,062)						
PDG	0.643	0.728	0.586	0.000	0.100	0.685
PGG	0.646	0.645	0.592	0.883	1.000	0.789
Trust	0.671	0.743	0.578	0.000	0.234	0.058
Trustworthiness	0.813	0.846	0.663	0.000	1.000	0.000
DG	0.655	0.689	0.586	0.027	1.000	0.350
Charity	0.705	0.710	0.616	0.053	1.000	0.073

Notes: Columns 1-3 report average cooperation rates across treatments. Columns 4-6 report *p*-values of *Chi-squared* tests, Bonferroni adjusted for six tests. All variables are binary. *PDG* is an indicator for the choice to cooperate in the simultaneous prisoner's dilemma game. *PGG* is an indicator for the choice to cooperate in a 4-player public goods game. *Trust* is an indicator for the choice to cooperate as first player in a sequential prisoner's dilemma game. *Trustworthiness* is an indicator for the choice to cooperate as second player in a sequential prisoner's dilemma game. *DG* is an indicator for the dictator choice to at least divide the pie in the dictator game equally. *Charity* is an indicator for the choice to divide the pie at least equally between the player and a charity for at least one of two charities.

Figure B2 shows the differences in cooperation rates in the baseline treatment across traits for individuals with proven understanding. As in the main analysis, we find no significant effects of decision-making traits on cooperation in the baseline treatment. As in the main analysis, the correlation of choices across games was not significantly different across primarily intuitive and primarily deliberative decision makers on average (ρ = 0.169 vs. ρ = 0.255, z = 1.224, p = 0.221).

Figure B2. Cooperation across decision-making traits in the Baseline treatment with proven understanding (n = 230)

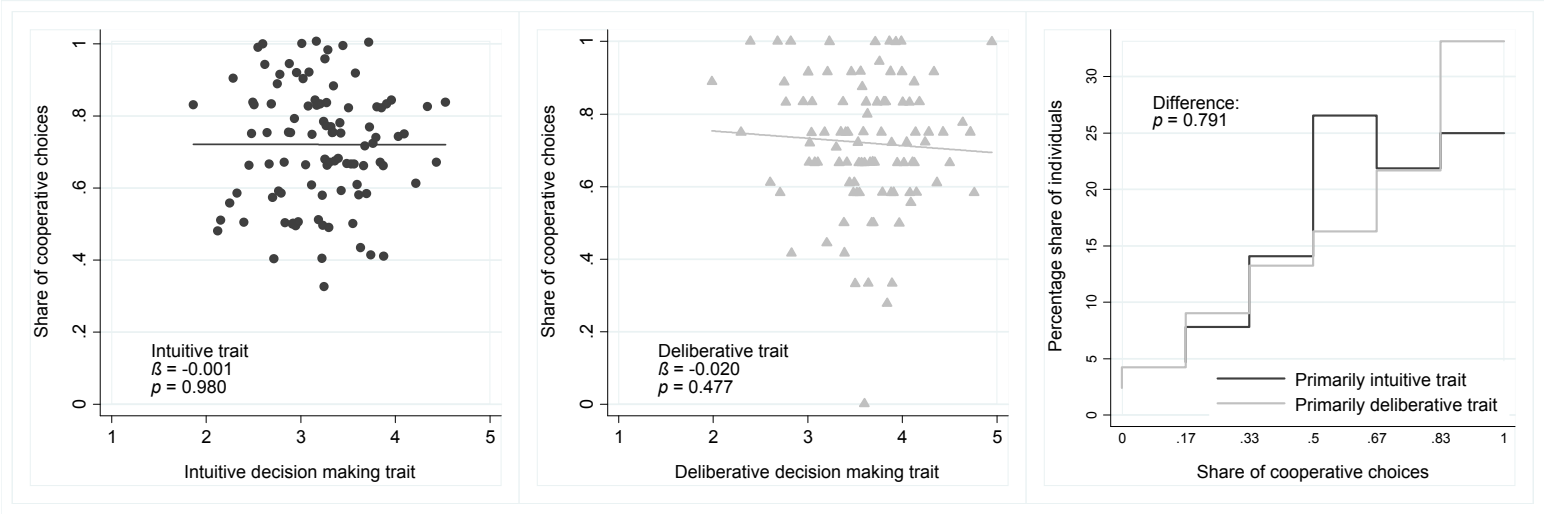
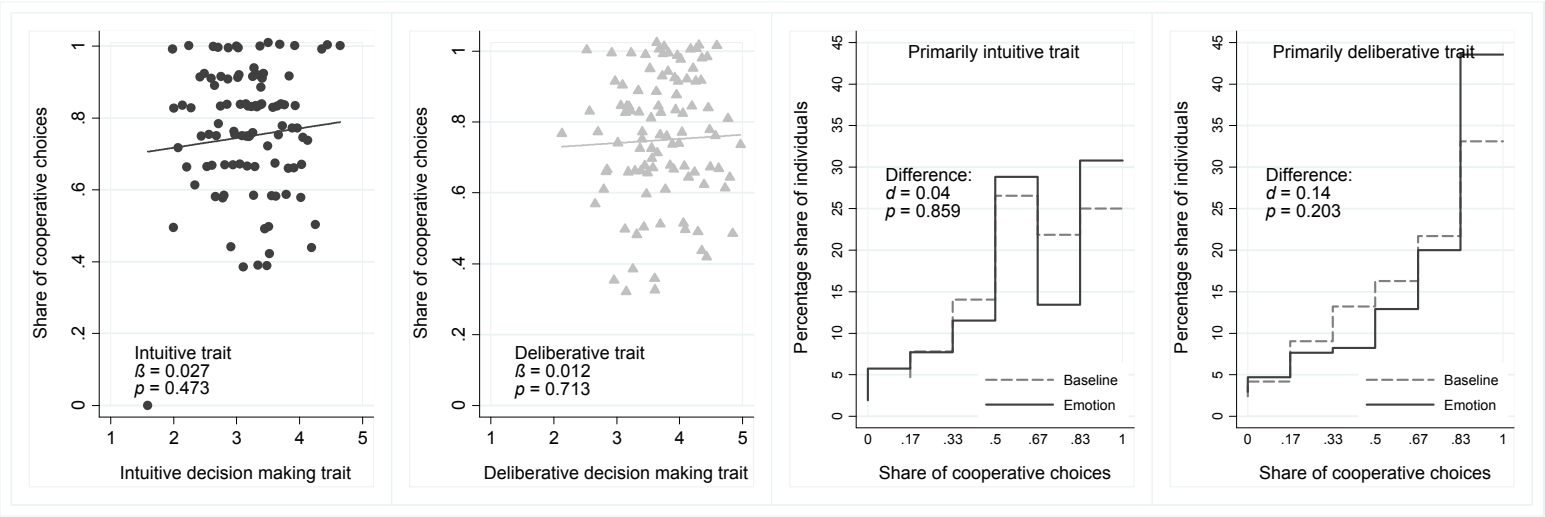


Figure B3 shows the interaction effects of states and traits when excluding subjects without proven understanding. As in the main analysis, we find that the emotion treatment only affected individuals with a primarily deliberative trait; effect sizes here were similar to the main analysis (difference-in-difference: p = 0.403). The reason treatment affected the cooperation rates of individuals with either trait negatively with somewhat larger effect sizes than in the main analysis (difference-in-difference: p = 0.884).

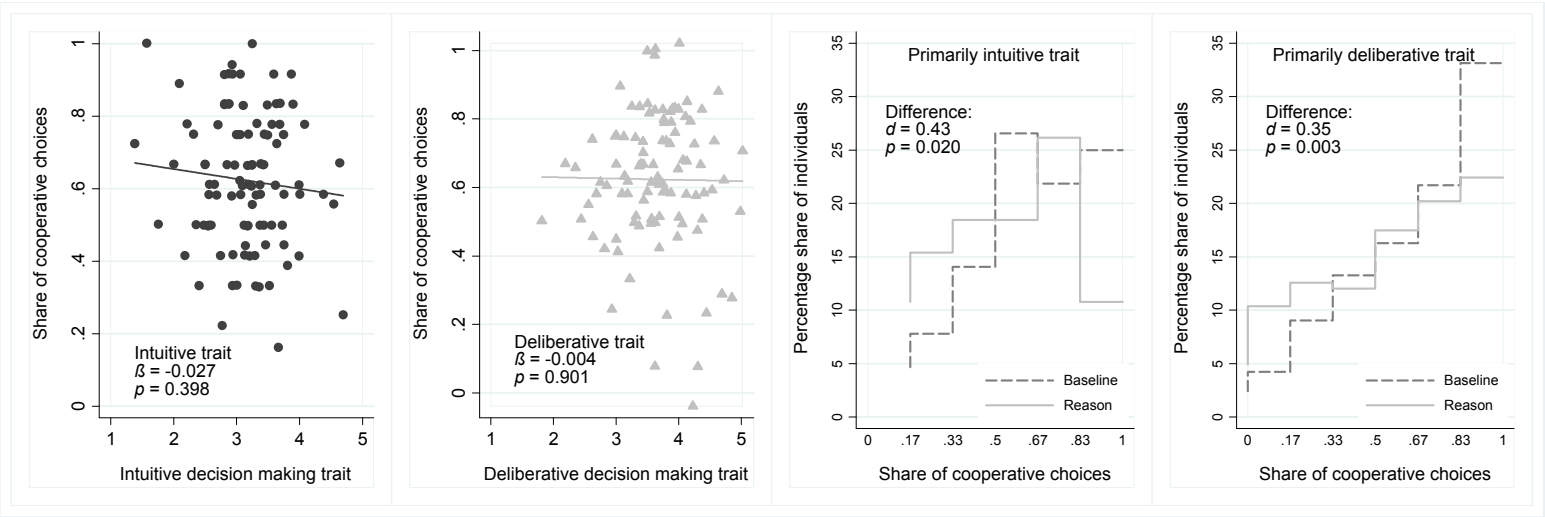
As in the main analysis, we find no significant effects of the treatments on the correlation of choices among each decision-making type, except for an increase the correlation of choices across games when inducing emotion in deliberative individuals (emotion: del. ρ = 0.255 vs. ρ = 0.338 vs., z = -2.043, p = 0.041; int. ρ = 0.169 vs. ρ = 0.233, z = -0.867, p = 0.386; reason: del. ρ = 0.255 vs. ρ = 0.285, z = -0.746, p = 0.456; int. ρ = 0.169 vs. ρ = 0.177, z = -0.110, p = 0.913).

Figure B3. Interactions effects on cooperative behavior when understanding proven

(a) Emotion treatment (n = 222)



(b) Reason treatment (n = 248)



Notes: Panels 1 and 2 show scatters over 100 equally sized bins of the trait and regression lines from OLS regressions controlling for the respective other trait. The differences reported in panels 3 and 4 are based on a two-sided t-test.

Finally, Table B2 reports the relation between decision-making traits and socioeconomic characteristics when excluding subjects without proven understanding. We find that the relation between gender, age and education is robust to excluding these subjects. Students in this smaller sample (10.29 percent) were also more likely to exhibit a primarily deliberative decision-making trait than other individuals (81.94 percent vs. 73.25 percent, $\chi^2 = 2.548$, $p = 0.110$).

Table B2. Socioeconomic characteristics across decision-making traits when understanding proven

OLS regressions. Dependent variable: Primarily intuitive trait				
	(1)	(2)	(3)	(4)
Female	0.095***			0.102***
	(0.033)			(0.033)
Age		0.003***		0.004***
		(0.001)		(0.001)
High School			-0.211**	-0.174**
			(0.086)	(0.083)
Tertiary education			-0.336***	-0.308***
			(0.084)	(0.081)
Income Q2				-0.054
				(0.056)
Income Q3				-0.096*
				(0.056)
Income Q4				-0.073
				(0.054)
Income Q5				-0.036
				(0.055)
Constant	0.208***	0.124**	0.526***	0.301***
	(0.022)	(0.050)	(0.081)	(0.099)
Observations	700	700	700	700
Adjusted R-squared	0.010	0.009	0.037	0.060

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. *Female* is an indicator of gender. *Age* is a linear measure of age. Educational levels *High School* and *Tertiary education* indicate the individual's highest level of education, while the reference is an indicator for Primary Education. *Income* indicators are constructed according to quintiles of the sample.

Appendix C – Robustness: Attrition from survey

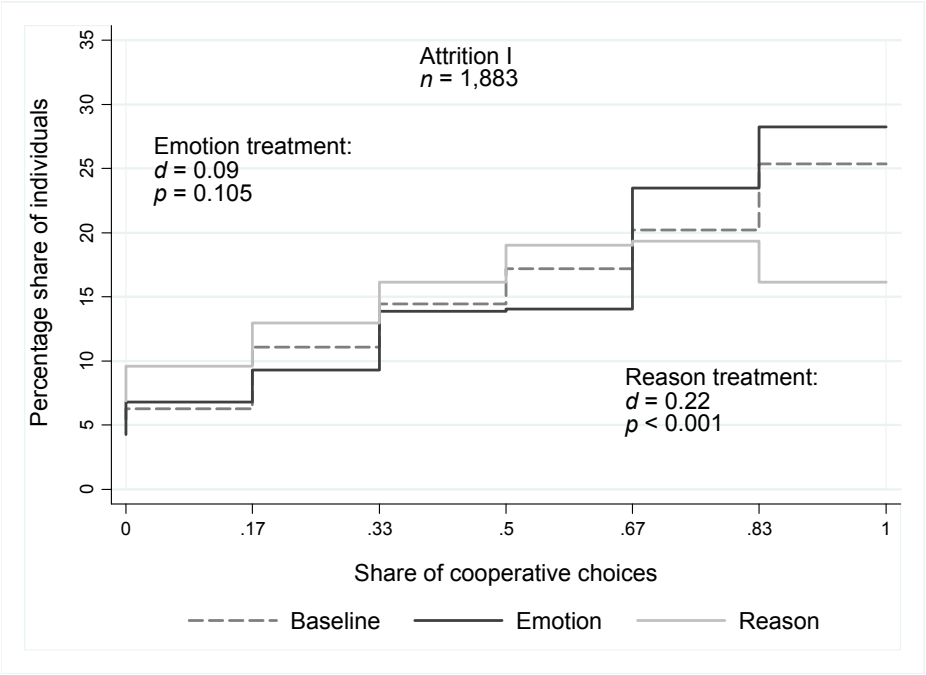
In total, 2,306 individuals clicked on the link to the survey. 474 subjects left the survey before completion, i.e. the total attrition rate was 20.6 percent. 185 subjects (or, 39.03 percent of subjects with incomplete answers) did not start answering the survey questions at all. Thus, we could rule out selective attrition across treatment conditions for these subjects. The remaining 289 subjects (or, 60.97 percent of incomplete answers) were assigned to either first answer the trait elicitation questionnaire (133 subjects) or to make decisions in the games (156 subjects). There was no significant difference in attrition rates across these conditions. 243 subjects (or, 51.27 percent of incomplete answers) started making choices in the games and were assigned to a treatment condition. There was no significant difference in attrition rates across treatments. Finally, four participants were omitted from the main analysis for violating our age restriction (only subjects who were at least 18 years old could participate) or misreporting their age (being older than oldest persons in Sweden). Here we test the robustness of results to including subjects with incomplete information.

Omitting subjects who did not start answering the survey leaves us with the information of a total of 2,121 subjects with complete (1,832 subjects) and incomplete (289 subjects) answers. A majority of incomplete answers contain missing values in the economic decisions (238 subjects, or 82.35 percent), the trait elicitation (153 subjects, or 52.94 percent), or both (134 subjects, or 46.37 percent).

Accordingly, Figure C1 shows that treatment effects remained largely unchanged when accounting for attrition. Table C1 shows the treatment effects for each game, also allowing for data that is incomplete in the subset of economic decisions. The correlation across games was larger in the emotion treatment (Attrition I: $\rho = 0.30$, Attrition II: $\rho = 0.30$) than the reason treatment (Attrition I: $\rho = 0.26$, $p = 0.036$; Attrition II: $\rho = 0.25$, $p = 0.058$) with a majority of the effect being driven by inducing reason (Attrition I: 66.00 percent, Attrition II: 73.76 percent).

Figure C1. Cooperation across treatments including attrition

(a) All subjects who completed economic decisions



(b) All subjects who completed economic decisions and traits questionnaire

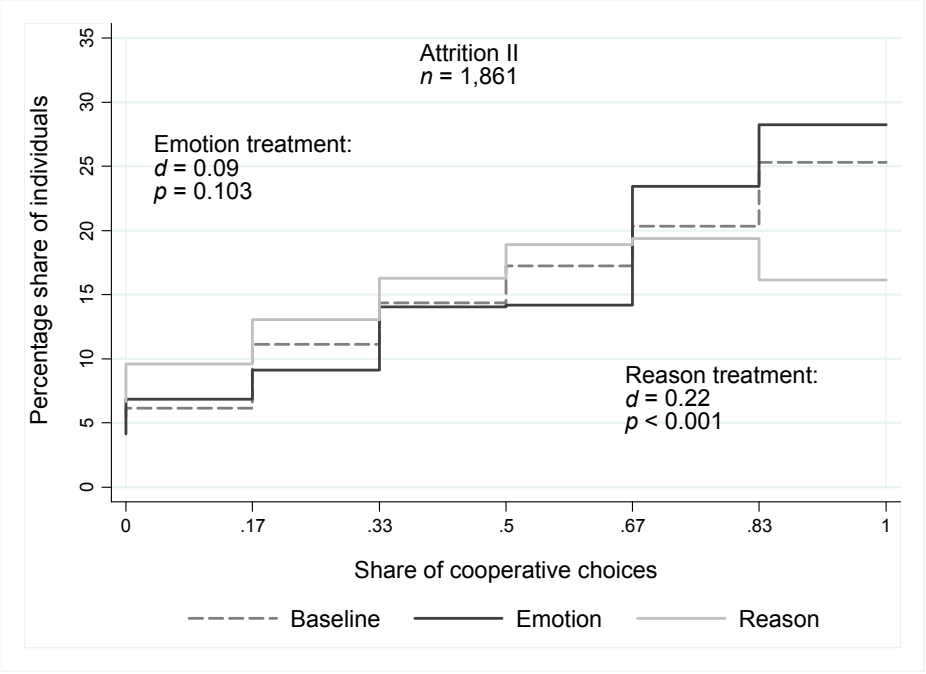


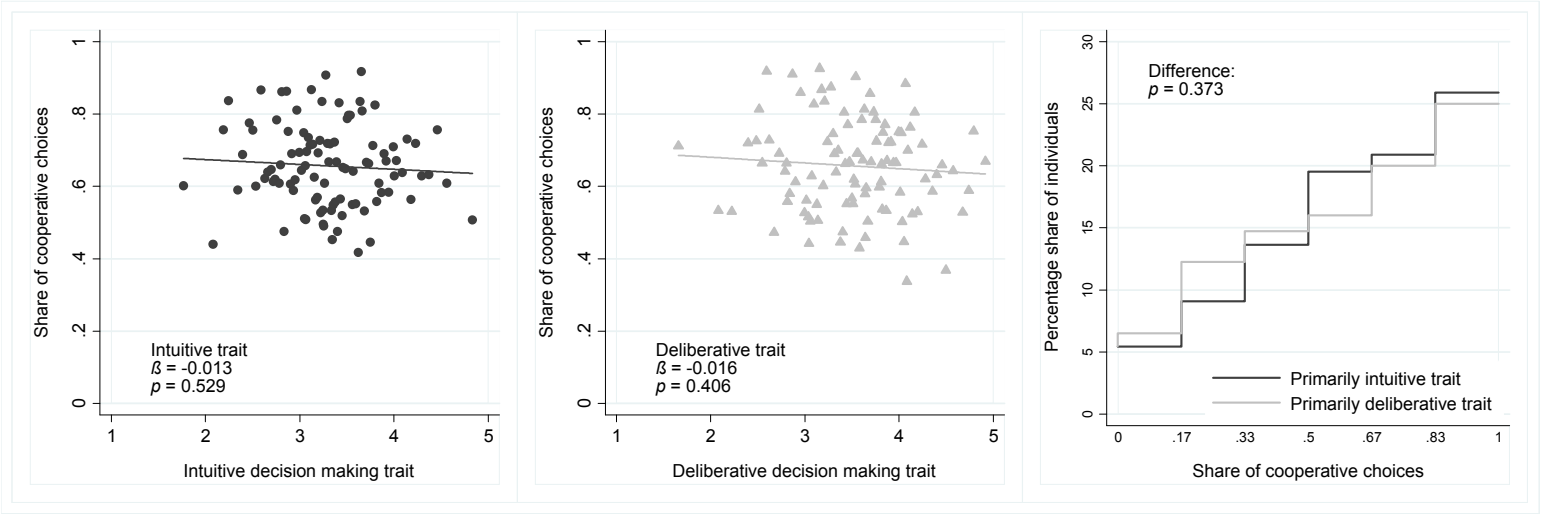
Table C1. Cooperation across games including attrition

	Baseline treatment	Emotion treatment	Reason treatment	Emotion vs. Reason	Baseline vs. Emotion	Baseline vs. Reason
All data (n = 2,121, *unbalanced)*						
PDG	0.650	0.707	0.605	0.009	0.583	0.773
PGG	0.588	0.594	0.559	1.000	1.000	0.737
Trust	0.627	0.694	0.568	0.000	0.215	0.299
Trustworthiness	0.757	0.796	0.665	0.000	1.000	0.000
DG	0.615	0.641	0.543	0.421	1.000	0.742
Charity	0.679	0.660	0.579	0.249	1.000	0.191
Economic decisions completed (n = 1,883)						
PDG	0.652	0.715	0.612	0.001	0.041	1.000
PGG	0.592	0.593	0.562	0.785	1.000	1.000
Trust	0.636	0.699	0.567	0.000	0.021	0.658
Trustworthiness	0.766	0.797	0.666	0.000	0.885	0.000
DG	0.616	0.637	0.543	0.102	1.000	0.137
Charity	0.676	0.661	0.583	0.007	1.000	0.051

Notes: Columns 1-3 report average cooperation rates across treatments. Columns 4-6 report *p*-values of *Chi-squared* tests, Bonferroni adjusted for six tests. All variables are binary. *PDG* is an indicator for the choice to cooperate in the simultaneous prisoner's dilemma game. *PGG* is an indicator for the choice to cooperate in a 4-player public goods game. *Trust* is an indicator for the choice to cooperate as first player in a sequential prisoner's dilemma game. *Trustworthiness* is an indicator for the choice to cooperate as second player in a sequential prisoner's dilemma game. *DG* is an indicator for the dictator choice to at least divide the pie in the dictator game equally. *Charity* is an indicator for the choice to divide the pie at least equally between the player and a charity for at least one of two charities.

Figure C2 shows that also in this sample, there was no significant difference in cooperation behavior across traits (phenotype: int. vs. del.: 0.272 vs. 0.291, $p = 0.539$). Figure C3a shows that also in this sample, primarily deliberative individuals increased their cooperation in the emotion treatment and more than primarily intuitive individuals ($p = 0.039$), while Figure C3b shows that both types decreased cooperation in the reason treatment ($p = 696$). In line with the main results, we find no significant effects of the treatments on the correlation of choices among each decision-making type (emotion: del. $\rho = 0.291$ vs. $\rho = 0.332$, $p = 0.108$; int. $\rho = 0.272$ vs. $\rho = 0.231$, $p = 0.250$; reason: del. $\rho = 0.272$ vs. $\rho = 0.221$, $p = 0.156$, int. $\rho = 0.291$ vs. $\rho = 0.266$, $p = 0.331$).

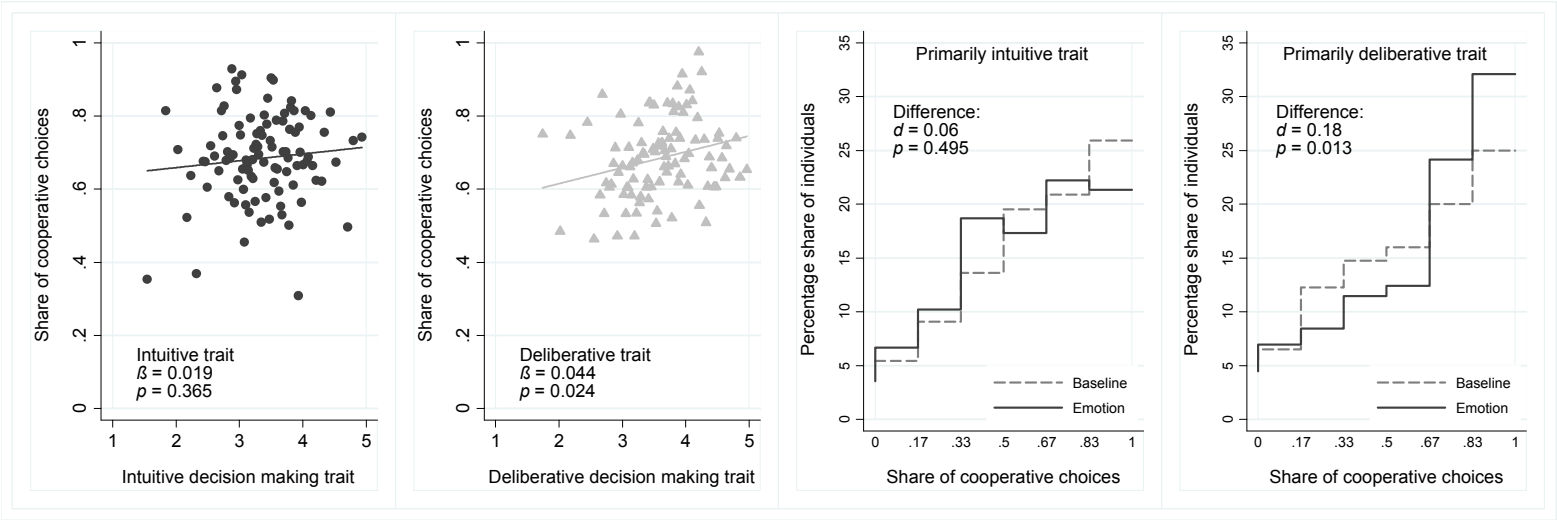
Figure C2. Cooperation across decision-making traits in the Baseline treatment including attrition ($n = 620$)



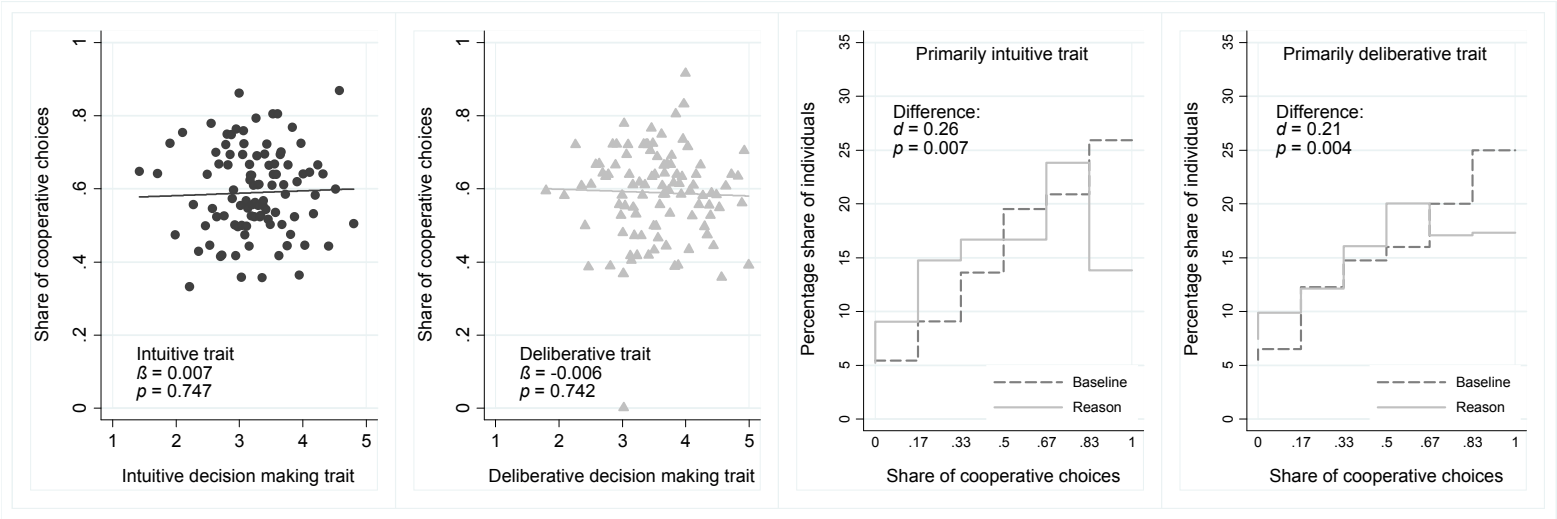
Notes: Panel 1 and 2 show scatters over 100 equally-sized bins of each trait and regression lines from OLS regressions controlling for the respective other trait. The difference reported in panel 3 is based on a two-sided *t*-test.

Figure C3. Interactions effects on cooperative behavior

(a) Emotion treatment (n = 646)



(b) Reason treatment (n = 637)



Notes: Panels 1 and 2 show scatters over 100 equally sized bins of the trait and regression lines from OLS regressions controlling for the respective other trait. The differences reported in panels 3 and 4 are based on a two-sided t-test.

Lastly, Table C2 shows that also the relation between decision-making traits and socio-economic characteristics is robust to including cases of attrition for whom these variables are not missing. Students in this somewhat larger sample (7.52 percent) were also more likely to exhibit a primarily deliberative decision-making trait than other individuals (75.36 percent vs. 64.03 percent, $\chi^2 = 7.189$, $p = 0.007$).

Table C2. Socioeconomic characteristics across decision-making traits including attrition

OLS regressions. Dependent variable: Primarily intuitive trait				
	(1)	(2)	(3)	(4)
Female	0.116***			0.119***
	(0.022)			(0.022)
Age		0.002***		0.003***
		(0.001)		(0.001)
High school			-0.143***	-0.123***
			(0.044)	(0.044)
Tertiary education			-0.270***	-0.255***
			(0.044)	(0.044)
Income Q2				-0.008
				(0.035)
Income Q3				-0.021
				(0.035)
Income Q4				0.020
				(0.035)
Income Q5				-0.015
				(0.036)
Constant	0.291***	0.237***	0.540***	0.342***
	(0.015)	(0.034)	(0.041)	(0.057)
Observations	1,834	1,834	1,834	1,834
Adjusted R-squared	0.014	0.006	0.029	0.048

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. *Female* is an indicator of gender. *Age* is a linear measure of age. Educational levels *High School* and *Tertiary education* indicate the individual's highest level of education, while the reference is an indicator for Primary Education. *Income* indicators are constructed according to quintiles of the sample.

Appendix D – Experimental Instructions

General Instructions

Welcome!

Thank you for participating in our study. The experiment in this study serves research that aims to understand how people make decisions. This research is being conducted by Manja Gärtner at Linköping University. She may be reached at manja.gartner@liu.se for questions or to report a research-related problem.

All decisions throughout this experiment are anonymous. The researchers do not know the identity of the respondents and no other participant will know who you are, nor will you know who other participants are.

This study will take about 20 minutes to complete.

The following experiment consists of several parts. You will be asked to make decisions that involve money and you have the chance to receive an additional payment. You will also be asked to answer questions about yourself.

Throughout the experiment there will be instructions that guide you through each part. Please read the instructions carefully.

Press next to start with the experiment.

Economic Games *(in random order)*

In this part of the experiment we ask you to make a number of decisions involving money. After the experiment, one of your decisions will be chosen at random and you will receive a payment according to that decision. CMA research AB will make sure that you will receive this payment within six weeks after the study ends, on top of the amount that you receive for participating.

Note that, because some of the payments depend also on the decisions of other participants, you will not get to know directly after finishing the survey how much money you will receive. We promise that the information in this survey is truthful. We do not use deception and you will interact with other, real participants.

Treatment *(randomized)*

Before you start this part, we would like you to reflect on how one can make decisions.

Sometimes people make decisions by using reason and relying on their brains. Other times, people make decisions by using emotion and relying on their hearts.

Many people believe that the brain [heart] is the part of our body that is most connected with good decision-making. When we think with our brains [feel with our hearts], rather than feel with our hearts [think with our brains], we make rationally [emotionally] satisfying decisions.

In this part of the experiment, **please make your decisions by relying on your brain [heart],** rather than your heart [brain].

Please press next to start with the first question.

Dictator game

In the following question, we ask you how to allocate 60 SEK between yourself and another participant. For this, you are paired randomly with another participant in this study. After the experiment, one of you is selected at random and that person's decision will determine the extra payments for you and the other participant.

We will make sure that all payments reach the other participant.

Remember to **make your decisions by relying on your brain [heart]**, rather than your heart [brain]. Press next to start to make the decision.

How much of the 60 SEK would you like to give to yourself and how much to another participant in this study?

- To myself: ____
- To other participant: ____

Charity

In each of the following two questions, we ask you how to allocate 60 SEK between yourself and an organization, The Red Cross and unicef. The Red Cross is the world's leading organization in helping people affected by armed conflict and disasters in conflict zones. Unicef defends the rights of children around the world, helping them to survive and develop.

We will make sure that all payments reach the respective organization.

Remember to **make your decisions by relying on your brain [heart]**, rather than your heart [brain]. Press next to start to make the decision.

Press next to start to make the decision.

How much of the 60 SEK would you like to give to yourself and how much to the Red Cross?

- To myself: ____
- To Röda Korset: ____

How much of the 60 SEK would you like to give to yourself and how much to unicef?

- To myself: ____
- To unicef: ____

Public goods game

In the following, you randomly assigned to interact with 3 other participants in this experiment. All of you receive this same set of instructions.

Each person in your group is given 40 SEK for this interaction. You each decide whether to KEEP the 40 SEK for yourself, or to CONTRIBUTE it to the group.

If you CONTRIBUTE, 80 SEK goes into the group's common project, and is then evenly divided among the 4 group members. Thus, for every group member that chooses CONTRIBUTE, each group member receives 20 SEK.

If everyone chooses CONTRIBUTE, everyone's money will double: each of you will earn 80 SEK.

But if everyone else chooses CONTRIBUTE, while you KEEP the 40 SEK, you will earn 100 SEK, while the others will earn only 60 SEK. That is because if you CONTRIBUTE, you only get 20 SEK back.

Thus you personally lose money if you CONTRIBUTE, no matter what the others choose.

Please make sure that you understand the instructions above.

Remember to **make your decisions by relying on your brain [heart]**, rather than your heart [brain]. Press next to start to make the decision.

Press next to start making the decision.

Do you choose to KEEP the 40 SEK for yourself or CONTRIBUTE 80 SEK to the group?

KEEP the 40 SEK for yourself

CONTRIBUTE 80 SEK to the group

The next two items are meant to assess your understanding of the decision making task you just participated in.

Which choice alternative in the previous screen did earn the highest monetary payoff for the group as a whole?

KEEP the 40 SEK for yourself

CONTRIBUTE 80 SEK to the group

Which choice alternative in the previous screen did earn the highest monetary payoff for you personally?

KEEP the 40 SEK for yourself

CONTRIBUTE 80 SEK to the group

Prisoner's dilemma games

In this interaction you are matched with another person. You will be Person A, and your partner will be Person B.

Both of you start with 30 SEK. If one of the questions is randomly selected for payment, you will receive the money you have at the end.

You and Person B will both make a choice: Whether or not to transfer your 30 SEK to the other person, in which case they will get 60 SEK. If you both choose to transfer, you each get 60 SEK. If neither of you transfer, you each get 30 SEK.

But if you transfer while the other person does not, you get 0 SEK while the other person gets 90 SEK. And if you do not transfer while the other person does, you get 90 SEK while the other person gets 0 SEK.

Please make sure that you understand the instructions above. In the following four different decisions based on the above.

Remember to **make your decisions by relying on your brain [heart]**, rather than your heart [brain]. Press next to start to make the decision.

Press next to start making the four decisions.

If Person A and Person B choose at the same time, I choose:

Knowing that Person B transferred 30 SEK, I choose:

Knowing that Person B did not transfer 30 SEK, I choose:

If Person B gets to know whether or not I transferred 30 SEK before making her/his choice, I choose:

Transfer 30 SEK/ Do not transfer 30 SEK

The next two items are meant to assess your understanding of the decision making task you just participated in.

How many SEK do person Person A and Person B get if both choose to transfer 30 SEK? (30 SEK each; 60 SEK each; Person A gets 0 SEK and Person B gets 90 SEK; Person A gets 90 SEK and Person B gets 0 SEK)

How many SEK do Person A and Person B get if Person A chooses to transfer 30 SEK but Person B does not transfer any SEK? (30 SEK each; 60 SEK each; Person A gets 0 SEK and Person B gets 90 SEK; Person A gets 90 SEK and Person B gets 0 SEK)

Risk elicitation

In the following, you can either choose a fixed amount of money that you will receive for sure or to play. If you choose to play, we will flip a fair coin and you will receive 100 SEK if the head comes up on top, but you will receive 0 SEK if tails comes up on top. Thus, you have a 50percentchance to win 100 SEK when you choose to flip the coin.

Remember to **make your decisions by relying on your brain [heart]**, rather than your heart [brain]. Press next to start to make the decision.

Each time you press next, you will get to the next question. Press next when you are ready to start.

Do you prefer (…) SEK for sure or to flip the coin for 100 SEK? *(randomized order)*

35 SEK for sure – flip the coin for 100 SEK

40 SEK for sure – flip the coin for 100 SEK

45 SEK for sure – flip the coin for 100 SEK

50 SEK for sure – flip the coin for 100 SEK

55 SEK for sure – flip the coin for 100 SEK

60 SEK for sure – flip the coin for 100 SEK

65 SEK for sure – flip the coin for 100 SEK

In the following, we give you a starter cash of 100 SEK. However, some of this money may be lost. You will face seven decisions on the following screens in which you can choose between losing a certain amount for sure and a lottery. If you choose the lottery, we will flip a fair coin and you lose nothing (0 SEK) if the head comes up on top, but you will lose 100 SEK if tails comes up on top. Thus, you have a 50percentchance to loose nothing when you choose the lottery.

Remember to **make your decisions by relying on your brain [heart]**, rather than your heart [brain]. Press next to start to make the decision.

Press next to start making the seven decisions.

Do you prefer to lose (…) SEK for sure or to flip the coin for losing 100 SEK? *(randomized order)*

Lose 65 SEK for sure – Flip the coin for losing 100 SEK

Lose 60 SEK for sure – Flip the coin for losing 100 SEK

Lose 55 SEK for sure – Flip the coin for losing 100 SEK

Lose 50 SEK for sure – Flip the coin for losing 100 SEK

Lose 45 SEK for sure – Flip the coin for losing 100 SEK

Lose 40 SEK for sure – Flip the coin for losing 100 SEK

Lose 35 SEK for sure – Flip the coin for losing 100 SEK

Time discounting

In the following, we ask you to imagine that you win 1000 SEK. However, you can choose between receiving the 1000 SEK at a specific point in time or being paid a larger amount six months later.

You will face twelve decisions. These decisions will not be selected for payment, but we ask to imagine that you could receive these payments for real.

Remember to **make your decisions by relying on your brain [heart]**, rather than your heart [brain]. Press next to start to make the decision.

Press next to start making the decisions.

Which option do you prefer? *(randomized order)*

1000 SEK today	1025 SEK in six months
1000 SEK today	1075 SEK in six months
1000 SEK today	1125 SEK in six months
1000 SEK today	1175 SEK in six months
1000 SEK today	1225 SEK in six months
1000 SEK today	1275 SEK in six months
1000 SEK in six months	1025 SEK in twelve months
1000 SEK in six months	1075 SEK in twelve months
1000 SEK in six months	1125 SEK in twelve months
1000 SEK in six months	1175 SEK in twelve months
1000 SEK in six months	1225 SEK in twelve months
1000 SEK in six months	1275 SEK in twelve months

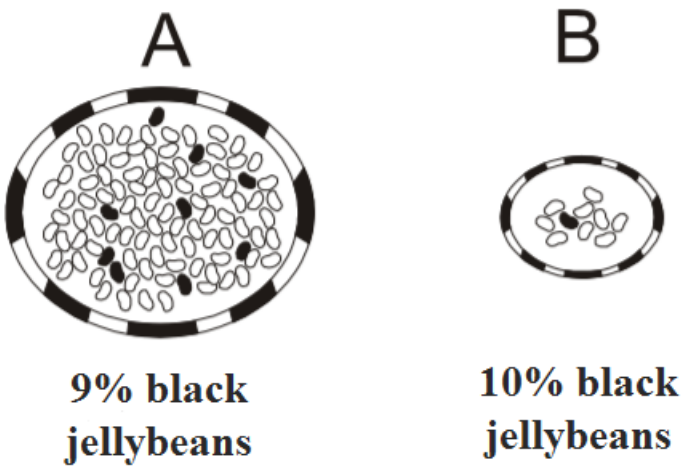
Jellybean task

On the next screen you will see two bowls filled with jellybeans. Bowl A has 100 jellybeans, Bowl B has 10 jellybeans. You will be asked to choose one of the two bowls. Please imagine that once you have selected a bowl, you will select a bean from that bowl (without looking at the bowl).

This decision will not be selected for payment, but imagine that if you selected a black bean, you would win SEK 100. Would you select a bean from Bowl A or Bowl B?

Remember to **make your decisions by relying on your brain [heart]**, rather than your heart [brain]. Press next to start to make the decision.

Press next to make your decision.



Which bowl would you prefer if a black bean wins 100 SEK? (Bowl A, Bowl B)

Manipulation check questions

Please rate the following statements according to how well they describe you when answering the questions in the last part of this experiment. (5-point scale: 1 completely false to 5 completely true)

The instructions in this experiment made me think *more* about my decisions.

I relied on my intuition when making the decisions in this experiment.

I relied on my deliberation when making the decisions in this experiment.

I relied on my emotions when making decisions in this experiment.

Decision styles (USID)

Imagine how you make decisions in life *in general*. Please rate each statement according to how well the statement describes you. (5-point scale: 1 completely false to 5 completely true)

(Intuition scale)

When I make a decision, it is more important for me to feel the decision is right than to have a rational reason for it.

When I make a decision, I trust my inner feeling and reactions.

With most decisions it makes sense to completely rely on your feelings.

I prefer drawing conclusions based on my feelings, my knowledge of human nature, and my experience of life.

Using my gut feelings usually works well for me in figuring out problems in my life.

I believe in trusting my hunches.

I hardly ever go wrong when I listen to my deepest gut feelings to find an answer.

I tend to use my heart as a guide for my actions.

I generally make snap decisions.

I make quick decisions.

I am often aware of how to decide even before I review all aspects.

I've had enough experience to just know what I need to do most of the time without trying to figure it out every time.

The right way to decide usually comes to mind almost immediately.

I typically figure out the way to decide swiftly.

I quickly do the right thing when deciding because I've often faced almost the same thing before.

I rarely need to mull things over; how to decide usually becomes quickly apparent.

(Deliberation scale)

Developing a clear plan is very important to me.

I like detailed action plans.

I prefer well-prepared meetings with a clear agenda and strict time management.

I make definite engagements, and I follow up meticulously.

When I make decisions, I proceed step-by-step.

Before making decisions I usually think about the goals I want to achieve.

I prefer making detailed plans rather than leaving things to chance.

I usually have clear, explainable reasons for my decisions.

I want to have a full understanding of all problems.

I like to analyze problems.

I study every problem until I understand the underlying logic.

I have no problem thinking things through carefully.

I enjoy intellectual challenges.

I enjoy solving problems that require hard thinking.

I prefer complex problems to simple problems.

I enjoy thinking in abstract terms.

Maximizing Tendency scale

No matter what it takes, I always try to choose the best thing.

I don't like having to settle for "good enough".

I am a maximizer.

No matter what I do, I have the highest standards for myself.

I will wait for the best option, no matter how long it takes.

I never settle for second best.

I am uncomfortable making decisions before I know all of my options.

Whenever I'm faced with a choice, I try to imagine what all the other possibilities are, even ones that aren't present at the moment.

I never settle.

Questionnaire

In this last part of the experiment, we ask you to answer a number of questions about yourself. Please read the questions carefully and answer them as honestly as possible.

Press next to start with the questions.

Please rate how often you have engaged in the following activities ***within the last 12 months.*** (5-point scale: Never, Once, More Than Once, Often, Very often)

I have given money to a charity (other than during this study).

I have given money to a stranger who needed it (or asked me for it).

I have donate goods or clothes to charity.

I have done volunteer work for a charity.

I have donated blood.

I have taken active steps to reduce my contribution to carbon emissions (the so called "CO2 emissions footprint"), such as buying carbon offsets with flights, signing up for green energy, taking the train instead of flying, or other.

I have paid my bills in time.

I have saved money every month.

I have saved towards a long-term goal such as buying a car, education or an apartment.

I have traded bonds, stocks or fonds.

I have done physical exercise.

I have smoked.

Please answer the following questions about ***your life in general.***

Have you made an active choice of pension fund? (Never, Once, More than once)

Would you like to donate your organs after death? (yes/no/don't know)

Did you register as organ donor? (yes/no)

Which party would you vote for if there were to be an election today? (Centerpartiet, Feministiskt initiativ, Liberalerna (f.d. Folkpartiet), Kristdemokraterna, Miljöpartiet, Moderaterna, Socialdemokraterna, Sverigedemokraterna, Vänsterpartiet, Other party, Would leave a blank vote, Would not vote, Don't know / Don't want to answer)

How much economic redistribution do you want in society? No redistribution means that the state does not influence the income distribution at all. Full redistribution means that everyone earns the same amount after taxes and subsidies. (Scale from 1 No redistribution to 10 Full redistribution)

What is your gender? (man/woman)

Which year were you born?

What is your highest level of education? (1. Primary school 2. Secondary school 3. University, at most 3 years. 4. University, more than 3 years.)

What is your current occupation? (Employed in the public sector, Employed in the private sector, Own business, Unemployed, Student, Retired)

What is approximately your annual income (of you, not your household) before taxes in the last year (2016)? Annual income refers to wage income, capital income and pensions before taxes. It does not include transfers.

What is approximately your household before taxes in the last year (2016)? Annual income refers to wage income, capital income and pensions before taxes. It does not include transfers.

Which country were you born in? (Sweden/Other. Please specify)

Are you married or living with a partner? (yes/no)

Do you have children? (no, yes: 1,2,3, more than 3)

Which country were your parents born in? (Mother/Father: Sweden/Other and specify)

How would you primarily classify your social background during your upbringing? (1. Working class 2. Lower middle class 3. Middle class 4. Upper middle class. 5. Upper class)

What is/was your father's highest education? (1. Primary school 2. Secondary school 3. University, at most 3 years. 4. University, more than 3 years)

What is/was your mother's highest education? (1. Primary school 2. Secondary school 3. University, at most 3 years. 4. University, more than 3 years)

How would you primarily classify your current social standing? (1. Working class 2. Lower middle class 3. Middle class 4. Upper middle class. 5. Upper class)