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How WEIRD are student samples? Lessons based on the trust game in Malawi

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Abstract

We have used the standard trust game on a random sample of university students (N=764) and a random sample of rural residents (N=834) in Malawi. The study identifies social preference types (Bauer, Chytilová, & Pertold-Gebicka, 2014; Fehr, Glätzle-Rützler, & Sutter, 2013) and how these relate to variations in trust and trustworthiness based on the standard trust game (Berg, Dickhaut, & McCabe, 1995). The games are framed as within-class and within-university for students and as within-village and within-district for the rural sample. Many previous studies have found students to represent a lower bound in experimental studies of pro-social, trust, and trustworthiness behavior compared to broader population samples. Contrary to this, we found that trust and trustworthiness were significantly higher among university students than among villagers in rural communities in Malawi. We decomposed the trust and trustworthiness to investigate the relative importance of alternative explanations for their variation and to explain the unexpected gap in trust and trustworthiness between the student and rural samples. We were able to explain most of the gap for trustworthiness

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and about half of the gap for trust. Factors contributing significantly to the variation in trustworthiness were social preference type, reciprocity norm, age, and gender. Trust and trustworthiness varied systematically across social preference types. Altruistic and egalitarian types were more common among the students than in the rural population, and the students also demonstrated stronger moral obligations to reciprocate in the game. On average, students and rural respondents were too optimistic about the expected returns in the trust game; students were more optimistic than rural subjects on average, and expectations influenced trust investments. Risk tolerance also enhanced trust investments; students were slightly more risk tolerant than rural subjects. Women were found to be less trusting and less trustworthy than men, and there was a larger share of women in the rural sample. There were only modest gains in trust and trustworthiness in the within-class vs. within-university and the within-village vs. within-district frames.

Keywords: Social preferences, Trust, Trustworthiness, university students, rural subjects, Malawi

JEL Classification: D01 , D9 , C72 , C92 , C93

1 Introduction

Social preferences have been defined by how people rank different allocations of material payoffs to themselves and others (C.F. Camerer, Fehr, et al., 2004). We utilize the experimental games developed by Fehr et al. (2013) and further refined by Bauer et al. (2014). One beauty of these games is that they are so simple that they also easily can be understood by kids and can be used to measure and classify subjects into social preference types and, therefore, are easy to apply in settings for respondents with limited education, such as rural villagers in developing countries. Fehr et al. (2013) and Bauer et al. (2014) used these games to categorize kids and adolescents into social preference types such as selfish, altruist, egalitarian, and spiteful, and some in-between categories, and to study how the population mixture of types changes with age and by gender. The first studies with these games were of European kids and adolescents. A more recent study by Holden and Tilahun (2021b) used these games to study the social preferences of youth in youth business groups in Ethiopia and related these to group trust and business group performance. They found substantial variation in group trust and that the social preference type composition of the groups had a substantial impact on group trust, which was positively correlated with business group performance. We are not aware of any other studies in the African context that have used these games to study the relationship between social preference types, trust, and trustworthiness.

In a meta-study of trust games Johnson and Mislin (2011) found evidence that subjects send less in trust games in Africa than those in North America. Many trust experiments have used students as respondents, and the evidence from Western industrialized countries indicates that students are less trusting and exhibit less trustworthiness than adults (Fehr & List, 2004; Johnson & Mislin, 2011). Henrich, Heine,

and Norenzayan (2010) suggested that students represented the lower bound for pro-social behavior in experiments based on a review of studies up to then. The finding that university students are less generous than representative samples has also been supported by more recent studies in Zurich by Falk, Meier, and Zehnder (2013), by Cappelen, Nygaard, Sørensen, and Tungodden (2015) in Norway, and by Snowberg and Yariv (2021) in the US.

We investigate whether this generalization holds in the case of Malawi, a poor country in Africa. University students in Malawi have to a limited extent, been exposed to social experiments, and unlike most studies with students in so-called "WEIRD" (Western, Educated, Industrial, Rich, and Democratic societies) (Henrich et al., 2010), we do not have a self-selected sample of students but a large random sample (N=764) from a broad set of disciplines in a national university with students coming from the whole country. We compare this with a representative random sample (N=834) of rural subjects from six districts in Malawi's Central and Southern Regions.

In this study, we combine the incentivized experimental games of Fehr et al. (2013) and Bauer et al. (2014) with the standard trust game based on Berg et al. (1995) with the strategy method to measure trustworthiness in terms of returning behavior for alternative amounts received. We framed the experiments to elicit social preference type, generosity (with additional dictator games for the student sample only),[1] trust and trustworthiness. The games were played with a random anonymous subject from the same class (village) and a random unknown subject in the university (district). All the subjects played the roles of trustors as well as trustees. The students also played the roles of dictators and receivers in the dictator games.

The main objectives of the study are to; a) assess how representative university students are in terms of trust and trustworthiness for the broader population in Malawi; b) make a comparison of social preference type distributions among university students and the rural sample and how it varies within-class vs. within-university for students, and within-village and within-district in the rural sample; c) assess how trust and trustworthiness vary across social preference types; d) assess how much of the variation in trust is correlated with differences in generosity (revealed by the dictator games) across the social preference types (student sample only); e) assess the extent to which the stated moral obligation to return at least as much as was sent by the trustor, is correlated with actual sending and returning behavior in the game, its difference for students and rural samples, across in-group and out-group framing, and across social preference types; f) assess the importance of trustworthiness expectations and risk tolerance for the trusting behavior; g) assess whether expectations about returning behavior of others varies systematically for students and rural subjects, and by framing; and h) assess whether in-group vs. out-group difference in trust and trustworthiness is much higher in the rural sample (village vs. district) than in student sample (class vs. university).

Based on the findings in previous studies comparing student and broader samples, we want to test the following hypotheses: H1) The rural sample population is, on average, more trusting and trustworthy than the student sample; H2) The rural sample population has a higher share of altruists and egalitarian members, and a smaller

[1] The dictator games were dropped in the rural study for budgetary reasons.

share of selfish and spiteful members, than the student sample population; H3) The moral obligation to reciprocate in the trust game is higher among the rural sample than the student sample; and H4) The expected returns in the trust game are higher in the rural sample than in the student sample. In addition, we test several hypotheses related to social preference types and the in-group vs. out-group differences.

The main contributions of the paper are the following. This is the first study to compare trust and trustworthiness in a large representative student sample with the broader population in an African context. To our knowledge, it is the first study to combine the social preference approach and categorization of Fehr et al. (2013) and Bauer et al. (2014) with the study of trust and trustworthiness among university students and rural respondents within a developing country. It is also the first study to relate the social preference types, the dictator game, and the trust game to within-class vs. within-university frames for students based on a large random sample of university students from a substantial number (48) of classes. Most previous studies of trust among students have been based on self-selected samples in developed countries. With a student population coming from the whole country in a national university, the student sample is also nationally representative geographically. The rural sample covers randomly sampled (64) villages and households in six districts in the country and has up to four members per household to ensure more variation in age and gender in the sample. This allows an inspection of a potential age bias in the student sample. A unique property of the student experiments is that we included standard and triple dictator games to elicit generosity. This allows us to assess how much of the difference in trust by social preference type can be explained by the difference in generosity.[2] To mimic the trust game more closely, we included a version of the dictator game where we tell the dictators that the receiver will receive triple the amount given by the dictator, as is the case for the trustor in the trust game. We also included a question about how morally obliged the subjects felt to return an amount at least as large as the amount sent by the trustors. As trusting people is risky, we also elicited expected returns in the trust game and used a simple risky investment game to get a measure for risk tolerance to assess whether these variables were important for the trusting behavior. This game is also similar to the trust game as the experimenter triples the amount invested, and the probability of winning the tripled amount was 0.5, 0.4, and 0.3 in four game rounds, and provides a measure of risk tolerance for state risk. This allowed us for the full sample to test how much of the difference in trust is due to social preference type, how much is driven by the moral norm to reciprocate, how much is driven by the expected return, how much is driven by risk tolerance, age, and gender. For trustworthiness, we assess how much social preference type, the stated moral obligation to reciprocate, age, gender. A unique contribution is that this allows us to assess the gap in trust and trustworthiness between the students and rural samples and to assess how much of the gap can be explained by the different components.

The paper is organized as follows. Part 2 presents the experimental designs. Part 3 outlines the sampling, data, and ethics. Part 4 presents relevant theory and previous studies, hypotheses for testing, and estimation strategy. Part 5 presents the results,

[2] This is based on the assumption that the dictator games capture generosity while the trust game captures generosity and trust and expected returns conditional on risk tolerance.

followed by a discussion of the main results in Part 6 before we conclude. An extended Appendix contains a lot of supplementary analyses.

2 Experimental designs

2.1 The social preference game

We used a set of simple incentivized binary dictator games building on the approach of Fehr et al. (2013) with the expansion (costly envy game) used by Bauer et al. (2014). This is the wording of one of 4*2 games played: Game 1: You can choose between two sharing options between yourself and another anonymous member of your own class (village) [3]:

Option 1: 1000 MK for yourself AND 1000 MK for another unknown member of your own class (village), or

Option 2: 1000 MK for yourself AND 0 MK for another unknown member of your own class (village)

What do you choose? 1 or 2? This game may be called

a) The costless prosocial game as the player can give more to the other player without sacrificing anything her/himself. The other games are called;

b) The costless envy game with options 1 (1000, 1000) and 2 (1000, 2000). Here also the player does not have to give up anything to allow the other player to get more than her/himself;

c) The costly prosocial game with options 1 (1000, 1000) and 2 (2000, 0). Equal sharing here is at own expense;

d) The costly envy game with options 1 (1000, 1000) and 2 (1500, 2000). Here the player is rewarded for being more generous to the other player.

The alternative framing conditions to own class (students) and own village (rural sample) are another unknown student in the university (students) and another unknown person in your district (rural sample).

After the players have made the eight binary choices, one of the eight games is randomly selected as the real game. This is recorded on a separate payment sheet. No payment is provided until after all games and the completed survey.

Each framing condition (player to play with) implies four binary choices. With two alternative framings for students and rural subjects, each respondent faces eight binary choices.[4] The subjects were told that one of the eight choice options would be randomly drawn to become the real game after all the games had been played.

For each framing condition, the subjects can be classified as a) Selfish, b) Altruistic, c) Weakly altruistic, d) Egalitarian, e) Weakly egalitarian, f) Spiteful, or g) Ambiguous. In other words, these games allow us to obtain social preference type distributions within-class and within-university for students, and within-village and within-district for the rural sample. The experimental protocol is presented in Appendix 1.

[3] English is used in the student sample and *Chichewa* is used in the rural sample.

[4] For practical reasons, we retained the same order of the eight choice options. The field experiment was integrated into a survey instrument, and we needed to keep things simple to minimize implementation errors. The administration of the in-group and out-group samples was quite demanding under the field conditions (rural sample). We, therefore, cannot rule out some order effects. The advantage is that the order should not lead to between-subject differences.

A difference in the implementation between the student sample and the rural sample was that the students were given tablets for answering the questions in an orchestrated way in a classroom with 16 students at the time. For the rural field experiments, we used trained enumerators to fill in the answers on tablets on behalf of the subjects. In this case, the enumerators read the explanations and questions from the tablet in the local language *Chichewa*.

2.2 The standard (1x) and triple (3x) dictator games

These games were only played with the student sample and had the same two alternative framing conditions (player to play with) as the social preference game. The wording of the 1x game is as follows:

You are given 1000 MK and can decide to give some to another anonymous member of your own class, and this person (decided by a lottery) will receive this exact amount you give if this becomes the real game.

D1: Out of 1000 MK you will select one of the following six options:

1) 1000 MK for your anonymous classmate, 0 MK for you

2) 800 MK for your anonymous classmate, 200 MK for you

3) 600 MK for your anonymous classmate, 400 MK for you

4) 400 MK for your anonymous classmate, 600 MK for you

5) 200 MK for your anonymous classmate, 800 MK for you

6) 0 MK= Nothing for your anonymous classmate, 1000 MK for you

Game D2 is identical to the game above except for the framing condition that the other player is another unknown student in the university.

Games D3 and D4 are the 3x dictator games and are introduced as follows:

D3 (D4): You are given 1000 MK and can decide to give some to another unknown member of your own class (another unknown student in the university), and this person (decided by a lottery) will receive three times the amount you give if this becomes the real game.

Out of 1000 MK you will select one of the following six options:

1) 1000 MK for your anonymous classmate (another unknown student in the university), 0 MK for you

2) 800 MK for your anonymous classmate (another unknown student in the university), 200 MK for you

3) 600 MK for your anonymous classmate (another unknown student in the university), 400 MK for you

4) 400 MK for your anonymous classmate (another unknown student in the university), 600 MK for you

5) 200 MK for your anonymous classmate (another unknown student in the university), 800 MK for you

6) 0 MK= Nothing for your anonymous classmate (another unknown student in the university), 1000 MK for you

The four games, D1-D4, have an equal chance of becoming the real game. This is determined in a two-step lottery process, where the 1x (D1, D2) vs 3x (D3, D4) is determined in the first step, and then the type of player to play with in the second step lottery (using a 20-sided die).

2.3 The trust game

We used the standard incentivized trust game. We used the same in-group and out-group framing in the trust game as in the social preference game. Ultimately, one of the two games will be randomly drawn to become the real game for payout. The subjects are senders (trustors) and receivers/reciprocators (trustees). The strategy method elicits what they will return as trustees to alternative senders (trustors) for alternative amounts received. Their choices as trustees will be binding for the real game and trustor they are randomly allocated to. The amounts they allocate as trustors will be tripled by the researchers such that the trustees receive the tripled amounts as a basis for deciding how much to keep and how much to return to the trustor. Anonymity is ensured such that the subjects will never know whom they played the game with. They are informed about this upfront.

The wording of the initial trust game for the trustors is as follows: [5]

T1a (in-group framing): You are given 1000 MK and can decide how much of the 1000 MK you are willing to invest if the tripled amount of your investment is to be sent to a random (anonymous) member of your own class (village)? Out of 1000 MK you will select one of the following six options:

1) 1000 MK for your anonymous classmate (villager), 0 MK for you
2) 800 MK for your anonymous classmate (villager), 200 MK for you
3) 600 MK for your anonymous classmate (villager), 400 MK for you
4) 400 MK for your anonymous classmate (villager), 600 MK for you
5) 200 MK for your anonymous classmate (villager), 800 MK for you
6) 0 MK= Nothing for your anonymous classmate (villager), 1000 MK for you.

The T1b game for the out-group is identical, except that the game is played with another unknown student in the university (another unknown person in the district).

The strategy method implies that the subjects, as trustees, respond to how much they will return for all the different possible amounts received in the game. As an example, if they find 1200 MK in the envelope they receive from the trustor, they have to respond to the following question:

T2a: How much will you leave in the envelope (return to the sender, a random anonymous person in the same class (village)) if the amount in the envelope is 1200 MK?

Out of 1200 MK you will select one of the following six options:

1) 1200 MK returned to an anonymous classmate (villager) , 0 MK for you
2) 1000 MK returned to an anonymous classmate (villager), 200 MK for you
3) 800 MK returned to an anonymous classmate (villager), 400 MK for you
4) 600 MK returned to an anonymous classmate (villager), 600 MK for you
5) 400 MK returned to an anonymous classmate (villager), 800 MK for you
6) 200 MK returned to an anonymous classmate (villager), 1000 MK for you
7) 0 MK returned to an anonymous classmate (villager), 1200 MK for you

The trust game was followed up with questions about the expected return (from the trustee) in the game in each of the framing conditions for the type of trustee. The wording is as follows:

[5] Presented in English to students and in *Chichewa* to the rural subjects.

In-group framing: How much of the tripled amount you have sent to the random member of your class (village) do you expect to get back?

1: Less than one third

2: One third

3: Half

4: More than half

5: Nothing as I sent nothing

6: Nothing, although I sent something

The same question was also used for the out-group framing. For the econometric analysis, we combined 5 and 6 above into a category 0 to have a rank-ordered variable for expected returns in the game.

As a final question related to the trust game, we asked about the moral obligation the receivers (trustees) felt about returning an amount to the sender (trustor), depending on the type of trustor, as follows:

In-group framing: As a receiver (trustee) in the game, how obliged do you feel to return an amount at least as big as the amount sent by the anonymous sender (trustor) from your class (village)?

1: Extremely obliged

2: Somewhat obliged

3: Not obliged at all

The same question was repeated for the out-group framing. After this, a lottery was used to determine the type of partner in the trust game.

2.4 The risky investment game

Four rounds of variants of the risky investment (RI) game (Gneezy, Leonard, & List, 2009; Gneezy & Potters, 1997) were used to obtain a measure (average share invested) of risk tolerance. Gillen, Snowberg, and Yariv (2019) found that measurement error, due to a substantial degree of random choice, is high with this game causing fairly low within-subject correlations between repeated rounds of the same game. We hope to reduce this problem and get a more reliable measure of risk tolerance by taking the average investment share from four rounds with the game for the same subjects.

In the first two rounds of the game, we used a two-step approach to introducing the game to reduce possible endowment effects (Holden & Tilahun, 2021a). The first step was introduced as follows:

This game takes place in two steps. First, you will choose between a risky and a safe amount of money. Afterward, you choose between alternative mixes of safe and risky amounts based on your preferences. This is a real game in Stage 2

Stage 1. You have the choice between

1. A risky amount of 3000 MK with a 50% chance of winning this amount (determined by one die toss: Die numbers 11-20= win, die numbers 1-10 =loss). 2. A safe amount of 1000 MK. State your preferred choice

Stage 2. Whether you prefer the risky or safe amount above, we give you the option to choose between an alternative mixture of risky and safe amounts.

What is your preferred combination of risky and safe amounts? Select your preferred combination of risky and safe amounts among the six alternatives below:

The lottery to determine the outcome for the risky amount you choose will take place immediately after you have made your preferred choice.

1: 50% chance of Risky amount = 3000 + Safe amount = 0 (full risk)
2: 50% chance of Risky amount = 2400 + Safe amount = 200
3: 50% chance of Risky amount = 1800 + Safe amount = 400
4: 50% chance of Risky amount = 1200 + Safe amount = 600
5: 50% chance of Risky amount = 600 + Safe amount = 800
6: Risky amount = 0 + Safe amount = 1000 (no risk)

The two first rounds of the RI game were identical. Rounds 3 and 4 skipped the first stage and also changed the p(win) to 0.4 in Round 3 and to 0.3 in Round 4.

An important difference between the student sample and the rural sample was that the students were computer literate, and we used programmed tablets that they filled their choices on, while the rural sample did not have this capability. We, therefore, used enumerators that filled the answers on the tablets for the rural respondents. We cannot rule out that this extra enumerator layer could have had some influence on the responses, but we had no other way of collecting the data from the rural sample. This difference gave the students more privacy in selecting and giving their answers. It is possible that this gave them more freedom to respond in a less socially acceptable way. All the games were orchestrated by the experimental team with the help of supervisors (and enumerators in the rural sample) who collected, randomized, and redistributed envelopes within classes (villages) and across classes (villages) and arranged the payments at the end for all the games. For practical reasons, we did not randomize the order of the experiments. We cannot, therefore, rule out order effects. The fact that the same order was used for all subjects makes the between-subject comparisons cleaner because they were not exposed to different orders on the games and treatments. The same applies to the within-subject comparisons that can also be done based on applying the same order of all treatments. No payments were made in the games till all games had been played.[6]

3 Sampling, data, and ethics

3.1 Sampling

Our student sample deviates from the typical WEIRD samples dominated in behavioral and experimental research (Henrich et al., 2010). First, we use university students from a developing country, Malawi. Second, we did not allow self-selection by students into our sample. Self-selection into experiments may, e.g., cause the selection of students with more need of immediate cash. Third, as we were starting a new behavioral and experimental economics program at the university, the students had not been exposed to typical behavioral experiments before. This should also make them more representative of the general population regarding their preferences. At the same time, they should have above-average cognitive ability such that we would expect fewer

[6]The exception is the three last rounds of the risky investment game played in a second-round session. However, the average risky investment share is not a central variable in our analysis. The previous round games and payouts may have influenced the responses in the repeated rounds of the risky investment game. Still, the elicited risk tolerance may be sufficiently reliable and affect trusting behavior, as trusting people is risky.

Table 1 Demographic characteristics of the samples

	Student sample			Rural sample		
	Male	Female	Total	Male	Female	Total
Number	475	289	764	341	493	834
Age, mean	23.66	22.24	23.12	38.11	38.52	38.35
Age, min	18	17	17	15	14	14
Age, max	48	41	48	89	90	90
Birth rank	2.99	2.57	2.83	3.26	3.61	3.47
Birth rank, min	1	1	1	1	1	1
Birth rank, max	11	9	11	14	15	15
Parents farm, dummy	0.49	0.46	0.48	1	1	1

comprehension problems and fewer decision errors than would be the case for a more general sample of adult Malawians. Fourth, students in the university come from the whole country and can, therefore, be considered nationally representative in the sense of ethnic diversity and geographical coverage. However, the sample consists of a narrow age interval and may be non-representative if preferences change systematically with age. This is something our rural sample allows us to test for.

A stratified random sampling approach was used for the student and rural studies. In the student study, we sampled subjects from 48 classes with a total sample of 764 subjects. The classes were selected to represent the different study years and academic programs at Lilongwe University of Agriculture and Natural Resources (LUANAR), with most classes being at the BSc level[7]. Up to 16 students were randomly sampled from each class. The experiments were implemented jointly for the students in a class, all simultaneously in the same classroom. The sessions took place during the coronavirus pandemic, so corona-safe measures were taken before, during, and after each session to prevent the spread of the virus. Similar safety measures were also taken during the field experiments with the rural sample.

The rural sample consisted of farm households and was a stratified random sample from six districts and villages in the Central and Southern Regions of Malawi.[8] The 2022 round included up to 4 members (above 16 years old) per household, giving more age variation than the student sample. We consider the sample fairly representative of smallholder farm households in Central and Southern Malawi. Multiple papers have been written and published based on these household panel data, e.g. Holden and Quiggin (2017a, 2017b); Katengeza, Holden, and Fisher (2019); Katengeza, Holden, and Lunduka (2019). Table 1 provides some basic demographic characteristics of the two samples. We note a much larger age variation and higher average age in the rural sample. We also note that nearly half of the student sample come from a farming background as their parents own farmland. We also note an overweight of males among the students and females in the rural sample.

[7]The number of MSc-students per class was smaller so students from several classes were pooled to fill the classroom with 16 MSc-students, especially for 2nd year MSc-students.

[8]The initial sample from 2006 used the Integrated Household Survey as a starting point in these districts and villages and consisted of 450 households. The sample has been surveyed repeatedly since then, with some attrition and replacement households.

3.2 Ethical issues

1. Approval: Our experiments included only standard incentivized games that are part of the toolkit of behavioral and experimental economists. As the two universities involved in this research did not have their own Institutional Review Boards for ethical approval of the experiments or the survey instruments at the time of the project fieldwork, our project relied on the high standard used by Norwegian researchers when implementing this kind of research. These guidelines are available here:

   https://www.forskningsetikk.no/en/guidelines/social-sciences-humanities-law-and-theology/guidelines-for-research-ethics-in-the-social-sciences-humanities-law-and-theology/

   It is a requirement that Norwegian researchers follow these guidelines. The project has followed these guidelines strictly. One challenge was that the project started during the coronavirus pandemic. It necessitated very strict rules during the implementation of surveys and experiments to prevent the spreading of the virus and ensuring that all coronavirus regulations were strictly followed through disinfecting all equipment (such as tablets used for the data collection) and hands, use of face masks, and appropriate distancing.

   The project is a capacity-building and research collaboration project funded under NORHED II by the Norwegian Agency for International Development (NORAD), and funding is based on ethical approval by the NORAD staff in charge of these projects.
2. Accordance: All the experiments were carried out following the relevant guidelines and regulations.
3. Informed consent: Prior informed consent was obtained from all student participants and the rural samples after they had been given an introduction to the project, survey, and experiments.

4 Theory and estimation strategy

Our study is exploratory and broad. We draw on many studies in behavioral and experimental economics that have studied social preferences and trust in different parts of the world, and we assess whether our study of students and rural people fits into the pattern observed in and across other countries. While students have been the dominant subjects in most such studies, the literature has started to expand and examine the external validity of findings based on samples with university students to more general population samples. We base our hypotheses on the findings in the limited number of such studies to assess whether they hold in our context. Below, we provide references for the hypotheses we aim to test in our study of the Malawian students and rural samples.

4.1 The theoretical and empirical foundation of our hypotheses

4.1.1 Classification in social preference types

Fehr et al. (2013) used prosocial, envy, and sharing games to classify subjects into five social preference types: Strong egalitarian, Weak egalitarian, Strong altruistic, Weak altruistic, and Spiteful. Bauer et al. (2014) enriched these games by adding a fourth, the costly envy game, to complement the costless envy game used by Fehr et al. (2013). Based on these four games, they categorized subjects as Altruistic, Inequality-averse, Spiteful, Selfish, and Ambiguous. They also used a sub-classification of selfish types into weakly altruistic, weakly inequality-averse, and weakly spiteful. We build on this and have categorized the subjects as follows: Altruistic, Weakly altruistic, Egalitarian, Weakly egalitarian, Spiteful, Selfish, and Ambiguous, in line with the classification by Holden and Tilahun (2021b) who have used the same games in their study of youth in Ethiopia.

4.2 Studies of pro-social behavior of students versus non-student samples with dictator and trust games

Several studies of students versus representative population samples in Zurich, Norway, and the USA have found students to be less generous on average (Cappelen et al., 2015; Falk et al., 2013; Snowberg & Yariv, 2021). Falk et al. (2013) investigate whether students' self-selection could explain this difference in such experiments. They do not find that social preferences influence participation in such experiments based on a large sample and a naturally occurring field donation. Falk et al. (2013) also used a trust experiment to compare the behavior of students and a general population based on the same recruitment procedure, instructions, decision process, and financial incentives. They found no significant difference in trusting behavior between students and non-students, but for trustworthiness, they found that students paid significantly less.

Cappelen et al. (2015) conducted a lab experiment on a broad population sample of the adult population in Norway using a dictator game and a trust game. They compared two student samples, one of economics students and one of non-economics students, based on earlier findings that economics students tend to be less pro-social than non-economics students in experiments. In line with earlier studies, student behavior represents a lower bound for pro-social behavior. The broader population sample (n=136) gave 52% more than the students (n=239) in the dictator game and returned 43% more in the trust game. They found that the non-economics students were less selfish than the economics students and, therefore, were closer to the broad population sample.

Snowberg and Yariv (2021) utilize a large-scale, online, incentivized survey applied to undergraduate student samples, a representative sample of the US, and a sample of US residents from MTurk, each with approximately 1000 participants. They found that students who self-select into experiments differ little in behavior in experiments from the overall student population. They also found no observer effects in a lab experiment compared to the incentivized survey with students. They found that the representative sample gave substantially higher amounts in dictator games than the student sample,

while the MTurk sample fell between these. The studies above, therefore, conclude, drawing also on earlier studies, that students represent a lower bound on pro-social behavior. These studies only represent developed countries. However, Henrich et al. (2010) compared dictator game-giving behavior from broader population samples in 16 countries, and here, the sample from the US had the largest average amount given. When comparing dictator game giving of college students with that of adult non-students in the US, the first group gave on average 32% compared to 47% for the latter (C.F. Camerer et al., 2004; Henrich et al., 2010). This result that students represent a lower bound is also supported by studies using the trust game, the ultimatum game, and the public goods game (J. Carpenter, Connolly, & Myers, 2008; J.P. Carpenter, Burks, & Verhoogen, 2005). Some studies show that trust and trustworthiness with the trust game increase with age up to the age 24-30 (J.P. Carpenter et al., 2005; Sutter & Kocher, 2003). The fact that students, on average, are younger than broad population samples may, therefore, contribute to the gap.

Social role theory has been used to propose that moral obligations influence decisions in the trust game (Buchan, Croson, & Solnick, 2008; Van Den Akker, van Assen, Van Vugt, & Wicherts, 2020).[9] We propose that such moral obligations may become stronger as the social distance from the other person is reduced. Our two alternative in-group and out-group framings help us to investigate this. Differences in the strength of moral obligations and differences in generosity and expected returns may partly drive the difference between in-group and out-group trust and trustworthiness.

There is literature on how trustworthiness expectations influence trust in the trust game. The common finding is that higher expectations lead to higher investments in the game; see Thielmann and Hilbig (2015) for a review. This implies that it is recognized that investment in the game is risky, and one should then expect risk tolerance to influence the decisions as well. However, several studies have demonstrated that the type of social risk observed in the trust game differs from risk framed as a gamble that is not influenced by another person's behavior. They suggest that betrayal sensitivity or aversion differs from risk aversion (Bohnet, Greig, Herrmann, & Zeckhauser, 2008). Houser, Schunk, and Winter (2010) distinguishes between strategic risk or uncertainty (like in the trust game) and state risk when assessing risk in a lottery that humans do not manipulate. They concluded that risk preferences estimated under state uncertainty (risk) conditions do not predict behavior in the trust game. However, some studies find a significant correlation between trust investment and risk tolerance measured with standard tools. Chetty, Hofmeyr, Kincaid, and Monroe (2021) uses data from 200 University of Cape Town students and uses a more powerful tool to elicit risk preferences that allow the separation of utility curvature and probability weighting. More optimistic preferences are associated with higher trust investments. They suggest that the tools used in earlier studies that did not detect such a significant correlation between risk tolerance and trust may have lacked statistical power to identify the relationship as significant. They demonstrate this with alternative simple measures of risk-taking behavior from their data.

[9] Buchan et al. (2008) investigated gender differences in the role of expectations and moral obligations to send and return money in the trust game, building on social role theory in form of gender differences in agentic or communal orientations.

It is common in many disciplines to view trust as a belief, the expectation of trustworthiness (Gambetta, 1988; Hardin, 2002; Rotter, 1980). Others have argued that generosity may influence the decision to send money in the trust game. Several studies have shown that the realized return to the amount sent in the trust game is close to zero (C. Camerer, 2003). Information about low and possibly negative returns in the game was not found to reduce the amount sent in a study by Ortmann, Fitzgerald, and Boeing (2000). Cox (2004) used a between-subject design and found that only a small share of the money returned in the trust game is due to expectations of trustworthiness or reciprocity. Ashraf, Bohnet, and Piankov (2006) made a decomposition of trust and trustworthiness based on data from Russia, South Africa, and the United States. They used a within-subject design to study this because it better controls for individual characteristics such as social preferences. They had a sequence of four games, including the dictator game, followed by the triple dictator game, the trust game (split for trustors and trustees), and a simple risk game with six choices between a 50-50 chance of winning an amount and six alternative certain amounts. The triple dictator game is similar to the trustor's decision in the trust game, except that some money may be returned in the trust game. They randomized the order of the dictator game and the trust game. They used the strategy method to identify amounts returned for all amounts received as trustees in the trust game.

We build on Ashraf et al. (2006) and investigate how expected return in the trust game and generosity (revealed with a dictator game) influence sending behavior in the trust game. We suggest that the mechanisms behind the sending behavior may vary with the social preference type. E.g., generosity may be more important for altruists than selfish and spiteful types. The key differences between our experiments and those of Ashraf et al. (2006) are:

a. We used the Fehr et al. game to separate our sample into social preference types and can thereby investigate more of the sample heterogeneity.

b. We used two alternative framing conditions: in-group (class in the student sample, village in the rural sample) and out-group (university in the student sample, district in the rural sample).

c. We used a sample of students and ordinary (rural) people. It allows us to assess whether the generalizations about students versus more general populations hold in the Malawian context.

d. All played the role of trustors and trustees in our game, with the trust decision made before the strategy method was used to measure trustworthiness.

e. We kept the same order of the games for all subjects.[10] We played the dictator game only with the students. We cannot rule out that this caused a downward bias in the trust game played after the dictator games, as found by Ashraf et al. (2006).

f. We asked about the moral obligation to return an amount at least as large as the amount sent by the trustor after the trust game has been played. This was done separately for the in-group and out-group framing. As expectations and moral obligations were asked about after the trust game was played, these questions did not

[10] Ashraf et al. (2006) varied the order of the dictator game and the trust game and found that trust was lower for those who played the dictator game first.

influence the decisions in the game, but we cannot rule out that the dictator game influenced the decisions in the trust game.

g. We asked about expected returns in the trust game after the game has been played, separately in the in-group and out-group framing.

h. We used a different game to elicit risk preferences, the Gneezy et al. (2009) risky investment game. By using the game repeatedly and taking the average investment level, we hope to reduce the measurement error that can be a problem (Gillen et al., 2019) and thereby have a reliable measure of risk tolerance. This game was played after the trust game to ensure that it did not frame the trust game.

4.3 Hypotheses for testing

Based on the above literature review comparing the behavior of students and broader populations, we test the following hypotheses by comparing our two samples:

H1) *The rural sample population is, on average, more trusting and trustworthy than the student sample.* This is based on earlier studies showing that students represent a lower bound on generosity. We test it by comparing the average shares sent as trustors by students and the rural sample in the trust game.

H2) *The rural sample population has a higher share of altruists and egalitarian members and a smaller share of selfish and spiteful members than the student sample population.* This is one potential explanation for students giving less than others in these games. Rural people may also have developed stronger social ties and trust than students have within a fairly limited period in the university.[11]

H3) *The moral obligation to return an amount at least as large as the amount sent is stronger for the rural sample population than the student sample.* This is based on the general literature that indicates that such social obligations and other-regarding preferences are weaker in student samples than among broader populations. This is assessed by comparing the share of the student sample by their stated degree of obligation to return an amount in the trust game that is at least as large as the amount sent by the trustor.

H4) *The expected return in the trust game in the rural sample is higher than in the student sample.* Earlier studies have found respondents to have, on average, quite realistic expectations about the net returns in the game, which are close to zero, implying that trustees return about one-third of the amount they receive, equivalent to the amount sent by the trustor. We build our hypothesis also on the assumption that people in a village know each other well and know what to expect in a reciprocal game and have had more time to build trust than students have had in the in-group setting (village vs. class).

Drawing on the studies by Fehr et al. (2013), Bauer et al. (2014), and Holden and Tilahun (2021b), we aim to test the following hypotheses related to social preference types and explanations of trust and trustworthiness.

H5) *Altruistic and egalitarian persons are more trusting and trustworthy than selfish and spiteful subjects.* There could be at least two mechanisms behind this. First, altruists and egalitarians may be more generous, something we investigate with the

[11] We also include a test on the impact of the study year of students as an additional control.

dictator game behavior (student sample only). Second, the moral obligation to reciprocate could be stronger among altruists and egalitarians than among the selfish and spiteful.

H6) *The difference in trust and trustworthiness between altruistic and egalitarian persons versus selfish and spiteful persons is explained by the difference in generosity as revealed by the triple dictator game.* This hypothesis can only be tested with the student data as the triple dictator game was only played with the student sample. First, we assess whether there is a significant difference in dictator game giving across these social preference types. Second, we assess whether including dictator game giving as an RHS variable combined with social preference type can eliminate the difference between the social preference types found in a model with only the social preference type dummies as RHS variables.

H7) *The moral obligation to return an amount at least as large as that the trustor sends is higher among altruists and egalitarians than among selfish and spiteful persons.* This expands on hypothesis H3. We test whether the stated moral obligation is stronger for the first two social preference types than the latter.

H8) *Selfish and spiteful subjects have lower expected returns in the trust game than the altruists and egalitarians.* This is based on the assumption that they perceive others as similar in their behavior.

H9) *The difference in trust between the altruists and egalitarians on the one side and the selfish and spiteful on the other side can be explained by their difference in generosity (measured with the dictator game in the student sample), a stronger moral obligation to reciprocate, and by their difference in the expected returns in the trust game.*

H10) *The difference in trust and trustworthiness between within-village and within-district for the rural sample is larger than between within-class and within-university for students.* This is based on the fact that the rural sample has stayed long in the village and the assumption that social interactions are frequent in villages and many have family ties, as Malawian villages typically are fairly small. Students may also develop social ties within their classes, but class structures may also change over time in the university.[12]

H11) *The differences in trust and trustworthiness between the student and the rural sample are explained by the differences in social preference types, differences in norms to reciprocate, differences in expected returns (for trust), and differences in risk tolerance (for trust), and differences in age and gender distribution.*

4.4 Statistical assessment and estimation strategy

The fact that we measure both trust and trustworthiness as proportions implies that they take on values in the range [0,1]. Tests for skewness and kurtosis reveal that we have to reject that the trust and trustworthiness variables are normally distributed at the 0.1% level. It is therefore likely that the linear panel data models we used to estimate the correlations are biased and inconsistent. As a robustness check, we also

[12] This could be debated and may depend on the nature of the village and how good the social relations are there as there could be substantial heterogeneity across villages. The fact that villages are quite endogenous entities in Malawi may favor our hypothesis, as villages may split into two new villages if there is some form of social conflict.

estimated fractional probit models. The results from such models were close to those in the linear panel data models. The advantage of the linear panel data models is that we better utilize the panel nature of the data.

Our first four hypotheses explore the external validity of earlier studies that compare student samples with more general samples. For this, we use simple statistical methods to compare means, medians, proportions, and distributions to inspect for stochastic dominance.

We use the following econometric models to test our hypotheses H5-H9:

Trusting behavior:

$$\begin{aligned} TRs_{vij} =& \alpha_0 + \alpha_{1s} SPTs_{vij} (+\alpha_2 D3s_{vij}) + \alpha_{3m} MOm_{vij} + \alpha_4 ETW_{vij} \\ &+ \alpha_5 R_{vi} + \alpha_{6c} C_{vi} + v_v + \eta_{ij} \end{aligned} \tag{1}$$

Trustworthiness behavior:

$$\begin{aligned} TWs_{vij} =& \beta_0 + \beta_{1s} SPTs_{vij} (+\beta_2 D3s_{vij}) + \beta_{3m} MOm_{vij} \\ &+ \beta_{6c} C_{vi} + v_v + \omega_{ij} \end{aligned} \tag{2}$$

where TRs_{vij} is the share of the endowment sent by trustor i in the village (class) v to an anonymous trustee belonging to group j, $SPTs_{vij}$ is the social preference type of trustor i (from a vector of social preference types s) towards an anonymous trustee belonging to group j, $D3s_{vij}$ is the share sent by the trustor in the triple dictator game to an anonymous trustee belonging to group j, MOm_{vij} is the moral obligation category m of trustor i as a trustee towards an anonymous trustor belonging to group j, ETW_{vij} is the average expected returned share of trustor i from an anonymous trustee belonging to group j, R_{vi} is a measure of the risk tolerance of the trustor, C_{vi} is a vector of control variables including demographic characteristics, v_v represent class(village) fixed effects as controls for unobserved factors, and η_{vij} is the error term. In the trustworthiness model, TWs_{vij} is the average share returned in the trust game by trustee i to an anonymous trustor belonging to group j andω_{ij} is the error term.

We estimate these models separately for the student and rural samples for two reasons. First, the triple dictator game was only used on the student sample. Second, we can more carefully assess the heterogeneity across the two samples by estimating the models separately. A step-wise estimation procedure is used for each sample, starting from a parsimonious model where only the social preference type vector is included in a model with group fixed effects. We also estimate these models separately in the in-group (class, village) framing and the out-group (university, district) framing to allow parameters to be estimated independently in each framing condition. These models are used to test hypothesis H3, whether the results are robust in the two samples and the alternative in-group and out-group specifications.

Second, in the student sample, we add the triple dictator game share given to assess whether the difference in trust by social preference type (hypothesis H3) can be explained by the difference in generosity, as revealed by the triple dictator game

(hypothesis H4). This allows us to assess how the inclusion of the dictator game variable influences the trust difference between social preference types.[13]

Third, we include the moral obligation to return an amount at least as large as the amount sent by the trustor in the game when the trustor serves as a trustee, represented with two dummy variables and using 'Extremely obliged' as the base category. This stated moral norm was elicited after the trust game had been played and did not directly influence the game's behavior. We assume that the trustor's moral norm to reciprocate also serves as a reference for their trusting behavior. This allows us, in the case of the student sample, to assess the importance of generosity (dictator game giving) versus moral norm obligation as explanations for trustor behavior in the trust game in the student sample. In the rural sample, it allows us to assess whether the difference in trusting behavior between social preference types is driven by differences in the moral norm to reciprocate in the game among trustors.

Fourth, we include the expected return in the trust game variable, a categorical variable ranked from 0 to 5, with a higher rank indicating a higher share returned in the game. This variable was determined separately in each trustor's in-group and out-group conditions. At the same time, we also include a measure of the trustor's risk tolerance, measured with the average share invested in four rounds of the risky investment game. The risky investment games were played after the trust game.[14] A recent study by Chetty et al. (2021) reviewed the risk-trust confound and combined non-strategic and strategic measures of risk preferences for a sample from South Africa. They found that non-strategic risk preferences significantly influenced trusting behavior and concluded that an important reason for not finding such a significant relationship in many earlier studies was that the tools and sample sizes did not possess sufficient statistical power to reveal the relationship. With the fairly large sample sizes and measure of risk tolerance, we assess whether we have been able to remove some notice by averaging four rounds of the experiment; we assess the importance of expected returns and risk tolerance for the amounts sent in the game. It allows us to assess the relative importance of this motive versus the generosity and the reciprocity norm variables in the student sample versus the strength of the reciprocity norm in the rural sample.

Finally, we add several demographic control variables, including age and gender, in both samples. We included a dummy for the student coming from a farming household (to cross-check with the rural sample where all belong to farming households), a dummy for the student being an economics student[15], and finally a dummy vector for the year of study for students which belong to the 1st-4th year in BSc-programs and 1st and 2nd-year MSc-programs. In particular, within-class trust and generosity may

[13] We cannot rule out that the dictator game exposure affected the behavior in the trust game in the student sample. Ashraf et al. (2006) varied the order of the triple dictator game and the trust game and found that the amount sent in the trust game was significantly reduced when the dictator game was played first. If it has resulted in a bias in the same direction in our game, this may imply a downward bias in the estimates of trust and trustworthiness in our student sample. We need to consider this when we examine our findings.

[14] Schechter (2007) used one round of the risky investment game in combination with the trust game in her study of the risk-trust confound in rural Paraguay. She found a significant positive correlation between investments in the two games. She played the risky investment game before the trust game and acknowledged that this may have framed the trust decision in the direction of a risky investment decision.

[15] Several studies have found that economics students tend to be less generous in experiments compared to students within other fields.

build up among students who have stayed longer together in the university. We assess whether this is the case.

Using our unusual within-subject design, we use a Difference-in-Difference approach to test hypothesis H10, allowing us to get within-subject differences in trust and trustworthiness in the in-group versus the out-group framing. We also assess the variation (heterogeneity) in the distributions of these differences in the two samples and test for stochastic dominance. Finally, although we have no hypotheses on this, we assess whether the in-group versus out-group difference varies significantly with the social preference type in the out-group framing in the two samples, whether it is correlated with the difference in generosity showed in the in-group versus out-group framing, the difference in the moral obligation to reciprocate, the difference in expected return in the game, and also assess how other control variables are correlated with these differences. This gives the following models for estimation.

$$\begin{aligned}\Delta TRs_{vi} =& TRs_{vi,j=1} - TRs_{vi,j=2} = \theta_0 + \theta_{1s} SPTs_{vi,j=2}(+\theta_2 \Delta D3s_{vi}) \\ &+ \theta_{3m} \Delta MOm_{vi} + \theta_4 \Delta ETW_{vi} + \theta_{2c} C_{vi} + v_v + \epsilon_{vi}\end{aligned} \tag{3}$$

$$\begin{aligned}\Delta TWs_{vi} =& TWs_{vi,j=1} - TWs_{vi,j=2} = \delta_0 + \delta_{1s} SPTs_{vi,j=2}(+\delta_2 \Delta D3s_{vi}) \\ &+ \delta_{3m} \Delta MOm_{vi} + \delta_4 \Delta ETW_{vi} + \delta_{2c} C_{vi} + v_v + \sigma_{vi}\end{aligned} \tag{4}$$

In order to test the hypothesis H11, we combined the data and started with a model that included only a dummy for sample type. The first step was to measure a potential gap in trust and trustworthiness between the student and rural samples. The dummy variable was set to '1' for the student sample and the rural sample was used as the reference group. We estimate the gap size with the parameters α_{1p} and β_{1p}, see equations (5) and (6). We use alternatively linear panel data models with group (group being class for students and village for the rural respondents) random effects and fractional probit models for robustness assessment. By stepwise addition of the variables in the parentheses in these equations (social preference type, the moral obligation to reciprocate dummies, the expected return, and the risk tolerance, age, and gender for the trust models, and the same variables except expected return and risk tolerance for the trustworthiness models) and estimating, we inspect how the coefficient on the student sample dummy changes across these models, we reveal the extent to which each of these added variables contributes to explaining the gap.

Trusting behavior:

$$\begin{aligned}TRs_{vijp} =& \alpha_0 + \alpha_{1p} D_p + (\alpha_{2p} SPTs_{vij} + \alpha_{3m} MOm_{vij} + \alpha_4 ETW_{vij} \\ &+ \alpha_5 R_{vi} + \alpha_{6c} C_{vi}) + v_v + \eta_{ij}\end{aligned} \tag{5}$$

Trustworthiness behavior:

$$\begin{aligned}TWs_{vij} =& \beta_0 + \beta_{1p} D_p + (\beta_{2s} SPTs_{vij} + \beta_{3m} MOm_{vij} \\ &+ \beta_{6c} C_{vi}) + v_v + \omega_{ij}\end{aligned} \tag{6}$$

Table 2 In-group and out-group trust and trustworthiness in student and rural samples

sample	Statistic	Trust In-group	Trust Out-group	Trustworthiness In-group	Trustworthiness Out-group
Students	Mean	0.523	0.451	0.396	0.375
	Median	0.400	0.400	0.386	0.367
	St.Error	0.011	0.012	0.008	0.009
	N	764	764	764	764
Rural	Mean	0.388	0.321	0.317	0.284
	Median	0.400	0.200	0.300	0.265
	St.Error	0.010	0.009	0.006	0.007
	N	834	834	834	834

5 Results

We present the key results for each hypothesis below and provide complementary analyses in Appendices.

Hypothesis H1: *The rural sample population is, on average, more trusting and trustworthy than the student sample.*

Table 2 presents the mean and median shares sent and returned by students and rural subjects in the trust game. Fig. 1 presents the full distributions by amounts sent (trust) and cumulative shares (stochastic dominance assessment). Fig. 2 presents the cumulative average shares returned (trustworthiness) based on responses with the strategy method (stochastic dominance assessment for student versus rural samples).

Taking the standard errors into account that are also presented in Table 2, trust and trustworthiness, as revealed with the trust game, are significantly higher in the student sample than the rural sample, and this goes both for the in-group and out-group framing conditions.

Hypothesis H1: Rejected!

Hypothesis H2: *The rural sample population has a higher share of altruists and egalitarian members and a smaller share of selfish and spiteful members than the student sample population.*

We test this hypothesis by estimating the proportions with 95% confidence intervals for each social preference type in the two samples. We do this separately for the in-group and out-group framing conditions. The results are presented in Fig.3.

Fig.3 shows that contrary to our hypothesis, the shares of altruists and egalitarians are significantly higher in the student sample than in the rural sample. Furthermore, the share of the selfish type is significantly higher in the rural sample than in the student sample, while the differences for the spiteful type were smaller and insignificant.

Hypothesis H2: Rejected!

Hypothesis H3: *The moral obligation to return an amount at least as large as the amount sent is stronger for the rural sample population than the student sample.*

This hypothesis is tested by estimating the proportions with 95% in each sample with different levels of stated moral obligation in the in-group and out-group framing conditions. The results are presented in Fig.4.

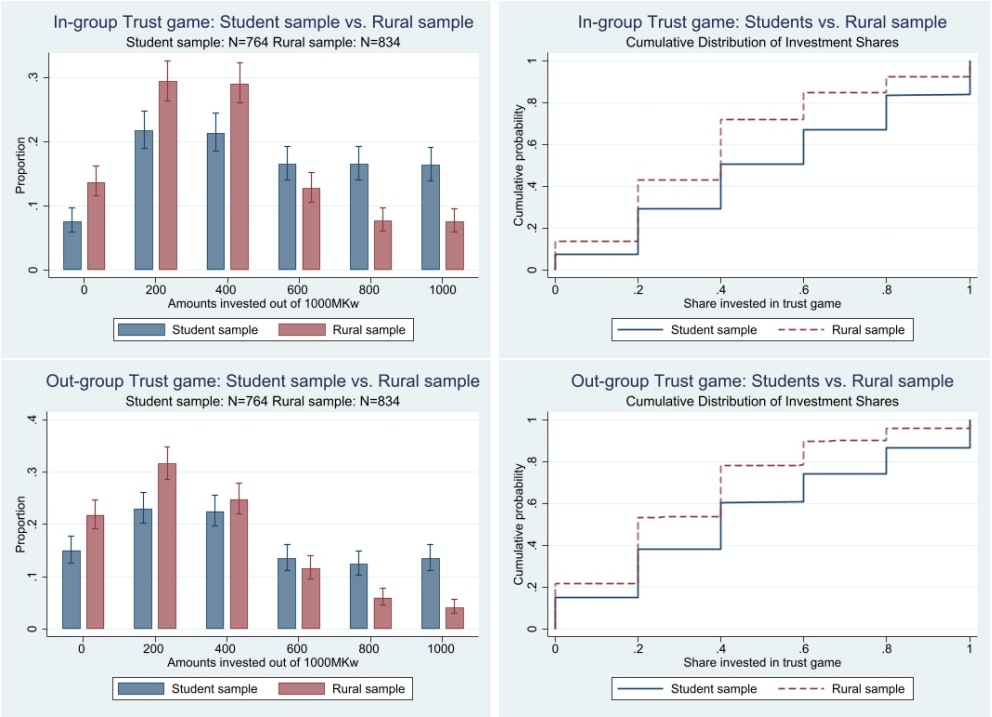

Fig. 1 Social preferences and investment in the trust game among university students

Fig.4 demonstrates that the moral obligation to reciprocate is much higher in the student sample than in the rural sample. This is the case both under the in-group and the out-group framing conditions.

Hypothesis H3: Rejected!

Hypothesis H4: *The expected return in the trust game in the village sample is higher than that in the student sample.*

We test this hypothesis by calculating the expected return distributions based on the ranked responses to this question in the in-group and out-group framing conditions. The estimated proportions with 95% confidence intervals are presented in Fig.5.

Compared to moral obligations, the differences in expected returns between the student and the rural samples are much smaller. However, we see that a larger share of the students expects to get back more than half of the amount received by trustees in both the in-group and out-group framing. In the in-group framing, a significantly larger share of the rural sample expects one-third or less returned. In the out-group framing, a higher share of the rural sample expects nothing or one-third compared to the student sample.

Hypothesis H4: Rejected!

Hypothesis H5: *Altruistic and egalitarian persons are more trusting and trustworthy than selfish and spiteful subjects.*

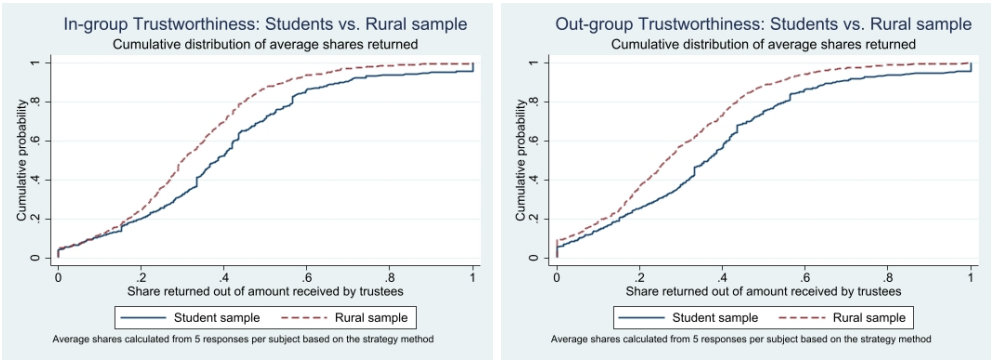

Fig. 2 In-group and out-group trustworthiness distributions for students vs. rural sample

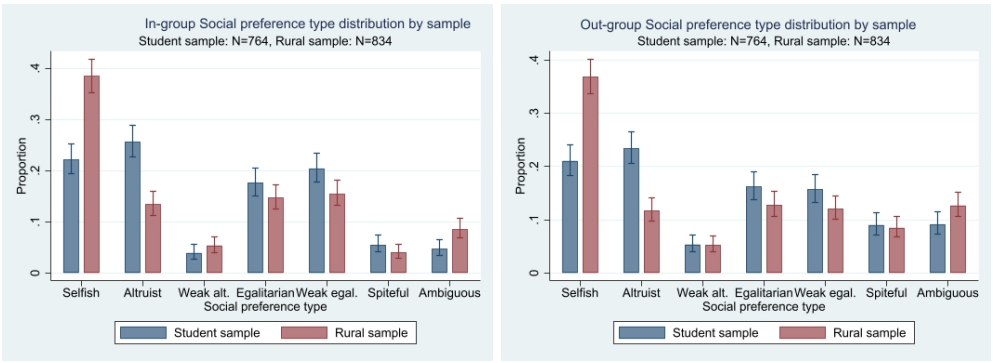

Fig. 3 In-group and out-group social preference type distributions for students vs. rural sample

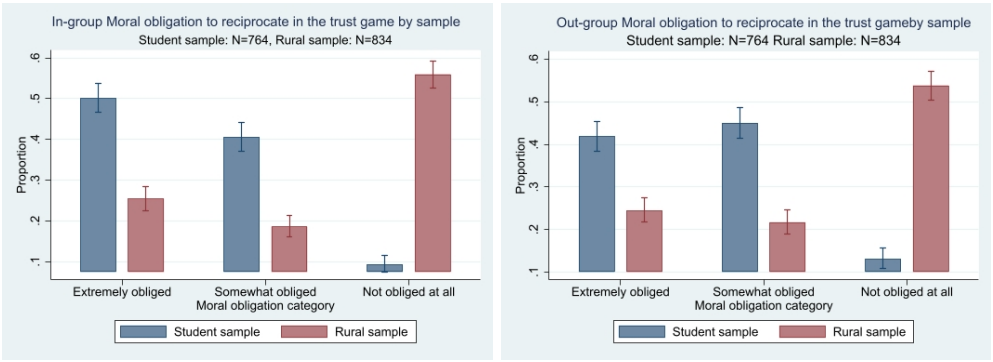

Fig. 4 In-group and out-group moral obligation to reciprocate in the trust game distributions for students vs. rural sample

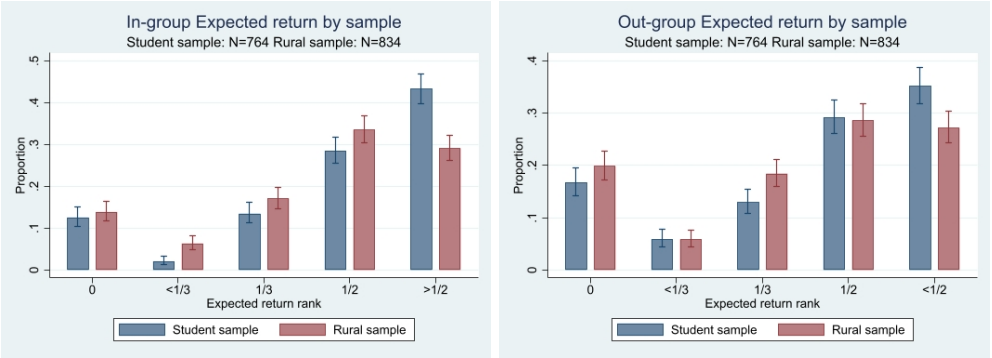

Fig. 5 In-group and out-group expected return distributions for students vs. rural sample

We investigate this hypothesis by comparing the mean and median in-group and out-group trust and trustworthiness shares by social preference type identified in the in-group and out-group framing conditions for the joint sample of students and rural subjects (N=1598). Table 3 presents the results. In addition, we assess the cumulative distributions of the measures of trust and trustworthiness under the in-group and out-group framing conditions by social preference type. Fig.6 presents these cumulative distributions.

Table 3 shows that there is a clear order with Altruist > Egalitarian > Selfish > Spiteful in terms of mean trust shares and mean shares returned (trustworthiness). Fig.6 shows the same stochastic dominance order for these four social preference types.

Hypothesis H5: Cannot be rejected!

Hypothesis H6: *The difference in trust and trustworthiness between altruistic and egalitarian persons versus selfish and spiteful persons is explained by the difference in generosity as revealed by the triple dictator game.*

We only played the dictator games with the student sample. Table 4 presents the mean, median, and standard errors for the triple dictator game giving shares by social preference type. We see the same pattern of dictator game giving for trust and trustworthiness with Altruist > Egalitarian > Selfish > Spiteful. The standard errors show that most of these differences are significant, except the difference between the selfish and spiteful in the out-group framing.

Fig.7 presents the distributions of the dictator game, giving shares under the in-group and out-group framing conditions by social preference type. The pattern across social preference types is similar to that for trust in Fig.6. This may imply that at least some of the differences in trust between social preference types are driven by differences in generosity, as revealed by the dictator game. To further investigate this, we run regressions for the student sample to assess the correlations between social preference type, dictator game giving, and trust, separately in the out-group and in-group framing. The results from linear panel data models with class fixed effects are presented in Tables 5 and 6. The first model in each of the tables uses the share given in the dictator game as the dependent variable and the social preference type dummy variables as RHS variables to test for significant differences between the types after

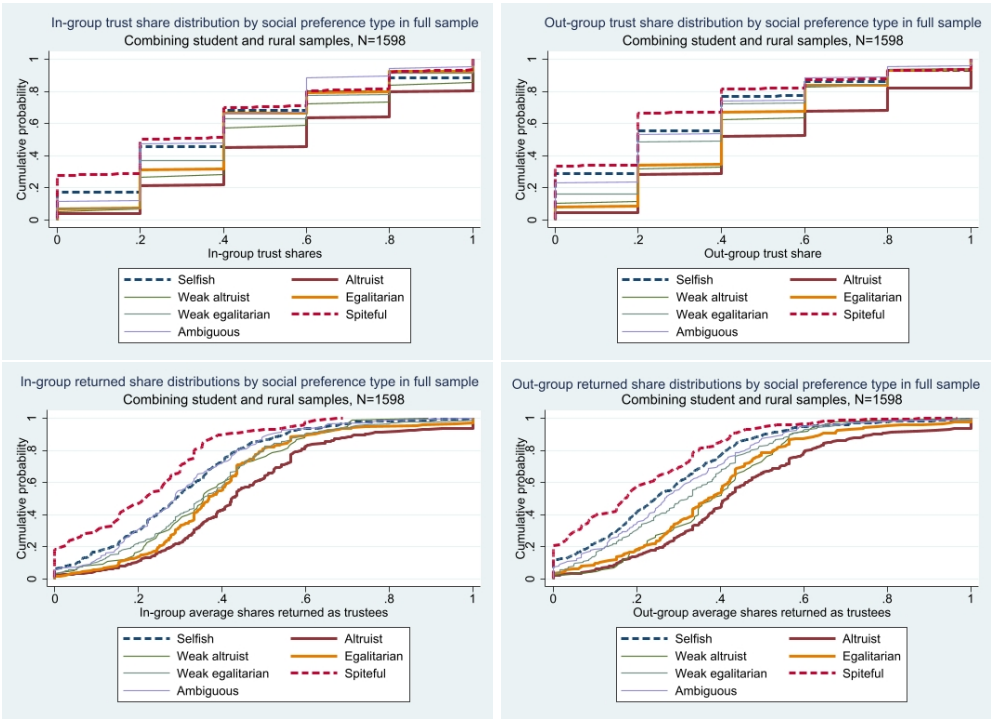

Fig. 6 In-group and out-group trust distributions by social preference type for combined sample

correction for class fixed effects and with cluster-robust standard errors corrected for clustering at class level. The selfish group is used as the base.

Table 5 shows that in the in-group (within-class) framing, altruists give significantly more than the selfish and the egalitarian, while the spiteful give significantly less than the selfish. In the second and third models in Table 5, in-group trust share is used as the dependent variable. Model (2) only includes social preference types and is otherwise specified as model (1). Again, the altruists gave significantly more than the selfish, but none of the other differences were significant for the four main types of social preferences. The constant term is also significantly larger in model (2) than in model (1), indicating that trust is driven by more than generosity. Model (3) tests whether and how much of the trust share variance can be related to generosity, as revealed by the triple dictator game. The dictator game-giving variable is highly significantly correlated with trust, and the coefficient on altruists is significantly reduced compared to model (2). This indicates that differences in trusting behavior between altruists and selfish types are at least partially explained by differences in generosity in the within-class framing.

Table 6 presents the same types of models as in Table 5 but for the out-group (within-university) framing. For the altruist vs. the selfish type, the results are similar in direction and significance as in the in-group framing. Much of the difference between altruists and selfish types appears to be explained by differences in generosity. In

Table 3 In-group and out-group trust and trustworthiness in full sample

Social pref type	Statistic	Trust In-group	Trust Out-group	Trustworthiness In-group	Trustworthiness Out-group
Selfish	Mean	0.402	0.320	0.301	0.269
	Median	0.400	0.200	0.289	0.244
	St.Error	0.014	0.014	0.009	0.009
	N	490	469	490	469
Altruist	Mean	0.572	0.531	0.453	0.448
	Median	0.600	0.400	0.424	0.419
	St.Error	0.017	0.018	0.013	0.014
	N	308	277	308	277
Weak altruist	Mean	0.509	0.440	0.371	0.383
	Median	0.400	0.400	0.356	0.386
	St.Error	0.034	0.030	0.022	0.019
	N	75	85	75	85
Egalitarian	Mean	0.448	0.428	0.390	0.384
	Median	0.400	0.400	0.369	0.372
	St.Error	0.017	0.017	0.012	0.014
	N	258	231	258	231
Weak egalitarian	Mean	0.449	0.372	0.360	0.322
	Median	0.400	0.400	0.353	0.322
	St.Error	0.017	0.019	0.012	0.014
	N	285	221	285	221
Spiteful	Mean	0.361	0.277	0.219	0.204
	Median	0.300	0.200	0.218	0.175
	St.Error	0.037	0.025	0.020	0.016
	N	76	140	76	140
Ambiguous	Mean	0.385	0.333	0.306	0.295
	Median	0.400	0.200	0.289	0.268
	St.Error	0.026	0.021	0.018	0.015
	N	106	175	106	175

the out-group framing, egalitarians were significantly more trusting than the selfish type. Differences in generosity may also contribute to explaining the difference, but less so than in the case of altruists. The addition of the dictator game-giving variable increased the R-squares from 0.053 to 0.197 in the in-group models and from 0.067 to 0.207 in the out-group models, and this indicates that there is still a log of unexplained variation in trust as indicated also be the significant and positive constant terms.

Hypothesis H6: Partly supported. The analyses provide only partial support for the hypothesis. As revealed by the triple dictator game, generosity appears to explain quite a lot of the difference in trust between altruists and selfish types, but not all.

Hypothesis H7: *The moral obligation to return an amount at least as large as that the trustor sends is higher among altruists and egalitarians than among selfish and spiteful persons.*

The distributions of the moral obligation to reciprocate in the trust game in the in-group and out-group framing by social preference type (the four main social preference types) in the full sample are presented in Fig.8. The graphs contain 95% confidence intervals for each proportion for each social preference type.

Table 4 Triple dictator game giving shares by social preference type under in-group and out-group framing conditions by students

In-group	Mean	Median	St.Error	N
Selfish	0.342	0.200	0.024	169
Altruist	0.546	0.400	0.022	196
Weak altruist	0.380	0.200	0.056	30
Egalitarian	0.382	0.400	0.023	135
Weak egalitarian	0.390	0.400	0.023	156
Spiteful	0.181	0.000	0.041	42
Ambiguous	0.344	0.200	0.047	36
Total	0.404	0.400	0.011	764
Out-group	**Mean**	**Median**	**St.Error**	**N**
Selfish	0.278	0.200	0.023	161
Altruist	0.494	0.400	0.024	179
Weak altruist	0.405	0.200	0.051	41
Egalitarian	0.360	0.400	0.024	124
Weak egalitarian	0.353	0.200	0.025	120
Spiteful	0.235	0.200	0.035	69
Ambiguous	0.337	0.200	0.036	70
Total	0.362	0.200	0.011	764

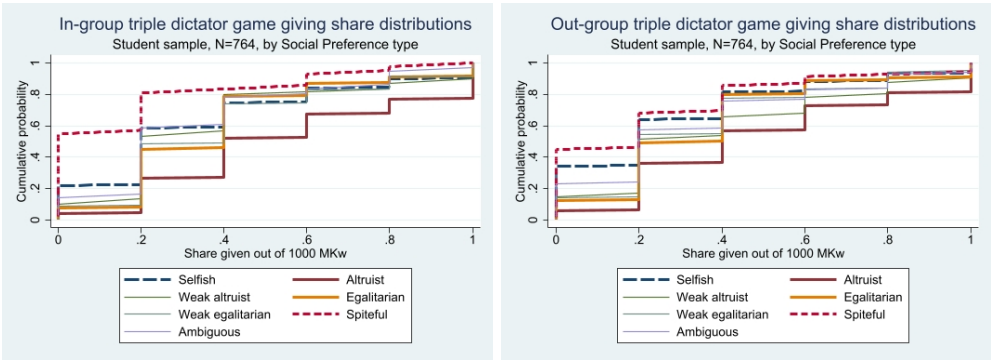

Fig. 7 In-group and out-group expected return distributions for students vs. rural sample

Fig.8 shows that altruists are most likely to state that they feel extremely obliged to return an amount at least as large as that sent by the trustor, followed by the egalitarians, who are also more likely to state that they are extremely obliged than the selfish and spiteful types. Conversely, the selfish and the spiteful are significantly more likely to state that they do not feel obliged to reciprocate in this way than the altruists and the egalitarians.

Hypothesis H7: Strongly supported.

Hypothesis H8: *Selfish and spiteful subjects have lower expected returns in the trust game than the altruists and egalitarians.*

Table 5 In-group generosity and trust by social preference type

VARIABLES	(1) In-group Generosity	(2) In-group Trust	(3) In-group Trust
D3-generosity			0.398***
			(0.043)
In-group base: Selfish			
Altruist	0.188***	0.137***	0.062**
	(0.032)	(0.031)	(0.028)
Weak altruist	0.028	0.016	0.005
	(0.063)	(0.067)	(0.055)
Egalitarian	0.028	0.004	-0.007
	(0.038)	(0.034)	(0.030)
Weak egal.	0.036	0.005	-0.009
	(0.034)	(0.031)	(0.033)
Spiteful	-0.158***	-0.099	-0.036
	(0.049)	(0.072)	(0.064)
Ambiguous	-0.001	-0.100**	-0.100**
	(0.039)	(0.049)	(0.048)
Constant	0.351***	0.496***	0.356***
	(0.021)	(0.021)	(0.027)
Observations	764	764	764
R-squared	0.086	0.053	0.197
Number of ClassID	48	48	48

With Class FE
Cluster-robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The distributions of the expected return ranks by the main social preference types are presented in Fig.9 for the in-group and out-group framing conditions in the full sample.

Fig.9 shows that a higher proportion of selfish and spiteful people expected to get nothing back, especially in the out-group framing. The results were more mixed across the other categories, with surprisingly large shares expecting to receive back half or more than half of the amount they sent in the trust game. Compared to the amounts returned, many of all the social preference types were unrealistically optimistic about the trustworthiness of their anonymous partners in the game, whether in the in-group or the out-group setting.

Hypothesis H8: There is some but weak support for this hypothesis.

Hypothesis H9: *The difference in trust between the altruists and egalitarians on the one side and the selfish and spiteful on the other side can be explained by their difference in generosity (measured with the dictator game in the student sample), a stronger moral obligation to reciprocate, and by a combination of difference in the expected returns in the trust game and risk tolerance.*

We assess this by running multiple regressions for the student sample, including the triple dictator game giving shares, the moral obligation to reciprocate, the expected

Table 6 Out-group generosity and trust by social preference type

VARIABLES	(1) Out-group Generosity	(2) Out-group Trust	(3) Out-group Trust
D3-generosity			0.401***
			(0.037)
In-group base: Selfish			
Altruist	0.201***	0.206***	0.125***
	(0.030)	(0.033)	(0.030)
Weak altruist	0.096*	0.076	0.038
	(0.052)	(0.049)	(0.040)
Egalitarian	0.057*	0.097***	0.074**
	(0.031)	(0.031)	(0.029)
Weak egal.	0.067	0.054*	0.027
	(0.041)	(0.031)	(0.027)
Spiteful	-0.071	-0.054	-0.026
	(0.044)	(0.058)	(0.054)
Ambiguous	0.055	0.070	0.047
	(0.046)	(0.047)	(0.045)
Constant	0.291***	0.373***	0.256***
	(0.021)	(0.020)	(0.024)
Observations	764	764	764
R-squared	0.072	0.067	0.207
Number of ClassID	48	48	48

With Class FE
Cluster-robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

return ranks, and risk tolerance, separately for models in the in-group and out-group framing conditions. The results are presented in Table 7.

Table 7 shows that all four possible explanatory variables to explain the variation in trust are significant. The triple dictator giving (generosity variable) is highly significant and has a similar parameter size in the in-group and out-group framing. The two moral obligations to reciprocate dummy variables, using Extremely obliged as the base, were both highly significant and with negative signs in the in-group model while only one of them was significant in the out-group model. This may imply that such moral obligations are stronger among students towards anonymous students in their own class than towards unknown students in the university. The expected return rank variable was highly significant and with a positive sign, showing that trust investments were higher for those with higher expected returns. Finally, risk tolerance, measured as the average investment rate out of four rounds of the risky investment game, was significant at 5% in both the in-group and out-group models and with a positive sign. More risk tolerant students also invested more in the trust game. Nevertheless, after all these alternative explanations have been included, altruists were still more trusting than the other social preference types. We are unsure what drives these additional differences, which are significant at 5 and 1% levels in the in-group and out-group models.

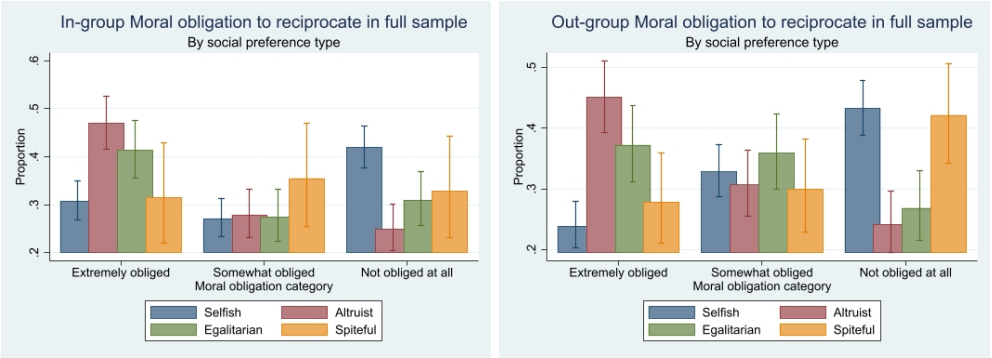

Fig. 8 In-group and out-group moral obligation to reciprocate in in-group vs. out-group framing for full sample

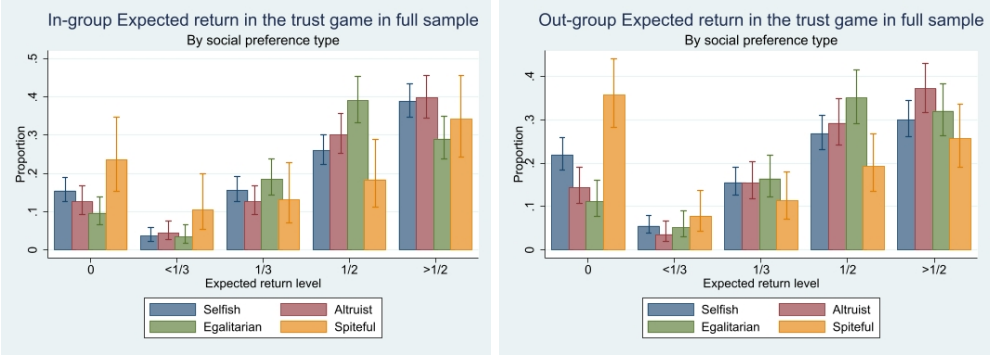

Fig. 9 In-group and out-group moral obligation to reciprocate in in-group vs. out-group framing for full sample

Hypothesis H9: There is support for the importance of all these variables as contributors to explain variation in trusting behavior in the trusting game, but for altruists, there remains an unexplained gap in trusting behavior.

Hypothesis H10: *The difference in trust and trustworthiness between within-village and within-district for the rural sample is larger than the difference for within-class and within-university for students.*

We test this hypothesis by comparing the mean within-subject differences between in-group and out-group trust and trustworthiness shares across the two samples and by also graphing and inspecting the cumulative distributions across the two samples. Table 8 presents the means, medians, and standard errors for these in-group vs. out-group differences by sample. Fig.10 presents the cumulative probability distributions.

From Table 8, we see that the mean differences are significantly higher than zero in both samples for trust and trustworthiness, meaning that, on average in-group trust and trustworthiness are larger than out-group trust and trustworthiness. We also see

Table 7 Testing alternative hypotheses to explain variation in in-group and out-group trust in student sample

VARIABLES	(1) In-group trust	(2) Out-group trust
Base: Selfish		
Altruist	0.060**	0.107***
	(0.029)	(0.032)
Weak altruist	0.022	0.033
	(0.049)	(0.042)
Egalitarian	-0.016	0.048
	(0.030)	(0.029)
Weak egal.	-0.015	0.024
	(0.033)	(0.027)
Spiteful	-0.024	-0.007
	(0.061)	(0.051)
Ambiguous	-0.117***	0.039
	(0.041)	(0.042)
D3 generosity	0.352***	0.366***
	(0.042)	(0.040)
Base: Extremely obliged		
Somewhat obliged	-0.061***	-0.064**
	(0.017)	(0.024)
Not obliged at all	-0.139***	-0.047
	(0.040)	(0.041)
Expected return	0.034***	0.040***
	(0.009)	(0.009)
Risk tolerance	0.097**	0.106**
	(0.037)	(0.043)
Constant	0.259***	0.147***
	(0.049)	(0.052)
Observations	764	764
R-squared, within	0.249	0.253
Number of Classes	48	48

With Class FE. Cluster-robust standard errors in parentheses, clustering on class. Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Table 8 In-group vs. Out-group differences in trust and trustworthiness by sample

Sample	Statistic	In-group-Out-group trust difference	In-group-Out-group trustworthiness difference
Student	Mean	0.072	0.021
	Median	0.000	0.000
	St.Error	0.008	0.004
	N	764	764
Rural	Mean	0.067	0.034
	Median	0.000	0.006
	St.Error	0.008	0.003
	N	834	834

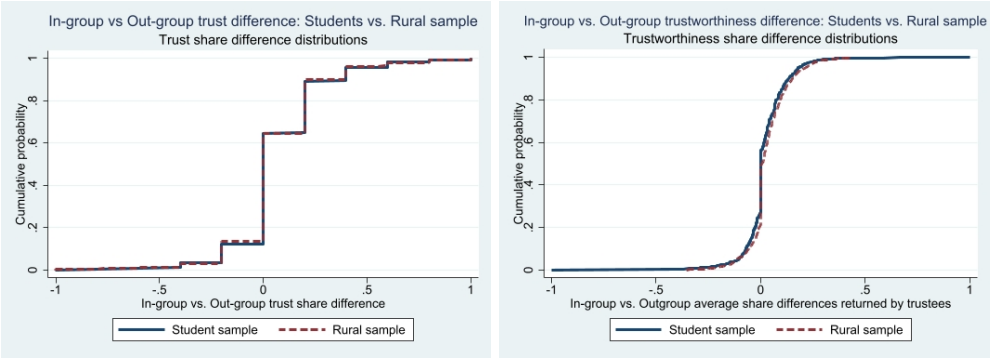

Fig. 10 In-group and out-group expected return expectation distributions for students vs. rural sample

that these differences are larger for trust than for trustworthiness, even though the medians for trust are all equal to zero, while the median for trustworthiness is zero in the student sample and positive in the rural sample. Regarding the hypothesis, we see in Table 8 that the mean trust difference is slightly higher but not significantly higher in the student sample than in the rural sample, contrary to our hypothesis. For trustworthiness, the difference is significant (at 5% level) in the rural sample but not in the student sample. We estimated the models specified in equations (3) and (4) to attempt to explain the in-group vs. out-group gap variation, but these models gave no significant interesting results, so we have left them out from the presentation and the Appendix. We have still included them in the estimation strategy to show that we investigated this without finding any interesting insights.

Fig.10 shows for the in-group vs. out-group trust differences that about 15% of the samples reveal lower in-group than out-group trust, slightly less than 50% of the samples were equally trusting in the in-group and out-group framing, and about 37% were more trusting in the in-group than the out-group framing. In other words, the majority of rural (student) subjects did not demonstrate higher trust in the within-village (within-class) than in the within-district (within-university) framing. For trustworthiness, the pattern was quite similar although we benefited from using the strategy method to obtain five responses from each subject for each measure of trustworthiness.[16] Fig.10 shows that just above 20% of the two samples revealed lower average trustworthiness in the in-group framing than the out-group framing, about 25% revealed the same trustworthiness under both framing conditions, and about 50% of the two samples revealed higher trustworthiness in the in-group than in the out-group setting. We also see a weak tendency of stochastic dominance in favor of the rural sample, supporting the evidence of higher in-group vs. out-group trustworthiness difference in the rural sample than in the student sample.

[16]This may imply that we have lower measurement error for trustworthiness than trust for which we have a single cruder measure.

Table 9 Decomposing the student-rural subject gap in trust and trustworthiness

Model	In-group Trust	Out-group Trust	In-group Trustworthiness	Out-group Trustworthiness
Parsimonious	0.142***	0.140***	0.083***	0.097***
+ Social preference type	0.126***	0.114***	0.065***	0.076***
+ Reciprocity norm	0.101***	0.096***	0.039**	0.047***
+ Expected return	0.092***	0.094***		
+ Risk tolerance	0.086***	0.089***		
+ Age, Sex	0.071***	0.078***	0.016	0.028*

Student-rural subject gap size in percentage point trust and trustworthiness shares. Significance levels: *** p<0.01, ** p<0.05. Full models in Appendix Tables A13-A16.

Table 10 Robustness check with fractional probit models: Decomposing the student-rural subject gap in trust and trustworthiness

Model	In-group Trust	Out-group Trust	In-group Trustworthiness	Out-group Trustworthiness
Parsimonious	0.135***	0.130***	0.079***	0.091***
+ Social preference type	0.119***	0.106***	0.060***	0.069***
+ Reciprocity norm	0.092***	0.085***	0.033**	0.035**
+ Expected return	0.082***	0.083***		
+ Risk tolerance	0.076***	0.078***		
+ Age, Sex	0.060***	0.066***	0.007	0.013

Student-rural subject gap size in percentage point trust and trustworthiness shares. The table shows the marginal effects. Significance levels based on cluster-robust standard errors, clustering at group level. Significance levels: *** p<0.01, ** p<0.05.

Hypothesis H10: There is weak support for the hypothesis for trustworthiness but not for trust. The two samples demonstrate quite similar sample heterogeneity.

Hypothesis H11: *The differences in trust and trustworthiness between the student and the rural sample are explained by the differences in social preference types, differences in norms to reciprocate, differences in expected returns (for trust), and differences in risk tolerance (for trust), and differences in age and gender distribution.*

We summarize the gap analysis from these models in Table 9. It contains only the coefficient on the student sample dummy, which represents the percentage point difference in trust and trustworthiness shares between students and rural subjects in each model specification. The full models are presented in Appendix Tables A13-A16. Fig. 11 presents the results from the last in-group trust and trustworthiness models in Tables A13 and A15.

Table 9 shows that students invest 14.2 and 14.0 percentage points more than rural subjects in the in-group and out-group trust experiment. For trustworthiness (shares returned), we see that the gap is smaller, 8.3 and 9.7 percentage points higher for students in the in-group and out-group framing, which are averages from the strategy method elicitation procedure. We wanted to assess how much of these gaps could be explained by adding social preference types in the models. We see that the gap is reduced to 12.6 and 11.4 percentage points for in-group and out-group trust. It

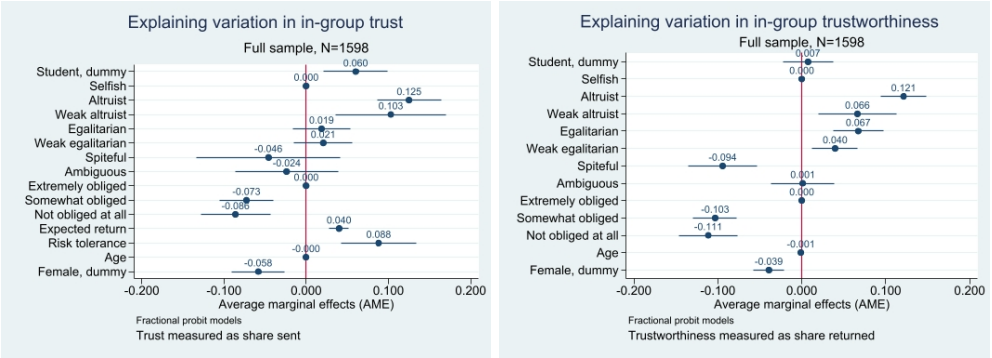

Fig. 11 In-group trust and trustworthiness share decomposition in full sample

is reduced to 6.5 and 7.6 for in-group and out-group trustworthiness. The gaps are still highly significant. We note that we at least partially controlled for generosity by including the social preference types as we found altruists more generous than other types. Next, we included the two dummy variables capturing differences in the reciprocity norm. The gap is further reduced to 10.1 and 9.6 percentage points for in-group and out-group trust and 3.9 and 4.7 percentage points for trustworthiness. This implies that the remaining gap in trustworthiness is fairly small, albeit still significant. For trust, we also want to assess whether differences in expected returns and risk tolerance can contribute to explaining some of the gaps. Table 9 shows that these two variables, both strongly significant (Tables A13 and A14), contributed to a further reduction in the gap, to 8.6 and 8.9 percentage points in in-group and out-group trust shares. Finally, we added the age and sex variables in the models as the age distributions were very different in the two samples, and the share of females was higher in the rural sample. Females are known to be less trusting in other studies but also more trustworthy. Table 9 shows that including age and the female dummy variable further reduced the gap, especially for the trustworthiness models. For in-group and out-group trustworthiness, the gap is reduced to 1.6 and 2.8 percentage points; the first is no longer significant, and the latter is only at the 10% level. For the in-group and out-group trust, the gaps are reduced to 7.1 and 7.8 percentage points, which are still highly significant. Compared to the first parsimonious model, we have been able to explain close to half of the gap for trust. The full decompositions for in-group trust and trustworthiness are presented in Fig. 11.

Hypothesis H11: We find support for the hypothesis in the data. We can explain more of the gap for trustworthiness than for trust. Systematic differences across the student and rural samples in social preference types, reciprocity norms, age, and gender explain almost the whole gap for trustworthiness. For trust, social preference types, reciprocity norms, expected returns, risk tolerance, and gender explain about half of the gap.

6 Discussion

6.1 Comparing the student and rural samples

How WEIRD is the student sample from Malawi? It is not completely WEIRD in the sense of the Western, Educated, Industrialized, Rich, and Democratic Country definition of Henrich et al. (2010). Only Educated and Democratic holds in the case of Malawi. Henrich et al. (2010) considered students weird in representing only a very narrow range in the form of age and education compared to broad population samples. Furthermore, student samples from Western, Educated, Industrialized, Rich, and Democratic Countries have been identified to provide lower-bound estimates of other-regarding preferences (generosity), trust, and trustworthiness within such countries. We aimed to assess whether this latter finding was also true in the case of Malawi (African, Educated, Rural, Democratic country). Perhaps not so surprising, the generalization from WEIRD samples did hold in the sense that the Malawian student sample is not very representative of the broader population (our rural sample) even though most students have a rural background. The big surprise was that the Malawian student sample was more trusting and trustworthy towards other students in their class and the university than the rural sample was towards other villagers and rural residents in the same district.

First, we assessed whether the age difference between the rural and student samples could explain the difference in trust and trustworthiness (Tables A5-A12 in the Appendix). In the case of trust, the age variable was insignificant in the rural sample, where we have the most variation in age. The age variable was significant and with a positive sign in the student sample and within university framing, and this does not reduce the gap in trust between the two samples if we were to extrapolate the age effect. For trustworthiness, age was weakly significant in the within-class model Table A9) but not in the within-university student sample models (Table A10), while age was significant and negative in the within-village and within-district rural sample models. The student sample results are barely consistent with the findings of J.P. Carpenter et al. (2005); Sutter and Kocher (2003) who found that trust and trustworthiness increase with age up to the age 24-30. Given the larger age variation in the rural sample, we may give more weight to the age estimates there. However, the small parameters on age can only explain a small share of the gap in trustworthiness between the student and rural samples. Midlarsky and Hannah (1989) found a non-linear concave relationship between age and generosity in donation experiments. We also tested for a possible non-linear relationship between age, trust, and trustworthiness in the rural sample but found no such significant non-linear relationship.

Second, a possible explanation could be that the rural sample comes from a geographically more restricted part of Malawi as it is drawn from two districts in Central Malawi and four districts in Southern Malawi.[17] We therefore constructed a dummy variable in the student data set for students from the same districts as those included in the rural sample. About 25% of the student sample originates from these six districts. When we assessed whether generosity, trust, and trustworthiness were significantly

[17] We should note that approximately 89% of the Malawian population lives in the Central and Southern Regions of Malawi.

different in the student sample for these six districts versus the other districts, we found none statistically significantly different. When the dummy variable for the students from these six districts was included in the student sample models for trust and trustworthiness, it never became significant.

Third, another possible selection issue we considered was whether coming from a farming background could matter. Our rural sample consists only of rural farming households. For the student sample, 48% have parents that own a farm. To assess the importance of coming from a farming background, we included a dummy variable for students having parents with a farm in the models for trust and trustworthiness. This variable is never significant in any of the models for trust and trustworthiness.

Fourth, another systematic difference between the student and the rural sample experiments was that we, for the students, could benefit from their computer literacy and, therefore, gave them programmed tablets to enter their responses. The rural sample was computer illiterate, and we relied on using trained experimental enumerators who filled the responses on the programmed tablets on behalf of the respondents. In the trust and trustworthiness models for the rural sample, we included enumerator dummy variables to control for possible enumerator bias. Moreover, the enumerators were organized such that they never interviewed more than one subject per village to eliminate possible confounding of location/village and enumerator selection. In terms of possible bias due to this systematic difference in the data collection method, students were granted more privacy when they filled out their responses. We would think that lack of such privacy could cause a bias toward more pro-social behavior. With the students giving the most pro-social responses in our experiment, we find it difficult to believe that this difference in the data collection method can explain why students are more trusting and trustworthy than the rural sample.

Fifth, we only included dictator games to elicit generosity in the student sample, and these games were played before the trust game. No payouts were made before all the games had been played. We avoided handing out endowments at the beginning of each game. Instead, subjects chose between alternative sharing options for the endowments between themselves and the other party. Could the fact that the dictator game was played before the trust game lead to an upward bias in the amounts sent and returned in the trust game? Ashraf et al. (2006) tested for this in their experiments that combined the triple dictator and trust games and randomized the order of the two games. They found that the measures of trust and trustworthiness were reduced when the dictator game was played before the trust game. We find it unlikely that we should have a strong effect in the opposite direction in our study.

Therefore, the gap in trust and trustworthiness between students and rural subjects remains a puzzle, and we have not been able to identify the underlying mechanisms, which can be an interesting topic for future research. In the next section, we discuss the results of our decomposition of trust and trustworthiness. It may provide additional insights regarding the gap we found between students and rural subjects.

6.2 Decomposing the gap in trust and trustworthiness between students and rural subjects

Our study has built on the excellent study by Ashraf et al. (2006) decomposed trust and trustworthiness. They had samples in Russia, South Africa, and the United States and combined trust experiments with triple dictator games, elicited risk preferences, and expected returns in the trust game. They found that unconditional kindness, or generosity as we have called it, as revealed with the triple dictator game, was most important for men's trust and trustworthiness in Russia and South Africa, while expected returns were more important for women and reciprocity for Americans.

Our study expands the decomposition analysis of trust and trustworthiness in several ways: splitting subjects by social preference type and eliciting trust and trustworthiness with two different framing conditions with whom the game is played. This allowed us to assess how trust and trustworthiness systematically differ across the social preference types and by type of framing. The fact that we found the surprising result that trust and trustworthiness were substantially higher among students than in the rural sample made us think about how we can draw on the insights from Ashraf et al. (2006) to also explain these gaps across the two samples. The gap sources are discussed below regarding the gap decomposition in Tables 9 and 10.

We found higher shares of altruists and egalitarians in the student sample and a higher share of selfish types in the rural sample (Table A1 in Appendix). This contributed to explaining part of the gap in trust and trustworthiness between students and the rural subjects, as we see in Tables 9 and 10. A much larger share of the students (50%) than the rural sample (25%) in the in-group framing felt extremely obliged to return an amount at least as large as that sent by the trustor (Table A2 in Appendix). This also explains part of the trust and trustworthiness gap between students and rural respondents. We were surprised by the much weaker moral reciprocity norm in the rural sample than in the student sample. We also found a larger variation in this norm across the social preference types in the student sample (see Table A3 in the Appendix). Expected returns potentially drive trust, and we found that true. We found unrealistically high return expectations in both the rural and student samples, with about 62 and 72% of the rural and student subjects expecting at least half of the amount received by the trustees to be returned to them. This difference with students being slightly more optimistic also contributed to their higher trust shares, and so did their slightly higher risk tolerance, as revealed by the repeated risky investment game (Fig. A8 in the Appendix). Finally, the facts that females were less trusting and trustworthy than men, and that the share of females was substantially higher in the rural sample, contributed to the gap and its explanation. With the inclusion of all these variables, almost the whole gap in trustworthiness is explained, and so is about half the gap in trust. We may speculate what can explain the remaining gap in trust. One possibility is that the measure of trust contains more measurement error as it is a cruder measure based on a single decision for each in-group and out-group framing. On the other hand, trustworthiness was elicited with the strategy method, where we obtained five responses for different amounts received for each framing condition. This may have reduced the measurement error as we averaged the five responses.

It is possible we could have explained more if we had also played the triple dictator game in the rural sample. The triple dictator game explained a large share of the variation in trust in the student sample also after the social preference type had been controlled for.

We did not include in our experimental tools to elicit ambiguity aversion or betrayal aversion. We cannot rule out that there are systematic differences in such preferences across the two samples. The surprisingly small difference between the within-village and within-district trust in the rural sample indicates that these villages, to a limited extent, have been able to build local trust. Why this is the case can be an interesting topic for future research. The large differences in the distribution of social preference types and moral obligations to reciprocate in the trust game between the student and rural samples are also interesting issues for further research.

6.3 Generalized trust in Malawi vs. other parts of the world

It is appropriate to compare the estimated levels of trust and trustworthiness in our two samples from Malawi with comparable data from other countries. We use outgroup measures of trust and trustworthiness as measures of generalized trust and trustworthiness. We use average shares sent and returned in the game, including separate measures for students and the rural sample, and compare with other studies in Table 11. We have prioritized other studies in Africa and a few other studies using student samples and broad population samples, and a metastudy by Johnson and Mislin (2011), which also makes some regional comparisons. They found average trust and trustworthiness shares to be significantly lower in the included African studies than in other regions. They also found that the student samples, on average, returned 80% less of a standard deviation than adult subject pools, while there were no significant differences between students and adult samples for sending behavior. Also, the study by Cappelen et al. (2015) found students to return significantly less than a representative population sample in Norway, while the difference was insignificant for sending behavior. Comparing the different student samples in Table 11, we see that sending behavior for Malawian students is close to the average for the African region based on the studies covered by Johnson and Mislin (2011) for the pooled student and non-student samples from Africa. For returning behavior by students, it is close to the average for the pooled sample for all regions in the metastudy. On the other hand, for the rural population sample from Malawi, we see that they send substantially lower shares than the average found for Africa in the metastudy, and for returning shares, these are, on average, also lower than the regional average for Africa in the metastudy. Only for a study of youth business group members in Ethiopia, there are lower shares sent and returned than in the rural sample in our study (Table 10).

7 Conclusion

We have studied trust and trustworthiness based on the standard incentivized trust game of Berg et al. (1995) in a sample of 764 students from 48 classes and 834 rural subjects from 64 villages in Malawi. We have investigated whether the generalizations for so-called WEIRD student samples hold in our study. WEIRD student samples are

Table 11 Average shares sent and returned in the trust game in different studies by sample type

Study	Source	Share sent Students	Share sent Broad	Share returned Students	Share returned Broad
Malawi	This study	0.451	0.321	0.375	0.284
Ethiopia youth	Holden and Tilahun (2021b)		0.227		0.225
South Africa	Chetty et al. (2021)	0.339		0.248	
South Africa	Ashraf et al. (2006)	0.428		0.27	
Norway	Cappelen et al. (2015)	0.535	0.517	0.21	0.31
USA	Buchan et al. (2008)	0.682		0.284	
Metastudy:					
All regions	Johnson and Mislin (2011)	Pooled	0.502	Pooled	0.372
Africa region	Johnson and Mislin (2011)	Pooled	0.456	Pooled	0.319

known to be less pro-social and less trustworthy and have therefore been considered to represent a lower bound on pro-social behavior. We also assumed that social relations in small communities help to build trust, and we wanted to assess the extent of such within-village trust in Malawi. By running the trust experiments in a large representative rural sample, we used the trust game to elicit within-village and within-district trust and trustworthiness with a within-subject design. We used within-class and within-university trust and trustworthiness among a large representative student sample as a reference sample for this.

Surprisingly, contrary to our hypotheses, we found both trust and trustworthiness to be significantly higher in the student than in the rural sample. We combined the trust game with several additional games and questions to decompose trust and trustworthiness and to try to explain the variation in these. First, we used the social preference type games of Fehr et al. (2013) and Bauer et al. (2014) that allowed us to split our samples into social preference types. Second, we used additional questions to classify subjects by their stated moral obligations to reciprocate by returning an amount at least as large as that sent by the trustor in the game. Third, we asked about the expected returns in the game, and fourth, we used four rounds of the risky investment game of Gneezy et al. (2009); Gneezy and Potters (1997) to get subject-level measures of risk tolerance. Finally, we also included age and gender, as the literature has found that these can contribute to explaining variations in trust and trustworthiness.

We could explain most of the gap between the student and the rural samples for trustworthiness and about half of the gap for trust. Factors contributing significantly to the variation in trustworthiness were social preference type, reciprocity norm, age, and gender. Social preference type, reciprocity norm, expected return, risk tolerance, and gender explained only about half of the student vs. rural sample gap for trust. Trust and trustworthiness varied systematically across social preference types. Altruistic and egalitarian types were more common among the students, while selfish types were more common in the rural sample. The students also demonstrated stronger

moral obligations to reciprocate in the game. On average, students and rural respondents were too optimistic about the expected returns in the trust game, and students were more optimistic than rural subjects on average, and more optimistic expectations were associated with higher trust investments. Non-strategic risk tolerance was also significantly positively correlated with trust investments, and students were, on average, slightly more risk tolerant than rural subjects. Female subjects were found to be less trusting and less trustworthy than males, and there was a larger share of females in the rural sample. There were only modest gains in trust and trustworthiness in the within-class vs. within-university and the within-village vs. within-district frames.

Our study demonstrates interesting heterogeneity in trust and trustworthiness that deserve further study. We may wonder whether selection causes a higher share of altruists and egalitarians and a lower share of selfish types in the student than in the rural sample. The substantially larger share of the students stating that they feel extremely obliged to return an amount at least as large as that sent by the trustor was also a surprising finding that explained more of the trust gap than the social preference type classification did. Our finding that non-strategic risk tolerance significantly influenced trust is also contrary to some earlier studies, which showed that only strategic betrayal aversion mattered. Our finding is consistent with other recent studies that found the same result (Chetty et al., 2021; Sabater-Grande, García-Gallego, Georgantzis, & Herranz-Zarzoso, 2022). They indicate that the earlier studies have been underpowered and that more sophisticated tools should be used to elicit risk preferences. This is an area for further research. Our finding that women were both less trusting and less trustworthy is consistent with earlier studies for trust but not for trustworthiness. We plan further to investigate the gender differences in our follow-up research. The final surprising and interesting result was that within-village trust was not much different from general (within-district) trust. More studies should investigate the local heterogeneity in village trust and its possible explanations. Finally, the overly optimistic expectations about the returns in the game among students and rural subjects represent a collective naivete that would be interesting to investigate further. Are Malawians generally too optimistic about the reciprocity behavior of their fellow Malawians?

Supplementary information. Supplementary information is provided with more detailed descriptive statistics in the following Appendices.

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Declarations

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- Conflict of interest/Competing interests: The authors declare no conflicts of interest.
- Ethics approval: Norwegian Agency for Development Cooperation (NORAD) approved the project that aims to enhance collaborative research between the Norwegian University of Life Sciences (NMBU) and Lilongwe University of Agriculture and Natural Resources (LUANAR) and to contribute to capacity-building within Behavioral and Experimental economics in LUANAR. At the time of the establishment of the project, the two universities did not have Review Boards for the ethical assessment of experimental protocols in Experimental Economics. The experiments used in the project are standard incentivized experiments used in many research projects in behavioral and experimental economics. The researchers in the project push for the establishment of such Review Boards in both universities and have used general guidelines to meet all ethical requirements associated with the types of experiments used in the project, including prior informed consent, and ensuring the anonymity of all respondents in all shared data and publications. Special care was taken as the experiments took place during the fourth round of the corona pandemic in Malawi to satisfy all safety measures needed to avoid contributing to the spread of the virus.
- Consent to participate: All subjects were explicitly asked at the beginning of each round, after receiving an introduction, about their consent to participate.
- Consent for publication: All authors are project members who have participated in the project and have agreed to publish the work jointly.
- Availability of data and materials: Experimental protocols and data will be made available upon the paper's publication and can be made available for reviewers upon request.
- Code availability: Codes for data analyses will be made available upon the publication of the paper and can be made available for reviewers upon request.
- Authors' contributions: Stein T. Holden (First author). The initial design of experimental protocols, conceptual ideas, data checking and cleaning, variable construction, statistical analysis, and paper write-up. Sarah Tione. Comments on experimental protocol, training of enumerators, implementation of experiments, data checking, and corrections. Mesfin Tilahun. Comments on experimental protocol, training of enumerators, piloting and implementation of experiments, commenting on drafts. Samson Katengeza. Comments on experimental protocol, recruitment of enumerators, and implementation of experiments, comments on drafts.

Appendix A Descriptive analyses

A.1 Classification in social preference types

Table A1 presents the classification of the student and the rural samples separately into social preference categories in their respective in-group and out-group framing conditions. The most noteworthy differences are that the share of selfish subjects is

Table A1 Student sample vs Rural sample: Social preference type distribution by type of trustee

	Anonymous classmate		Unknown student	
764 subjects	Percent	Cumulative	Percent	Cumulative
Selfish	22.1	22.1	21.1	21.1
Altruist	25.7	47.8	23.4	44.5
Weak altruist	3.9	51.7	5.4	49.9
Egalitarian	17.7	69.4	16.2	66.1
Weak egalitarian	20.4	89.8	15.7	81.8
Spiteful	5.5	95.3	9.0	90.8
Ambiguous	4.7	100.0	9.2	100.0
	Anonymous villager		Unknown person from district	
835 subjects	Percent	Cumulative	Percent	Cumulative
Selfish	38.4	38.4	36.9	36.9
Altruist	13.4	51.9	11.7	48.6
Weak altruist	5.4	57.3	5.3	53.9
Egalitarian	14.7	72.0	12.8	66.7
Weak egalitarian	15.5	87.4	12.1	78.8
Spiteful	4.1	91.5	8.5	87.3
Ambiguous	8.5	100.0	12.7	100.0

much higher in the rural sample than in the student sample and that the share of altruists is much higher in the student sample.

A.2 Trusting behavior by sample, social preference type, and in-group vs. out-group framing

In Fig.A1 we investigate whether the trusting behavior as measured with the standard trust game varies significantly by social preference type a) among university students and b) among rural respondents. In a within-subject design, we investigate how trust varies among students when the game is played with a student within their class versus with an unknown student within the university. For the rural sample, the within-subject design implied that they played the game with another anonymous person within their village or with another unknown person from the same district.

Fig. A1 reveals that altruists in the student sample were significantly more trusting than all other social preference types, and the spiteful were less trusting than the other types. The difference in trust between altruists and egalitarians was lower in the rural sample and the amounts sent were generally lower in the rural sample than in the student sample.

A.3 Trustworthiness behavior by sample, framing, amount received, and social preference type

How much of the amount received from a trustor do you, as a trustee, want to return to the trustor conditional on the amount sent and the type of trustor? We investigated this for the student and rural samples using the strategy method. The trustee is informed that we tripled the amount sent by the trustor out of MK. 1000 the trustor initially could allocate. We asked this question for all possible amounts received, except

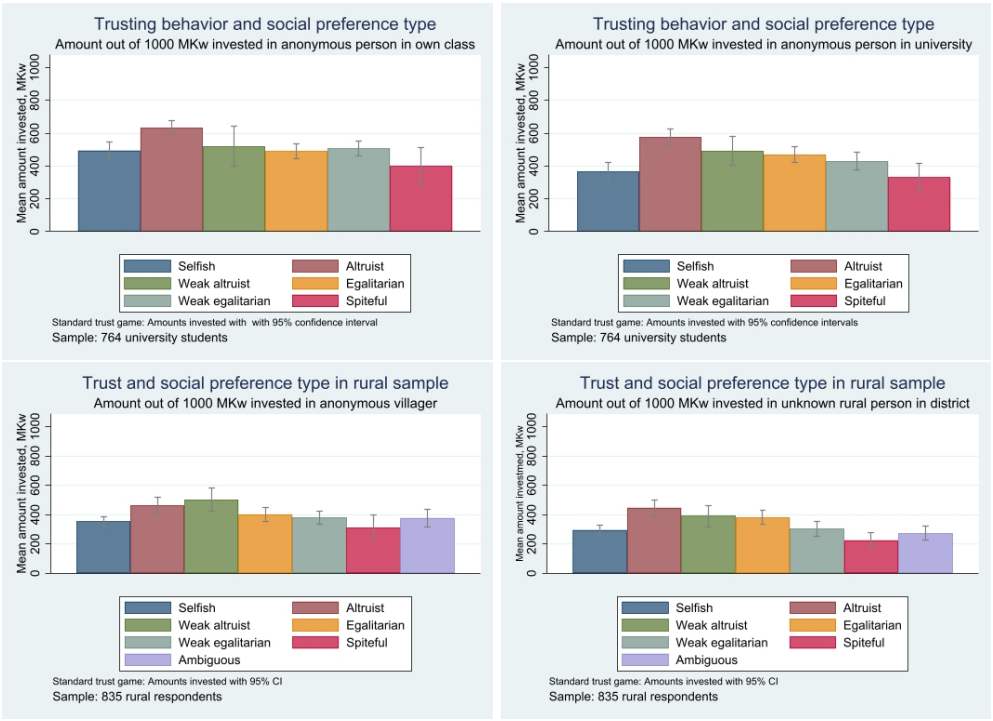

Fig. A1 In-group and out-group investment in the trust game by social preferences type in the student and rural samples

when nothing is received, by type of trustor. The stated amount by the trustee was binding when the real amount received was identified in the envelope received from the randomly identified trustor. Figures A2-A5 show the stated amounts returned by the trustees from the student (Fig. A2 and A3) and rural samples (Fig. A4 and A5) by type of trustor, amounts received, and social preference type of the trustee.

Fig. A2-A5 reveal a very consistent pattern in terms of relative amounts returned by social preference type, as we also saw for trusting behavior among students and rural subjects in Fig. A1. Those classified as spiteful and selfish return less than the egalitarian and the altruistic types who return the most. We find small variations in the share returned of the amount received across amounts received within each social preference type. In the student sample, the altruists returned almost half the amount received, the selfish returned less than one-third, and the spiteful returned even less. In the rural sample, the amounts returned were smaller on average and only slightly above one-third on average for the altruists. There was a weak tendency towards higher amounts returned in the in-group than in the out-group framing among the students and the rural sample.

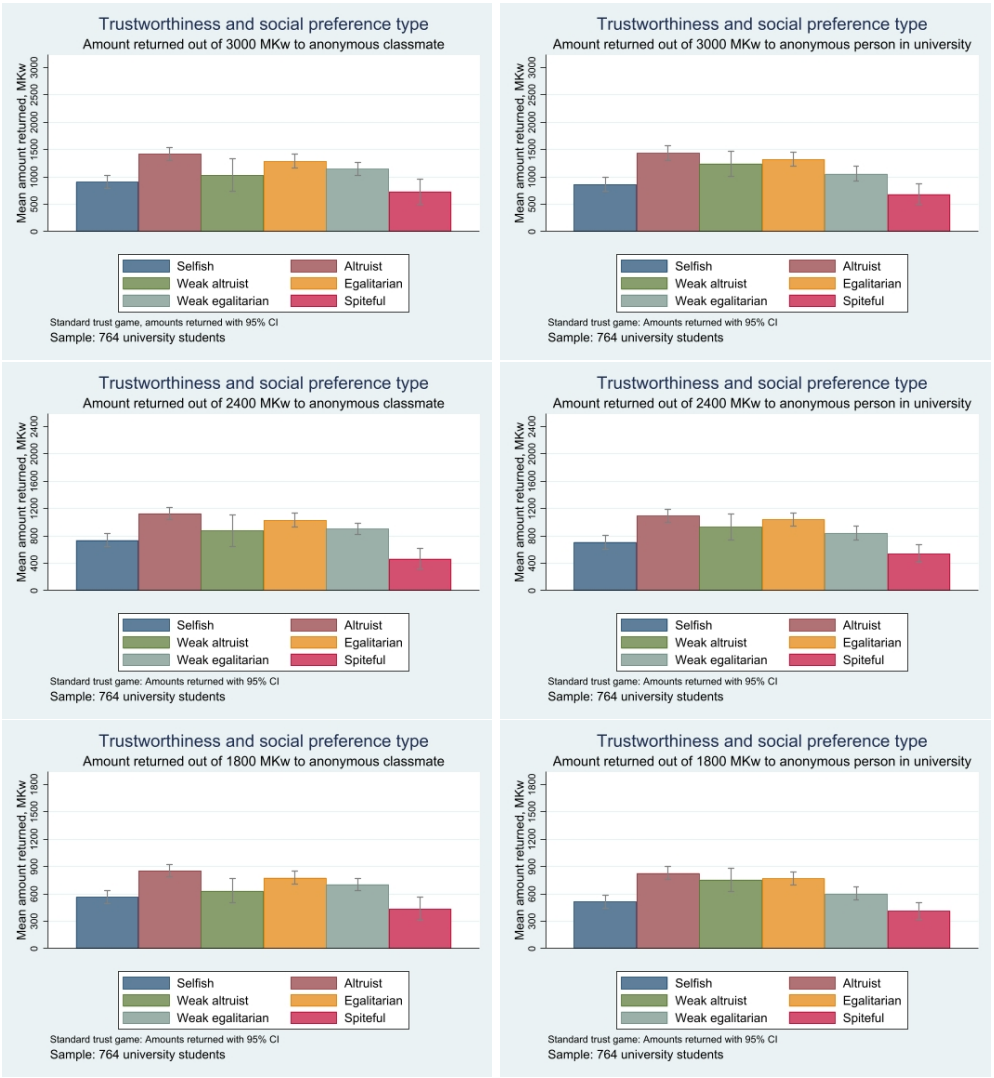

Fig. A2 Trustworthiness (amount returned) by social preference type in the trust game among university students: For large amounts received

A.4 Social preference type and dictator game giving: Student sample

The 1x and 3x (triple) dictator games were only played with students. Fig. A6 shows the distribution by social preference type in the 2x2 within-subject treatment design. The graph shows the mean amounts given with 95% confidence intervals by social preference type in each of the four treatments.

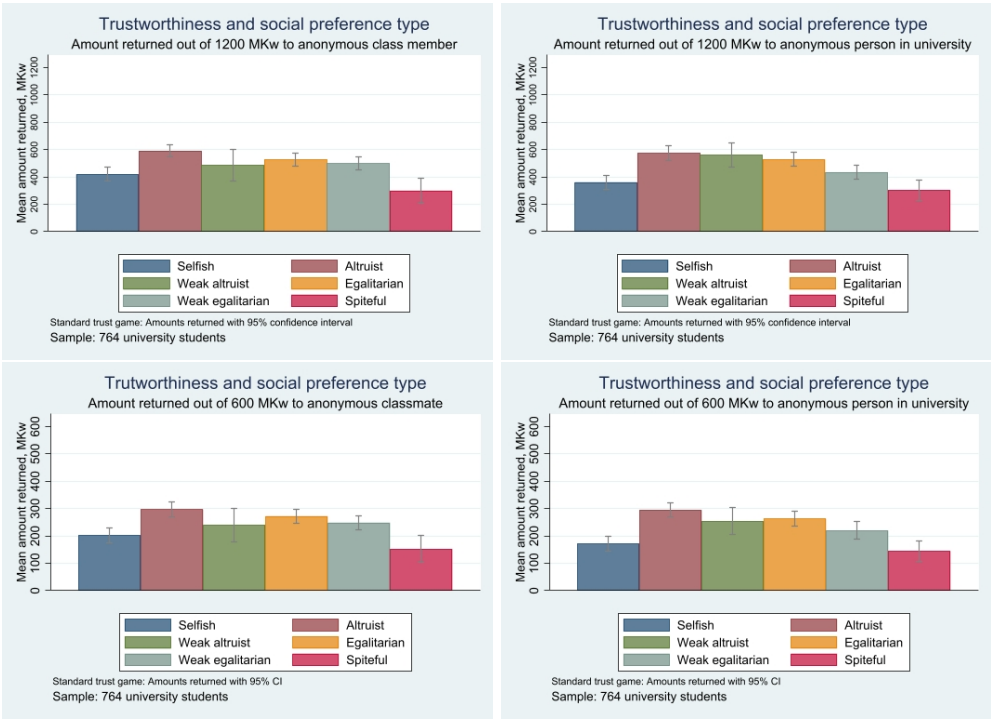

Fig. A3 Trustworthiness (amount returned) by social preference type in the trust game among university students: For small amounts received

Fig. A6 shows that the spiteful give the smallest amounts, followed by the selfish, the egalitarian, and the altruists giving the most. There is, therefore, a clear consistency between the simple binary games used to classify subjects into social preference types and their giving behavior in these dictator games. It is noteworthy, however, that even those classified as spiteful and selfish give something. The effect of switching from the standard (1x) to the triple (3x) dictator game is modest in terms of amounts sent.

A.5 The moral obligation to reciprocate, trusting, and trustworthiness behavior

The students (rural subjects) were asked, 'How obliged do you feel to return an amount that is at least as large as the amount sent by the trustor if the trustor is a) an anonymous classmate (anonymous person in own village); b) another unknown student in the university (another unknown person in the district);' with three alternative answers; i) Extremely obliged, ii) Somewhat obliged, and iii) Not obliged at all. The overall distribution of answers is presented in Table A2 for the two samples and the two alternative within-subject framing conditions.

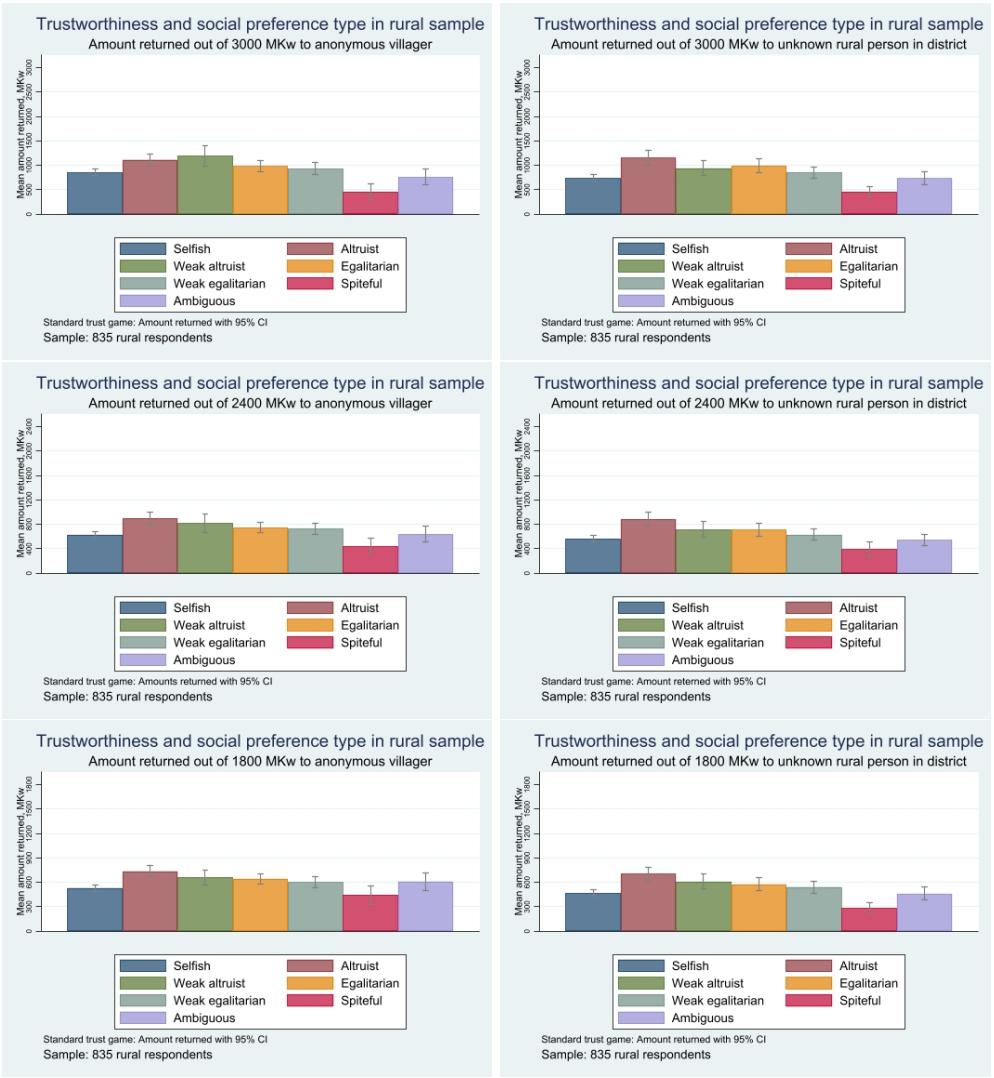

Fig. A4 Trustworthiness (amount returned) by social preference type in the trust game in rural sample: For large amounts received

Table A2 shows the distribution of the stated moral obligation to reciprocate by returning at least as large an amount as that sent by the trustor in the game with the alternative in-group and out-group framing conditions used throughout our experiments for the student and rural samples. We note a much larger share of students (50.1%) stating that they feel extremely obliged to return an amount as large as the amount sent by a classmate than a rural villager did for another anonymous villager from the same village (25.4%). A larger share of students also stated that they felt extremely obliged to return an amount at least as large as the amount received from

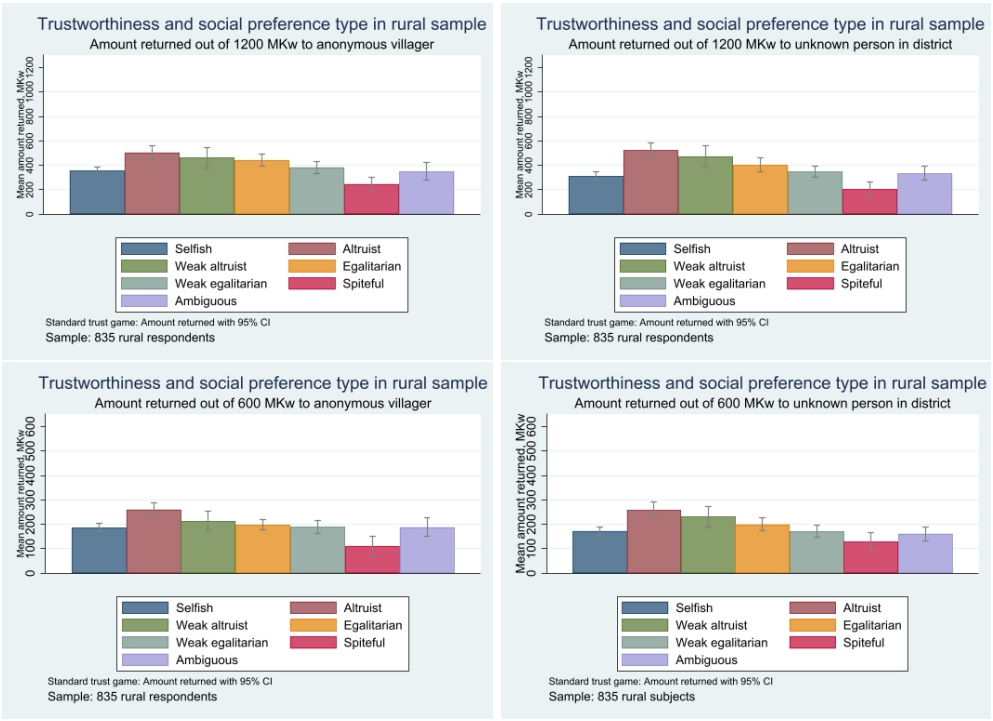

Fig. A5 Trustworthiness (amount returned) by social preference type in the trust game in rural sample: For small amounts received

Table A2 Student sample vs Rural sample: Moral norm to reciprocate by returning at least as much as was sent by the trustor, by type of trustor

	Anonymous classmate		Unknown student	
Moral norm	Percent	Cumulative	Percent	Cumulative
Extremely obliged	50.1	50.1	41.9	41.9
Somewhat obliged	40.6	90.7	45.0	86.9
Not obliged at all	9.3	100.0	13.1	100.0
	Anonymous villager		Unknown person in ditrict	
Moral norm	Percent	Cumulative	Percent	Cumulative
Extremely obliged	25.4	25.4	24.5	24.5
Somewhat obliged	18.6	44.0	21.7	46.2
Not obliged at all	56.0	100.0	53.8	100.0

another unknown student in the university (41.9%), compared to 24.5% for a rural villager versus another unknown person in the same district. The shares of the rural sample that did not feel obliged at all to return at least the amount sent were much higher in the rural sample with 56.0% for the in-group and 53.8% for the out-group compared to students where only 9.3% and 13.1% stated that they did not feel obliged at all.

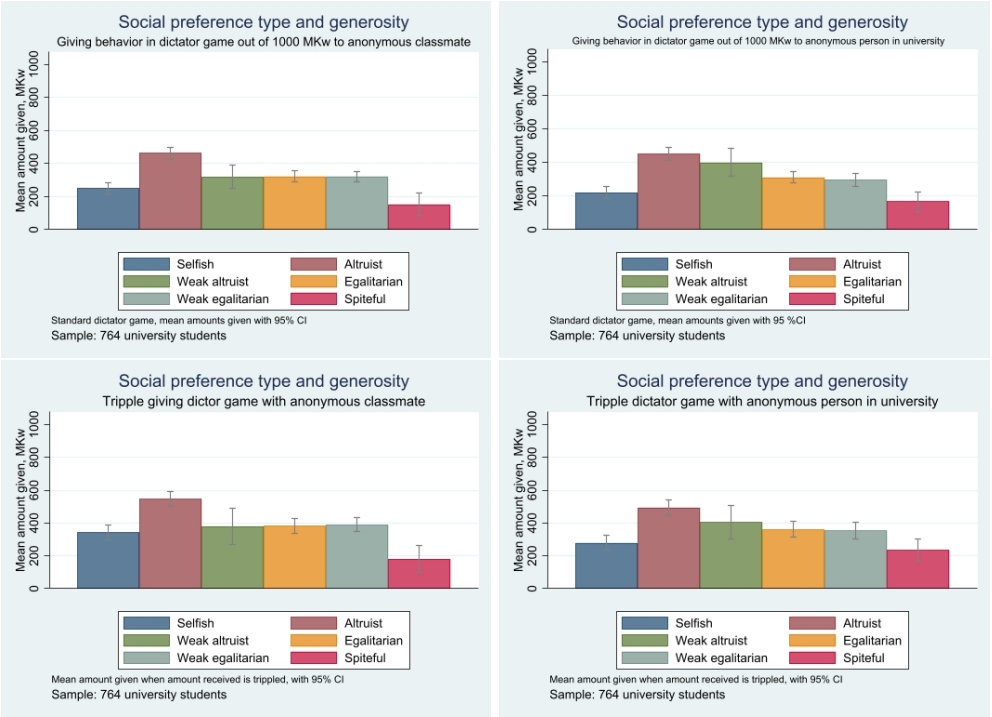

Fig. A6 Social preferences and in-group and out-group dictator game giving in 1x and 3x dictator games among university students

The upper four graphs in Fig. A7 show the mean amounts invested with 95% confidence intervals in the trust game by moral obligation categories for students and rural subjects with their respective in-group and out-group framing. We see that the moral obligation categories are associated with substantially larger differences across categories in the student sample than in the rural sample. Those with a stronger moral obligation to reciprocate are also more trusting. When we look at the last four graphs in Fig. A7, we see the same pattern for trustworthiness based on the case when subjects received a large tripled amount of MKw 3000. It is noteworthy that even those who did not feel obliged at all to return as much as was sent by the trustor still returned substantial amounts on average.

Table A3 shows the variation in this reciprocity norm by social preference type of the trustees as identified with the social preference games in the in-group and out-group settings. We see that the moral norm to reciprocate was much stronger among students classified as altruists or egalitarians and weaker among those classified as selfish and spiteful. These differences were much smaller across social preference types of the trustees in the rural sample.

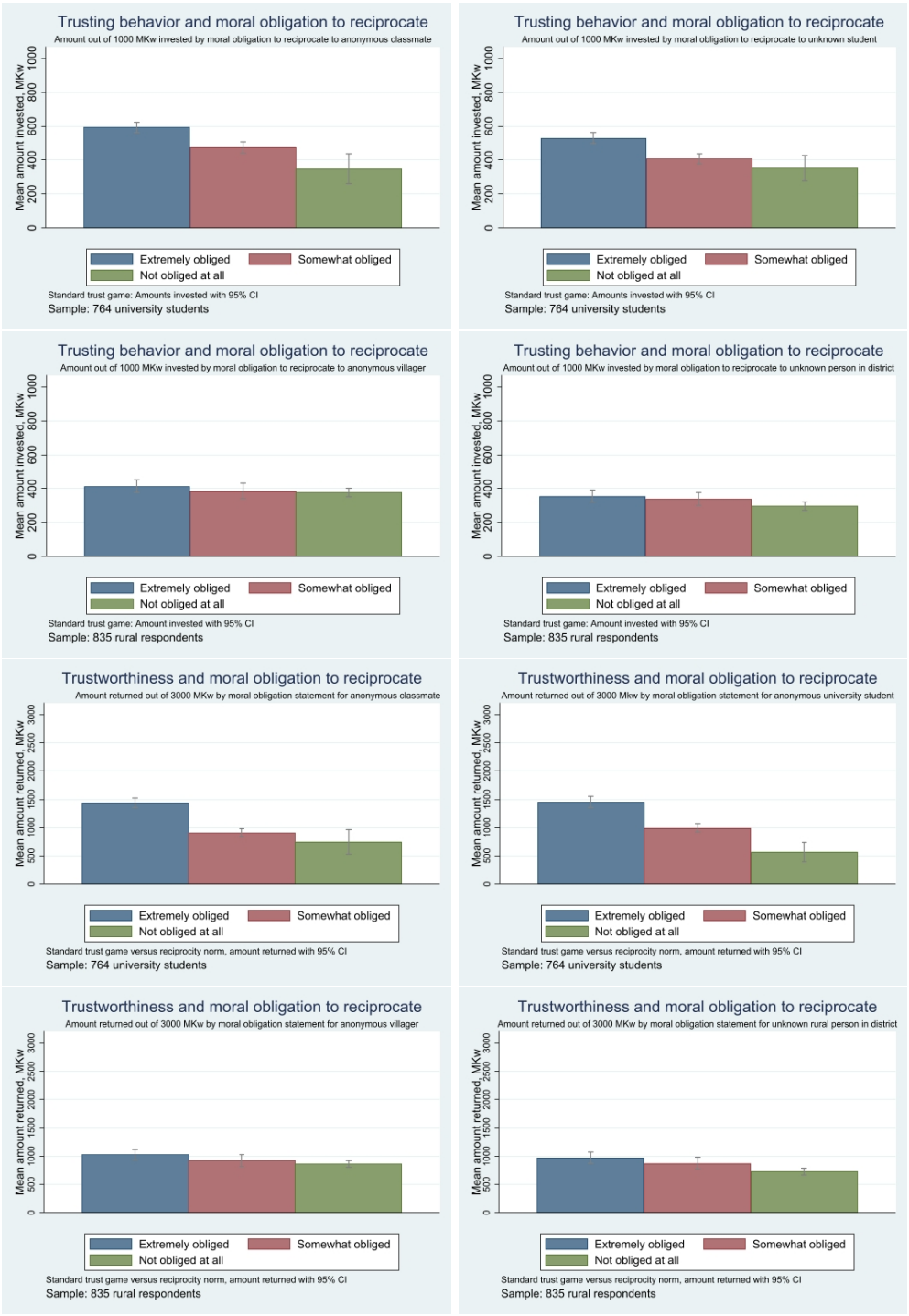

Fig. A7 Moral obligation to reciprocate, trust, and trustworthiness

Table A3 Student sample vs Rural sample: Moral norm to reciprocate by returning at least as much as was sent by trustor, by type of trustee, and by social preference type (% within each type)

	Anonymous classmate			Unknown student		
	Extremely obliged	Somewhat obliged	Not obliged	Extremely obliged	Somewhat obliged	Not obliged
Selfish	37.9	47.9	14.2	28.0	50.9	21.1
Altruist	57.7	36.2	6.1	55.3	37.4	7.3
Weak altruist	33.3	46.7	20.0	51.2	41.5	7.3
Egalitarian	60.0	31.1	8.9	48.4	41.1	10.5
Weak egal.	51.9	41.7	6.4	39.2	50.8	10.0
Spiteful	40.5	42.9	16.7	30.4	43.5	26.1
Ambiguous	47.2	52.8	0.0	38.6	51.4	10.0
	Anonymous villager			Unknown person in district		
	Extremely obliged	Somewhat obliged	Not obliged	Extremely obliged	Somewhat obliged	Not obliged
Selfish	27.1	16.2	56.7	21.7	23.4	54.9
Altruist	28.6	13.4	58.0	26.5	18.4	55.1
Weak altruist	28.9	17.8	53.3	29.6	15.9	54.6
Egalitarian	21.1	23.6	55.3	24.3	29.9	45.8
Weak egal.	24.0	20.9	55.0	25.7	17.8	56.4
Spiteful	20.6	26.5	52.9	25.4	16.9	57.8
Ambiguous	22.9	21.4	55.7	26.7	21.0	52.4

A.6 Expectations about amounts returned in the trust game by sample and framing condition.

Expectations about amounts returned in the trust game may influence investments by trustors in the trust game. These expectations may also depend on the type of player they play with (in-group vs. out-group framing). The expectations were classified into six categories, as shown in Table A4, by sample type and partner framing in the game.

Notably, 85.4% of the student sample expected to receive back at least the amount they invested in the within-class game, while this share was reduced to 77.3% in the out-group framing. In the rural sample, these shares were 79.8% and 74.3% within the village and within the district. We also note that more than half of the students and rural samples expected trustees to return half or more of the amount they received. This indicates a widespread and strong belief in the trustworthiness of people.

If expected returns influence trust, risk tolerance may also influence trust as trusting people is risky, and less risk tolerant people may respond less to higher expected returns than more risk tolerant people. We assess whether there is a systematic difference between the student and rural sample in the distribution of their risk tolerance as measured with the average shares invested in the four rounds of the incentivized risky investment game. Fig. A8 shows the cumulative probability distributions for the average investment shares in the two samples.

The average risky investment share is 0.593 (+/-0.02) for students and 0.532 (+/-0.02) for the rural sample. Fig. A8 shows that students invest more in the risky investment game, and the investment share distribution in the student sample stochastically dominates that of the rural sample.

Table A4 Student sample vs Rural sample: Trustors' expected amount returned by the trustee, by type of trustee

	Anonymous classmate		Unknown student	
Response	Percent	Cumulative	Percent	Cumulative
Nothing, as I sent nothing	5.3	5.3	8.4	8.4
Nothing, although I sent some	7.2	12.5	8.4	16.8
Less than one third	2.1	14.6	5.9	22.7
One third	13.5	28.1	13.0	35.7
Half	28.5	56.6	29.2	64.9
More than half	43.3	100.0	35.2	100.0
	Anonymous villager		Unknown person in district	
Response	Percent	Cumulative	Percent	Cumulative
Nothing, as I sent nothing	4.7	4.7	8.0	8.0
Nothing, although I sent some	9.1	13.8	11.8	19.8
Less than one third	6.4	20.2	5.9	25.7
One third	17.2	37.4	18.5	44.2
Half	33.6	71.0	28.7	72.9
More than half	29.1	100.0	27.2	100.0

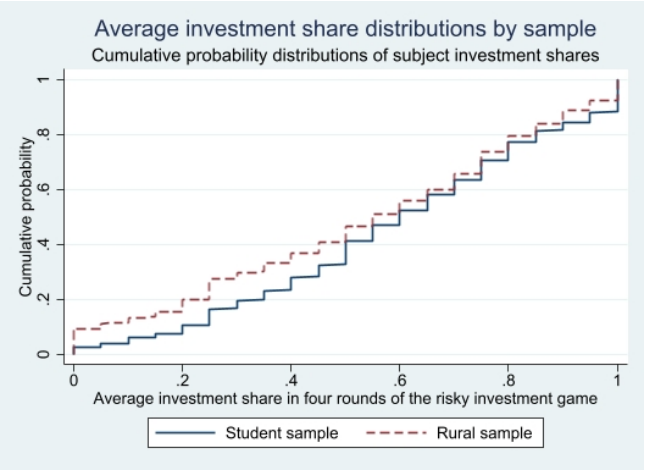

Fig. A8 Risk tolerance: Cumulative risky investment shares by sample

A.7 Regression models decomposing trust by sample and in-group vs. out-group framing

In the following analysis, we do the analyses separately for the student and rural samples. This allows us to investigate whether there are systematic differences in the factors influencing or being correlated with trust and trustworthiness in the two samples. We can only include the measure of generosity based on the triple dictator game in the analyses of the student sample.

Table A5 presents in-group trust models for the student sample. We start with a simple model and add controls stepwise to assess their effects on the results. The first model tests whether the trust investment varies significantly across social preference

types with the selfish category as a base. We see that altruists invested significantly more than the selfish, while none of the other types had a trust investment that deviated significantly from the selfish category. The second model adds the triple dictator game share given by the subjects (a measure of generosity), and it is highly significant and with a positive sign. It indicates that trusting behavior is partly driven by generosity. The size of the parameter on the altruist type is reduced from 0.137 to 0.062 and may indicate that more of the trust investment by altruists is due to their higher generosity towards classmates. In the third model, we included the categorical moral norm to return an amount at least as large as that sent by the trustor. The moral norm of the trustor may also influence her/his perceptions about the likelihood of the trustee having the same normative attitude. The result in the table demonstrates that trusting behavior is also driven by the reciprocity norm. A weak or no norm to reciprocate in the trust game are associated with a highly significantly lower willingness to invest in the game as a trustor. In the fourth model, we add a categorical rank variable for the expected return (see Fig. 9 for the categories) combined with a measure of risk tolerance in the form of the average amount invested in four rounds of the risky investment game. The expected return rank variable was highly significant and with a positive sign demonstrating that trusting behavior is partly driven by the expected returns. The risk tolerance variable was also significant at the 5% level, with a positive sign indicating that more risk tolerant subjects invested more in the trust game. Finally, in model (5), we included additional controls and changed from class fixed effects to class random effects to allow for assessment of the importance of students being business and economics students and whether the year of study matters (socialization over time in the university). Unlike in other studies, economics students were not found to be significantly less trusting than other students, and first-year BSc and MSc students appeared slightly more trusting. Female students were significantly less trusting than male students, in line with findings in many other studies.

Table A6 presents the same sequence of models for out-group (within-university) trust in the student sample. We briefly note some major differences compared to the in-group trust models in Table A5. Table A6 shows that egalitarians are also more trusting than the selfish group, although they also are significantly less trusting than the altruists before controlling for triple dictator game giving (generosity). The lack of moral norm to reciprocate and risk tolerance appeared less significant in the out-group setting for students, but the total 'explanatory power' of the RHS variables was about the same, with an R-square of 0.26 and 0.27 when all variables were included. The expected returns and risk tolerance were significant at the same levels and with slightly higher coefficients than in the within-class models. The economics students were slightly less trusting in the within-university models, and the first-year BSc- and MSc students were significantly more trusting than others. Another difference was that age was significant (at 5% level) and with a positive sign.

Table A7 shows the within-village trust model results for the rural sample but without the dictator game generosity variable, as the dictator game was not played with the rural sample. The direction of the responses is similar in the rural sample, with altruists investing significantly more in the trust game than the selfish baseline group. In this sample, even those categorized as weak altruists invested significantly

Table A5 Within-class trust models in student sample

VARIABLES	(1) T1a	(2) T1a	(3) T1a	(4) T1a	(5) T1a
In-group base: Selfish					
Altruist	0.137***	0.062**	0.051*	0.060**	0.051*
	(0.031)	(0.028)	(0.029)	(0.029)	(0.028)
Weak altruist	0.016	0.005	0.015	0.022	0.023
	(0.067)	(0.055)	(0.050)	(0.049)	(0.048)
Egalitarian	0.004	-0.007	-0.023	-0.016	-0.035
	(0.034)	(0.030)	(0.030)	(0.030)	(0.028)
Weak egal.	0.005	-0.009	-0.022	-0.015	-0.016
	(0.031)	(0.033)	(0.034)	(0.033)	(0.032)
Spiteful	-0.099	-0.036	-0.037	-0.024	-0.029
	(0.072)	(0.064)	(0.062)	(0.061)	(0.060)
Ambiguous	-0.100**	-0.100**	-0.117**	-0.117***	-0.125***
	(0.049)	(0.048)	(0.046)	(0.041)	(0.044)
D3 generosity		0.398***	0.367***	0.352***	0.340***
		(0.043)	(0.043)	(0.042)	(0.043)
Base: Extremely obliged					
Somewhat obliged			-0.062***	-0.061***	-0.068***
			(0.018)	(0.017)	(0.018)
Not obliged at all			-0.165***	-0.139***	-0.149***
			(0.040)	(0.040)	(0.039)
Reciprocity expectation				0.034***	0.035***
				(0.009)	(0.009)
Av. Risky Inv. share				0.097**	0.087**
				(0.037)	(0.037)
Age					0.005
					(0.003)
Female, dummy					-0.073***
					(0.022)
Parents own farmland					0.011
					(0.022)
Econ student, dummy					-0.016
					(0.027)
Year of study: Base: 1st BSc					
2nd year BSc					-0.062*
					(0.034)
3rd year BSc					-0.057*
					(0.033)
4th year BSc					-0.030
					(0.044)
1st year MSc					0.006
					(0.045)
2nd year MSc					-0.149***
					(0.033)
Constant	0.496***	0.356***	0.418***	0.259***	0.233***
	(0.021)	(0.027)	(0.031)	(0.049)	(0.077)
Observations	764	764	764	764	764
R-squared	0.053	0.197	0.220	0.249	
Number of ClassID	48	48	48	48	48

With Class FE, except model (5) with class RE. Cluster-robust standard errors in parentheses, clustering on class. Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Table A6 Within-university trust models in student sample

VARIABLES	(1) T1bs	(2) T1bs	(3) T1bs	(4) T1bs	(5) T1bs
Out-group base: Selfish					
Altruist	0.206***	0.125***	0.113***	0.107***	0.099***
	(0.033)	(0.030)	(0.031)	(0.032)	(0.031)
Weak altruist	0.076	0.038	0.027	0.033	0.053
	(0.049)	(0.040)	(0.041)	(0.042)	(0.041)
Egalitarian	0.097***	0.074**	0.064**	0.048	0.028
	(0.031)	(0.029)	(0.029)	(0.029)	(0.029)
Weak egal.	0.054*	0.027	0.022	0.024	0.029
	(0.031)	(0.027)	(0.026)	(0.027)	(0.026)
Spiteful	-0.054	-0.026	-0.028	-0.007	-0.006
	(0.058)	(0.054)	(0.052)	(0.051)	(0.047)
Ambiguous	0.070	0.047	0.042	0.039	0.036
	(0.047)	(0.045)	(0.045)	(0.042)	(0.037)
D4s-generosity		0.401***	0.385***	0.366***	0.360***
		(0.037)	(0.037)	(0.040)	(0.041)
Base: Extremely obliged					
Somewhat obliged			-0.062**	-0.064**	-0.057**
			(0.025)	(0.024)	(0.024)
Not obliged at all			-0.060	-0.047	-0.046
			(0.043)	(0.041)	(0.039)
Reciprocity expectation				0.040***	0.043***
				(0.009)	(0.009)
Av. Risky Inv. share				0.106**	0.104**
				(0.043)	(0.043)
Age					0.008**
					(0.004)
Female, dummy					-0.052**
					(0.023)
Parents own farmland					0.013
					(0.019)
Econ student, dummy					-0.037*
					(0.022)
Year of study: Base: 1st BSc					
2nd year BSc					-0.094***
					(0.034)
3rd year BSc					-0.074**
					(0.035)
4th year BSc					-0.064
					(0.051)
1st year MSc					-0.025
					(0.054)
2nd year MSc					-0.207***
					(0.063)
Constant	0.373***	0.256***	0.305***	0.147***	0.039
	(0.020)	(0.024)	(0.033)	(0.052)	(0.084)
Observations	764	764	764	764	764
R-squared, within	0.067	0.207	0.215	0.253	0.269
Number of ClassID	48	48	48	48	48

With Class FE, except model (5) with class RE. Cluster-robust standard errors in parentheses, clustering on class. Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Table A7 Within-village trust models in rural sample

VARIABLES	(1) T1a	(2) T1a	(3) T1a	(4) T1a
In-group base: Selfish				
Altruist	0.087***	0.086***	0.086***	0.082***
	(0.025)	(0.025)	(0.027)	(0.029)
Weak altruist	0.162***	0.162***	0.158***	0.152***
	(0.038)	(0.038)	(0.038)	(0.038)
Egalitarian	0.046*	0.049*	0.049	0.045
	(0.027)	(0.027)	(0.029)	(0.029)
Weak egal.	0.008	0.009	0.011	0.009
	(0.022)	(0.022)	(0.022)	(0.022)
Spiteful	-0.035	-0.033	-0.017	-0.020
	(0.053)	(0.052)	(0.052)	(0.053)
Ambiguous	0.050	0.053	0.050	0.044
	(0.051)	(0.048)	(0.050)	(0.050)
Base: Extremely obliged				
Somewhat obliged		-0.032	-0.031	-0.031
		(0.032)	(0.032)	(0.032)
Not obliged at all		-0.044*	-0.045*	-0.046*
		(0.023)	(0.025)	(0.025)
Expected return			0.036***	0.036***
			(0.007)	(0.007)
Av. Risky Inv. share			0.040	0.041
			(0.031)	(0.031)
Age				-0.000
				(0.001)
Female				-0.032
				(0.024)
Constant	0.500***	0.531***	0.422***	0.440***
	(0.051)	(0.057)	(0.058)	(0.056)
Observations	834	834	834	834
R-squared	0.085	0.089	0.118	0.121
Number of village_id	64	64	64	64

With village and enumerator FE. Cluster-robust standard errors in parentheses, clustering on villages. Significance levels: *** p<0.01, ** p<0.05, * p<0.1

more. The moral norm to return at least as much as that sent by the trustor had the expected sign but was less significant than for the student sample. This may also be because the group stating they were extremely obliged was smaller in the rural sample (Table A3), and the difference in average trust investment by moral obligation category was lower in the rural sample (Fig. A7). The reciprocity expectation was highly significant and similar in the rural sample to the student sample; thus, expected returns matter in the trust game. Finally, we see that our measure of risk tolerance is insignificant and with a positive sign.

Table A8 presents the trust models for the rural sample when the game was played with another unknown person in the district (generalized trust). We see significant differences by social preference type, with altruists investing most in the trust game followed by weak altruists and egalitarian, then by the selfish (base), weak egalitarian, and ambiguous, and finally with the spiteful investing significantly less than the selfish.

Table A8 Within-district trust models in rural sample

VARIABLES	(1) T1b	(2) T1b	(3) T1b	(4) T1b
Out-group base: Selfish				
Altruist	0.175***	0.175***	0.166***	0.162***
	(0.024)	(0.025)	(0.023)	(0.023)
Weak altruist	0.099**	0.100**	0.103**	0.097**
	(0.043)	(0.043)	(0.043)	(0.044)
Egalitarian	0.107***	0.105***	0.094***	0.088**
	(0.034)	(0.034)	(0.035)	(0.033)
Weak egal.	-0.000	-0.003	-0.001	-0.003
	(0.032)	(0.032)	(0.031)	(0.030)
Spiteful	-0.064*	-0.064*	-0.047	-0.051
	(0.036)	(0.034)	(0.031)	(0.031)
Ambiguous	0.002	0.001	-0.003	-0.005
	(0.027)	(0.026)	(0.025)	(0.025)
Base: Extremely obliged				
Somewhat obliged		-0.024	-0.019	-0.020
		(0.025)	(0.025)	(0.025)
Not obliged at all		-0.068***	-0.054**	-0.056**
		(0.022)	(0.022)	(0.022)
Expected return			0.035***	0.036***
			(0.007)	(0.007)
Av. Risky Inv. share			0.017	0.017
			(0.032)	(0.032)
Age				-0.000
				(0.001)
Female				-0.029
				(0.022)
Constant	0.374***	0.421***	0.328***	0.353***
	(0.045)	(0.050)	(0.052)	(0.051)
Observations	834	834	834	834
R-squared	0.111	0.122	0.156	0.159
Number of village_id	64	64	64	64

With village and enumerator FE. Cluster-robust standard errors in parentheses, clustering on villages. Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Only one of the moral obligation dummy variables was significant at the 1 and 5% levels, with a negative sign for those feeling no such obligation. Those with a strong moral norm, therefore, invested more than those without such a norm. The expected return rank variable was highly significant and about the same size as in the student sample. Finally, the risk tolerance variable is insignificant but has a positive sign, like for the within-village setting.

A.8 Regression models decomposing trustworthiness by sample and in-group vs. out-group framing

The following models attempt to decompose possible explanations for systematic differences in trustworthiness with the student and rural samples. We use the average within-subject share returned in the trust game elicited with the strategy method with the in-group and out-group framing. By running the models separately for the

student and rural samples, we can inspect whether the results are similar or different in the two samples.

Table A9 presents the models for the within-class framing in the student sample. Here, we can investigate the relative importance of generosity (revealed in the triple dictator game), the moral obligation to reciprocate, and their importance for the differences in shares returned in the trust game by social preference type. Finally, we also assess the importance of other controls, like in the previous trust models for students.

Model (1) in Table A9 shows that altruists and egalitarians returned significantly higher shares than the selfish, and the spiteful returned significantly less than the selfish. The selfish returned 32.5% of the amount sent by trustors on average. Dictator game-giving behavior was highly significantly and positively correlated with the share returned in the trust game, as seen in model (2) in Table A9. Including this variable reduced the coefficient for altruists the most, but it was also reduced for the other significant social preference types, indicating that generosity partly drives the returning behavior in the trust game. In model (3), the moral obligation to return at least as much as that sent by the trustor is added with two dummy variables for weak and no such moral obligation and being extremely obliged as the base category. Both the moral obligation dummy variables are highly significant and have negative signs. It shows that moral norms are very important for the returning behavior in the trust game and shows that reciprocity norms are important. Finally, in model (4), we see that the amount returned increases with the age of the student (significant at 10% level), is lower for female students (significant at 5% level), is lower for economics students (significant at 1% level), and is lower for 1st year MSc students than BSc students.

Table A10 presents the trustworthiness models for students in the within-university framing. The results are similar to the results for the within-class trustworthiness models. The main differences were for the additional controls in model (4), where age and the female dummy variables are insignificant, the economics student dummy again is highly significant and negative, but the study year is insignificant for first-year MSc students. The latter result indicates lower within-class trustworthiness among 1st year MSc students, but this is not due to them being less trustworthy towards other students in general.

Table A11 presents the within-village trustworthiness models for the rural sample. The results for the social preference types are similar in relative differences as in the student sample. As we did not get a measure for generosity in the rural sample, we cannot assess its relative importance. The moral obligation dummy variables are highly significant and have negative signs. They indicate that those stating that they feel extremely obliged to return an amount at least as large as that sent by the trustor in the village return a larger amount than those who feel somewhat obliged and those who do not feel obliged. The last two categories are not significantly different in their returning behavior. A clear difference from the student sample is that age is highly significant and with a negative sign in the rural sample (it was positive and significant in the student sample). However, a ten-year difference in age is only associated with a one percentage point reduction in the share sent, so age does not make a big and

Table A9 Within-class trustworthiness in the student sample: Average share of 5)

VARIABLES	(1) twas	(2) twas	(3) twas	(4) twas
In-group base: Selfish				
Altruist	0.153***	0.079***	0.067***	0.060***
	(0.026)	(0.021)	(0.021)	(0.020)
Weak altruist	0.049	0.031	0.044	0.041
	(0.046)	(0.038)	(0.0) 37	(0.035)
Egalitarian	0.113***	0.091***	0.071***	0.059***
	(0.030)	(0.026)	(0.026)	(0.025)
Weak egal.	0.073***	0.050**	0.036*	0.029
	(0.023)	(0.022)	(0.020)	(0.019)
Spiteful	-0.087**	-0.048	-0.049	-0.057*
	(0.034)	(0.036)	(0.033)	(0.033)
Ambiguous	0.005	-0.035	-0.044	-0.052*
	(0.030)	(0.028)	(0.028)	(0.027)
D1s - generosity		0.381***	0.339***	0.330***
		(0.040)	(0.041)	(0.041)
Base: Extremely obliged				
Somewhat obliged			-0.104***	-0.107***
			(0.017)	(0.018)
Not obliged at all			-0.166***	-0.177***
			(0.035)	(0.036)
Age				0.004*
				(0.002)
Female, dummy				-0.037**
				(0.016)
Parents own farmland				0.010
				(0.015)
Econ student, dummy				-0.043***
				(0.015)
Year of study: Base: 1st BSc				
2nd year BSc				-0.008
				(0.021)
3rd year BSc				0.011
				(0.023)
4th year BSc				0.052
				(0.041)
1st year MSc				-0.081***
				(0.021)
2nd year MSc				-0.069
				(0.054)
Constant	0.325***	0.225***	0.306***	0.243***
	(0.016)	(0.022)	(0.026)	(0.057)
Observations	764	764	764	764
R-squared, within	0.092	0.226	0.290	0.301
Number of ClassID	48	48	48	48

With Class FE, except model (4) which used class RE to accommodate the Econ student dummy. Cluster-robust standard errors in parentheses, clustering on class. Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Table A10 Within-university trustworthiness in student sample

VARIABLES	(1) twbs	(2) twbs	(3) twbs	(4) twbs
Out-group base: Selfish				
Altruist	0.166***	0.094***	0.064**	0.064***
	(0.030)	(0.027)	(0.024)	(0.023)
Weak altruist	0.110***	0.061**	0.034	0.033
	(0.033)	(0.029)	(0.032)	(0.031)
Egalitarian	0.138***	0.114***	0.089***	0.081***
	(0.031)	(0.028)	(0.025)	(0.024)
Weak egal.	0.056*	0.035	0.015	0.015
	(0.032)	(0.029)	(0.028)	(0.027)
Spiteful	-0.066**	-0.046	-0.046*	-0.042
	(0.030)	(0.030)	(0.026)	(0.027)
Ambiguous	0.057	0.021	0.006	0.006
	(0.037)	(0.035)	(0.032)	(0.033)
D2s - generosity		0.344***	0.306***	0.303***
		(0.037)	(0.034)	(0.034)
Base: Extremely obliged				
Somewhat obliged			-0.110***	-0.107***
			(0.016)	(0.017)
Not obliged at all			-0.196***	-0.193***
			(0.029)	(0.028)
Age				0.004
				(0.003)
Female, dummy				-0.002
				(0.015)
Parents own farmland				0.009
				(0.017)
Econ student, dummy				-0.052***
				(0.016)
Year of study: Base: 1st BSc				
2nd year BSc				-0.001
				(0.023)
3rd year BSc				0.022
				(0.021)
4th year BSc				0.058
				(0.055)
1st year MSc				-0.012
				(0.022)
2nd year MSc				-0.011
				(0.024)
Constant	0.300***	0.219***	0.323***	0.237***
	(0.019)	(0.021)	(0.024)	(0.065)
Observations	764	764	764	764
R-squared, within	0.100	0.225	0.301	0.304
Number of ClassID	48	48	48	48

With Class FE, except model (5) which used class RE to accommodate the Econ student dummy. Cluster-robust standard errors in parentheses, clustering on class. Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Table A11 Within-village trustworthiness models for rural sample

VARIABLES	(1) twas	(2) twas	(3) twas
In-group base: Selfish			
Altruist	0.124***	0.122***	0.121***
	(0.019)	(0.019)	(0.019)
Weak altruist	0.078***	0.078***	0.076***
	(0.024)	(0.023)	(0.023)
Egalitarian	0.060***	0.063***	0.055***
	(0.014)	(0.014)	(0.014)
Weak egal.	0.019	0.021	0.014
	(0.017)	(0.017)	(0.015)
Spiteful	-0.063**	-0.058**	-0.069**
	(0.025)	(0.026)	(0.027)
Ambiguous	0.020	0.026	0.020
	(0.029)	(0.028)	(0.028)
Base: Extremely obliged			
Somewhat obliged		-0.058***	-0.060***
		(0.016)	(0.016)
Not obliged at all		-0.054***	-0.055***
		(0.019)	(0.019)
Age			-0.001***
			(0.000)
Female, dummy			-0.025**
			(0.010)
Constant	0.283***	0.323***	0.390***
	(0.022)	(0.024)	(0.026)
Observations	834	834	834
R-squared	0.137	0.153	0.172
Number of villages	64	64	64

With village and enumerator FE. Cluster-robust standard errors in parentheses, clustering on villages. Significance levels:
*** p<0.01, ** p<0.05, * p<0.1

substantive difference that could explain the difference between the overall difference in trustworthiness between the student and rural samples. The mean age in the rural sample was about 38 years, against 23 in the student sample. The difference in mean in-group trustworthiness shares was about eight percentage points for the student versus the rural sample (39.6 vs 31.7) and cannot be explained by the age difference alone and the age difference in the student sample points in opposite direction (older students being more trustworthy). Finally, we see that females are significantly (at 5% level) less trustworthy than male subjects, which we also found for the student sample with the within-class framing. This is the opposite of what has been found for trustworthiness in many other studies, where the dominant finding has been that women are less trusting but more trustworthy.

Table A12 presents the within-district trustworthiness share models for the rural sample. The results are similar to that with the within-village framing, except that

Table A12 Within-district trustworthiness models for rural sample

VARIABLES	(1) twas	(2) twas	(3) twas
Out-group base: Selfish			
Altruist	0.155***	0.155***	0.153***
	(0.022)	(0.022)	(0.023)
Weak altruist	0.087**	0.087**	0.082**
	(0.033)	(0.035)	(0.036)
Egalitarian	0.080***	0.078***	0.073***
	(0.022)	(0.023)	(0.024)
Weak egal.	0.035	0.033	-0.030
	(0.022)	(0.021)	(0.022)
Spiteful	-0.076***	-0.076***	-0.087***
	(0.025)	(0.024)	(0.024)
Ambiguous	0.007	0.007	-0.001
	(0.020)	(0.019)	(0.019)
Base: Extremely obliged			
Somewhat obliged		-0.021	-0.023
		(0.018)	(0.018)
Not obliged at all		-0.065***	-0.066***
		(0.018)	(0.017)
Age			-0.001***
			(0.001)
Female, dummy			-0.014
			(0.012)
Constant	0.232***	0.277***	0.337***
	(0.024)	(0.027)	(0.031)
Observations	834	834	834
R-squared	0.182	0.202	0.215
Number of villages	64	64	64

With village and enumerator FE. Cluster-robust standard errors in parentheses, clustering on villages. Significance levels:
*** p<0.01, ** p<0.05, * p<0.1

the female dummy was insignificant. Most of the explained variation in trustworthiness came from the splitting in social preference types with the ranking in terms of trustworthiness: Altruists > Egalitarian > Selfish > Spiteful.

A.9 Decomposing trust and trustworthiness gaps in the combined student and rural subject sample

We start from the simplest combined model, including only a dummy variable for the student versus the rural sample, to identify the total gap for each of the in-group and out-group measures of trust and trustworthiness. To more closely inspect the contribution of each added variable, we add them one by one and see how they influence the coefficient on the student sample dummy variable. For in-group and out-group trust in Tables A13 and A14, we sequentially add the social preference type dummy vectors, the moral obligation vectors, the expected returns rank variable, the risk tolerance variable, and finally, age and gender (female dummy variable). Similarly, we

Table A13 Decomposing in-group trust in the combined sample of students and rural subjects

VARIABLES	(1) T1as	(2) T1as	(3) T1as	(4) T1as	(5) T1as	(6) T1as
Student, dummy	0.142***	0.126***	0.101***	0.092***	0.086***	0.071***
	(0.019)	(0.019)	(0.020)	(0.020)	(0.019)	(0.021)
Base: Selfish						
Altruist		0.133***	0.126***	0.126***	0.129***	0.124***
		(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Weak altruist		0.098***	0.100***	0.102***	0.106***	0.100***
		(0.036)	(0.035)	(0.034)	(0.034)	(0.034)
Egalitarian		0.027	0.021	0.021	0.024	0.020
		(0.019)	(0.018)	(0.018)	(0.018)	(0.018)
Weak egal.		0.021	0.017	0.017	0.021	0.018
		(0.018)	(0.018)	(0.017)	(0.018)	(0.018)
Spiteful		-0.069	-0.066	-0.049	-0.046	-0.048
		(0.047)	(0.045)	(0.043)	(0.044)	(0.043)
Ambiguous		-0.016	-0.016	-0.022	-0.019	-0.025
		(0.034)	(0.032)	(0.032)	(0.032)	(0.033)
Base: Extremely obl.						
Somewhat obliged			-0.072***	-0.069***	-0.071***	-0.070***
			(0.017)	(0.017)	(0.017)	(0.017)
Not obliged at all			-0.094***	-0.085***	-0.083***	-0.085***
			(0.021)	(0.021)	(0.021)	(0.021)
Expected return				0.039***	0.039***	0.039***
				(0.006)	(0.006)	(0.006)
Risk tolerance					0.089***	0.084***
					(0.023)	(0.024)
Age						-0.000
						(0.001)
Female						-0.059***
						(0.017)
Constant	0.381***	0.354***	0.421***	0.314***	0.267***	0.312***
	(0.012)	(0.016)	(0.021)	(0.026)	(0.030)	(0.036)
Observations	1,598	1,598	1,598	1,598	1,598	1,598
Number of group	112	112	112	112	112	112

With group random effects. Cluster-robust standard errors in parentheses, clustering on groups.
Significance levels: *** p<0.01, ** p<0.05, * p<0.1

decompose in-group and out-group trustworthiness in Tables A15 and A16 by adding variables in the same sequence but without including the expected return and risk tolerance variables. We observe a gradual reduction in the gap in each of Tables A13-A16 as we add variables, showing that each variable type contributes to explaining part of the gap. The included variables can largely explain what initially appeared as a mysterious and surprising gap in trust and trustworthiness between students and rural subjects.

Table A14 Decomposing out-group trust in the combined sample of students and rural subjects

VARIABLES	(1) T1bs	(2) T1bs	(3) T1bs	(4) T1bs	(5) T1bs	(6) T1bs
Student, dummy	0.140***	0.114***	0.096***	0.094***	0.089***	0.078***
	(0.020)	(0.020)	(0.021)	(0.021)	(0.020)	(0.022)
Base: Selfish						
Altruist		0.179***	0.168***	0.157***	0.158***	0.154***
		(0.020)	(0.021)	(0.021)	(0.021)	(0.021)
Weak altruist		0.094***	0.084***	0.080**	0.084***	0.082***
		(0.031)	(0.032)	(0.031)	(0.031)	(0.031)
Egalitarian		0.087***	0.078***	0.068***	0.067***	0.061***
		(0.021)	(0.020)	(0.020)	(0.020)	(0.020)
Weak egal.		0.029	0.023	0.020	0.024	0.024
		(0.022)	(0.021)	(0.020)	(0.021)	(0.021)
Spiteful		-0.062**	-0.063**	-0.043	-0.039	-0.041
		(0.031)	(0.030)	(0.028)	(0.029)	(0.028)
Ambiguous		0.010	0.005	0.001	0.003	0.002
		(0.024)	(0.024)	(0.023)	(0.022)	(0.022)
Base: Extremely obl.						
Somewhat obliged			-0.066***	-0.064***	-0.064***	-0.063***
			(0.019)	(0.019)	(0.019)	(0.019)
Not obliged at all			-0.091***	-0.072***	-0.071***	-0.074***
			(0.021)	(0.020)	(0.020)	(0.021)
Expected return				0.041***	0.040***	0.041***
				(0.006)	(0.005)	(0.005)
Risk tolerance					0.072***	0.068***
					(0.025)	(0.025)
Age						0.000
						(0.001)
Female						-0.053***
						(0.016)
Constant	0.311***	0.276***	0.342***	0.238***	0.201***	0.234***
	(0.013)	(0.018)	(0.024)	(0.028)	(0.034)	(0.037)
Observations	1,598	1,598	1,598	1,598	1,598	1,598
Number of group	112	112	112	112	112	112

With group random effects. Cluster-robust standard errors in parentheses, clustering on groups.
Significance levels: *** p<0.01, ** p<0.05, * p<0.1

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Table A15 Decomposing in-group trustworthiness in the combined sample of students and rural subjects

VARIABLES	(1) twas	(2) twas	(3) twas	(4) twas
Student, dummy	0.083***	0.065***	0.039**	0.016
	(0.015)	(0.014)	(0.015)	(0.015)
In-group base: Selfish				
Altruist		0.131***	0.122***	0.120***
		(0.015)	(0.014)	(0.014)
Weak altruist		0.064***	0.067***	0.063***
		(0.024)	(0.023)	(0.023)
Egalitarian		0.079***	0.072***	0.068***
		(0.015)	(0.015)	(0.015)
Weak egalitarian		0.045***	0.041***	0.038***
		(0.015)	(0.014)	(0.014)
Spiteful		-0.092***	-0.088***	-0.091***
		(0.021)	(0.020)	(0.020)
Ambiguous		0.005	0.007	0.002
		(0.021)	(0.019)	(0.019)
Base: Extremely obliged				
Somewhat obliged			-0.100***	-0.100***
			(0.012)	(0.013)
Not obliged at all			-0.111***	-0.113***
			(0.018)	(0.017)
Age				-0.001***
				(0.000)
Female				-0.037***
				(0.010)
Constant	0.313***	0.276***	0.357***	0.417***
	(0.009)	(0.011)	(0.014)	(0.020)
Observations	1,598	1,598	1,598	1,598
Number of group	112	112	112	112

With group random effects. Cluster-robust standard errors in parentheses, clustering on groups. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

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Table A16 Decomposing out-group trustworthiness in the combined sample of students and rural subjects

VARIABLES	(1) twbs	(2) twbs	(3) twbs	(4) twbs
Student, dummy	0.097***	0.076***	0.047***	0.028*
	(0.015)	(0.014)	(0.014)	(0.015)
Out-group base: Selfish				
Altruist		0.152***	0.136***	0.134***
		(0.017)	(0.016)	(0.017)
Weak altruist		0.097***	0.084***	0.082***
		(0.021)	(0.024)	(0.024)
Egalitarian		0.100***	0.088***	0.084***
		(0.017)	(0.016)	(0.017)
Weak egalitarian		0.037**	0.029	0.028
		(0.019)	(0.018)	(0.018)
Spiteful		-0.078***	-0.078***	-0.083***
		(0.018)	(0.017)	(0.017)
Ambiguous		0.022	0.015	0.011
		(0.019)	(0.018)	(0.019)
Base: Extremely obliged				
Somewhat obliged			-0.084***	-0.084***
			(0.014)	(0.014)
Not obliged at all			-0.134***	-0.135***
			(0.017)	(0.017)
Age				-0.001***
				(0.000)
Female				-0.022**
				(0.010)
Constant	0.278***	0.241***	0.333***	0.384***
	(0.010)	(0.013)	(0.016)	(0.023)
Observations	1,598	1,598	1,598	1,598
Number of group	112	112	112	112

With group random effects. Cluster-robust standard errors in parentheses, clustering on groups. Significance levels: *** p<0.01, ** p<0.05, * p<0.1.

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