Social Relationships and Trust*

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Abstract

Social connections play an important role for people coping with insecure living conditions. We analyze whether a reduction in trade partners’ social distance helps overcome information asymmetries in a two-person exchange. Reduced social distance leads to more trust and cooperation among participants from an informal-housing area in Cairo. Although this higher cooperation is reflected by higher solidarity, principals underestimate their friend’s intrinsic motivation to cooperate leading to a loss in social welfare. We relate this to agents’ inability to signal their trustworthiness and to principals’ limited control over the agent in the trust game.

Keywords: trust, hidden action, social distance, solidarity, reciprocity.

JEL Codes: C72, C93, D82, O12

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1 Introduction

In developing countries, social networks play a pivotal role, particularly among the poor, as formal (market) institutions are weak or non-existent (Cox and Fafchamps, 2008). Social networks work through a mix of intrinsic and extrinsic motivation (e.g. Coate and Ravallion, 1993; Cox and Fafchamps, 2008; Platteau, 1994) and serve various purposes. Examples include mutual insurance (Fafchamps, 1992; Foster and Rosenzweig, 2001), the access to goods and services through reciprocal exchange (Kranton, 1996) and informal contract enforcement as exercised in rotating savings and credit associations (Fafchamps, 1996; Karlan, 2005; Karlan et al., 2009). However, even within the social network, information asymmetries often cannot be entirely removed leaving some leeway for non-compliance. In turn, for the transaction to take place it requires a sufficient level of trust among trade partners. The aim of this paper therefore is to analyze whether trade partners can overcome this dilemma by interacting with a socially close person ("friend") as opposed to an ex-ante unknown person ("stranger"). We additionally examine the driving forces behind this change in behavior.

We study these questions through an experiment that we conducted in an informal housing area in the Greater Cairo Region in Egypt. Residents of this area, Manshiet Nasser, strongly rely on their social relationships in their everyday lives (e.g. Singerman, 1995; Hoodfar, 1997). More generally, Arab countries can be characterized as collectivist societies in which most of the transactions take place in close-knit groups (Hofstede, 2002). Strong social ties among kin and close friends typically lead to a strong distinction between in-group and out-group members (strangers). Trust towards strangers is low (Ermisch and Gambetta, 2008; Alesina and Giuliano, 2009). In our experiment, all participants played a binary trust game with hidden action and a series of dictator games. In each of these games, they had to make the decision in a familiar situation in which they interacted with their friend and in a less familiar situation in which the partner was a stranger.

In the trust game with hidden action, trustors (principals) are unable to learn ex-post whether their trade partner (the agent) cooperated or not. Even when the other is their friend, principals cannot monitor her, neither personally nor through their social network. Informal contract enforcement is thus not possible and principals must rely on their knowledge about their friend, i.e. whether she is a ‘good’ type, that they accumulated prior to the experiment. This design enables us to isolate the effect of social distance on trust in terms of a reduction in information asymmetries.
The dictator games aim at revealing participants’ social preferences and their value of social relationships. By introducing role uncertainty we confront participants with the possibility of a positive or negative income shock to which decision makers can respond by transferring part of the endowment (see also Coate and Ravallion, 1993). We implement an anonymous and a non-anonymous treatment in order to distinguish between different motivations for transfers. The anonymous dictator game provides a measure of participants’ solidarity, whereas in the non-anonymous dictator game we measure participants’ reciprocity. We also receive information about subjects’ socio-economic characteristics and indicators of their relationship to their friend and, more generally, of their social network through a post-experimental questionnaire.

Trust games conducted in developing countries so far examined trust towards strangers mostly using the standard Berg et al. (1995) trust game design. Compared to students in industrialized countries, trust towards strangers is typically low (for a survey see Cardenas and Carpenter, 2008), a finding that is overall in line with the literature on strong social ties. We expect trust to increase in response to a reduction in the social distance between trade partners due to the reduction in information asymmetries. On the other hand, high trust and cooperation among insiders of a network are typically attributed to close monitoring and punishment, which is, however, not possible in our game setup. Evidence from dictator games further suggest strong norms of altruism and reciprocity in these communities (D’Exelle and Riedl, 2009; Cardenas and Carpenter, 2008) which might facilitate trust and cooperation.

More recently, interest in the use of individuals’ real-world social networks in experiments has increased. Most related to our study are the papers by D’Exelle and Riedl (2009); Goeree et al. (2010); Brañas-Garza et al. (2010) and Leider et al. (2009) which run dictator games to study prosocial giving in networks. Our study deviates from these studies in several respects. First, we draw on a different, highly heterogenous subject pool that strongly depends on their social network for survival. Except for the study by D’Exelle and Riedl (2009) who collected their data from household heads in a rural village in Nicaragua, all other studies conducted their experiment among students or pupils in Europe or the US. Second, in addition to the dictator game, we analyze the effect of social distance on behavior in the trust game. Third, we required invited participants

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1 Prior to these studies, social distance has been modeled in experiments by changing the degree of anonymity between players, for instance by providing certain information about the other (e.g. his gender) or by letting subjects meet before taking the decision. Examples for dictator games are Hoffman et al. (1996, 1999); Bohnet and Frey (1999).

2 Leider et al. (2009) let subjects play dictator games with different exchange rates (efficiency-increasing, neutral and efficiency-decreasing) as well as a helping game.
to take part in our experiment together with a friend. This mutual agreement ensured a direct and
two-sided link between friends. In contrast, the above mentioned studies used network elicitation
tools to obtain detailed information about the social network of the participants, also with the aim
to analyze additional questions, such as whether the content of the network (D’Exelle and Riedl,
2009) or subjects’ position within the network (Goeree et al., 2010) play a role. Leider et al. (2009)
and Goeree et al. (2010) have further been interested in dictator’s behavioral pattern for several
social distances, i.e. including indirect friends. The advantage of using network elicitation methods
is that the experimenter can randomly draw one out of all direct friends. However, in all mentioned
studies, participants were limited to fellow pupils, students and head of households. This restriction
might lead to an underestimation of the effect of social distance on behavior. In contrast, our study
does not restrict the set of friends out of which invitees could choose, provided they were adults and
not among their close family. At the same time, however, we lose the randomness in the selection
procedure. Somewhat similar is perhaps the approach used in Glaeser et al. (2000). They vary
social distance of participants by allowing them to self-select into pairs upon arrival. They find
that knowing each other longer results in slightly more trust and trustworthiness.

We find high levels of baseline solidarity towards strangers, with a majority of dictators
sharing the endowment in the one-way anonymous setup. Similar to other studies, D’Exelle and
Riedl (2009, e.g.), we find that baseline solidarity varies little with individual characteristics. Since
baseline solidarity is relatively high among our subjects, we consequently find a relatively small -
albeit significant - increase in the amount given to the friend. Leider et al. (2009) on the other
hand observe comparatively low levels of giving towards strangers but a strong responsiveness to
changes in the social distance between the dictator and the recipient. When the veil of anonymity is
lifted, the average amount allocated to both a socially close and a socially distant person increases
significantly. As in Leider et al. (2009), the increase in individuals’ giving between treatments and
between stranger and friend pairing are substitutes.

Results from the trust game reveal that a reduction in social distance is associated with
a significant increase in trust and cooperation (trustworthiness). Thus, networks indeed seem to
facilitate trade by reducing screening and thus transaction costs which tend to be high in these
environments (Karlan, 2005; Fafchamps, 1996). While solidarity is the main predicting variable for

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3 They are primarily interested in a methodological question, i.e. how trusting behavior in a standard trust
experiment is predictable by attitudinal survey questions.

4 They recruited students from an introductory economics class and allowed those who arrived together to play
together, raising the likelihood that participants know each other.
agents’ probability to cooperate with both their friend and a stranger, principals’ trust decision is not correlated with their solidarity neither in the friend nor in the stranger pairing.\(^5\) Surprisingly, principals who are willing to share their endowment in the dictator game, are not willing to trust the very same friend in the trust game. Instead, the driving force behind the increase in trust seems to come from the fact that principals are much more inclined to follow their beliefs when interacting with their friend. In the unfamiliar situation, principals are not confident about their beliefs and principals’ social preferences step in.

The most puzzling result is that, on average, principals’ friends are much more willing to cooperate than principals anticipate (72% versus 40%). In turn, too few principals opt for trust so that there is a loss in social welfare.\(^6\) Estimation results further suggest that principals do not incorporate their friend’s baseline solidarity when forming their expectations. At first sight, this seems odd. However, even selfish individuals will comply to norms of solidarity and reciprocity in an environment in which individuals are strongly dependent on their social network (e.g. Axelrod, 1984; Yamagishi and Yamagishi, 1994). Consequently, ‘good’ types will be unable to communicate, or to signal, their trustworthiness. Second, as argued by Hayashi et al. (1999), individuals who live in collectivist societies, in which stable and committed relationships play an important role, are used to have some control over others. If they find themselves in a situation with little "sense of control", cooperation levels drop. Similarly, principals in our trust game refrained from trusting albeit the nature of the decision problem was not so different from the decision in the anonymous dictator game.

The rest of this paper is organized as follows. In Section 2, we provide some background information about the field setting. We describe the setup of the experiment and give an overview of the procedure in section 3. Section 4 discusses the results from the dictator game and the descriptive results from the trust game. In section 5, we analyze the determinants of trust and cooperation in the friend and in the stranger pairing while we look more closely at individual friend pairs, in particular whether friends’ expectations and behavior match, in section 6. Section 7 concludes.

\(^5\)Ashraf et al. (2006) also find that unconditional kindness significantly affects trustworthiness but also trust in a typical Berg et al. (1995) trust game design. In contrast to our results, they find that expectations significantly affect the amount given by the principal. Given the different trust game setup, however, results may only partly be comparable.

\(^6\)Principals’ low trust towards their friends cannot be explained by factors such as betrayal aversion Bohnet et al. (2008). For betrayal aversion to matter, it would require that principals expect cooperation from their friend but withdraw from choosing trust because of high levels of betrayal aversion.
2 Research Design

2.1 Background

We conducted our study in Manshiet Nasser, one of the oldest and largest informal housing areas in Cairo. Manshiet Nasser is a squatter settlement built on government-owned land. Its location along the limestone cliffs of the Mokattam plateau and its difficult accessibility challenge any upgrading of basic infrastructure like water supply or sewage disposal. Living and environmental conditions are very poor. Population estimates range from 300,000 up to 1 million inhabitants with a population density of more than 100,000 persons per square meter. The average household size is 6 persons and more than 30% of the families live in one single room (UN-Habitat, 2003). In comparison to many other informal housing areas in developing countries, violent crime is a rare event. There is a low level of social engagement in Manshiet Nasser (UN-Habitat, 2003). The few active NGOs typically have some religious - Muslim or Coptic - background. Other sources of activities are mostly informal savings associations, called gam’iyaat in the Egyptian dialect. They are frequently used to meet financial needs, such as funeral or marriage costs (Hoodfar, 1997; Singerman, 1995).

2.2 Procedure

Conducting experiments in a Muslim country poses several changes. We pay great attention to the choice of the recruiters, the facilitator and the assistants as well as on the language used when announcing the experiment and during the experiment itself. In the timing and duration of the experimental sessions (workshops) we further took care that participants would not miss any prayer time.

We employed three local female assistants for the recruitment of participants. By using female recruiters we wanted to facilitate the recruitment of female participants. We provided recruiters only with some general information about the study. They were not aware of the purpose of the study nor did they know the game protocol or procedure. The recruiters invited pairs of friends, i.e. each invited participant (invitee) had to bring a friend. The invitee was told that participation at the workshop was only possible together with her friend. This mutual agreement

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7 In 1992, roughly 20% or about 2.5 million of the population of the Greater Cairo Area lived in informal housing areas (El Araby, 2002). This number is steadily increasing (UN-Habitat, 2006). According to the 2006 Census, the population of Greater Cairo amounts to 18 million. Recent estimates suggest that more than 40 percent of the population of Greater Cairo lives in informal housing areas. Manshiet Nasser is part of the Cairo Governorate with a population of 6.8 million, which is a 10 percent increase since the last Census in 1996.

8 There is some flexibility on prayer times as long as a missed prayer is completed before the next scheduled prayer.
<table>
<thead>
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<th>Mean</th>
<th>Std. Dev.</th>
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<td>262.58</td>
<td>70</td>
<td>1690</td>
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</tbody>
</table>

Table 1: Participants’ Characteristics.

to attend the workshop guaranteed a two-sided and direct link between friends.\textsuperscript{9}

In total, 144 slum dwellers from all 9 districts of Manshiet Nasser participated in our study. The participants are quite heterogeneous with respect to their socio-economic status, which is common for informal housing areas in Cairo. While about 40% of the participants receive a regular monthly waged income, only 5% earn more than 500 L.E., which is equivalent to about 94 US$\textsuperscript{10}. In Table 1 we present some characteristics of the participants. Educational attainment varies substantially among participants, ranging from illiterates (30% of our sample) to university graduates (10%). We also observe much heterogeneity related to age. Older people in our sample typically have less education than the younger people which reflects Egypt’s efforts over the last decades to improve and expand the educational system. Only 9% of the illiterate participants are younger than 25. More than 60% of our sample spent some time of their life outside Manshiet Nasser. This fraction is higher for participants above the median age of 27. The average household in our sample comprises of 6 members and has 3 rooms available. Despite this heterogeneity in terms of socio-economic background characteristics, friend pairs exhibit very similar characteristics with regard to age, schooling, employment status, wealth and sex. Many see each other on a daily basis and have known each other for many years.

We conducted five sessions with 24 to 30 participants within a week in May 2008. The

\textsuperscript{9}The only restriction was that we did not allow direct family members and minors to participate.
\textsuperscript{10}At the time of the study, the exchange rate was about 1 Egyptian Pound (L.E.) for 0.19 US$. 
sessions took place at a cultural theater located in one of the central districts of Manshet Nasser. It provided enough rooms and space to run the experiments, which is rarely the case in Manshet Nasser due to the lack of public infrastructure and public space. The sessions were run by a female experimenter, supported by a large group of assistants. The experimenter and the assistants received extensive instructions and training before the experiment.

Upon arrival, participants could only register together with their friend. Otherwise, they were not allowed to participate. After the registration, they received a folder that contained three large envelopes with the material for the three tasks and the questionnaire, and 5 L.E. as a show-up fee for arriving on time. The show-up fee was announced in the recruitment process by the recruiter and paying it immediately had the purpose of strengthening our credibility and trustworthiness. Participants were not allowed to open the folder. Invitees and their friends were then seated at spaced intervals in the front and, respectively, in the back of a large room to prevent any communication among friends. After a short introduction we required participants to give their consent for the experiment and the survey.

Explaining the games to participants with different levels of education poses a challenge and is time consuming. We addressed this challenge in several ways. The experimenter read out aloud the instructions to ensure that every participant gets the same information and to minimize any educational advantage. Additionally, we illustrated the experiments on charts and demonstrated the procedure in front of the participants. Relevant parts were repeatedly explained by the experimenter. Moreover, participants only learned about a game before they actually played it. This made it easier for participants to understand the games and also ensures that participants cannot condition their behavior on subsequent tasks. There was no feedback about outcomes between the different experiments. After each set of instructions, the experimenter went through several examples. We did not allow any questions in public, but all participants could ask questions in private before playing a game. For the decisions, a participant and a research assistant went to a predetermined place outside the large room. If necessary the research assistant explained the game once more or answered questions. The participants made their decisions in private and handed the envelope with the decision over to the assistant. Afterwards, participants were accompanied to their seat where they waited for further instructions. During this time, participants were monitored by two assistants to prevent any interaction among them.

Each session started with the trust game followed by the two dictator games, a summary
of the experiments and an interview-based questionnaire.\textsuperscript{11} The questionnaire contained questions on socio-economic characteristics, such as sex, age, education, employment status, and household assets, as well as questions on social and risk preferences and on characteristics of their relationship to the friend with whom they participated in the workshop. When questions referred to a scale, the interviewers showed a small picture with faces assigned to the upper and lower bound and, where applicable, to the mid point with the aim to help the less educated participants. All decisions were performed with coded envelopes. There was no interaction of participants with the experimenters during the whole experiment. We did not change the order of the trust game and the dictator game, because it involved more effort to explain the trust game and we wanted the concentrated attention of the participants. However, we did change the order of the dictator games and decisions. On average, participants earned a total of 34 L.E. (approx. 6.5 US $ at the time of the experiment) which is twice a worker’s daily wage.

3 Games and Experimental Conditions

We define social distance in terms of the path length between agents (Karlan et al., 2005). Subjects were asked to make each decision twice. Once they had to decide in the familiar situation, i.e. a situation in which they were confronted with their friend, and once in the unfamiliar situation, i.e. a situation in which they were confronted with a stranger. Only one decision was implemented and paid.

3.1 Trust Game

We used a binary trust game with hidden action as depicted in Figure 1 (see also Charness and Dufwenberg, 2006). The principal can either trust or distrust her agent. If she trusts, the agent can either betray or cooperate. In the latter case, there is a little chance (one-sixth) that the cooperative effort is lost for the principal. Applying backward induction and assuming selfish and risk-neutral subjects, the "distrust" strategy with the sure outcome is the dominant strategy (although it is Pareto-inferior) since the principal would expect the agent to maximize her payoff by choosing the betray option. On the other hand, if there exists a sufficient level of trust between subjects, they will choose the (trust, cooperate) strategy. This should be the case despite the small chance

\textsuperscript{11}Principals who opted for "distrust" in both stranger and friend pairing in the trust game and who thus had a sure payoff of 10 L.E. could have been exposed to an endowment effect in the following dictator games. However, we do not find any significant effect.
Figure 1: One-shot Binary Trust Game with Hidden Action for Agents (Payoffs in L.E., Egyptian Pound.)

of a low outcome for the principal. First of all, the expected payoff of the principal (assuming risk-neutrality) for this strategy is 20 2/3 L.E. which is strongly preferable to the distrust strategy where the principal would receive 10 L.E. only. Furthermore, we have chosen payoffs so that the joint payoff in case of bad luck is greater than the joint payoff in the distrust case (24 L.E. versus 20 L.E.); in Charness and Dufwenberg (2006) instead, principals receive zero (instead of 4) and the joint payoff is equal to the sure outcome. So provided both subjects trust each other and given the trust game is played in a non-anonymous setup, pairs could afterwards just split up the 24 L.E. so that each of them would be better off than if the principal had chosen to distrust in the first place. What this trust game nicely captures is the fact that economic exchanges often involve some moral hazard. If the principal receives 4 L.E. only, it is impossible for him to find out whether the agent betrayed him or not, even if the agent is the principals’ friend.

In the beginning of each session a coin was tossed to determine whether invitees or their friends played the trust game as principal. Since we expected a low level of trust, we implemented the strategy method for agents. We thus obtain an observation for every agent. To determine the success or failure in case of cooperation, the assistant drew one out of six numbered cards after the agent made her decisions. A success was determined by card numbers 2, 3, 4, 5 or 6 and a failure by card number 1. Each principal and each agent played the game twice, once with her friend and once with some other randomly chosen person ("stranger") among the other group (invitees
or friends). We explained participants at length that only one decision would determine their income and that the decision would be randomly selected in public at the end of the session. Both decisions were made in a non-anonymous setting, but we revealed the identities only ex-post. This means that participants learned at the end of the session with whom they played the game. After making their decisions, participants were asked about their expectations about others’ behavior for both decisions.

3.2 Dictator Game

In the second and third part of the experiment, participants played a dictator game. In each dictator game a decision maker received two envelopes with 20 L.E. For the first decision, she had the possibility to allocate any of the 20 L.E. to her friend, and for the second, to a stranger. The dictator games differed with respect to the anonymity of the decision maker. In the non-anonymous treatment (DGNA) the recipient learned ex-post the identity of the decision maker, while in the anonymous treatment (DGA) she did not. After the DGNA, we additionally asked decision makers why they chose that particular amount and what amount they would expect from their friend and, respectively, from some other person. In order to have data for both principals and agents in the trust game, each participant played the role of the decision maker and the role of the recipient. Thus, we have 144 decision makers, each making two decisions in the DGNA and two in the DGA. We paid participants either for their role as decision maker or as recipient and only for one decision per treatment (friend or stranger). We determined the role and the relevant decision for each treatment before the game was played but we revealed it only at the end of the session. To ensure anonymity in the DGA treatment, we only determined the role but not the payment-relevant decision. The role uncertainty resembles a positive income shock for a decision maker and negative income shock for a recipient, respectively. Transfers can thus be interpreted as a mutual insurance against this shock, measuring an individual’s solidarity towards other community members, rather than an individual’s altruism (see also Coate and Ravallion, 1993). Analog to Leider et al. (2009), in the anonymous dictator game we label the amount given to a stranger as "baseline solidarity" and the amount given to the friend as "directed solidarity". In the non-anonymous dictator game,

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12 We varied the order of the decisions between sessions.
13 Note that we varied the order of the decisions between sessions.
14 Leider et al. (2010) refer to the amount the decision maker gives to a nameless person as "baseline altruism" and the additional amount given to a friend as "direct altruism", thereby assuming that these amounts are additively separable. In order to allow for the possibility that these amounts are substitutes, we label the entire amount given to the friend as directed solidarity.
we measure reciprocity due to the possibility of future interaction and enforcement.

4 Results

4.1 Dictator Game

In total 144 participants made four allocation decisions each. The results are shown in Table 2. On average, decision makers allocate 7.29 L.E. (36%) of the available 20 L.E. to a socially distant recipient (stranger) in the anonymous treatment. If decision makers can direct the transfer towards a socially close person, i.e. their friend, transfers increase to on average 8.85 L.E. (44%). The decision makers’ loss of anonymity leads to a further increase in transfers. If the recipient is a stranger, decision makers allocate on average 7.90 L.E. (40%) to the recipient. If instead the recipient is a socially close person, she receives on average 9.21 L.E. (46%). Compared to the DGA, the social distance effect in the DGNA is slightly smaller (17% versus 22%). The increases in response to a reduction in social distance and to the loss of anonymity are each statistically significant (based on the Wilcoxon signed-rank test). Note that the social distance effect and the non-anonymity effect are substitutes (compare Leider et al. (2010)): The higher the amount allocated to a friend relative to a stranger under anonymity, the less the decision maker gives extra to her friend under non-anonymity.15

The variance of the amount given also changes with respect to social distance and anonymity. It is smallest in the friend pairing in the NA treatment and is statistically different from the variance in the anonymous treatment (variance ratio test of $2\times \text{Pr}(F>f) = 0.0308$) as well as from the variance of the amount given to a stranger in the NA treatment (variance ratio test of $2\times \text{Pr}(F>f) = 0.0391$).

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<td>stranger</td>
<td>7.29 (3.55)</td>
<td>7.90 (3.10)</td>
</tr>
<tr>
<td></td>
<td>friend</td>
<td>8.85 (3.12)</td>
<td>9.21 (2.60)</td>
</tr>
</tbody>
</table>

Amount given in each treatment to the friend and, respectively, to the stranger (out of 20 L.E.). Standard deviations are reported in parentheses.

Table 2: Summary Statistics for the Dictator Game (N=144).

15This can be demonstrated by running the following regression: $\Delta \text{NAEffect}_i = \beta_1 \Delta SDEffect_i + \beta_2 X_i + \epsilon_i$, where $\Delta \text{NAEffect}_i$ is the difference between transfers to the friend in the anonymous and in the non-anonymous treatment and $\Delta SDEffect_i$ is the difference between transfers to a friend and a stranger in the DGA. The coefficient $\beta_1$ is smaller than one and statistically significant.
The observed high shares of giving are similar to results of dictator games conducted in other developing countries. Cardenas and Carpenter (2008) provide an extensive overview of various dictator game results in developing countries and report an average allocation in the anonymous treatment of about 38% in experiments using a non-student subject pool. This is also consistent with evidence in the development economics literature (Fafchamps, 1992) and in anthropological studies (Singerman, 1995; Hoodfar, 1997) on strong norms of solidarity and reciprocity among the poor as a form of mutual insurance. These norms are explained by people’s high exposure, or vulnerability, to a variety of shocks, such as economic, environmental, and health shocks (Dercon, 2006; Fafchamps, 1999) against which they cannot formally insure and typically have limited resources to cope with. The high level of solidarity is the main difference to studies in Western cultures and also explains the larger directed giving to friends in these studies, see e.g. Brañas-Garza et al. (2010); Leider et al. (2009) or Goeree et al. (2010). They found that giving increases between 36% to 52% if the recipient is a direct friend instead of a stranger, even under anonymity. Similar to our study, on the other hand, D’Exelle and Riedl (2009) observe a comparatively low increase of giving of 18% among household heads in rural Nicaragua. Additional evidence that such a norm of reciprocity is prevalent within the community comes from subjects’ expectations. In the DGNA, subjects expect to receive 6.67 L.E. (sd = 2.99, N=144) from a stranger, which is about 1 L.E. less than they themselves give on average. From a socially close person they expect to receive 9.26 L.E. (sd = 2.66, N=144), slightly more than their average transfer.

In order to analyze how baseline solidarity is associated with directed giving to the friend, we run standard OLS regressions for both treatments, DGA and DGNA.\(^{16}\) We use the following model:

\[
\text{Giving}_i = \beta_1 \text{Base}_i + \beta_2 \text{EXP}_i + \beta_3 X_i + \epsilon_i
\]  

with decision maker \(i\). \(\text{Base}\) is the decision maker’s baseline solidarity and \(X\) includes individual characteristics such as age, sex and years of schooling. For the NA treatment, we additionally include the decision maker’s expectation about his friend’s level of giving in the DGNA, \(\text{EXP}\). In a second specification, we also control for differences between decision maker and friend characteristics. Since a decision maker \(i\) is asked to make a transfer to her friend \(j\) and, vice versa, her friend \(j\) is asked to make a transfer to \(i\), \(E[\epsilon_i, \epsilon_j] \neq 0\), that is the error terms of each

\(^{16}\)Our results are very similar when we run the regression using a standard Tobit model.
<table>
<thead>
<tr>
<th>Decision makers’ transfer to friend</th>
<th>DGA</th>
<th>DGNA</th>
</tr>
</thead>
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<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
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<tr>
<td>Baseline solidarity</td>
<td>0.570***</td>
<td>0.548***</td>
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<td></td>
<td>(0.092)</td>
<td>(0.100)</td>
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<td>ΔBaseline solidarity</td>
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<td>(0.040)</td>
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<td>Decision maker’s expectation</td>
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</tr>
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<td>0.024</td>
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<td></td>
<td>(0.021)</td>
<td>(0.024)</td>
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<tr>
<td>ΔAge</td>
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<td>(0.412)</td>
<td>(0.417)</td>
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<tr>
<td>Years of schooling</td>
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<tr>
<td></td>
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<td>(0.079)</td>
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<tr>
<td>ΔYears of schooling</td>
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<tr>
<td></td>
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<td>−0.228</td>
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<tr>
<td></td>
<td>(0.417)</td>
<td>(0.447)</td>
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<td>ΔWealth</td>
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<tr>
<td></td>
<td>(0.535)</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>144</td>
<td>144</td>
</tr>
<tr>
<td>R²</td>
<td>0.43</td>
<td>0.44</td>
</tr>
</tbody>
</table>

* p<0.10,  ** p<0.05,  *** p<0.01
DGA refers to the anonymous dictator game, DGNA to the non-anonymous dictator game. Robust standard errors are reported in parentheses. In all specifications, standard errors account for clustering on the decision maker and recipient level (two-way clustering). Wealth is an index calculated from participants’ household assets using factor analysis.

Table 3: Determinants of Decision Makers’ Transfers to Their Friend in the Anonymous and Non-anonymous Dictator Game.
friend pairing are correlated. In order to correct standard errors, we apply a two-way clustering as proposed by Miller et al. (2009). The results are displayed in column (1) to (4) in Table 3.

In both treatments, the amount given to the friend is largely determined by her baseline solidarity. A one-unit increase in solidarity is associated with a 0.57 unit increase in the DGA (column 1). In the DGNA, the coefficient is smaller (0.25 and 0.24, respectively) as decision makers’ transfer is strongly determined by their expectations about their friend’s norm of reciprocity. As mentioned earlier, given the comparatively low level of baseline solidarity, studies on social networks in Western societies found considerable larger increases (e.g. Leider et al., 2009). Differences in baseline solidarity between the decision maker and her friend reduce directed giving. The coefficient is, however, not significant. Individual characteristics of the decision maker and her friend seem to have no influence on directed giving. The fact that individual characteristics have little effect on the allocation decision in the dictator game has also been observed by other studies (D'Exelle and Riedl, 2009; Goeree et al., 2010).

In summary, we observe a high level of solidarity and reciprocity among our subjects which is typical for this context. Nonetheless, social distance significantly affects transfers.

4.2 Trust Game - Descriptive Statistics

The aggregate results of the trust game are presented in Figure 2. Only 17 out of 72 principals (24%) opted for trust when confronted with a stranger. The trust rate increases substantially to 40% (29 out of 72) when confronted with a socially close person. Agents are also sensitive towards decreased social distance. The cooperation rate of agents increases from 55% when confronted with a stranger to 72% when interacting with a socially close person. Reduced social distance also leads to efficiency gains. In the stranger pairing, only 7 out of 72 pairs (10%) succeed in implementing the (trust, cooperate) outcome compared to 20 pairs (28%) in the friend pairing.

Interestingly, at the aggregate level principals’ expectations are not sensitive to a change in social distance. Principals expect on average slightly less cooperative behavior from their friend than from a stranger (see Figure 2). On the other hand, agents have better calibrated expectations, that is their expectations are quite close to observed trust levels. Agents also respond to the reduction in social distance: they expect significantly more trust from their friend than from a stranger ($\chi^2_{(1)} = 3.67, p = 0.055$).

---

$^{17}$Principals’ expectations refer to the agent choosing "cooperate". Agents’ expectations refer to the principal choosing "trust".

$^{18}$This difference is, however, statistically not significant ($\chi^2_{(1)} = 1.01, p = 0.314$).
The familiar situation provides two surprising results. First, we find a rather wide gap between trust and cooperation: Whereas on average only 40.28% of the principals opt for "trust", 72.22% of all agents opt for "cooperate" (remember that we implemented the strategy method for agents). Second and relatedly, while principals follow their expectations in the friend pairing (Spearman’s $\rho = 0.4226$, $p = 0.00$) contrary to the stranger pairing (Spearman’s $\rho = 0.1136$, $p = 0.34$), the high level of cooperation is not anticipated by principals: only about 40% expect a cooperative behavior from their friend. We might have conjectured that our participants are accustomed to high levels of trustworthiness as most of their transactions take place within their social network, exactly because of the low likelihood of betrayal. Indeed, we observe that trusting principals come close to the observed level of cooperation. On average they expect 66% of agents to cooperate. For distrusting principals this number is significantly lower: they only expect 23% to cooperate ($\chi^2_{(1)} = 12.86$, $p < 0.01$). This observation, thus, supports the above conjecture. Unfortunately, not much empirical evidence on trustworthiness in Arab countries is available. The only piece of indirect evidence on trustworthiness comes from Bohnet et al. (2009). In their study people require on average a level of trustworthiness of 70% before they trust a stranger.\footnote{This is in contrast to Western countries, e.g. Switzerland and USA, where people are willing to trust at a level of 50%. Note that Bohnet et al. (2009) conducted their experiments in the Gulf region, Switzerland and USA with...}
raises the question why people, who know each other well and who share a strong norm of solidarity
and reciprocity, do not expect this high level of cooperation. In the next section, we first explore the
impact of social distance on trust and cooperation before coming back to this question in section
6.

5 How a Reduction in Social Distance Affects Trust and Cooperation

The essence of trust is that a principal places something valuable at the disposal of another person
with the belief that the other will not misuse it. Given the within-subject design we explore, we
are particularly interested in whether the role of subjects’ preferences and beliefs change depending
on whether they interact with their friend or a socially distant person. Additionally, we control
for social network, friendship and individual characteristics. We thus estimate the following binary
choice models for principals’ decision to trust and, respectively, for agents’ decision to cooperate:

\[
\text{Trust}_i = \beta_1 \text{Exp}_i + \beta_2 \text{SocPref}_i + \beta_3 \text{RiskPref}_i + \beta_4 \text{Net}_i + \beta_5 \text{Friendship}_{ij} + \beta_6 X_i + \epsilon_i \tag{2}
\]

\[
\text{Cooperate}_i = \beta_1 \text{SocPref}_i + \beta_2 \text{RiskPref}_i + \beta_3 \text{Net}_i + \beta_4 \text{Friendship}_{ij} + \beta_5 X_i + \epsilon_i \tag{3}
\]

where \(\text{Exp}\) refers to principal i’s expectation that the agent - her friend j or some stranger - chooses
to cooperate, i.e., to reward her trust. \(\text{SocPref}\) stands for social, other-regarding and \(\text{RiskPref}\)
for risk preferences. \(\text{Net}\) captures characteristics of the principal’s (general) social network while
\(\text{Friendship}\) refers to variables describing the relationship to her friend j. Finally, \(X\) represents
individual characteristics, such as sex, age and years of schooling. Given that we measure trust
through an experiment, subjects’ social and risk preferences should not affect beliefs about others’
trustworthiness but should affect trust behavior directly (Fehr, 2009). The binary choice model for
agents’ decision to cooperate is the same but without expectations since we applied the strategy
method.

\footnote{a student subject pool and a trust game without hidden action.}

\footnote{Naef et al. (2009) show that differences in preferences and beliefs can explain most of the trust gap between the US and Germany. Note that they draw on a between-subject design.}
To capture social preferences we include the amount given to the stranger and to the friend in the anonymous dictator game, i.e. baseline and directed solidarity. We complement this measure with a dummy variable indicating whether the subject volunteers for a non-profit organization, i.e. a measure of altruism, and the frequency of lending money to friends (never, once/several times per year, or once per month or more). We should observe a positive relationship between each of these variables and both trust and cooperation (e.g. Castillo and Carter, 2002; Ashraf et al., 2006).

In order to measure risk we have to rely on attitudinal questions that we asked in the post-experimental questionnaire. Ideally, we would have elicited risk attitudes through actual behavior in a risk game (see e.g. Schechter, 2007; Bohnet et al., 2009). We abstained from doing so since such a game could be associated with gambling which is strictly forbidden in Islam. We asked participants about their risk attitudes in general as well as with respect to financial aspects and to people. Admittedly, this risk measure might be a poor one in this context as it requires some level of abstraction and the level of education of our participants was low. Nevertheless, it should give us at least a proxy of the risk attitudes of our participants. The literature provides mixed evidence about the influence of risk attitudes on trust behavior (see e.g. Schechter, 2007; Karlan, 2005; Eckel and Wilson, 2004; Houser et al., 2010). For instance, Schechter (2007) finds a positive impact of risk on trusting behavior for rural villagers in Paraguay whereas Houser et al. (2010) find that risk preferences, albeit explaining behavior in a risk game, have no explanatory power in the trust game. We also control for risk preferences in agents’ decision to cooperate because of the chance move following cooperation. Agents who are very risk averse might try to avoid being confronted with the chance move and are therefore more likely to choose "betray".

Network statistics provide information about an individual’s wider social network irrespective of a particular relationship (see also Karlan et al., 2009; Glaeser et al., 2000). We include the number of close friends besides family members and a dummy if the first two sources of borrowing are her family and close friends, that is her social network provides sufficient financial resources for

---

21 The results do not change if we use baseline solidarity for both pairings.

22 The questions are taken from the German Socio-Economic Panel (GSOEP). Participants were asked to answer the following questions on an 11-point scale they were shown by the assistant: "How do you see yourself: Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?" as well as "People can behave differently in different situations. How would you rate your willingness to take risks in the following areas - (a) financial matters, (b) faith in other people?". The 11-point scale ranges from trying to avoid risks ("0") to fully prepared to take risks ("10").

23 Dohmen et al. (2005) have shown for a representative German sample that these risk questions predict actual risk behavior in experiments pretty well. Recently, Hardeweg et al. (2009) have validated the same risk questions with a representative rural subsample of a panel survey in Thailand. They show that the general risk question as used in this study correlates with behavior in a risk experiment. However, the relationship is better for better educated participants.
mutual insurance. We assume that having few close friends and borrowing money primarily from friends and relatives are proxies for strong social ties. Following Ermisch and Gambetta (2008) and Alesina and Giuliano (2009), we expect that this is associated with a lower probability to trust strangers and a higher probability to trust friends. Similarly, strong social ties are likely to be associated with lower reciprocity towards strangers compared to friends. Additionally, we control for a subject’s perception of her immediate neighborhood which is a proxy for her embeddedness in the community and hence a measure for her dependence on her social connections (see also Alesina and La Ferrara, 2002). If participants perceive their neighbors as strangers they are more dependent on their network, fostering trust towards friends but diluting trust towards strangers.²⁴

While all friends brought to the workshop are direct friends, we nevertheless want to assess possible differences in the quality of the relationship. Although participants have two-sided links, it is possible that some participants are forced into a particular relationship, for instance because of existing group ties, geographic proximity or someone’s value for accessing certain goods and services. Limited free-choice with regard to friendships is typical in small communities and collectivist cultures, as e.g. in Arab countries (Hofstede, 2002). If this is the case, we would observe different behavior depending on the authenticity of the relationship. We include the following two dummy variables: whether friends meet daily and whether they have been knowing each other for more than four years. The two measures give us a proxy for the intrinsic value of the relationship, information exchange and for learning about each other’s type (Marmaros and Sacerdote, 2006; Homans, 1950). Hence, we expect higher trust and cooperation among friends with more frequent interactions and long-term relationships. Both intuitions also have a long-standing game theoretical foundation (e.g. Kreps et al., 1982; Karlan et al., 2009; Coleman, 1990).

Results from the probit estimations are reported in Tables 4 and 5. Using the fact that we have two decisions for each principal and each agent - i.e., one for each pairing - we provide estimates from running random effects probit models with robust standard errors in the first four columns. The dummy variable "paired with friend" refers to the friend pairing, i.e. it measures the effect of a decrease in social distance on an individual’s decision. Note that expectations as well as the amount given in the DGA differ by pairing; all other variables do not change.

The estimates from the first four models in Table 4 provide a clear picture. Principals trust socially close persons significantly more than strangers and this is mainly driven by their

²⁴Alesina and La Ferrara (2002) suggest that trust is influenced by how long an individual has lived in a community. We therefore alternatively used a dummy for being born in Manshiet Nasser. However, it does not significantly affect trust and cooperation.
Principals’ decision to trust

<table>
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<tr>
<th></th>
<th>panel-I</th>
<th>panel-II</th>
<th>panel-III</th>
<th>panel-IV</th>
<th>stranger</th>
<th>friend-I</th>
<th>friend-II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
</tr>
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<td>Paired with friend (d)</td>
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<td>0.696**</td>
<td>0.671**</td>
<td>0.668**</td>
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<tr>
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<td>(0.269)</td>
<td>(0.274)</td>
<td>(0.278)</td>
<td>(0.277)</td>
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<td>Principal’s expectations (d)</td>
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<td>(Baseline/directed) solidarity</td>
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<td>0.179</td>
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<td>0.365*</td>
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<td>(0.139)</td>
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<td>Longterm relation (d)</td>
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<tr>
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<td>0.22</td>
<td>0.22</td>
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</table>

(d) marginals for discrete change of dummy variable from 0 to 1
* p<0.10, ** p<0.05, *** p<0.01
Marginal effects are reported with robust standard errors in parentheses from estimating random effects and simple probit models for the probability that the principal opts for trust. Frequency of lending money is a categorical variable (never, once/several times per year, or once per month or more). Risk refers to an 11-point scale ranging from trying to avoid risks (“0”) to fully prepared to take risks (“10”). Controls include age, sex and years of schooling of individuals as well as dummies for household head, born in Manshiet Nasser and invitee.

Table 4: Determinants of Principals’ Behavior in the Trust Game.
expectations. In the third and fourth model, we additionally control for risk and social preferences as well as for individual characteristics.²⁵ We find some evidence that social preferences matter. Principals who are more solidary tend to place more trust in agents, but this is not statistically significant. The frequency of lending money and volunteering significantly increase the likelihood of trust. Risk preferences seem to have no impact. Alternative measures, such as the responses given to the other two risk questions and a dummy for self-employment, do not change results.

The descriptive analysis suggests that expectations play a different role in the two pairings. Therefore, we look at each pairing separately in the last three columns. The models in columns (5) and (6) show that expectations do not affect principals’ trust in strangers while they significantly and strongly affect trust in friends, i.e. subjects who expect a cooperative behavior of their friend are 48% more likely to opt for trust. The results further suggest that the decision to trust a stranger is mainly influenced by social preferences. Both the frequency of lending money and volunteering significantly increase the probability that principals trust a stranger and the coefficients for baseline solidarity, volunteering and lending money are jointly significant.²⁶ In the last column, we additionally control for differences in the type of relationship among our friend pairs. However, both coefficients are statistically not significant.

Overall it seems plausible that social (and risk) preferences step in when uncertainty about the agent’s behavior becomes too high, as is in the stranger pairing. A reduction in social distance between trade partners, on the other hand, leads to a reduction in information asymmetries and thus to higher trust. Before we turn to the question about what determines these expectations and their accuracy in detail, we discuss the estimation results for agents.

The estimation results for modeling agents’ decision to cooperate are shown in Table 5. Without controlling for other factors, the magnitude of the friend dummy is almost exactly the same as in the previous Table 4. The second and third column suggest that cooperation is strongly correlated with solidarity, i.e. the amount given in the DGA. Each additional Egyptian Pound given in the DGA increases the probability to opt for cooperate by, on average, about 16%. This is in line with other evidence, (see e.g. Castillo and Carter, 2002; Ashraf et al., 2006). Remember, however, that directed solidarity is significantly greater than baseline solidarity so that higher levels of cooperation in the friend pairing are reflected by the higher amount given to the friend relative to the stranger in the DGA. Other control variables, such as age and years of schooling, do not

²⁵ Including additional variables to control for invitees and wealth levels, amongst others, do not change the results.
²⁶ A Wald test yields a p-value < 0.05. The same test is not significant for the friend pairing (p-value > 0.33).
<table>
<thead>
<tr>
<th></th>
<th>panel-I</th>
<th>panel-II</th>
<th>panel-III</th>
<th>panel-IV</th>
<th>stranger</th>
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<th>friend-II</th>
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<tbody>
<tr>
<td>Paired with friend (d)</td>
<td>0.641**</td>
<td>0.323</td>
<td>0.351</td>
<td>0.336</td>
<td>(0.269)</td>
<td>(0.265)</td>
<td>(0.268)</td>
</tr>
<tr>
<td>(Baseline/directed) solidarity</td>
<td>0.171***</td>
<td>0.158***</td>
<td>0.155***</td>
<td>0.066***</td>
<td>0.067***</td>
<td>0.072***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.050)</td>
<td>(0.051)</td>
<td>(0.053)</td>
<td>(0.019)</td>
<td>(0.022)</td>
<td>(0.022)</td>
<td></td>
</tr>
<tr>
<td>Volunteer (d)</td>
<td>0.219</td>
<td>0.021</td>
<td>-0.067</td>
<td>0.142</td>
<td>0.169*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.354)</td>
<td>(0.400)</td>
<td>(0.140)</td>
<td>(0.090)</td>
<td>(0.086)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency of lending</td>
<td>0.023</td>
<td>0.108</td>
<td>-0.062</td>
<td>0.038</td>
<td>0.065</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.198)</td>
<td>(0.209)</td>
<td>(0.088)</td>
<td>(0.066)</td>
<td>(0.067)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk preferences</td>
<td>0.024</td>
<td>0.025</td>
<td>0.020</td>
<td>-0.008</td>
<td>-0.015</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.042)</td>
<td>(0.044)</td>
<td>(0.018)</td>
<td>(0.015)</td>
<td>(0.015)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Close friends (#)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.004</td>
<td>0.005*</td>
<td>0.004*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.004)</td>
<td>(0.003)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>Borrowing within network (d)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.128</td>
<td>0.161</td>
<td>0.098</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.127)</td>
<td>(0.112)</td>
<td>(0.112)</td>
</tr>
<tr>
<td>Neighbors like strangers (d)</td>
<td>0.251**</td>
<td>0.272***</td>
<td>0.285***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.128)</td>
<td>(0.088)</td>
<td>(0.084)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Daily visits (d)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.228**</td>
</tr>
<tr>
<td>Longterm relation (d)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>0.111</td>
</tr>
</tbody>
</table>

(d) marginals for discrete change of dummy variable from 0 to 1
* p<0.10, ** p<0.05, *** p<0.01
Marginal effects are reported with robust standard errors in parentheses from estimating random effects and simple probit models for the probability that the agent opts for cooperate in the binary trust game.
Frequency of lending money is a categorical variable (never, once/several times per year, or once per month or more). Risk refers to an 11-point scale ranging from trying to avoid risks ("0") to fully prepared to take risks ("10"). Controls include age, sex and years of schooling of individuals as well as dummies for household head, born in Manshiet Nasser and invitee.

Table 5: Determinants of Agents' Behavior in the Trust Game.
have any significant effect (column 4).

Looking at the results for the single regressions in the last three columns sheds more light on the determinants of different cooperation levels in the stranger and friend case. Cooperation in both the unfamiliar and the familiar situation is mainly driven by agents’ solidarity. However, additional variables affect agents’ probability to cooperate. In line with our hypothesis, strong social ties - proxied by the number of close friends - are associated with a higher probability to cooperate with the friend. Moreover, cooperation is more likely among friends who see each other daily.

To sum up, agents react to reduced social distance. Different cooperation levels in the stranger and in the friend pairing can be fully explained by different levels of solidarity towards friends relative to strangers. Indeed, we observe about the same fraction of agents who share the endowment in the anonymous dictator game and who cooperate in the trust game. Agents are reluctant to cheat even though principals cannot observe their action. Since agents were asked to assume a trusting principal, our results may also reflect the fact that agents felt obliged to reciprocate trust with a cooperative behavior. This would be consistent with a norm of "balanced reciprocity" which is typically prevalent in such communities (Sahlins, 1972; Singerman, 1995).

6 Determinants and Accuracy of Principals’ Expectations

So far, we have examined principals’ and agents’ behavior. In this section, we will take a closer look at the determinants of principals’ expectations and their accuracy. The aim of this exercise is to gain a better understanding about the gap at the aggregate level between principals’ expectations (and trust) and agents’ cooperation in the friend pairing, as illustrated in Figure 2. In the literature, one explanation for low trust levels has been that agents fail to communicate their trustworthiness (e.g. Arrow, 1972; Fukuyama, 1995; Camerer, 1988; Bénabou and Tirole, 2006). If agents were successful in signaling their trustworthiness, principals should - based on our findings in the previous section - expect a higher willingness to cooperate from more solidary friends. To test this claim, we estimate the following probit model:

\[ ExpCooperate_i = \beta_1 X_i + \beta_2 X_j + \epsilon_i \]  (4)
where $ExpCooperate$ is 1 if the principal $i$ expects his friend $j$ to cooperate and $X$ represents individual characteristics of the principal $i$ and her friend $j$, respectively. In particular, we include her friend’s directed solidarity, i.e. the amount her friend allocated to her in the anonymous dictator game.

Results for the determinants of principals’ expectations are reported in columns (1) and (2) in Table 6. Indeed, in line with the above claim, principals fail to incorporate their friend’s directed solidarity. Consequently, they underestimate their friend’s intrinsic motivation to cooperate. What could explain this finding? Presumably, the observed high level of solidarity and reciprocity dilutes any signal of agents so that principals cannot effectively distinguish between good and bad types in their everyday life based on observed social preferences. The underlying problem is that in committed relationships even selfish individuals cooperate: "Committed partners may often be assured of mutual cooperation, but this does not mean that they trust each others’ goodwill" (Yamagishi and Yamagishi, 1994, p. 135). If, as in the trust game, the risk of betrayal is high, principals, particularly those who are very loss averse, will abstain from choosing trust. In turn, principals also do not learn about the trustworthiness of their friends.

An additional driver could have been that in the trust game, the betray option was less tempting than assumed by principals. In the trust game, cooperative agents earned 20 L.E. which corresponds to one to two daily wages. Compared to this payoff, the additional gain from cheating was relatively small. Moreover, they could help their friend earn an even slightly higher payoff if the (trust,cooperate) outcome was realized.

Further, descriptive statistics reveal that even though principals significantly best respond more often when confronted with their friend than with a stranger ($\chi^2_{(1)} = 4.33$, $p = 0.037$), expectations are not more accurate in the familiar situation ($\chi^2_{(1)} = 1.78$, $p = 0.182$). In contrast, expectations about giving in the non-anonymous dictator game improve when decision makers know

---

27 We also tested whether risk and social preferences affect expectations. We found no impact and, therefore, do not include them in the analysis. This is in line with Naef et al. (2009) and Fehr (2009).

28 A similar finding is reported in Leider et al. (2010) were recipients show a quite accurate assessment of decision makers’ giving across various social distances but systematically underestimate their baseline altruism.

29 Anecdotal evidence and anthropological studies suggest high levels of mistrust even within the social (kin) network. Singerman (1995) reports about a family business which is run by two brothers. At some point one of them realized that the took a greater share of the profits than agreed upon. Lacking the possibility to sanction this behavior, he found himself monitoring his brother in the shop. Thus it might not be uncommon for principals to expect an agent, including her friend, to capitalize on a situation with hidden action. Relatedly, Barr et al. (2008) and Barr and Genicot (2008) find that genetic relatedness not necessarily support enforcement based on intrinsic motivation.

30 Note that choosing the betray option would also induce costs of lying as agents had to pretend that they cooperated and the effort got lost. They would also violate the norm of reciprocity.

31 Recall that the trust game was the first game played in each session so that subjects did not know whether they would be able to earn similar high payoffs in the following games.
the other better: the absolute deviation of expectations from actual behavior is significantly smaller in the friend than in the stranger pairing (Wilcoxon signed-rank test, \( z = -4.042, p < 0.01 \)). This together with the fact that principals do not take into account agent’s solidarity could therefore be a sign that, contrary to agents, principals assess their decision in the trust game differently from that in the dictator game. The empirical findings by Hayashi et al. (1999) support such an explanation. They found that in Japan decision makers are more likely to cooperate in a (sequential) Prisoner’s Dilemma when they have a stronger "sense of control" over the other. In contrast, US subjects were less sensitive to changes in the experimental design, relying instead on generalized trust. Hayashi et al. (1999) argue that their finding reflects the collectivist nature of the Japanese society and the important role stable and committed relationships play in which control over others is possible Yamagishi and Yamagishi (1994). Along these lines, principals in our experiment might have perceived a lower sense of control in the trust game than in the dictator game as their final payoff depended on their friend’s behavior without being able to interfere. This feeling was strong enough to prevent principals from realizing that the decision problem of the agent was not very different from the one in the DGA and hence they underestimate their friends’ intrinsic motivation to cooperate.

Finally, we look at the determinants of the accuracy of expectations and estimate the following model:

\[
AccuracyExp_i = \beta_1 X_i + \beta_2 X_j + \beta_3 Friendship_{ij} + \epsilon_i
\]  

(5)

where AccuracyExp is 1 if the principal i correctly anticipates his friend’s behavior and, as before, \( X \) represents individual characteristics of the principal i and her friend j. Friendship refers to variables describing the quality of the friendship between principal i and friend j (see section 5).

Columns (3) and (4) of Table 6 display the results for modeling the determinants of principals correctly predicting their friend’s behavior. This is independent from whether the friend cooperates or not since knowing the agent better may also imply expecting a greater likelihood of betrayal. As a robustness check we alternatively considered only cooperative behavior, see column (5) in Table 6. Results hardly change. Our findings suggest that women are not simply naive but that indeed they have more cooperative (female) friends.\(^{32}\) One explanation could be that female friendships differ from male friendships. It could also reflect the fact that in Egypt women are

\(^{32}\)We should note that all our friend pairs are same-sex pairs. The fact that we had no mixed pair reflects the strong gender roles in Egypt.
<table>
<thead>
<tr>
<th>Determinants</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-0.003</td>
<td>-0.008</td>
<td>0.007</td>
<td>0.009</td>
<td>0.006</td>
</tr>
<tr>
<td>Female (d)</td>
<td>0.262**</td>
<td>0.288**</td>
<td>0.311***</td>
<td>0.343***</td>
<td>0.333***</td>
</tr>
<tr>
<td>Years of Schooling</td>
<td>-0.005</td>
<td>-0.020</td>
<td>0.003</td>
<td>0.000</td>
<td>0.007</td>
</tr>
<tr>
<td>Born in Manshiet Nasser (d)</td>
<td>-0.127</td>
<td>-0.052</td>
<td>-0.192</td>
<td>-0.344**</td>
<td>-0.292***</td>
</tr>
<tr>
<td>Friend: directed solidarity</td>
<td>-0.025</td>
<td>-0.031</td>
<td>(0.020)</td>
<td>(0.151)</td>
<td>(0.088)</td>
</tr>
<tr>
<td>Friend: volunteer (d)</td>
<td>0.267*</td>
<td>0.141</td>
<td>(0.132)</td>
<td>(0.016**</td>
<td>(0.007)</td>
</tr>
<tr>
<td>Friend: frequency of lending</td>
<td>0.061</td>
<td>(0.088)</td>
<td>(0.019)</td>
<td>(0.018)</td>
<td>(0.019)</td>
</tr>
<tr>
<td>Friend: risk preferences</td>
<td>0.018</td>
<td>(0.019)</td>
<td>(0.018)</td>
<td>(0.019)</td>
<td>(0.019)</td>
</tr>
<tr>
<td>Friend: close friends (#)</td>
<td>-0.016**</td>
<td>(0.007)</td>
<td>(0.007)</td>
<td>(0.007)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>Friend: borrowing within network (d)</td>
<td>-0.141</td>
<td>(0.132)</td>
<td>(0.132)</td>
<td>(0.132)</td>
<td>(0.132)</td>
</tr>
<tr>
<td>Friend: neighbors like strangers (d)</td>
<td>0.283*</td>
<td>(0.145)</td>
<td>(0.145)</td>
<td>(0.145)</td>
<td>(0.145)</td>
</tr>
<tr>
<td>Friend: higher transfer in DGNA (d)</td>
<td>-0.345***</td>
<td>(0.114)</td>
<td>(0.114)</td>
<td>(0.114)</td>
<td>(0.114)</td>
</tr>
<tr>
<td>Accuracy of beliefs in DGNA (d)</td>
<td>0.043*</td>
<td>0.040**</td>
<td>(0.025)</td>
<td>(0.025)</td>
<td>(0.025)</td>
</tr>
<tr>
<td>Daily visits (d)</td>
<td>-0.017</td>
<td>0.009</td>
<td>(0.143)</td>
<td>(0.143)</td>
<td>(0.143)</td>
</tr>
<tr>
<td>Longterm relation (d)</td>
<td>0.364***</td>
<td>0.218**</td>
<td>(0.138)</td>
<td>(0.138)</td>
<td>(0.138)</td>
</tr>
</tbody>
</table>

N 72 72 72 72 72
Pseudo R² 0.08 0.20 0.12 0.22 0.30

(d) marginals for discrete change of dummy variable from 0 to 1
* p<0.10, ** p<0.05, *** p<0.01
Marginal effects are reported from estimating probit models on the determinants of the probability that principals' expect cooperation and the probability that principals' expectations are correct. Columns (3) and (4) report results independent from whether the principal correctly anticipated cooperation or betray and column (5) reports results for correctly anticipating cooperation only. Variables are defined as before. "Higher transfer in DGNA" refers to the transfer made in the DGA. Robust standard errors in parentheses.

Table 6: Principals' Expectations in the Trust Game.
typically the leaders of informal saving groups called *gam‘iyyaat* (Singerman, 1995). Women are also actively participating in these informal saving groups. On the one hand, women may therefore have more experiences in assessing others’ behavior. On the other hand, women may be perceived as more trustworthy than men. Empirical evidence also shows, for instance, that women are more reliable and exhibit higher repayment rates than men in microfinance programs or informal saving groups (Morduch, 1999; Anderson and Baland, 2002). Recall, however, that we did not find any significant differences between men and women in the dictator game.

The accuracy of expectations is negatively affected if the friend displays a non-anonymity effect, i.e. that she gives in the NA treatment more than in the anonymous treatment. This suggests that principals have more difficulties in correctly anticipating their friend’s behavior if she behaves differently under anonymity. Nevertheless, principals who are able to form correct expectations when actions are observable have also better chances under anonymity. Knowing one’s friend for a long time also has a positive, significant effect on the accuracy of beliefs. This also indicates that a more homogenous friend sample in terms of longer friendships would have led to more accurate beliefs and presumably more trust. Put differently, part of the gap between trust and cooperation among friends can also be explained by individual and friendship characteristics.

### 7 Conclusions

In this paper, we study how the social distance between two trade partners influences their behavior in several exchange situations. The main insights from this paper are the following: First, albeit reduced social distance significantly increases giving in the anonymous and non-anonymous dictator game, the increase is - compared to findings in developed countries (e.g. Leider et al., 2009) - small relative to the amount given to a stranger. Interestingly, reciprocity towards friends is to a lesser extent associated with individuals’ directed solidarity than with expectations about the reciprocal behavior of their friend.

Second, as expected, trust and cooperation among friends is higher than among strangers. Similar to the results for reciprocity, we find that the increase in trust is not driven by stronger social preferences towards friends but by expected returns. On the contrary, differences in cooperation levels towards friends and strangers can be fully explained by differences in agents’ baseline and directed solidarity. Put differently, agents treat their decision problem similar to the one in the dictator game and, consequently, behave in a similar way. Principals’ behavior, on the other hand,
is neither related to solidarity, nor are expectations about their friend’s behavior very accurate. On average, expectations are too low relative to agents' cooperation levels. As a result, social welfare in the trust game with hidden action is lost.

We explain this gap between overall trust and cooperation among friends by the little leeway strong social norms in these communities leave for agents to signal their trustworthiness. These strong social norms of solidarity and reciprocity prevail since it is also beneficial for selfish agents to comply with these norms given that formal market institutions are weak or non-existent. Complementary to this, principals find themselves in a situation with little control over their friend’s decision due to the hidden action element in the trust game. They themselves cannot observe their friend’s behavior nor can they draw on their social network. As a result, many principals wrongly refrain from trusting their friend.

Trust, and investment rates, are low in countries in the Arab region. In the literature it has been attributed to the tribal nature of Arab societies that fosters trust within limited boundaries and hampers it towards outsiders. Consequently, as Bohnet et al. (2009) demonstrate, subjects from the Gulf require higher levels of trustworthiness than their Western counterparts in order to enter a (anonymous) trust relationship. Against this background, our results are intriguing in that they suggest that strong social ties are not necessarily associated with high trust among insiders.

References


