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Inter-Ethnic Trust and Reciprocity: Results of an Experiment with Small Business Entrepreneurs

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Abstract

We experimentally investigate inter-ethnic trust and reciprocity by letting subjects from distinct ethnic origins play the trust game (Berg, Dickhaut, and McCabe, 1995). The participants in the experiment are male small business entrepreneurs of Turkish or Belgian ethnic origin, all of whom have a business in the same city (Ghent, Belgium). Our main finding is that the average levels of trust and reciprocity are independent of ethnic origin and, moreover, independent of the ethnic origin of the counterparty.

JEL: C91, J71
Keywords: ethnic discrimination, experimental economics, trust game

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1 Introduction

Trust between individuals is generally believed to be inversely related to social distance. It follows from this view that differences in ethnicity between interacting parties will generally result in lower levels of trust, lower levels of interaction, and hence in ethnic discrimination, i.e. differential treatment according to ethnicity. While much empirical evidence on ethnic discrimination can be found in the literature, the underlying mechanisms and the nature of discrimination are less well documented. Recently, Fershtman and Gneezy (2001) proposed an experimental approach to studying ethnic discrimination. By letting participants of distinct ethnic groups play various types of games, they identify the magnitude of ethnic discrimination, the extent to which discrimination is based on ethnic stereotypes, and the accuracy of these stereotypes. The participants in their study were Israeli Jewish students. In this paper, we follow their approach in that we let participants belonging to different ethnic groups play the trust game (Berg, Dickhaut, and McCabe, 1995). The participants in our experiment are male small business entrepreneurs of either Turkish or Belgian ethnic origin who run a business in the medium-sized Flemish City of Ghent, Belgium. The experiment was conducted by messengers who visited the participants in their shop or at home.

It is widely recognized that trust plays a vital role in society, and in economic interactions in particular.[1] Trust enhances trade,[2] and trade enhances economic development. Arrow (1972) argues that economic transactions almost

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[1] Coleman (1984) has argued that the social organization of trust should be incorporated into economic analysis. North (1990) presents an analytical framework in which differences in social institutions relating to trust may affect economic performance. Fukuyama (1996) offers a massive overview of the importance and consequences of trust in many different societies.

[2] The reverse is also true: Trade enhances trust. Adam Smith in his 1763 Lecture on "The Influence of Commerce on Manners" argued that "Of all nations in Europe, the Dutch, the most commercial, are the most faithful to their word" (Adam Smith, 1964, p. 253). They are not so trustworthy *per se* because they are Dutch, but because "A dealer is afraid of losing his character, and is scrupulous in observing every engagement. When a person makes perhaps twenty contracts in a day, he cannot gain so much by endeavouring to impose on his neighbours, as the very appearance of a cheat would make him lose."

always incorporate an element of trust. Hence the determinants of trust are of interest. According to Lazear (1999), "Trade between individuals is facilitated when all traders share a common culture and language." It can be argued that a common culture and language, and social proximity in general, enhance trust as they serve as coordination devices for sharing expectations. Schelling (1960, p. 57) points out that "Most situations [...] provide some clue for coordination behavior, some focal point for each person's expectation of what the other expects him to expect to be expected to do." The detection of such focal points is more difficult when the interacting parties belong to different linguistic, social, religious, or ethnic groups. Put differently, differences in background between potential trading partners may significantly impede the formation of trust, and therefore the gains from trade. Knack and Keefer (1997) and Zak and Knack (2001) provide cross-country evidence of the relations between social distance, trust, and economic performance.

In this paper we focus on ethnicity as a potential determinant of interpersonal trust and reciprocity. The study of ethnic discrimination is, moreover, of interest in its own right. The trust game results of Fershtman and Gneezy (2001) for the Israeli Jewish society indicated "a consistent pattern of discrimination and mistrust" (p. 353) towards Eastern Jews, by *both* Ashkenazic and Eastern Jews. This pattern of discrimination disappeared when a dictator game was played, i.e. when trust was not an issue. This additional observation leads to the conclusion that the ethnic discrimination was based on ethnic stereotypes rather than on "taste for discrimination" in the sense of Becker (1957). Furthermore, the ethnic stereotypes underlying mistrust towards Eastern Jews proved to be incorrect, as the patterns of reciprocity (and therefore of trustworthiness) revealed no differences between the two groups. In related settings with a religious or regional dimension instead of a purely ethnic one, Fershtman, Gneezy, and Verboven (2002) draw a further distinction between "discrimination against"

and "discrimination in favor of" by comparing transfers to a counterparty of known background with transfers to a counterparty of unknown background. Holm (2000) reports results on bargaining experiments with native and non-native Swedish high school students. In the context of the trust game, he finds no systematic ethnic discrimination. The experiment reported in this paper provides complementary results about trust and reciprocity in an inter-ethnic context.

Our choice of subjects (male small business entrepreneurs in Ghent of Turkish or Belgian ethnic origin) is motivated as follows. There are reasons to believe that ethnic discrimination will generally lessen as the interacting parties have more and more other characteristics in common. This raises the following question: If ethnic discrimination is present in a given society, will it (nearly) disappear in subpopulations with subjects differing *only* with respect to ethnicity? Our set-up goes some way in addressing this question, and the evidence yields an answer in the positive. As we argue in Section 3, there are clear signs of discrimination towards people of Turkish origin in Flemish society. Against this background, the participants in our experiment were equal with respect to gender, socio-professional category, and place of residence, *and they knew this*. Religion is probably the most important factor we did not control for. Participants also knew the first name of the opponent they were matched with, and so were able to deduce his ethnic affiliation.[3] The experimental results, somewhat to our surprise, indicated no sign of differential treatment according to ethnicity. Specifically, both ethnic groups exhibit similar average levels of trust, are on average equally trusted, and on average they trust participants from the other ethnic group just as much as they trust participants from their own eth-

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[3] Turkish and Belgian first names are distinct, and therefore signal the ethnic background. Although the participants were uninformed about the ethnic affiliation of other participants, it is reasonable to assume that they could infer their opponent's ethnic affiliation from this signal.

nic group. Essentially the same results hold with regard to reciprocity. This leads to the tentative conclusion that ethnic discrimination between interacting parties vanishes when sufficiently many other characteristics are equal.

The choice of small business entrepreneurs as subjects can be further motivated. The current practice in experimental economics is to study the behaviour of student populations, conjecturing that the results have more general validity. Many of these experiments show that student populations behave substantially differently from the theoretical predictions of game theory (Roth et al., 1999). Henrich et al. (2001), however, have pointed out that current experimental research cannot answer the question whether these deviations from the theoretical predictions are universal patterns of behaviour or environment-specific. Although student populations across countries do show cultural differences, they argue that the cultural variety might be small compared to other groups in society. Furthermore, the conjecture that experiments with students do not significantly alter the results has been rejected (Fehr and Falk, 2002). As a final point of motivation, we note that small business entrepreneurs are engaged in daily trading activities, so that trust plays a central role in their professional life.

Since trust (and also reciprocity) involves two parties - and their respective ethnic origins - we draw an analytical distinction between trust comparisons when the "trustor" is kept fixed and the trustee varies, and trust comparisons when the trustor varies and the trustee is kept fixed. For example, it may be the case that ethnic groups E and E' trust E equally and trust E' equally, while E and E' are trusted differently by E (and therefore also by E'). Such patterns of trust are observed in the Israeli Jewish society (Fershtman and Gneezy, 2001).

In Section 2 we present a distributional framework for the analysis of interethnic trust and reciprocity by means of the trust game. Section 3 sketches the main characteristics of the Turkish population in the city where we ran the

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experiment. Section 4 offers a detailed overview of the organisation and set-up of the experiment. Section 5 presents the empirical results and Section 6 concludes.

2 Intra- and inter-ethnic trust and reciprocity

The trust game is a two-player, two-stage game, where in stage 1 player A decides how to divide a given amount of money between himself and player B. The amount he transfers to player B is then tripled. In stage 2, player B decides how to divide the received amount between himself and player A. In experimental settings where anonymous players play the game only once, it is typically found that player A transfers a positive amount to player B, and that B responds by transferring back a positive amount to A. The subgame perfect Nash equilibrium outcome for selfish players, i.e. zero transfers, is rarely observed. While a positive transfer from A to B can be the result of altruism or fairness considerations, it has often been interpreted as an indicator of 'trust'. That is, player A anticipates that player B will 'reciprocate' by transferring back some part of the amount he receives. Thus, the stage 1 transfer is interpreted as a (noisy) measure of how much A trusts an anonymous counterparty, and the stage 2 transfer as a (conditional) measure of how much B reciprocates (given the stage 1 transfer).

Now consider players A and B of ethnic affiliation E and E', respectively, who are playing the trust game, and assume there is a common signal of the respective ethnic affiliations of the players. We write EE' to denote the ethnic type of the pair of players. Let $F^1_{EE'}$ and $F^{2|1}_{EE'}$ denote the distributions of the stage 1 transfers and of the stage 2 transfers given the stage 1 transfer, respectively, in the trust game played by ethnic type EE' players. Hypotheses about intra- and inter-ethnic trust and reciprocity are naturally stated in terms

of the distributions $F_{EE'}^1$ and $F_{EE'}^{2|1}$, respectively, for different ethnic types. We give conditions under which intra- and inter-ethnic trust (or reciprocity) can be called 'equal', and we regard these as null hypotheses to be tested from sample data. The conditions rely on a notion of invariance with respect to ethnic affiliation. In view of some empirical observations made by Fershtman and Gneezy (2001) about ethnic discrimination, we distinguish between two types of conditions, depending on whether the invariance concerns the ethnic affiliation of the active or of the inactive party at the relevant stage of the game. In the sequel, $E \neq E'$.

Consider first trust. Perhaps the most natural definition of equality of intra- and inter-ethnic trust is that trust be independent of the ethnic affiliation of the trustee, i.e. the *inactive* party at that stage of the interaction. In terms of the trust game, this amounts to invariance of the distribution of the stage 1 transfer with respect to the ethnic affiliation of player B. Formally,

$$H_I^T: \qquad F_{EE}^1 = F_{EE'}^1 \quad \text{and} \quad F_{E'E'}^1 = F_{E'E}^1 \qquad (1)$$

meaning that E trusts E and E' equally and E' trusts E and E' equally. One can also, of course, consider the ethnic-specific subhypotheses $F_{EE}^1 = F_{EE'}^1$ and $F_{E'E'}^1 = F_{E'E}^1$ separately. The foregoing definition, when extrapolated outside the trust game, amounts to the restriction that an individual's actions do not depend on the ethnic affiliation of the other individuals he interacts with (but they may depend on his own ethnic affiliation). Hence it reflects the general notion of absence of ethnic discrimination: everybody is treated in a manner that is independent of their ethnic background. Alternatively, equality of intra- and inter-ethnic trust may be defined by the condition that trust placed in any trustee be independent of the ethnic affiliation of the trustor, i.e. the *active* party at that stage. In the context of the trust game, this requires the distribution of the stage 1 transfer to be invariant with respect to the ethnic affiliation of

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player A, viz.

$$H_A^T: \qquad F_{EE}^1 = F_{E'E}^1 \quad \text{and} \quad F_{E'E'}^1 = F_{EE'}^1 \qquad (2)$$

meaning that E and E' have equal trust in E, and E and E' have equal trust in E'. Again, ethnic-specific subhypotheses can be considered. From a normative point of view, the latter definition is definitely less appealing than the former. It makes sense, however, from an economic point of view. If two players from different ethnic backgrounds are rational and have no taste for discrimination in the sense of Becker (1957), there may be no reason why they would treat, say, E differently. It may be rational, however, if they (both) treat E' differently from E. This type of differential treatment of E and E', provided it has a rational foundation without taste for discrimination, is referred to as statistical discrimination (see Arrow, 1973, and Phelps, 1972). Finally, it is natural to define complete equality of intra- and inter-ethnic trust by the requirement that trust be independent of the ethnic affiliation of the two parties. In the trust game, this amounts to $F_{EE}^1 = F_{EE'}^1 = F_{E'E}^1 = F_{E'E'}^1$.

Along the same lines, we can define equality of intra- and inter-ethnic reciprocity as reciprocal behaviour that is independent of the ethnic affiliation either of player A (the *inactive* party at that stage), i.e.[4]

$$H_I^R: \qquad F_{EE}^{2|1} = F_{E'E}^{2|1} \quad \text{and} \quad F_{E'E'}^{2|1} = F_{EE'}^{2|1}, \qquad (3)$$

or of player B (the *active* party at that stage), i.e.

$$H_A^R: \qquad F_{EE}^{2|1} = F_{EE'}^{2|1} \quad \text{and} \quad F_{E'E'}^{2|1} = F_{E'E}^{2|1}, \qquad (4)$$

or of both.

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[4]In these definitions, an equality between two conditional distributions is to be interpreted as a set of pairwise equalities, i.e. the equality should hold for each possible value of the stage 1 transfer.

3 Turkish immigrants in Ghent: ethnographic information

The Turkish migration to Belgium occurred in three waves (Bayar, 1992). The first wave of migration started in the early sixties when many European countries were suffering from serious structural labour shortages in sectors such as mining and construction. Accordingly, they stimulated migration from countries such as Morocco and Turkey. The second stream of Turkish immigrants arrived in the mid-seventies. Around 1975, the number of Turkish immigrants living in Ghent amounted to 4,200. Most of them came from Emirdag, a subdistrict in the Province of Emirdag (South Central Anatolia). The last wave of immigration took place in the early eighties when Turkish ethnic and religious minorities left Turkey.

At present the number of Turkish immigrants in Ghent and their Belgian born offspring has increased to around 9,000. The Turkish community is the largest ethnic minority in Ghent and constitutes around 7% of the total population and 57% of its ethnic minority groups.[5] The majority of the ethnic minority groups are Islamic, 25% of whom regularly attend mosque. The unemployment rate among workers of Turkish origin is twice the overall unemployment rate, and their average unemployment spells are significantly longer than the population average, both for men and women (Van den Herrewegen, 2001). Their level of schooling is low compared to the population average, and 55% have poor knowledge of Dutch, the official language. Most entrepreneurs of Turkish origin are male and are active in the retail sector. They are geographically concentrated in the poorer parts of the city, where ethnic minorities are over-represented. The local authorities are trying to impede the formation of ethnic clusters by actively promoting a more uniform spread of housing opportunities.[6]

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[5] The second largest ethnic minority group has its origins in Morocco (9%).

[6] See Cutler and Glaezer (1997) for US-based evidence showing that ethnic segregation

Finally, in the latest local elections, which were held in November 2000, 19.5% of the votes went to the extreme right party (*Vlaams Blok*), which is actively opposed to the integration of non-EU immigrants into (Flemish) society. This percentage is comparable to other Flemish cities. It reveals that there is a discriminatory attitude among these voters against immigrants, most of whom are Turks.

4   The experiment

The participants in the experiment were male small business entrepreneurs of either Belgian (B) or Turkish (T) ethnic origin, running a shop in the City of Ghent. The participants were matched in pairs and knew each other's first name, which signalled their ethnic origin. Thus we had four ethnic types of participant pairs: BB, BT, TB, and TT, with the understanding that the ethnic affiliation of the participant assuming the role of player A is mentioned first. Participants were visited in their shop or at home. The details of the recruitment and matching of the participants, and how we approached and instructed them, are given in the following subsections.

4.1   Recruitment and matching of the participants

The recruitment of Turkish participants was based on a list of two-hundred addresses obtained from the city administration. The list covered most of the existing retail shops run by Turkish entrepreneurs. The recruitment of Belgian participants was based on a list of 1643 Belgian businesses obtained from the data set "Business Infobel 2001", where the selection criteria were postal code "9000" (City of Ghent) and NACE code "52.xxx".[7]

The actual search for participants started two weeks before the experiment

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leads to lower earnings but not the reverse.

[7]Retail trade and repair, except of motor vehicles, motorcycles, and repair of personal and household goods.

took place. Two messengers visited, in an imposed order, as many addresses as were needed to reach 100 Belgian and 100 Turkish entrepreneurs willing to participate. Belgian entrepreneurs were approached in Dutch by a Belgian messenger. Turkish entrepreneurs were approached by a Turkish messenger, but had the option to choose between the Turkish and the Dutch language. Almost all Turkish entrepreneurs preferred the Turkish language. The messengers handed over a letter that asked the entrepreneur to participate in a study on decision-making by entrepreneurs that would take place on November 7, 2001. The English translation of this letter is given in Appendix 1. If the entrepreneur was willing to participate, the messenger filled out his first and last name, address, and phone number. It was necessary to visit the entrepreneurs before the experiment took place in order to obtain information about their first names, gender, willingness to participate, and to ensure the highest achievable response rate.

Once 100 Belgian and 100 Turkish participants were found, we matched them in pairs, resulting in 25 pairs of each ethnic type (BB, BT, TB, and TT). The participants were not randomly paired, because the geographic distribution of Turkish shops in the City of Ghent is concentrated in a limited number of streets. The Turkish participants were recruited from 40 different streets. About 20% were concentrated in one street; 50% were recruited from four different streets. In order to minimise potential perceived (mutual) recognition by first name, we divided the City of Ghent into four quadrants and put the following constraints on the matches: (i) TT matches within the same quadrant were not allowed; (ii) TT matches were always between participants with first names appearing more than once in the data set; (iii) TT matches were always between participants with first names that did not appear in the same street of the participants; (iv) TT matches between participants with identical names were not allowed; (v) Turkish participants from any street containing mainly Turkish

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shops either all assumed the role of player A or all assumed the role of player B. There is no reason to believe that constraints (i)-(v) imply a bias. A similar degree of geographical concentration did not apply for the Belgian participants. They were recruited from 67 different streets. About 10% were located in one street; 30% were recruited from four different streets. Consequently, we matched Belgian participants only subject to the constraint that participants from the same street or with identical first names were never paired.

4.2   Experimental procedure

We conducted the experiment with the help of 10 Belgian and 8 Turkish messengers. They were different from the messengers who recruited the participants. All of the Belgian and three of the Turkish messengers were third or fourth year university undergraduate students. The remaining five Turkish messengers were in their late twenties, workers, and recruited via a public servant from the cultural integration administration of the City of Ghent.[8] The messengers received an hourly wage of BEF 300,[9] which is a normal wage for this kind of job. They visited only participants from their own ethnic origin. The large number of messengers was crucial in order to conduct the experiment as rapidly as possible. Streets where a large number of (mostly Turkish) entrepreneurs participated in the experiment were as much as possible simultaneously visited by the different messengers. This reduced potential effects by word of mouth to a minimum.

Players A were visited in the morning of the day of the experiment. Players B were approached in the afternoon or evening of the same day. Each messenger visited on average six players A and six players B. In the event of absence, a new appointment was made immediately, mainly by mobile phone contact.

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[8] The number of Turkish students finishing their university degree is very small. We wanted to have messengers with a level of maturity comparable to third or fourth year students.

[9] Approximately EUR 7.5.

Relatively many Turkish entrepreneurs were absent on the first call. In some cases an appointment had to be made the next day or two days later. In a few cases a Turkish participant was absent for a longer period. We allowed only for new appointments that were at most two days from day one of the experiment. Players B that had been matched with absent players A were informed either that a new appointment was to be made or that an appointment was no longer possible. In the latter case, player B was contacted by phone and did not receive a monetary reward. In the event that player B was absent, we informed player A about the absence and returned to player A the amount that player B would have received (i.e. three times the amount player A had transferred).

We instructed the messengers extensively about the experiment the morning of the day when the experiment took place. The messengers had to follow a well-defined procedure. First they introduced themselves as working in the research project about which the participant had been approached two weeks earlier. Next they asked the participant to accept the following rules. The written instructions for the experiment (given here in Appendix 2) were read together. If the participant had any questions about the instructions, answers would be given only by repeating the exact wording of these instructions. If the participant asked any other questions, the messenger did not answer them. After the participant had accepted these rules, the instructions were read. Then the messenger handed over two opaque envelopes to the participant and stepped back so as to guarantee that the participant could make his decision alone and in private. All envelopes used in the experiment displayed the following text on top:

Entrepreneur in Step 1:...........
Entrepreneur in Step 2:...........

The first names of the participants were filled out in capital handwritten letters.

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For participants assuming the role of player A, one envelope was sealed. This envelope contained BEF 400 in bills of BEF 100, and it displayed the following text in the middle:

Step 1: You are receiving BEF 400.

The second envelope was open and displayed the following text in the middle:

Step 1: Enclose the amount that you give to the other entrepreneur. Keep the rest. Seal the envelope.

For participants assuming the role of player B, one envelope was sealed. It contained three times as much in BEF 100 bills as what player A had transferred, and it displayed the following text in the middle:

Step 2: You are receiving three times as much as what the other entrepreneur has given to you.

The second envelope was open and displayed the following text in the middle:

Step 2: Enclose the amount that you give back to the other entrepreneur. Keep the rest. Seal the envelope.

At each stage of the procedure, the participants were only allowed to transfer multiples of BEF 100. After the participant had taken his decision, the messenger collected the instructions and the two envelopes. When the participant had assumed the role of player A, he was informed that a few days later he would be handed over a sealed envelope with the amount that the other entrepreneur was sending back to him. The messenger thanked the participant and left the shop.

Recall that we started with 25 participating pairs of each ethnic type. Table 1 presents the numbers of completed stages in the trust game according to the

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ethnic type of the participants. The drop-outs were due to one of the following reasons: (i) the participant could not be reached; (ii) the participant refused to cooperate after reading the instructions (but before taking note of the first names of the participants); (iii) in four cases the stage 1 transfer was zero, in which case it was decided not to implement stage 2. After stage 2 was completed, a messenger visited the participant assuming the role of player A and handed over in a sealed envelope the amount that player B had transferred back to him.

Table 1: Numbers of participating pairs according to ethnic type

| | ethnic type | | | | |
	BB	BT	TB	TT	Total
Stage 1	24	23	21	21	89
Stage 2	24	16	17	14	71

Two other collaborators phoned the participants after they had been visited by one of the messengers. As a matter of experimental quality control, they asked whether (i) the entrepreneur had been visited or not, and (ii) the envelope contained the right amount of money. These two questions were a check from our side on the messengers. Some further questions were asked to a subsample of participants assuming the role of player A, in order to find out to what extent they had understood the game. The answers revealed that 90% of the participants of each ethnic group had fully understood the structure of the game.

5   Experimental results

Figure 1 graphs the observed transfers in the trust game, according to the ethnic type of the participating pairs. The observations are sorted in ascending order by the amounts transferred in stages 1 and 2. Some stage 2 transfers are missing. Observe that in most cases the stage 2 transfer (if non-missing) exceeds the stage 1 transfer, irrespective of ethnic type. In 7 cases out of 71, the stage 2 transfer was smaller than the stage 1 transfer. In 6 cases, the stage

Figure 1: Transfers according to ethnic type
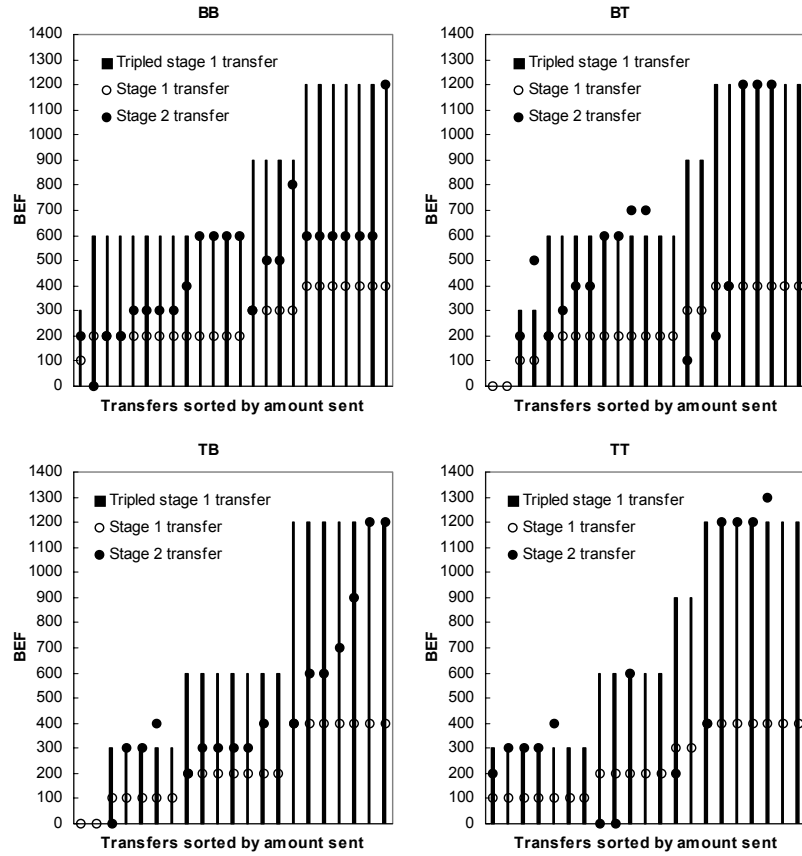
2 transfer exceeded the tripled stage 1 transfer, meaning that some participants took money from their own pocket. This was rather unexpected, and we checked by phone whether or not the participant had understood the instructions. They all had, and all explicitly motivated their decision to return more than received by their gratitude for the revealed trust in them from the other participant. It is surprising that this occurs most often when the stage 1 transfer is small, but the numbers are too small to draw any firm conclusions.

Table 2 presents the average stage 1 and stage 2 transfers according to eth-

nic type. In line with Figure 1, the average stage 2 transfer is almost always larger (and often much larger) than the corresponding stage 1 transfer. Belgian participants transfer in stage 1 on average slightly higher amounts than Turkish participants, while the reverse is true in stage 2: Turkish participants return on average more than do Belgian participants. At first sight, however, Figure 1 and Table 2 do not seem to indicate large differences in trust or reciprocity between Belgian and Turkish participants. We now turn to more formal tests of these hypotheses.

Table 2: Average transfers according to ethnic type (numbers of transfers in parentheses)

	Stage 1 transfer	ethnic type			
		BB	BT	TB	TT
Stage 1		270.8 (24)	243.5 (23)	223.8 (21)	242.9 (21)
Stage 2	100	200.0 (1)	350.0 (2)	250.0 (4)	300.0 (5)
	200	366.7 (12)	487.5 (8)	300.0 (6)	200.0 (3)
	300	525.0 (4)	100.0 (1)	- (0)	200.0 (1)
	400	687.7 (7)	840.0 (5)	800.0 (7)	1060.0 (5)

5.1   Trust

Let F_{BB}^1 be the population distribution of the stage 1 transfers in the trust game played by type BB participants, and define F_{BT}^1, F_{TB}^1, and F_{TT}^1 similarly. Recalling the definitions of equality of intra- and inter-ethnic trust, we test the hypotheses

$$H_I^T \quad : \quad F_{BB}^1 = F_{BT}^1 \quad \text{and} \quad F_{TT}^1 = F_{TB}^1, \tag{5}$$

$$H_A^T \quad : \quad F_{BB}^1 = F_{TB}^1 \quad \text{and} \quad F_{TT}^1 = F_{BT}^1, \tag{6}$$

as well as their ethnic-specific subhypotheses, and the joint hypothesis H^T: $F_{BB}^1 = F_{BT}^1 = F_{TB}^1 = F_{TT}^1$. For any subhypothesis, say $F_{BB}^1 = F_{BT}^1$, the observed stage 1 transfers of participant pairs BB and BT define a $k \times 2$ contingency table, where k is the number of distinct stage 1 transfers, and the

columns refer to BB and BT. This contingency table induces a χ^2 test statistic of independence (i.e. of $F_{BB}^1 = F_{BT}^1$), say

$$\chi^2 = \sum_{i,j} \frac{(f_{ij} - Ef_{ij})^2}{Ef_{ij}}, \tag{7}$$

where f_{ij} is the observed frequency in cell (i,j) and $Ef_{ij} = f_{i \cdot} f_{\cdot j}/f$, with $f_{i \cdot} = \sum_j f_{ij}$, $f_{\cdot j} = \sum_i f_{ij}$ and $f = \sum_{i,j} f_{ij}$. The χ^2 statistic is sensitive to any departure from $F_{BB}^1 = F_{BT}^1$. In order to test whether F_{BB}^1 and F_{BT}^1 have equal means, we also compute the difference-in-means statistic

$$D = \frac{|\hat{\mu}_{BB} - \hat{\mu}_{BT}|}{\sqrt{s_{BB}^2/n_{BB} + s_{BT}^2/n_{BB}}} \tag{8}$$

where n_{BB} and n_{BT} are the numbers of observed stage 1 transfers, $\hat{\mu}_{BB}$ and $\hat{\mu}_{BT}$ their sample averages, and s_{BB}^2 and s_{BT}^2 their sample variances. For testing the hypothesis H_I^T and H_A^T, we take the sums of the corresponding χ^2 statistics and of the corresponding D statistics. For testing H^T, we compute the χ^2 statistic induced by the $k \times 4$ contingency table with columns BB, BT, TB, and TT, and a difference-in-means statistic as the sum of the six pairwise D statistics. All χ^2 and difference-in-means statistics thus defined are of a two-sided nature. Should a difference-in-means statistic be significant, however, the direction of departure from the null would be clear from Table 2.

Given the relatively small number of observations available, we do not rely on asymptotics. Instead, we perform Monte Carlo permutation tests (see e.g. Good, 2000). Specifically, for any statistic considered, we compute 10000 Monte Carlo statistics after randomly permuting the relevant contingency table(s). The p-value associated with an observed statistic, then, is the fraction of corresponding Monte Carlo statistics exceeding that statistic. Table 3 reports the values of the χ^2 and difference-in-means statistics and their p-values.

The test outcomes show no sign at all of ethnic discrimination in the sense of mistrust towards participants from a different ethnic background: the p-values

cast no doubt either on H_I^T or on any of its subhypotheses. The picture is different for H_A^T and its subhypotheses. While Turkish and Belgian participants appear to trust Turkish participants equally, they apparently trust Belgian participants differently, as is indicated by the p-value of 0.031 of the χ^2 statistic. The evidence is not overwhelming, but the number of observations is rather limited. On the other hand, the average transfers from Turkish to Belgian and from Belgian to Belgian participants do not differ significantly. Comparison of the upper-left and lower-left panels of Figure 1 reveals that, if anything, the variance of the stage 1 transfers (and therefore of trust) from Turkish to Belgian participants is higher than from Belgian to Belgian participants. The joint hypothesis H_T has moderate p-values, which was anticipated from the results regarding H_I^T and H_A^T. On the whole, we conclude that this experiment reveals essentially no differences in trust between Turkish and Belgian participants. Given the sometimes tense relationship between immigrants and natives in Flemish cities (as in many other European cities), this is a rather unanticipated conclusion: not only do Turkish and Belgian participants have (on average) equal trust and are they equally trusted, but they also trust participants from the other ethnic background as much as they trust participants from their own ethnic background.

By way of comparison, in their study of trust relating to Ashkenazic and Eastern Jews, the main conclusions of Fershtman and Gneezy (2001) constitute a strong rejection of H_I^T and a non-rejection of H_A^T.

5.2 Reciprocity

We analyse intra- and inter-ethnic reciprocity by testing the hypotheses

$$H_I^R \quad : \qquad F_{BB}^{2|1} = F_{TB}^{2|1} \quad \text{and} \quad F_{TT}^{2|1} = F_{BT}^{2|1}, \tag{9}$$

$$H_A^R \quad : \qquad F_{BB}^{2|1} = F_{BT}^{2|1} \quad \text{and} \quad F_{TT}^{2|1} = F_{TB}^{2|1}, \tag{10}$$

Table 3: Tests of equality of intra- and inter-ethnic trust

	Hypothesis	χ^2 statistic	χ^2 p-value	diff.-in-means statistic	diff.-in-means p-value
	$F_{BB}^1 = F_{BT}^1$	3.162	0.627	0.831	0.442
	$F_{TT}^1 = F_{TB}^1$	4.667	0.383	0.457	0.696
H_i^T :	$F_{BB}^1 = F_{BT}^1$ and $F_{TT}^1 = F_{TB}^1$	7.829	0.507	1.289	0.595
	$F_{BB}^1 = F_{TB}^1$	9.826	0.031	1.291	0.214
	$F_{TT}^1 = F_{BT}^1$	6.367	0.171	0.016	0.963
H_a^T :	$F_{BB}^1 = F_{TB}^1$ and $F_{TT}^1 = F_{BT}^1$	16.19	0.027	1.307	0.578
H^T	$F_{BB}^1 = F_{BT}^1 = F_{TB}^1 = F_{TT}^1$	17.17	0.136	3.897	0.637

their ethnic-specific subhypotheses, and the joint hypothesis H^R: $F_{BB}^{2|1} = F_{TB}^{2|1} = F_{BT}^{2|1} = F_{TT}^{2|1}$ in much the same way as above. The χ^2 and D statistics (and their sums) are computed for the relevant pairs of conditional distributions of the stage 2 transfers, given any particular stage 1 transfer, in exactly the same way as we did for the stage 1 transfers. We do not report these statistics, however, because the numbers of observations are far too small to draw meaningful conclusions; see Table 2. Rather, we sum these statistics over the four distinct (positive) stage 1 transfers. Table 4 reports the values of the χ^2 and difference-in-means statistics and their p-values, computed from 10000 Monte Carlo permutations.

The resemblance to the results regarding trust is striking. There is little or no evidence of ethnic discrimination in the sense of unequal reciprocity against participants of a different ethnic origin. H_I^R and its subhypotheses all have p-values exceeding 0.2. Concerning H_A^R, Belgian and Turkish participants reciprocate equally against Turkish participants, while they reciprocate differently against Belgian participants (p-value of 0.04). This difference, again, is not a difference in average reciprocity. As a result of the overall somewhat smaller p-values for the χ^2 statistics (compared to the results on trust), the joint hy-

pothesis of fully equal reciprocity H^R has a small p-value (0.015) for the χ^2 statistic, but not for the difference-in-means statistic. We reach a similar conclusion as in the case of trust: Belgian and Turkish participants reciprocate on average equally, are equally reciprocated against, and reciprocate against participants from the other ethnic origin as they do against participants from their own ethnic background. A further conclusion is that the average levels of reciprocity are fairly high.

The results of Fershtman and Gneezy (2001) regarding reciprocity can be interpreted as a non-rejection of H_A^R, while H_I^R is not tested for.

Table 4: Tests of equality of intra- and inter-ethnic reciprocity

	Hypothesis	χ^2 statistic	χ^2 p-value	diff.-in-means statistic	diff.-in-means p-value
	$F_{BB}^{2|1} = F_{TB}^{2|1}$	14.08	0.277	2.431	0.676
	$F_{TT}^{2|1} = F_{BT}^{2|1}$	16.19	0.284	2.482	0.535
$H_i^R:$	$F_{BB}^{2|1} = F_{TB}^{2|1}$ and $F_{TT}^{2|1} = F_{BT}^{2|1}$	30.27	0.194	4.913	0.734
	$F_{BB}^{2|1} = F_{BT}^{2|1}$	20.22	0.040	7.149	0.455
	$F_{TT}^{2|1} = F_{TB}^{2|1}$	16.12	0.169	2.316	0.583
$H_a^R:$	$F_{BB}^{2|1} = F_{BT}^{2|1}$ and $F_{TT}^{2|1} = F_{TB}^{2|1}$	36.34	0.028	9.465	0.491
H^R	$F_{BB}^{2|1} = F_{TB}^{2|1} = F_{BT}^{2|1} = F_{TT}^{2|1}$	74.85	0.015	26.86	0.432

6 Conclusion

This paper has adopted an experimental procedure to investigate trust and reciprocity between male small business entrepreneurs from Turkish and Belgian ethnic backgrounds in the Belgian City of Ghent. We have utilized the trust game formulated by Berg, Dickhaut, and McCabe (1995), within an inter-ethnic context in order to test for the existence of ethnic discrimination, much in the same spirit as originally done by Fershtman and Gneezy (2001). Our findings suggest that the average trust and average reciprocity of Turkish and Belgian

participants are independent of ethnic affiliation. Turkish and Belgian participants trusted and reciprocated equally (on average), are equally trusted and reciprocated against, and trusted and reciprocated in a manner irrespective of whether or not the counterparty belonged to the same ethnic group. Although it is hard to believe that in the Belgian context (and in many others) a player's strategy is unaffected by his opponent's ethnic affiliation, this is probably much more plausible for specific subpopulations. This is exactly what we find: when the chosen subpopulations share gender, socio-professional category and place of residence, no ethnic discrimination remains.

While we have formulated notions of equality of intra- and inter-ethnic trust and reciprocity in general terms, their appeal in any human interaction will depend on how well the interaction isolates trust, reciprocity and perhaps other basic aspects of human behaviour. In particular, we feel that in the trust game, as we used it, the stage 1 and stage 2 transfers may also reflect altruism or fairness considerations (in addition to trust and reciprocity). To this extent, the distributions of the transfers also incorporate elements of intra- and inter-ethnic altruism and fairness. Moreover, it can be argued that if the stage 1 transfers are (solely) motivated by a taste for discrimination, then they are uninformative about trust in the other party. It would be a challenge to design a game that disentangles trust and taste for discrimination.

7   Appendix 1: Recruitment of participants

The introduction letter was in Dutch for the Belgian entrepreneurs, while the Turkish entrepreneurs had the choice between Turkish and Dutch. The English translation is given here.

Dear Sir,

Ghent University is carrying out a research project on decision-

making by self-employed entrepreneurs. We would like to know whether you would be willing to participate in this research project. The data will be processed anonymously. Your cooperation will take at most 10 minutes and you may receive a cash prize. The interviewer would like to make an appointment with you on Wednesday, November 7, 2001. We thank you for your cooperation.

8   Appendix 2A: Instructions for player A

The instructions were in Dutch for the Belgian entrepreneurs, while the Turkish entrepreneurs had the choice between Turkish and Dutch. The English translation is given here.

You and another self-employed entrepreneur from the City of Ghent are being asked to make the following decisions:

Step 1:

You receive BEF 400 from us. The other entrepreneur receives no money. Upon receiving this money, you must decide whether you want to give part of this amount to the other entrepreneur, and, if so, how much (exclusively in BEF 100 bills).

Step 2:

The amount of money you give to the other entrepreneur is tripled. In other words, for every BEF 100 you give, the other entrepreneur receives BEF 300.

Then the other entrepreneur must decide whether he wants to return to you part of the amount he received (i.e. three times the amount you give) , and, if so, how much (exclusively in BEF 100 bills). This amount is not once again tripled.

Step 3:

In a few days from now, we will hand to you the amount the other entrepreneur returns to you. Your participation ends at that point.

Your decisions and those of the other entrepreneur remain unknown to the interviewer. The other entrepreneur is given exactly the same instructions concerning the decisions to be made

9 Appendix 2B: Instructions for player B

The instructions were in Dutch for the Belgian entrepreneurs, while the Turkish entrepreneurs had the choice between Turkish and Dutch. The English translation is given here.

You and another self-employed entrepreneur from the City of Ghent are being asked to make the following decisions:

Step 1:

The other entrepreneur receives BEF 400 from us. You receive no money. Upon receiving this money, the other entrepreneur must decide whether he wants to give part of this amount to you, and, if so, how much (exclusively in BEF 100 bills).

Step 2:

The amount of money the other entrepreneur sends to you is tripled. In other words, for every BEF 100 the other entrepreneur gives, you receive BEF 300.

Then you must decide whether you want to return to the other entrepreneur part of the amount received (i.e. three times the amount the other entrepreneur gives), and, if so, how much (exclusively in BEF 100 bills). This amount is not once again tripled.

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Step 3:

In a few days from now, we will hand to the other entrepreneur the amount you return to him. Your participation ends at that point.

Your decisions and those of the other entrepreneur remain unknown to the interviewer. The other entrepreneur is given exactly the same instructions concerning the decisions to be made.

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