Coordination and Network Proximity: Experimental Evidence from the Field*

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Abstract

We conduct a field experiment in real-world social networks to analyse the influence of network proximity on the ability of two persons to coordinate costly effort. Using data on the friendship networks of 22 villages in Uganda, we identify the effect of proximity between two participants by experimentally varying the effort costs and the disclosure of their identities. We find that effort in the coordination task is higher if the paired participants are friends and have common friends, i.e., they are part of the same triad. We do not find support for alternative measures of network proximity that involve a different combination of direct and common friends.

Keywords: Coordination, social networks, experiments
JEL Classification: C72, C90, L14

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1. Introduction

Societies' ability to coordinate behaviour is of crucial importance, as a lack of coordination can lead to large individual and social costs. Coordination does not take place in a social vacuum, and efficient coordination might crucially depend on the social connections among the relevant agents. An important and understudied way in which social networks can influence coordination is through altruism or trust generated by network-based proximity – i.e., how close two individuals are in a network.

To investigate this mechanism, we combine data from an incentivized coordination task with data on the real-world friendship networks of 22 villages in Uganda. For the coordination task, we use a two-player minimum-effort game (MEG) (Van Huyck et al., 1990). In this game, two individuals choose simultaneously and independently how much effort to invest in a joint project, with the lowest chosen effort determining both players' payoffs. While it is impossible to exogenously change connections in real-world social networks, we introduce treatment variations along two dimensions to analyze the influence of network proximity. First, we match participants subsequently in different pairs, varying the disclosure of the participants' identities across the pairs. Either no player knows the other's identity (anonymous pairs – AN), or both players are informed about each other's identity (fully disclosed pairs – FD). Second, we vary the effort costs between subjects. Half of them are randomly assigned to a high effort cost (HEC) treatment, while the other half face low effort costs (LEC).

Our main prediction is that higher proximity in village social networks increases effort, and that this effect is stronger in the HEC condition. To develop this hypothesis, we use evidence from different experimental studies. In laboratory experiments of the MEG with anonymous pairs, it has been shown that higher effort costs lower effort (Goeree and Holt, 2001, 2005). We expect that higher effort costs also increase the scope for an influence of network proximity on effort. Furthermore, combining the insight that altruism and trust increase the ability to coordinate on a Pareto superior equilibrium in the MEG (Chen and Chen, 2011), and evidence on how altruism and trust are positively influenced by closeness (Freeman, 1978; Leider et al., 2009; Etang et al., 2011; Binzel and Fehr, 2013; D'Exelle and Riedl, 2018), maximum network flow (Ford Jr and Fulkerson, 1956; Karlan et al., 2009), and network triads (Jackson et al., 2012), we develop specific hypotheses on each of these three measures of network proximity.

To test our hypotheses, we use the experimental treatments in the following way. We use the within-subject variation in identity disclosure to create our main variable of analysis. The within-difference in effort between the AN and FD pairs filters out any influence of variables that remain constant between both treatments. As information on network proximity is only revealed in the FD treatment, we expect the within-difference to increase with proximity in the FD pair. The small-scale nature of the villages ensures that connections can be known to the participants and that (close to) complete elicitation of the social network is possible. To test the hypotheses on the different measures of network proximity, we look at the effect of direct and indirect connections, as depending on the measure, either only direct connections, only indirect connections, or both types of connections are considered relevant.

Our results show that in the high cost condition, having common friends has a positive influence on effort among pairs with a direct tie, but not among pairs without a direct tie. Similarly, having a direct tie has a positive influence on effort among pairs with common friends, but not among pairs without common friends. These results support the importance of triads through which network proximity influences coordination. We do not find support for alternative measures of network proximity that involve a different combination of direct and common friends.

Our work contributes to the experimental literature on coordination on networks. A growing number of economics studies has studied the role of network structures for coordination behavior. Keser et al. (1998); Berninghaus et al. (2002) were among the first to highlight the relevance of network structures for the ability to coordinate. They show that subjects interacting on a circle eventually coordinate on the risk-dominant equilibrium. Since then, empirical evidence has been generated on the role of network characteristics such as the number of connections (McCubbins et al., 2009), clustering Cassar (2007), density vs centrality (Rosenkranz and Weitzel, 2012).

We make the following contributions to this literature. First, to study the influence of network-based proximity, we make use of real-world networks.[1] The existing literature typically uses lab experiments where social connections are artificially imposed on anonymous participants. Our use of real-world networks can help address some of the questions raised about internal and external validity when social connections are imposed and made evident in the lab. Note that we do not make any reference to social networks in our experiment. Our results indicate that even without making networks salient, behaviour in our experiments is influenced by real-world proximity. Second, most of the existing literature assumes that social connections influence who is able to coordinate with whom, and/or who receives information about others' behaviour. Our study of the role of network proximity sheds light on a new way in which networks can influence coordination. In addition, we provide a systematic comparison of three measures of network proximity. Third, we use a dyadic approach, and apply it across multiple pairs. While this diverges from the standard approach where one and the same behavior is exhibited towards all partners (Jackson and Zenou, 2015), it has the advantage that it is less restrictive in the sense that it allows partner-specific

[1]There is also a large literature that studies real-world social networks in developing countries, like our country of study. The importance of network connections has been observed for a wide range of economically relevant behaviors, such as risk sharing and transfers (Fafchamps and Lund, 2003; Karlan et al., 2009; Jackson et al., 2012; Ligon and Schechter, 2012; D'Exelle and Verschoor, 2015), social learning (Bandiera and Rasul, 2006; Conley and Udry, 2010; D'Exelle and Verschoor, 2023), peer influence (D'Exelle et al., 2023), and women's involvement in intra-household decisions (D'Exelle and Ignowski, 2023).

behavior.[2]

The remainder of this paper is structured as follows. Section 2 presents the design of the experiment, including a description of the MEG game, the experimental treatments, the hypotheses that guide the empirical analysis, and the study implementation. Section 3 shows descriptive results on proximity and effort, and a regression analysis that estimates the effect of proximity on effort. Section 4 presents some robustness tests and Section 5 concludes.

2. Experimental design

Following a survey that collected data on individual social networks, participants played a bilateral Minimum Effort Game (MEG). We begin by outlining a theoretical framework for the MEG that incorporates the notion of social proximity. Then we describe in detail how we conceptualize social proximity following well-established social network concepts. Based on this, we introduce the experimental treatment comparisons that allow us to analyze the causal influence of social proximity on coordination behavior. Next, we derive the hypotheses that will guide the subsequent analysis, and we end with details on the implementation of the survey and the experiment.

2.1. The minimum effort game

The two-player Minimum Effort Game (MEG) represents a coordination situation where payoffs depend on the minimal effort exerted by either player. A player i's individual payoff Π_i is defined as:

$$\Pi_i(e) = a \times \min\{e_i, e_j\} - c \times e_i \qquad (1)$$

where the players' strategies are given by the vector e, which represents their effort choices $e = (e_i, e_j)$. The parameter a represents the marginal benefit of effort, while c stands for the marginal private cost of effort, with $a > c > 0$.

Based purely on the individual payoff structure as presented in expression 1, any combination of (e_i^*, e_j^*) with $e_i^* = e_j^*$ is a Nash equilibrium, implying that there are as many pure-strategy Nash equilibria as there are effort levels. That is, from an effort combination where $e_i = e_j$, neither a unilateral increase nor a unilateral decrease of effort is beneficial. On the one hand, a unilateral increase does not alter $\min\{e_i, e_j\}$ while increasing costs from effort exertion. On the other, a unilateral decrease reduces $\min\{e_i, e_j\}$ by more than the amount saved on effort costs (as $a > c$). These equilibria can be Pareto-ranked. Both players are better off in an equilibrium where they both exert higher effort, with $e_i^* = e_j^* = e_{max}$ being the Pareto-optimal choice of effort levels.

[2]We know of one other study that allows for partner-specific coordination decisions. van Gerwen and Buskens (2018) find that this can be either disadvantageous or advantageous for coordination, depending on the distribution of preferences in the network.

2.2. Treatments

Exogenously varying proximity in real-world friendship networks is not feasible. We can, however, experimentally control the conditions under which proximity can influence effort. To estimate the causal effect of network proximity on effort in the MEG, we will exploit experimental variation along two dimensions: identity disclosure and effort costs.

Proximity can only have an influence if participants have information on the identity of the participant they are matched with. To control information about the identity of the matched participants, participants are matched subsequently in different pairs, and we vary the disclosure of the identities of participants across the pairs. Either participants have information on the other's identity (full disclosure condition – FD), or not (anonymity condition – AN).[3] We will exploit this 'within-variation' in knowledge about proximity to filter out any influence of variables that remain constant between both treatments, by using the within-difference in effort between the AN and FD conditions as main variable of analysis.

A second condition that influences the scope for an influence of proximity on effort relates to the cost of effort in the MEG. The relevance of effort costs for coordination in the MEG has been corroborated by numerous experimental studies. Among others, Goeree and Holt (2001, 2005) have demonstrated that higher effort costs lead to lower effort levels. To create variation in effort costs, half of the experimental sessions are randomly assigned to a 'high effort cost' (HEC) treatment, while in the other sessions participants face 'low effort costs' (LEC).

2.3. Hypotheses

2.3.1. Hypothesised effect of effort cost and proximity

We hypothesise that *higher network proximity increases effort, and the more so with a higher effort cost*. This hypothesis is based on a set of empirical and theoretical studies that we summarize next.

Following Goeree and Holt (2001, 2005), we expect that coordination on the Pareto optimal equilibrium is easier with lower effort costs. As a result, if proximity facilitates coordination on the pareto optimal equilibrium, the effect should be stronger with higher effort costs. In other words, the higher the effort costs, the more room there is for social proximity to influence coordination. Put differently, in the LEC condition coordination on the pareto optimal equilibrium should be possible independently of proximity, while with HEC, a low proximity pair might not be able to reach a high effort equilibrium, while a pair with higher proximity might be able to do so.

We distinguish two mechanisms that could support a positive influence of proximity on coordination, which work via altruism or trust (or anticipated reciprocity). We will start by showing how

[3] In another part of this experiment we considered a separate semi-disclosure condition where only one participant in a pair is informed about the other's identity. This treatment was conducted with a separate sample and will not be analyzed in this chapter.

altruism and trust could increase the ability to coordinate on a Pareto optimal equilibrium. In the next section, we will explore how we expect social proximity to influence altruism and trust.

Altruism and trust have the potential to increase coordination in the following ways. First, with $a > c > 0$ in equation 1, it is beneficial to increase effort only if the matched player does the same. Otherwise, the individual pay-off will decrease by c, and one is worse-off. In other words, one needs to 'trust' the matched player to increase effort. Second, directed altruism can also facility coordination. Chen and Chen (2011) demonstrated theoretically and empirically that with altruism, the Pareto-optimal equilibrium can be reached for a larger set of underlying cost (and benefit) parameters. For a more detailed description of their model, see Appendix B.1.

In sum, we hypothesise that (knowledge about) higher proximity leads to higher effort, and the more so in the HEC condition. Assuming that proximity is irrelevant in the AN condition, we also expect proximity (in the FD condition) to lead to a higher within difference in effort between AN and FD ('FD-AN difference'). Table 1 summarizes the hypothesised effect of proximity on this within-difference in effort.

Table 1: Hypothesised Effect of Proximity on Effort

Proximity	HEC	$>>$
	LEC	$\geq$

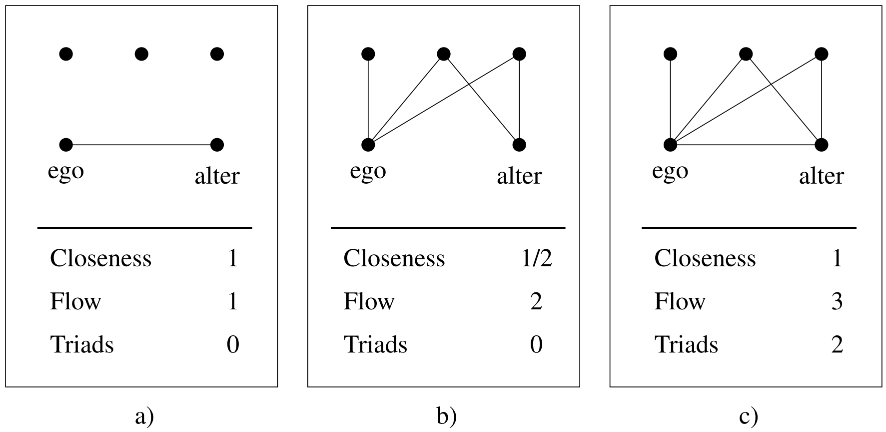
Notes: $>>$ positive effect, $\geq$ non-negative effect. HEC: high effort cost condition, LEC: low effort cost condition.

2.3.2. Direct ties and common friends

In a next step, we refine our hypothesis, developing how altruism and trust can be supported by network proximity, using three concepts of network proximity: closeness, maximum network flow, and triads. Each of them uses a different combination of direct and indirect ties, as shown by Figure 1. Each panel shows a network graph that consists of 5 nodes. The pair of nodes of interest are labeled 'ego' and 'alter'. They can have a direct friendship tie (panels a and c), and have a common friend (panels b and c). Each of the three panels in Figure 1 has a different combination of direct ties and common friends. In panel a) both nodes have a direct tie but no common friends, in panel b) they only have common friends, but no direct tie, and in panel c) they have a direct tie and common friends. Based on these constellations, we introduce the three network proximity concepts.

First, closeness is defined as the inverse of the distance between two people (Freeman, 1978). The distance is measured as the shortest path between them, i.e., the minimal number of steps needed to move from one person to the other. If two individuals have a direct tie, only one step needs to be taken, independently of whether they have common friends. Two steps are needed if

Figure 1: Network-based Proximity



two individuals have a common friend and no direct tie. As we have a direct tie in both panels a) and c), both have the same closeness, which is higher than in panel b). Several experimental studies have shown that proximity in the form of direct friendship ties or living in the same village increases both altruism and trust (Leider et al., 2009; Etang et al., 2011; Ligon and Schechter, 2012; Binzel and Fehr, 2013; D'Exelle and Riedl, 2018). Goeree et al. (2010) extended this focus by generating evidence in support of an inverse distance law. They elicited friendship networks and investigated dictator game giving among teenagers in an all-girls high school. They found a negative relation between geodesic distance in friendship networks and dictator sharing. Brañas-Garza et al. (2010) conducted a similar study with Spanish students and found similar results.

Second, maximum network flow between two nodes is defined by the number of distinct paths that connect them (Ford Jr and Fulkerson, 1956). A direct tie creates a path between two individuals, and so does a common friend. The sum of direct friends and common friends makes up the maximum network flow between the two individuals. In that sense, direct ties and common friends contribute in equal and independent way to social proximity. Network flow is highest in panel c) and lowest in panel a). Support for this mechanism is provided by Karlan et al. (2009). They present an economic model in which common ties can increase trust between two individuals, as they can act as social collateral to enforce contracts. They find empirical support for this mechanism using data on informal borrowing in Peru.

Third, network triads consist of a direct tie between ego and alter, and a common friend. If ego and alter have more common friends, there are multiple triads. That is, conditional on two individuals having a direct tie, an additional triad between them emerges with each additional common friend. The two individuals form part of as many triads as they have common friends. There are no triads in panels a) and b), while there are two triads in panel c). Support for the importance of network triads is provided by Jackson et al. (2012). They show that to enforce the exchange of favors between any two individuals their relation needs to be 'supported' by a common friend. They demonstrate the importance of 'support', analysing data on exchange networks from rural villages in India.[4]

Having demonstrated how the three measures of network proximity can increase altruism or trust, we are ready to refine the hypothesised effect of network proximity into predictions regarding the influence of direct ties ('Tie') and common friends ('Common'). The entries of Table 2 display the expected difference in effort between FD and AN. No difference is indicated by a '$=$', and a positive difference is indicated either by '$\geq$' or '$>>$', with '$>>$' standing for a stronger effect than '$\geq$'.

Table 2: Hypothesised Effect of Tie and Common on Effort

		Closeness	Flow	Triads
a) Tie				
HEC	NoCommon	$>>$	$>>$	$=$
	Common	$>>$	$>>$	$>>$
LEC	NoCommon	$\geq$	$\geq$	$=$
	Common	$\geq$	$\geq$	$\geq$
b) Common				
HEC	NoTie	$>>$	$>>$	$=$
	Tie	$=$	$>>$	$>>$
LEC	NoTie	$\geq$	$\geq$	$=$
	Tie	$=$	$\geq$	$\geq$

Notes: $>>$ positive effect, $\geq$ non-negative effect, $=$ no effect. HEC: high effort cost condition, LEC: low effort cost condition, (No)Common: pairs with(out) common friends, (No)Tie: pairs with(out) a direct tie.

Panel (a) of Table 2 depicts the expected effect of a direct tie. As explained before, the scope for an effect of proximity on effort is larger with higher effort costs. That is, a direct tie can increase ego's effort in HEC, and this effect is expected to be stronger than in LEC. Under a closeness-based and a flow-based perspective, a direct tie is expected to increase ego's effort independently of whether ego and alter have any friends in common. When focusing on triads, a direct tie as such has no effect unless the pair also has at least one common friend. We summarize these considerations in a first hypothesis.

Hypothesis 1 (Direct tie)**.**

1. *A direct tie in FD increases ego's effort relative to that in AN*

[4]Note that their concept of 'support' is an edge property, and is different from 'clustering' or 'closure' (Coleman, 1988), which is a node property. Clustering is a property of the neighbourhood of a node and occurs if two friends of ego are also friends. It does not require that ego and alter are direct friends.

a) *independently of whether ego and alter have any friends in common (Flow and Closeness).*
b) *only if ego and alter have at least one common friend (Triads).*

2. *The effect of a direct tie is stronger in HEC than in LEC.*

A similar reasoning applies to the role of common friends outlined in Panel (b) of Table 2. As for direct ties, the scope for common friends to change effort exertion is larger in HEC than in LEC. Hence, any effect of having a common friend should be stronger in HEC than in LEC. Under a flow-based perspective, having common friends is expected to increase effort exertion independently of whether ego and alter have a direct tie. Under a closeness-based perspective, this positive effect of common friends only exists when ego and alter do not have a direct tie. Under a triads-based perspective, on the contrary, it exists only when there is a direct tie between ego and alter. These considerations are summarized in a second hypothesis.

Hypothesis 2 (Common friends)**.**

1. *Having common friends in FD increases ego's effort relative to that in AN*

   a) *independently of whether ego and alter have a direct tie (Flow).*
   b) *only if ego and alter* do not have *a direct friendship tie (Closeness).*
   c) *only if ego and alter* have *a direct friendship tie (Triads).*

2. *The effect of having common friends is stronger in HEC than in LEC.*

Having developed hypotheses about the effect of Tie and Common on the FD-AN difference, our previous assumption that proximity is irrelevant in the AN condition requires further clarification. Even though the identities of ego and alter are not revealed in the AN condition, it is still plausible that the paired participants have certain beliefs about the likelihood that they are friends or have a common friend. However, as the expectations of 'Tie' or 'Common' always lie between 0 and 1, Tie or Common will have a positive influence in the FD condition relative to the AN condition, while a revealed absence of Tie or Common in FD will have a negative influence relative to the AN condition. This could explain – as we will confirm later – why some participants have a negative FD-AN difference. Note that this only applies to the mechanism that works via altruism. If proximity works via trust or 'anticipated reciprocity', expectations about Tie and Common in the AN condition are obviously irrelevant, as no reciprocal action can be taken with the identities remaining undisclosed.

2.4. Experimental procedures

For each experimental session participants from at most two villages where convened in a central place, such as a school or church. Assignment of treatments to sessions and participants to sessions was randomized. The HEC version of the game was used in six sessions, and the LEC version in seven sessions.

Effort costs c were set to 500 UGX in the LEC treatment, and to 1500 UGX in the HEC treatment. The benefit parameter a was set to 2000 UGX in both conditions.[5] We plug these parameters into expression 1, and normalize such that the most efficient effort choice is 8000 UGX for both LEC and HEC treatments. This gives the following payoff equations:

$$\Pi_i = 2000 + 2000 \times \min\{e_i, e_j\} - 500 \times e_i \quad \text{(LEC)} \quad (2)$$

$$\Pi_i = 6000 + 2000 \times \min\{e_i, e_j\} - 1500 \times e_i \quad \text{(HEC)} \quad (3)$$

Effort choices could be stated as integer numbers in the range of 0 to 4. Table 3 displays payoffs for each possible effort constellation, for LEC in the upper panel and for HEC in the lower panel. Rows indicate player i's decision, while the columns indicate player j's decision. For each cell, the first entry denotes player i's payoff and the second entry denotes player j's payoff (payoff i, payoff j).

Table 3: Payoff Tables

LEC		Player j				
		4	3	2	1	0
	4	8000, 8000	6000, 6500	4000, 5000	2000, 3500	0, 2000
	3	6500, 6000	6500, 6500	4500, 5000	2500, 3500	500, 2000
Player i	2	5000, 4000	5000, 4500	5000, 5000	3000, 3500	1000, 2000
	1	3500, 2000	3500, 2500	3500, 3000	3500, 3500	1500, 2000
	0	2000, 0	2000, 500	2000, 1000	2000, 1500	2000, 2000

HEC		Player j				
		4	3	2	1	0
	4	8000, 8000	6000, 7500	4000, 7000	2000, 6500	0, 6000
	3	7500, 6000	7500, 7500	5500, 7000	3500, 6500	1500, 6000
Player i	2	7000, 4000	7000, 5500	7000, 7000	5000, 6500	3000, 6000
	1	6500, 2000	6500, 3500	6500, 5000	6500, 6500	4500, 6000
	0	6000, 0	6000, 1500	6000, 3000	6000, 4500	6000, 6000

Instructions were read out at the beginning of a session, and a number of example decisions

[5]At the time of the experiment 1 US dollar was equal to around 2600 UGX. Average daily earnings of the study participants are equal to about 4 US dollars.

were discussed. To make the game easier to comprehend, participants were told that they should imagine that they had four days at their disposal which they could either spend working at home or on a joint project with another person. For each day that they worked at home they would gain a certain income of c while on a day where they decided to work on the project they would gain a if the other person decided to do the same. If the other person decided to stay at home they would gain 0 for that day. For the detailed instructions see Appendix B.

Control questions on how to calculate own and others' earnings were asked in private. If participants were unable to answer the control questions further clarifications were given in private. If they were still unable to answer the control questions, a note was made such that we could exclude their decisions from the analysis. About 7% of our participants had problems understanding the instructions and were excluded from the analysis.[6]

Each participant took two decisions with different opponents in each disclosure condition. The order of the disclosure conditions was randomized at the individual level. In the FD condition both opponents were from the same village. In the AN condition participants were once paired with someone who lived in the same village and once with someone from a different village.[7][8] The two decisions in the FD condition allow us to observe within-subject variation in behavior along social proximity. Participants were randomly re-matched into new pairs for each decision. To avoid learning effects, we gave no feedback between decisions.

Individual decision cards were used to record participants' effort choices and beliefs about the effort choice of their counterpart. In AN, no other information was given or entered in the decision card. In contrast, in FD, to disclose identities, a decision card displayed the participant's own name and picture as well as the counterpart's name and picture, to show that both participants had information about each other.Matching of pairs, as well as preparation of the decision cards was performed before the experiment started. Participants were seated at desks with sufficient distance from each other, so that they were unable to read their neighbors' decision cards. They were instructed not to talk to their neighbors and to keep their decisions confidential throughout the experiment. Participation was entirely voluntary, and participants were told that they were free to leave the experiment at any point. Nobody made use of this option.

Effort choices were incentivized by informing participants that, at the end of the experiment, one of their decisions would be selected at random to be paid out. This protocol of randomly selecting one single decision for payment was followed to avoid hedging between different decisions (for theoretical arguments and empirical evidence in favor of this procedure, see Azrieli et al.,

[6]If a counterpart did not understand the instructions, the respondent's decision was included in the individual level analysis, but it was excluded from any analysis at the dyad level.

[7]Different-village matches were used to test whether it matters that the (anonymous) opponent lives in the same village or not. In this paper we only use same-village pairs to allow for direct comparability with FD.

[8]The same might be true for the SD treatments. Appendix **??** presents some results with the SD treatments, but we don't refer to them.

2018, 2020). Belief elicitation was not incentivized.[9] Payments were made in private at the end of the experiment. Payments received as well as any decisions made by the participants were treated confidentially, and this was clearly explained at the beginning of the experiment.

2.5. Survey

To elicit social networks and individual socio-economic characteristics, a few weeks before the experiment all participants were interviewed individually and in private. Answers were recorded electronically with tablets.

2.5.1. Network elicitation

The survey had two sections. The first one elicited the individual network of each participant. Enumerators used a stack of cards to show a photograph and name of each of the other respondents in a village. With each card shown, they asked the respondent whether they knew the other person. If they knew the other, they asked whether they were friends. If they were friends, they asked whether they were close friends.[10] To avoid order effects, the stack of cards was reshuffled before each interview.

This method is a time and resource intensive way of eliciting a community's friendship network, but helps reduce reporting bias. By showing individual pictures, all participants get the same cues to remember all of their connections. Without such cues, more connected people might be more likely to forget a link (Brewer, 2000). This could create non-random errors in the elicitation of the networks which, in turn, could bias the estimated effect of network connections on individual behavior.

2.5.2. Socioeconomic characteristics

The second section of the survey collected important socio-economic characteristics, such as wealth, age, education, gender, ethnicity, occupation, trust, agreeableness and risk aversion. To elicit household wealth we asked a variety of questions on the characteristics of the home a family lived in (number of rooms, type of flooring, etc.), their access to electricity, and how much livestock they owned. Based on the answers to these questions we constructed a wealth index using a principal component analysis.

We further asked questions on three relevant psychological traits: trust, agreeableness, and risk aversion. To measure trust we used a principal component analysis of the answers to three

[9]We chose not to incentivize beliefs because there is evidence that incentivized belief elicitation entails the risk that participants hedge between action and beliefs, especially when they have a financial stake in the predicted action, which is the case in our set-up (Rutström and Wilcox, 2009; Blanco et al., 2010; Armantier and Treich, 2013).

[10]The precise questions were (1) 'This person lives in your village. Do you know him/her?', (2) 'Are you friends?', and (3) 'Are you close friends?'.

questions: whether respondents thought that most people can be trusted , whether most people would try to take advantage if they had the chance and whether most of the time people tried to be helpful. These questions are based on the World Value Survey. To measure agreeableness we used a principle component analysis of the answers to the following questions from the Big Five questionnaire (Costa and McCrae, 1992): whether one tries to forgive and forget when insulted, whether one is ready to fight back if somebody else starts a fight, and whether one hesitates to express anger even if it is justified. Risk aversion was measured with a self-reported score that indicates whether respondents 'Take risk a lot', 'Take risk but not a lot', 'Avoid risk but not a lot', or 'Avoid risk a lot'.

3. Results

In this section, we first describe effort decisions across the disclosure and cost conditions. Next, we disaggregrate this analysis by the natural variation in social proximity between paired respondents. Finally, we use regression analysis to generate more advanced insights in the effect of social proximity on effort.

3.1. Sample

We conducted the study in the Sironko district in eastern Uganda. In this district, we recruited a sample of participants, using a multicluster sampling approach. In the first step, we selected a random set of 22 villages. The selected villages were small-scale, close-knit communities of the type that is common in the rural areas of most Sub-Saharan African countries. In each village, we aimed to include as many of the households as possible.[11] From each of the households, one adult was chosen at random to participate in the survey and experiment.

In total 197 respondents participated in the experiment, 96 in the LEC treatment, 101 in the LEC treatment. Appendix A.2 presents descriptive statistics of important socio-economic characteristics as captured with the survey. Table A.2 shows that socio-economic characteristics are balanced between the LEC and HEC treatments.

Each session took about two hours and included between 13 and 24 participants. 197 participants took a total of 591 decisions, 288 of which in LEC and 303 in HEC. In LEC, 96 of the decisions were taken in AN and 192 in FD. In HEC, 101 of the decisions were taken in AN and 202 in FD.[12]

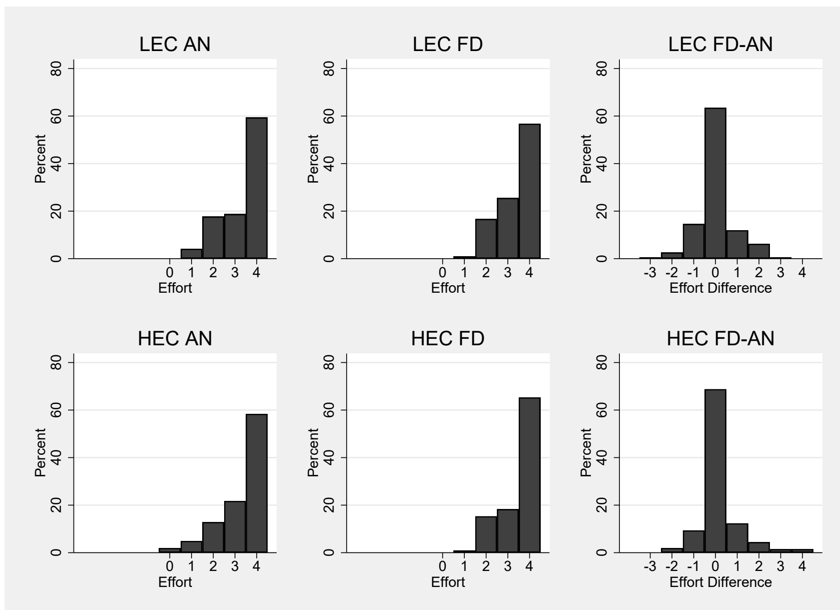
[11]The number of households that we were able to reach relative to the overall number of households in a village defines the coverage rate. Coverage varied between 70 and 100%.

[12]In this count, only participants who are part of the communities' respective network are included (that is, isolates are disregarded). Robustness checks show that this exclusion of isolates does not influence results (see Section 4).

3.2. Effort decisions by disclosure and effort costs

Figure 2 displays the distribution of effort in same-village pairs in the AN condition (left column) and the FD condition (middle column), separately for LEC (upper row) and HEC (bottom row). In all four histograms, the mode of the distribution is 4, the maximal effort. Comparing the average effort and beliefs about the opponent's effort (see Table A.8 in the Appendix for details), we observe that for both disclosure conditions, the difference in effort choices between the LEC and HEC conditions is rather small. The differences in beliefs about the opponent's effort, are somewhat larger.

Figure 2: Effort in LEC and HEC



Using the individual effort decisions in the AN and FD conditions, we construct the within-difference. To that end, we combine each FD decision with the participant's decision in AN. This renders 192 FD-AN difference observations in LEC and 202 FD-AN difference observations in HEC. The histograms in the right column of Figure 2 display the distribution of the FD-AN effort difference, separately for the LEC and HEC conditions. In both distributions, the mode is zero.

3.3. Effort decisions by proximity

We continue with the FD-AN difference. To analyse how it varies with social proximity, we disaggregate the average FD-AN difference by whether the participant ('ego') has a direct tie with the paired participant ('alter') in the matched FD pair. Ties are defined as *and*-ties of the friendship network. In particular, we assume a tie is present if both participants report that they are close friends. As participants only know whether they are connected with a close friend in FD, we focus on whether ego has a tie with alter in FD and ignore ties in AN.

Table 4 presents the results. The upper panel reports the average FD-AN effort difference by effort condition (LEC vs. HEC) and by whether ego has a tie with alter ('Tie') or not ('NoTie'). The last row of the panel displays p-values of a Mann-Whitney U test that compares the FD-AN difference between Tie and NoTie. We observe that in HEC, the FD-AN difference is significantly larger for pairs with a direct tie than for pairs without (two-sided p-value of a Mann-Whitney U test is 0.012). In LEC, the difference between Tie and NoTie is not statistically significant. The last column of the table presents the test results of a Mann-Whitney U test that compares the FD-AN differences between the LEC and HEC conditions. For the observations where ego has a direct tie ('Tie), the FD-AN difference depends strongly on the effort cost (two-sided p-value = 0.003). For NoTie, on the contrary, there is no significant difference between the LEC and HEC conditions.

Table 4: *FD-AN effort difference by 'tie' and 'common'*

	LEC			HEC			p-value$^{(b)}$
	N	average	st.dev.	N	average	st.dev.	
Tie	77	-0.03	0.84	59	0.39***	1.00	0.003
NoTie	115	0.10	0.85	142	0.10	0.85	0.631
p-value$^{(a)}$		0.207			0.012		
Common	153	0.06	0.88	161	0.17**	0.87	0.288
NoCommon	39	0.00	0.69	41	0.22	1.04	0.375
p-value$^{(a)}$		0.543			0.505		

Notes: Average FD-AN difference in effort for LEC and HEC, split by Tie/NoTie in the upper panel and Common/NoCommon in the lower panel. *(a)* Two-sided p-values of an independent-sample Mann-Whitney U test between FD-AN Tie and FD-AN NoTie (upper panel) and FD-AN Common and FD-AN NoCommon (lower panel). *(b)* Two-sided p-values of an independent-sample Mann-Whitney U test between FD-AN LEC and FD-AN HEC. ***, **, * indicate significance levels at 1, 5, and 10% of a Wilcoxon signed-rank test.

Next, we analyze how common friends influence effort choices, by dis-aggregating the average FD-AN effort difference by the existence of common friends between ego and alter in FD. Of the 394 observations in our data, 80 have no friends in common ('NoCommon'). The rest have at least one common friend ('Common'). The lower panel of Table 4 reports the average FD-AN difference in the LEC and HEC conditions, split by Common and NoCommon. The p-values in the last row of the panel indicate that the FD-AN difference is not significantly different between Common and NoCommon, in either cost condition. The p-values in the last column of the panel show that the FD-AN difference is not statistically different between the LEC and HEC conditions, for either Common and NoCommon.

3.4. Regression analysis

The descriptive analysis has three shortcomings that we try to address with regression analysis. First, Tie and Common might be correlated, which could bias the descriptive comparisons. A regression allows a cleaner separation of the effects of Tie and Common. Second, the previous analysis did not look at possible interactions between Tie and Common. We need to identify such interactions, to obtain insights in the three different concepts of social proximity laid out in our conceptual framework. Third, even though we use the within-difference between the AN and FD conditions, there is still a chance that the estimated effect of social proximity suffers from omitted variable bias, if some unobservables that are correlated with social proximity also influence the AN-FD difference. In a regression we can address this bias with the help of controls. Our main specification looks as follows:

$$\begin{aligned} y_{ij} = \beta_0 &+ \beta_1 \text{ HEC} + \beta_2 \text{ Tie} + \beta_3 \text{ HEC} \times \text{Tie} + \beta_4 \text{ Common} + \beta_5 \text{ HEC} \times \text{Common} \\ &+ \beta_6 \text{ Tie} \times \text{Common} + \beta_7 \text{ HEC} \times \text{Tie} \times \text{Common} + \beta_8 \text{ X}_i + \beta_9 \text{ X}_j + \mu_e + \varepsilon_{ij} \end{aligned} \tag{4}$$

where y_{ij} is the FD-AN difference when i (ego) is matched with j (alter). 'HEC' is equal to one for the high effort condition, zero for the low effort condition. 'Tie' is equal to one if ego and alter are close friends, zero otherwise. 'Common' is equal to one if ego shares at least one friend with alter, zero otherwise. ε_{ij} is the error term.

Note that the interaction terms 'Tie×Common' and 'HEC×Tie×Common' allow us to separate the three different definitions of network-based proximity as laid out in Hypotheses 1 and 2. Specifically, a positive interaction supports the importance of 'triads', i.e., there is only a positive effect of direct or common ties if they co-exist. A zero coefficient would be in line with a 'flow' perspective, while the 'closeness' perspective is supported by either a zero or even a negative interaction.

'HEC' is the effect of being in the high cost condition versus being in the low cost condition when ego and alter do not have direct a tie and common friends. 'Tie' denotes the effect of having a tie but no common friends in LEC, while 'HEC×Tie' denotes the difference in this effect between LEC and HEC. 'Common' denotes the effect of having common friends but no tie in LEC, while 'HEC×Common' denotes the difference in this effect between LEC and HEC. 'Tie×Common' denotes the influence of Common on the FD-AN difference when two counterparts have a tie in LEC, relative to the influence of Common when they do not have a tie. Read alternatively, 'Tie×Common' denotes the influence of Tie on the FD-AN difference when ego and alter have common friends in LEC, relative to the influence of Tie when they have no common friends. 'HEC×Tie×Common' denotes the difference in this effect between LEC and HEC.

As variables 'Tie' and 'Common' are not randomized, they might be correlated with ε_{ij}, which potentially biases the regression estimates. To reduce the risk of omitted variable bias, we include a set of control variables. X_i and X_j represent ego's and alter's socioeconomic and psychological characteristics, including education, age, wealth, gender, risk aversion, agreeableness, and trust, as captured with the survey.[13] To increase efficiency of the estimates, we also include experimenter fixed effects, μ_e, which control for observable and unobservable characteristics of the research assistants employed during the experimental sessions.

Standard errors are adjusted for potential dependencies within villages, estimated with bootstrapping. Here we follow Cameron et al. (2008) who show that bootstrapping gives more accurate standard errors than cluster-robust standard errors if the number of clusters is low, as in our case.

Table 5: *Influence of Proximity on Effort*

	(1)	(2)	(3)	(4)	(5)
HEC	0.174	0.021	0.214	0.186	0.231
	(0.111)	(0.108)	(0.288)	(0.278)	(0.239)
Tie		-0.190		-0.209	0.085
		(0.144)		(0.157)	(0.242)
HEC × Tie		0.493***		0.546***	-0.517*
		(0.178)		(0.175)	(0.285)
Common			-0.001	0.078	0.112
			(0.143)	(0.146)	(0.162)
HEC × Common			-0.050	-0.231	-0.290
			(0.363)	(0.350)	(0.327)
Tie × Common					-0.321
					(0.339)
HEC × Tie × Common					1.111***
					(0.358)
Constant	-0.511	-0.210	-0.330	-0.243	-0.226
	(0.506)	(0.469)	(0.506)	(0.492)	(0.475)
R^2	0.070	0.087	0.071	0.090	0.093

Notes: OLS regressions with the difference in ego's effort between FD and AN as dependent variable. N = 393. Standard errors in parentheses, clustered and bootstrapped at village level, with 2000 repetitions; ***, **, * indicate two-sided significance levels at 1, 5, and 10%. AND-ties of the village friendship network used. Experimenter fixed effects included as well as controls for ego and alter characteristics (education, age, wealth, gender, risk aversion, trust, and agreeableness) included in all models. For the coefficients of the controls see Appendix Table A.10.

Table 5 presents the results. In Column (1), the coefficient of 'HEC' is not statically significant. This indicates that the expected FD-AN difference is not different between the HEC and LEC conditions. In Column (2), we include 'Tie' and 'HEC×Tie'. The coefficient of 'Tie' is not significant. This indicates that the FD-AN difference in LEC does not vary between pairs with a tie and those without a tie. The coefficient of 'HEC×Tie', on the other hand, is positive and highly significant. This indicates a strong difference between the effect of having a tie in LEC and HEC.

[13] Given that we work with the FD-AN difference, two alters exist for each observation – one in AN and one in FD. No information is given about the AN alter. The FD alter, on the other hand, is identifiable and information about their socioeconomic characteristics is present. We mirror this by including characteristics of the FD alter, but not of the AN alter.

The effect of having a tie in HEC is also highly significant (p = 0.006, 'Tie' + 'HEC×Tie' = 0, Wald test), and so is the difference between HEC and LEC for pairs with a tie (p = 0.004, 'HEC' + 'HEC×Tie' = 0, Wald test). In Column (3), we include 'Common' and 'HEC×Common' (instead of 'Tie' and 'HEC×Tie'). Neither the coefficient of 'Common' nor that of 'HEC×Common' is significant.

The effects identified in these three models are in line with the descriptive analysis presented earlier. Columns (4) and (5) provide new insights, as they include both Tie and Common in the same regression. In Column (4) we observe that the coefficients of 'Common' and 'HEC×Common' are again not significant. The coefficient of 'HEC×Tie' remains significant and positive as in Model (2), and it increases slightly in magnitude. Also the absolute effect of having a tie in HEC is highly significant (p = <0.001, 'Tie' + 'HEC×Tie' = 0, Wald test). Similarly, the difference between HEC and LEC for pairs with a tie stays significant (p = 0.028, 'HEC' + 'HEC×Tie' = 0, Wald test). In sum, the previously identified effects involving Tie remain when controlling for the existence of common friends.

Column (5) uses the full specification (4), including an interaction between Tie and Common. The most striking result is the positive coefficient of 'HEC×Tie×Common' which is highly significant. To make the interpretation of this interaction effect easier, we predict the effects of Tie and Common in different scenarios. The upper panel of Table 6 reports the predicted effect of having at least one common friend, disaggregated by whether a pair has a direct tie. The lower panel reports the predicted effect of having a tie, disaggregated by whether a pair has at least one common friend.

Table 6: *Influence of Proximity on Effort - Details for Model (5)*

a) Effect of Common	LEC	HEC	LEC vs. HEC $^{(a)}$
Tie=0	0.112	-0.178	0.375
Tie=1	-0.209	0.612***	0.005
Tie=0 vs. Tie=1 $^{(a)}$	0.344	0.009	

Notes. Effect of having common friends. Table entries calculated as follows: Tie=0 in LEC: 'Common'; Tie=0 in HEC: 'Common + HEC × Common'; Tie=1 in LEC: 'Common + Tie × Common', Tie=1 in HEC: 'Common + HEC × Common + Tie × Common + HEC × Tie × Common'. ***, **, * indicate significance levels at 1, 5, and 10% of a Wald test. *(a)* Two-sided p-value of a Wald test that compares coefficients in the same row/column.

b) Effect of Tie	LEC	HEC	LEC vs. HEC $^{(a)}$
Common=0	0.085	-0.432	0.069
Common=1	-0.236	0.358***	0.001
Common=0 vs. Common=1 $^{(a)}$	0.344	0.009	

Notes. Effect of having a tie. Table entries calculated as follows: Common=0 in LEC: 'Tie'; Common=0 in HEC: 'Tie + HEC × Tie'; Common=1 in LEC: 'Tie + Tie × Common', Common=1 in HEC: 'Tie + HEC × Tie + Tie × Common + HEC × Tie × Common'. ***, **, * indicate significance levels at 1, 5, and 10% of a Wald test. *(a)* Two-sided p-value of a Wald test that compares coefficients in the same row/column.

The results in the upper panel show that the effect of Common is only significant in the HEC condition and in pairs who are friends (lower right cell), but not in any of the other cells. A comparison with the other cells shows that the effect of Common is significantly smaller if we move to the LEC condition (see p-value in last column) or if pairs are not direct friends (see p-value in last row). We summarize these insights in a first result.

Result 1 (Influence of Common)**.**

(i) The effect of Common on the FD-AN difference is positive and significant in the HEC condition and where pairs are friends.

(ii) The positive effect of Common on the FD-AN difference is larger among friends in the HEC condition, than among friends in the LEC condition, or non-friends in the HEC condition.

In the lower panel, we observe that the effect Tie is only significant in the HEC condition and in pairs who have a common friend (lower right cell), but not in any of the other cells. A comparison with the other cells shows that the effect of Tie is significantly smaller if we move to the LEC condition (see p-value in last column) or if pairs do not have a common friend (see p-value in last row). We summarize these insights in a second result.

Result 2 (Influence of Tie)**.**

(i) The effect of Tie on the FD-AN difference is positive and significant in the HEC condition and where pairs have a common friend.

(ii) The positive effect of Tie on the FD-AN difference is larger among pairs who have a common friend in the HEC condition, than pairs with a common friend in the LEC condition, or pairs without a common friend in the HEC condition.

In sum, this analysis shows how Tie and Common interact in their influence on effort. Most importantly, they only have a significant influence if they exist jointly, and only in HEC. The stronger relevance in HEC is in line with the hypotheses. The finding that both a direct tie and a common friend is needed to see an effect provides evidence in favor of a triads perspective on network proximity.

4. Robustness tests

We conduct a number of robustness checks. First, we change our sample by including isolates and participants who did not understand the instructions. Second, we consider alternative econometric specifications.

4.1. Sample

Participants without any links in the friendship network (i.e., isolates) may behave differently, or be treated differently in interactions with other community members. That is why we had excluded the (relatively small) group of isolates from the main analysis. Including these isolates increases the number of observations slightly from 393 to 413. Importantly, the observed results remain robust with isolates included in the sample. See Appendix Table A.11 for details. Another group of participants we had excluded from the main analysis are participants who failed to answer the control questions correctly. A lack of understanding of the instructions might mean that participants did not grasp the strategic nature of the game to the extent required. Their exclusion reduced the sample size from 428 to 393. Including these participants does, however, not change the results in any substantial way, as demonstrated by Appendix Table A.12.

4.2. Alternative specifications

Effort choices in the experiment could take values 0, 1, 2, 3, and 4. That is, effort choices are discrete and constrained to a restricted interval. The linear model ignores both of these aspects, meaning that predicted values might differ from the available choices and/or be outside of the restricted choice interval. We re-run the analysis with an ordered logit model to check whether the discrete nature of the choice data has an influence on the observed results. The previously observed results do not change qualitatively under this approach (see Appendix Table A.16 for details).

Another aspect that might have influenced results is participants' degree, and a possible correlation between degree and the existence of direct ties and common friends. A participant's degree provides information about the amount of connections that person has in their community's friendship network. A more connected person is also more likely to have a direct tie and common friends with a matched partner in the experiment. This might change behavior in AN. Further, a more connected person might feel more or less vulnerable to the threat of observability, changing behavior in FD. Including degree as a control in the analysis leaves all previously observed effects unaffected (see Appendix Table A.15).[14] [15]

[14]We randomly varied the order of the two disclosure conditions at the session level. The order might have influenced results. If the AN decision was taken first, there is no risk of information spillover. However, if the FD decision is taken first, identity information disclosed in this setting could at least partially influence the later AN decision. Appendix Section A.5.3 shows that this is not the case.

[15]As each respondent took decisions in both AN and FD conditions, we can also use a panel regression with individual fixed effects. This provides results that are qualitatively identical to those of the difference-based approach used in our main analysis (see Appendix Section A.5.6). However, it has the drawback that considering the interaction between Common and Tie becomes practically impossible as it would require four-way interactions.

5. Conclusion

In this paper, we analysed the role of network-based proximity as a coordination device. We combined data from individual decisions in a bilateral minimum effort game (MEG) with real-world friendship networks in Ugandan villages. We hypothesised that higher proximity in friendship networks between two participants increases effort. To test this hypothesis, we experimentally varied effort costs and identity disclosure in a pair, and focused on three different concepts of network-based proximity: closeness (Freeman, 1978), maximum network flow (Ford Jr and Fulkerson, 1956), and triads (Jackson et al., 2012).

We found that common friends have a positive influence on individual effort in the high cost condition for pairs with a direct tie, but not for those without. Similarly, having a direct tie has a positive influence on effort in the high cost condition for pairs with common friends, but not for those without. Of the three concepts of network-based proximity that we used, these results are most in line with a triads effect.

While both altruism and trust can be increased by triads, it should be noted that we are unable to empirically separate the altruism and trust mechanisms. Each of them might have contributed to the positive effect of triads on effort in our experiment. Further work that experimentally separates these mechanisms could provide a fruitful avenue of research – similar to for example the approach used by Leider et al. (2009) and Ligon and Schechter (2012) who separated altruism and reciprocity motives behind prosocial giving between two actors.

There might be two additional mechanisms behind the identified effect of triads on effort contribution. First, if both ego and alter form part of the same triad, they also experience some 'clustering'. Clustering (or also referred to as 'closure') occurs when two friends of the same person are also friends (Coleman, 1988). If both ego and alter form part of the same triad, both of them face 'closure' of their friendship ties, as both have two friends who are also friends. Coleman (1988) argues that 'closure' might increase the pressure to contribute to public goods or the enforcement of social norms. Second, the conditionality of the effect of common friends on the existence of a direct tie might also be the result of an information effect. If ego and alter are friends they will more likely know that they have common friends, which might increase its behavioural influence.

Lastly, our approach is binary in considering the existence of direct ties and common friends, and ignores the total number of connections one has with the rest of the village. Extending this to an approach that considers the number of triads, as well as the number of connections of ego, alter and the common friends could be interesting for the following reasons. First, it might allow us to test whether the mechanism works via 'clustering'. If it does, we should find that more clusters around 'ego' or 'alter' increase effort. Second, it might provide further evidence for the 'support' mechanism that we argued lies behind the positive effect of triads. Jackson et al. (2012), who introduced the concept of 'support', looked at the wider network of a society and demonstrated that to enforce favor exchange all links in a subnetwork need to be ‘supported’. Looking at the wider networks around ego and alter could provide further support for this mechanism.

References

Anderson, S. P., Goeree, J. K., and Holt, C. A. (2001). Minimum-effort coordination games: Stochastic potential and logit equilibrium. *Games and Economic Behavior*, 34(2):177–199.

Armantier, O. and Treich, N. (2013). Eliciting beliefs: Proper scoring rules, incentives, stakes and hedging. *European Economic Review*, 62:17–40.

Azrieli, Y., Chambers, C. P., and Healy, P. J. (2018). Incentives in experiments: A theoretical analysis. *Journal of Political Economy*, 126(4):1472–1503.

Azrieli, Y., Chambers, C. P., and Healy, P. J. (2020). Incentives in experiments with objective lotteries. *Experimental Economics*, 23(1):1–29.

Bandiera, O. and Rasul, I. (2006). Social networks and technology adoption in Northern Mozambique. *The Economic Journal*, 116(514):869–902.

Berninghaus, S. K., Ehrhart, K.-M., and Keser, C. (2002). Conventions and local interaction structures: experimental evidence. *Games and Economic Behavior*, 39(2):177–205.

Binzel, C. and Fehr, D. (2013). Social distance and trust: Experimental evidence from a slum in cairo. *Journal of Development Economics*, 103:99–106.

Blanco, M., Engelmann, D., Koch, A. K., and Normann, H.-T. (2010). Belief elicitation in experiments: is there a hedging problem? *Experimental Economics*, 13(4):412–438.

Brañas-Garza, P., Cobo-Reyes, R., Espinosa, M. P., Jiménez, N., Kovárík, J., and Ponti, G. (2010). Altruism and social integration. *Games and Economic Behavior*, 69(2):249–257.

Brewer, D. D. (2000). Forgetting in the recall-based elicitation of personal and social networks. *Social Networks*, 22(1):29–43.

Cameron, A. C., Gelbach, J. B., and Miller, D. L. (2008). Bootstrap-based improvements for inference with clustered errors. *Review of Economics and Statistics*, 90(3):414–427.

Cassar, A. (2007). Coordination and cooperation in local, random and small world networks: Experimental evidence. *Games and Economic Behavior*, 58(2):209–230.

Chen, R. and Chen, Y. (2011). The potential of social identity for equilibrium selection. *American Economic Review*, 101(6):2562–2589.

Coleman, J. S. (1988). Free riders and zealots: The role of social networks. *Sociological Theory*, 6(1):52–57.

Conley, T. G. and Udry, C. R. (2010). Learning about a new technology: Pineapple in Ghana. *American Economic Review*, 100(1):35–69.

Costa, P. T. and McCrae, R. R. (1992). Normal personality assessment in clinical practice: The NEO personality inventory. *Psychological Assessment*, 4(1):5.

D'Exelle, B., Habraken, R., and Verschoor, A. (2023). What should I aspire to? Peer effects in adolescents' friendship networks. *Economic Development and Cultural Change*.

D'Exelle, B. and Ignowski, L. (2023). Friends in the village: Do they matter for women's involvement in household decisions? *Journal of Population Economics*.

D'Exelle, B. and Verschoor, A. (2015). Investment behaviour, risk sharing and social distance. *The Economic Journal*, 125(584):777–802.

D'Exelle, B. and Verschoor, A. (2023). Village networks and entrepreneurial farming in Uganda. *World Development*, 167:106241.

D'Exelle, B. and Riedl, A. (2018). Gender Inequality and Resource Sharing: Evidence from Rural Nicaragua. *Journal of Development Perspectives*, 2(1-2):62–87.

Etang, A., Fielding, D., and Knowles, S. (2011). Does trust extend beyond the village? Experimental trust and social distance in Cameroon. *Experimental Economics*, 14:15–35.

Fafchamps, M. and Lund, S. (2003). Risk-sharing networks in rural Philippines. *Journal of Development Economics*, 71(2):261–287.

Ford Jr, L. R. and Fulkerson, D. R. (1956). Solving the transportation problem. *Management Science*, 3(1):24–32.

Freeman, L. C. (1978). Centrality in social networks conceptual clarification. *Social Networks*, 1(3):215–239.

Goeree, J. K. and Holt, C. A. (2001). Ten little treasures of game theory and ten intuitive contradictions. *American Economic Review*, 91(5):1402–1422.

Goeree, J. K. and Holt, C. A. (2005). An experimental study of costly coordination. *Games and Economic Behavior*, 51(2):349–364.

Goeree, J. K., McConnell, M. A., Mitchell, T., Tromp, T., and Yariv, L. (2010). The $1/d$ law of giving. *American Economic Journal: Microeconomics*, 1(1):183–203.

Jackson, M. O., Rodriguez-Barraquer, T., and Tan, X. (2012). Social capital and social quilts: Network patterns of favor exchange. *American Economic Review*, 102(5):1857–97.

Jackson, M. O. and Zenou, Y. (2015). Games on networks. In Young, H. P. and Zamir, S., editors, *Handbook of Game Theory with Economic Applications*, volume 4, pages 95–163. Elsevier.

Karlan, D., Mobius, M., Rosenblat, T., and Szeidl, A. (2009). Trust and social collateral. *Quarterly Journal of Economics*, 124(3):1307–1361.

Keser, C., Ehrhart, K.-M., and Berninghaus, S. K. (1998). Coordination and local interaction: Experimental evidence. *Economics Letters*, 58(3):269–275.

Leider, S., Möbius, M. M., Rosenblat, T., and Do, Q.-A. (2009). Directed altruism and enforced reciprocity in social networks. *Quarterly Journal of Economics*, 124(4):1815–1851.

Ligon, E. and Schechter, L. (2012). Motives for sharing in social networks. *Journal of Development Economics*, 99(1):13–26.

McCubbins, M. D., Paturi, R., and Weller, N. (2009). Connected coordination: Network structure and group coordination. *American Politics Research*, 37(5):899–920.

Monderer, D. and Shapley, L. S. (1996). Potential games. *Games and Economic Behavior*, 14(1):124–143.

Rosenkranz, S. and Weitzel, U. (2012). Network structure and strategic investments: An experimental analysis. *Games and Economic Behavior*, 75(2):898–920.

Rutström, E. E. and Wilcox, N. T. (2009). Stated beliefs versus inferred beliefs: A methodological inquiry and experimental test. *Games and Economic Behavior*, 67(2):616–632.

van Gerwen, N. and Buskens, V. (2018). Partner-specific behavior in social networks: Coordination among actors with heterogeneous preferences. *Social Networks*, 52:68–80.

Van Huyck, J. B., Battalio, R. C., and Beil, R. O. (1990). Tacit coordination games, strategic uncertainty, and coordination failure. *The American Economic Review*, 80(1):234–248.

Online Appendix

A. Additional information

A.1. Implementation

We ran 13 sessions, each consisting of participants from two different villages. Assignment of cost conditions was randomized at session level. Three experimenter teams were running the sessions, with experimenter assignment done at random across the two cost conditions. Table A.1 displays details.

Table A.1: Implementation

Session	Villages	Experimenter	Treatment	Participants	Understanding	Final
2	1121, 1152	3	LEC	19	17	16
4	1131, 1151	1	HEC	18	17	15
6	1112, 1142	2	LEC	16	14	12
8	1111, 1142	2	HEC	21	19	19
10	1131, 1562	2	HEC	20	18	18
14	1521, 1542	3	HEC	17	13	12
16	1511, 1522	1	LEC	18	17	15
18	1412, 1432	2	HEC	25	24	23
20	1621, 1622	2	LEC	13	13	13
22	1621, 1624	1	LEC	18	16	16
24	1623, 1642	3	HEC	15	14	14
26	1742, 1751	2	LEC	15	13	13
28	1742, 1751	1	LEC	14	13	11

Even numbered sessions participated in this experiment, odd numbered sessions participated in a partner experiment (except session 12 which participated in the partner experiment). Villages are numbered according to their location, with the digits denoting district, subdistrict, and village. Experimenter numbers 1, 2, 3 denote the three teams that were guiding the different sessions. The treatment is denoted by LEC and HEC, which stands for low effort cost and high effort cost.

The column 'Participants' provides the original amount of participants who were present in each session. The column 'Understanding' gives the number of those participants who understood instructions. The column 'Final' provides the number of understanding participants that have at least one direct connection in their village's friendship network (that is, those that are not isolates). The understanding non-isolates make up the final sample included in the analysis. As can be seen, the two steps eliminate a small number of participants (up to 5) from each session.

A.2. Socioeconomic Characteristics and Networks

Table A.2 provides results for the socioeconomic measures, differentiated by the between treatments HEC and LEC. The column on the right side provides the two-sided p-value of a Mann-Whitney U test that compares between characteristics of participants in LEC and HEC.

Table A.2: Characteristics by Between Treatment

	LEC			HEC			
	N	mean	st. dev.	N	mean	st. dev.	p-value
Education	96	5.71	3.19	101	5.85	3.39	0.870
Age	96	41.82	14.15	101	41.36	13.32	0.909
Wealth	96	-0.15	2.66	101	-0.10	2.06	0.310
Gender	96	0.55	0.50	101	0.60	0.49	0.553
Risk aversion	96	2.01	0.91	101	1.95	0.90	0.633
Trust	96	-0.18	1.42	101	-0.15	1.34	0.651
Agreeableness	96	0.12	1.82	101	-0.06	1.77	0.576

Notes: Education in years of schooling. Gender is fraction female. Wealth, trust, and agreeableness are indices. Risk aversion measured on 4 point scale, higher number means more risk averse. Two-sided p-value is based on a Mann-Whitney U test.

Virtually all participants belong to the Bugisu tribe, which is the dominant ethnic group of the study area. Most of them report having their own household farm which they work on as their main occupation. Participants have, on average, enjoyed 5.71 years of schooling in LEC and 5.85 in HEC. They are, on average, 41.82 years old in LEC and 41.36 in HEC. Roughly equal fractions of men and women participated, with 55% of participants being female in LEC and 60% in HEC. The mean of the wealth index is close to zero, and has roughly equal standard deviations in LEC and HEC.[16] For risk aversion, the displayed scores (2.01 for LEC and 1.95 for HEC) indicate, on average, mild risk aversion (2 = 'Take risk but not a lot'). Trust and agreeableness scores also have a mean that is close to zero, and roughly similar standard deviations in LEC and HEC. No major differences show in these socioeconomic measures, indicating that characteristics are largely balanced across conditions.

Table A.3 shows that Tie and Common, our main network measures of interest, are balanced across treatments with 30% of participants in LEC and 39% of participants in HEC being connected by a direct tie. Participants in LEC report on average 2.96 common friends with their counterparts, while participants in HEC report 2.62 common friends. None of the differences between treatments is significant.

Further, Table A.4 shows details for the correlation between Tie and Common, split by treatment. In both LEC and HEC, the correlation is strongly significant. Spearman's rho is almost identical in the two treatments. Hence, the two treatments are balanced, not only with regard to Tie and Common as such, but also with regard to the correlation between these two variables.

Further details on Tie and Common by village can be found in Table A.5. The table displays the average amount of common friends per village (with standard error), and the percentage of pairs that have a tie.

[16] The socioeconomic survey was asked to 537 respondents. While some of these participated in another experiment, 197 participated in this experiment. The wealth index was calculated based on the full population of 537 respondents. The mean close to 0 hence indicates that our participants in the experiment do not differ from the general population average.

Table A.3: Networks by Effort Costs

	LEC			HEC			
	N	mean	st. dev.	N	mean	st. dev.	p-value
Tie	96	0.30	0.46	101	0.39	0.49	0.275
Common	96	2.96	3.14	101	2.62	2.58	0.670

Two-sided p-value is based on a Mann-Whitney U test.

Table A.4: *Correlations - Tie and Common*

Treatment	Spearman's rho	p-value
LEC	0.524	$<$0.001
HEC	0.523	$<$0.001

Additionally, from this table, information can be retrieved on the size of the villages and the amount of community members in each village that participated in the experiment. The deviation between village size and the reported N is not due to attrition, but because different experiments / treatments were conducted with the community members, the N here only reports on those that participated in the experiment / treatments this paper reports on.

Table A.5: *Tie and Common by Village*

Village	Size	N	Common		Tie
			mean	sd	%
1111	27	9	2.56	2.92	55.56
1112	30	6	2.17	1.83	0
1121	27	7	1.43	1.40	0
1131	25	10	1.20	1.03	40.00
1142	30	16	1.13	1.02	0
1151	15	5	0.40	0.55	0
1152	28	9	1.78	2.54	0
1412	34	15	4.00	2.20	40.00
1432	27	8	4.13	2.23	50.00
1511	20	6	1.67	0.52	33.33
1521	31	6	3.33	3.14	66.67
1522	25	9	7.22	5.07	66.67
1531	22	7	5.57	2.44	57.14
1542	32	6	4.67	2.88	50.00
1562	32	11	2.36	2.87	45.45
1621	33	15	3.73	3.45	40.00
1622	20	5	2.80	0.84	20.00
1623	10	9	0.89	1.05	44.44
1624	25	9	4.67	3.24	77.78
1642	19	5	0.00	0.00	0
1742	34	13	2.15	2.03	15.38
1751	32	11	2.36	2.34	45.45
Total	27.53	197	2.79	2.86	34.52

A.3. Experimental Behavior

A.3.1. AN - FD Transitions

This subsection gives a detailed account of decisions in AN and FD and the relation between them, aimed at providing a closer understanding of the FD-AN difference. Table A.6 displays numbers for LEC and Table A.7 for HEC.

Table A.6: *Effort in AN and FD (LEC)*

All						
AN → FD	0	1	2	3	4	Total
0	0	0	0	0	0	0
1	0	0	5	2	1	8
2	0	0	16	8	10	34
3	0	1	7	18	10	36
4	0	1	4	21	88	114
Total	0	2	32	49	109	192

NoTie						
AN → FD	0	1	2	3	4	Total
0	0	0	0	0	0	0
1	0	0	4	1	1	6
2	0	0	8	8	5	21
3	0	1	2	7	7	17
4	0	0	3	13	55	71
Total	0	1	17	29	68	115

Tie						
AN → FD	0	1	2	3	4	Total
0	0	0	0	0	0	0
1	0	0	1	1	0	2
2	0	0	8	0	5	13
3	0	0	5	11	3	19
4	0	1	1	8	33	43
Total	0	1	15	20	41	77

In both tables, rows stand for AN decisions and columns for FD decisions. The number in each cell displays the amount of times a specific AN - FD effort choice combination occurred. Most observations are centered on the diagonal where effort in AN is equal to effort in FD. The triangle above (and to the right of) that diagonal shows observations for which effort in FD is larger than in AN, and the triangle below (and to the left of) that diagonal shows cases where effort in FD is lower than in AN.

For LEC Tie, there are 15 observations in FD where effort is lower than in AN, while there are only 3

Table A.7: *Effort in AN and FD (HEC)*

All						
AN → FD	0	1	2	3	4	Total
0	0	0	1	0	3	4
1	0	0	5	2	3	10
2	0	1	12	7	6	26
3	0	1	10	20	13	44
4	0	0	3	8	107	118
Total	0	2	31	37	132	202

NoTie						
AN → FD	0	1	2	3	4	Total
0	0	0	0	0	2	2
1	0	0	2	0	2	4
2	0	1	8	4	3	16
3	0	0	9	14	10	33
4	0	0	2	8	77	87
Total	0	1	21	26	94	142

Tie						
AN → FD	0	1	2	3	4	Total
0	0	0	1	0	1	2
1	0	0	3	2	1	6
2	0	0	4	3	3	10
3	0	1	1	6	3	11
4	0	0	1	0	29	30
Total	0	1	10	11	37	59

such observations in HEC Tie. In LEC NoTie there are 19 observations where effort in FD is smaller than in AN, and in HEC NoTie there are 20 such observations. A Chi-square test indicates that significantly more observations are located in the lower triangle for LEC Tie than for HEC Tie (two-sided p-value is 0.014) and marginally more for HEC NoTie than in HEC Tie (two-sided p-value is 0.068). These differences coincide with the observed differences in effort in FD-AN, suggesting that the frequency of a negative FD-AN difference largely captures the previously observed differences in effort levels.

Moreover, a large amount of participants chooses the maximal effort of 4 already in AN. For LEC Tie, there are 43 (out of 77) observations where effort of 4 is chosen in AN and, for LEC NoTie, there are 71 (out of 115) such observations. In HEC NoTie there are 87 (out of 142) observations where effort in AN is 4, and in HEC Tie there are 30 (out of 59) such observations. In sum, for HEC Tie, about half of the observations have an AN effort of 4, and for LEC Tie, HEC NoTie, and LEC NoTie that fraction seems even higher. Given the restriction of the choice set to values 0, 1, 2, 3, and 4, the high fraction of participants that choose effort 4 in AN is problematic because these participants could not increase effort any further in FD, even if they wanted to. This might even be responsible for a substantial amount of the negative FD-AN differences.

A.3.2. Descriptive Results and Non-parametric Testing

Table A.8 shows that, for all treatments, the average effort exerted and average beliefs held over the effort exerted by the other lie between 3 and 4.

Table A.8: *Individual Beliefs and Effort*

	LEC			HEC		
	N	average	st.dev.	N	average	st.dev.
a) Beliefs						
AN	96	3.28	0.87	101	3.02	1.06
FD	192	3.36	0.83	202	3.29	0.92
p-value*		0.201			0.002	
b) Effort						
AN	96	3.33	0.91	101	3.30	1.01
FD	192	3.38	0.80	202	3.48	0.79
p-value*		0.698			0.022	

* reports two-sided p-values of a Wilcoxon matched-pairs signed-ranks test between AN and FD.

Panel a) shows that average beliefs in AN are slightly lower in HEC than in LEC (difference in means is 0.26; two-sided p-value of a Mann Whitney U test is 0.098). Moreover, beliefs increase somewhat when moving from AN to FD. The difference between beliefs in AN and FD is not significant in LEC, while it is in HEC (difference in means is 0.27; two-sided p-value of a Wilcoxon test is 0.002).

Panel b) adds that the average effort exerted in AN is almost identical in LEC and HEC. Effort increases slightly when moving from AN to FD. Consistently with the results observed in panel a), the difference between effort exertion in AN and FD is not significant in LEC, while in HEC it is (difference in means is 0.18; two-sided p-value of a Wilcoxon test is 0.022).

In this part, we want to know whether effort exertion is influenced by having a tie. Participants only know whether they have a tie in FD, but not in AN. Hence, observations are split according to whether ego has a tie with alter in FD. Each FD decision is then matched with ego's decision in AN. This produces AN - FD matches which are categorized according to the existence of a tie in FD.

Panels a) and b) of Table A.9 display effort exertion based on these AN - FD matches. As can be seen in panel a), 136 such AN - FD matches exist where the FD pair has a direct friendship tie, out of which 77 in LEC and 59 in HEC. Panel b) shows further that 257 such AN - FD matches exist where the FD pair does not have a direct friendship tie, 115 of which in LEC and 142 of which in HEC.

When ego has a tie with alter in FD (panel a)), individual effort exertion in HEC differs significantly between AN and FD (two-sided p-value of a Wilcoxon test is 0.002), while it does not when ego does not have a tie with alter in FD (panel b)). This means that, in an HEC pair with a known tie, ego exerts significantly higher effort than in AN. In an HEC pair that is known not to have a tie, on the contrary, effort exertion does not differ from AN. In LEC, individual effort exertion does not differ between AN and FD, independently of whether an FD pair has a direct friendship tie (panel a)) or not (panel b)).

In a next step, we want to know whether this relation between FD and AN differs between Tie and NoTie. To that end, panel c) reflects the difference in effort levels between FD and AN, split by Tie and

Table A.9: *Individual Effort and Having a Tie*

	LEC			HEC		
	N	average	st.dev.	N	average	st.dev.
a) Tie						
AN	77	3.34	0.85	59	3.03	1.19
FD	77	3.31	0.83	59	3.42	0.83
p-value*		0.422			0.002	
b) NoTie						
AN	115	3.33	0.95	142	3.40	0.90
FD	115	3.43	0.77	142	3.50	0.77
p-value*		0.283			0.551	
c) FD - AN						
Tie	77	-0.03	0.84	59	0.39	1.00
NoTie	115	0.10	0.85	142	0.10	0.85
p-value+		0.207			0.012	

* reports two-sided p-values of a Wilcoxon matched-pairs signed-ranks test between AN and FD. + reports two-sided p-values of an independent-sample Mann-Whithey U test between FD - AN Tie and FD - AN NoTie.

NoTie. We will call the difference in effort exertion between AN and FD 'effort in FD-AN' or 'FD-AN difference'. In HEC, effort in FD-AN differs significantly between Tie and NoTie (two-sided p-value of a Mann-Whitney U test is 0.012). The positive FD-AN difference is larger for pairs with a direct tie than for pairs without. This means that, relative to AN, effort increases more in FD when a pair has a tie than when it does not have a tie.In LEC, on the other hand, the difference between Tie and NoTie is not significant.

A.4. Regression Results

Table A.10: *Influence of Social Proximity on Effort*

	(1)	(2)	(3)	(4)	(5)
HEC	0.174	0.021	0.214	0.186	0.231
	(0.111)	(0.108)	(0.288)	(0.278)	(0.239)
Tie		-0.190		-0.209	0.085
		(0.144)		(0.157)	(0.242)
HEC × Tie		0.493***		0.546***	-0.517*
		(0.178)		(0.175)	(0.285)
Common			-0.001	0.078	0.112
			(0.143)	(0.146)	(0.162)
HEC × Common			-0.050	-0.231	-0.290
			(0.363)	(0.350)	(0.327)
Tie × Common					-0.321
					(0.339)
HEC × Tie × Common					1.111***
					(0.358)
Educ ego	0.034	0.036	0.033	0.034	0.033
	(0.025)	(0.026)	(0.024)	(0.025)	(0.024)
Age ego	0.003	0.003	0.003	0.003	0.003
	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)
Wealth ego	-0.011	-0.011	-0.011	-0.011	-0.010
	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)
Gender ego	0.100	0.087	0.105	0.101	0.098
	(0.155)	(0.157)	(0.154)	(0.156)	(0.153)
Risk ego	0.066	0.063	0.066	0.062	0.061
	(0.068)	(0.067)	(0.069)	(0.068)	(0.067)
Trust ego	-0.013	-0.015	-0.013	-0.016	-0.018
	(0.057)	(0.056)	(0.057)	(0.056)	(0.055)
Agree ego	-0.045	-0.040	-0.046	-0.039	-0.038
	(0.030)	(0.027)	(0.030)	(0.028)	(0.028)
Educ alter	-0.003	-0.002	-0.003	-0.003	-0.003
	(0.014)	(0.015)	(0.014)	(0.015)	(0.015)
Age alter	0.005	0.004	0.005	0.004	0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Wealth alter	-0.009	-0.010	-0.009	-0.010	-0.010
	(0.019)	(0.019)	(0.019)	(0.020)	(0.021)
Gender alter	-0.007	-0.020	-0.002	-0.008	-0.015
	(0.095)	(0.093)	(0.096)	(0.093)	(0.095)
Risk alter	-0.098**	-0.090**	-0.099**	-0.095**	-0.098***
	(0.044)	(0.043)	(0.039)	(0.038)	(0.038)
Trust alter	-0.011	-0.008	-0.011	-0.008	-0.010
	(0.038)	(0.037)	(0.039)	(0.038)	(0.040)
Agree alter	0.043	0.048*	0.042	0.046*	0.047**
	(0.027)	(0.025)	(0.026)	(0.024)	(0.024)
Constant	-0.511	-0.210	-0.330	-0.243	-0.226
	(0.506)	(0.469)	(0.506)	(0.492)	(0.475)
R^2	0.070	0.087	0.071	0.090	0.093

Notes: N = 393. OLS regressions with the difference in ego's effort between FD and AN as dependent variable. Standard errors in parentheses (clustered and bootstrapped at village level, with 2000 repetitions; ***, **, * indicate two-sided significance levels at 1, 5, and 10%, respectively). Experimenter fixed effects included in all models. AND-ties of the village friendship network used.

A.5. Robustness

A.5.1. Isolates

Table A.11: *Effort and Social Proximity (including isolates)*

	(1)	(2)	(3)	(4)	(5)
HEC	0.133	-0.006	0.113	0.094	0.127
	(0.121)	(0.121)	(0.300)	(0.296)	(0.222)
Tie		-0.147		-0.191	0.109
		(0.159)		(0.164)	(0.227)
HEC × Tie		0.476**		0.527***	-0.349
		(0.192)		(0.182)	(0.280)
Common			0.051	0.130	0.159
			(0.116)	(0.116)	(0.137)
HEC × Common			0.024	-0.159	-0.205
			(0.361)	(0.352)	(0.305)
Tie × Common					-0.326
					(0.323)
HEC × Tie × Common					0.920***
					(0.356)
Educ ego	0.031	0.033	0.031	0.032	0.031
	(0.024)	(0.024)	(0.023)	(0.023)	(0.022)
Age ego	0.004	0.003	0.004	0.003	0.003
	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)
Wealth ego	-0.007	-0.007	-0.007	-0.007	-0.006
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
Gender ego	0.127	0.112	0.121	0.118	0.116
	(0.145)	(0.147)	(0.146)	(0.148)	(0.146)
Risk ego	0.054	0.050	0.056	0.052	0.052
	(0.066)	(0.065)	(0.068)	(0.066)	(0.067)
Trust ego	-0.015	-0.018	-0.015	-0.018	-0.020
	(0.056)	(0.054)	(0.056)	(0.054)	(0.053)
Agree ego	-0.038	-0.032	-0.037	-0.031	-0.029
	(0.030)	(0.027)	(0.030)	(0.028)	(0.026)
Educ alter	-0.001	0.001	-0.001	0.000	-0.000
	(0.014)	(0.014)	(0.014)	(0.014)	(0.015)
Age alter	0.005*	0.005*	0.005*	0.005	0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Wealth alter	-0.013	-0.015	-0.014	-0.015	-0.015
	(0.017)	(0.018)	(0.018)	(0.018)	(0.019)
Gender alter	-0.012	-0.026	-0.019	-0.024	-0.030
	(0.092)	(0.089)	(0.094)	(0.090)	(0.092)
Risk alter	-0.086*	-0.078*	-0.084**	-0.080**	-0.082**
	(0.044)	(0.043)	(0.042)	(0.041)	(0.041)
Trust alter	-0.012	-0.008	-0.013	-0.010	-0.011
	(0.037)	(0.036)	(0.038)	(0.038)	(0.040)
Agree alter	0.038	0.042*	0.040	0.043*	0.044*
	(0.026)	(0.024)	(0.026)	(0.024)	(0.024)
Constant	-0.569	-0.340	-0.476	-0.402	-0.388
	(0.505)	(0.457)	(0.486)	(0.471)	(0.460)
R^2	0.058	0.075	0.059	0.076	0.078

Notes: N = 413. OLS regressions with the difference in ego's effort between FD and AN as dependent variable. ***, **, * indicate two-sided significance levels at 1, 5, and 10%, respectively; robust standard errors (in parentheses). Experimenter fixed effects included in all models. AND-ties of the friendship network used.

A.5.2. Understanding

Table A.12: *Effort and Social Proximity (including participants who did not understand the instructions)*

	(1)	(2)	(3)	(4)	(5)
HEC	0.165*	0.032	0.197	0.172	0.222
	(0.098)	(0.102)	(0.272)	(0.264)	(0.229)
Tie		-0.144		-0.150	0.097
		(0.139)		(0.147)	(0.189)
HEC × Tie		0.431**		0.474***	-0.570*
		(0.177)		(0.167)	(0.310)
Common			-0.019	0.033	0.075
			(0.132)	(0.126)	(0.147)
HEC × Common			-0.039	-0.192	-0.259
			(0.338)	(0.320)	(0.305)
Tie × Common					-0.279
					(0.286)
HEC × Tie × Common					1.096***
					(0.359)
Educ ego	0.040*	0.041*	0.039*	0.039*	0.039*
	(0.023)	(0.023)	(0.023)	(0.023)	(0.022)
Age ego	0.003	0.003	0.003	0.003	0.003
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Wealth ego	-0.018	-0.018	-0.018	-0.018	-0.017
	(0.026)	(0.026)	(0.026)	(0.027)	(0.027)
Gender ego	0.079	0.066	0.083	0.079	0.076
	(0.147)	(0.149)	(0.147)	(0.149)	(0.147)
Risk ego	0.066	0.067	0.065	0.065	0.064
	(0.059)	(0.058)	(0.060)	(0.059)	(0.059)
Trust ego	-0.021	-0.021	-0.020	-0.021	-0.024
	(0.051)	(0.049)	(0.051)	(0.049)	(0.049)
Agree ego	-0.042	-0.037	-0.043	-0.037	-0.035
	(0.029)	(0.027)	(0.029)	(0.027)	(0.028)
Educ alter	-0.010	-0.010	-0.011	-0.011	-0.011
	(0.012)	(0.013)	(0.013)	(0.013)	(0.013)
Age alter	0.004	0.004	0.004	0.004	0.003
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Wealth alter	-0.007	-0.007	-0.006	-0.006	-0.007
	(0.018)	(0.018)	(0.018)	(0.019)	(0.020)
Gender alter	-0.005	-0.017	-0.000	-0.003	-0.009
	(0.084)	(0.083)	(0.083)	(0.081)	(0.083)
Risk alter	-0.103***	-0.100***	-0.105***	-0.105***	-0.109***
	(0.039)	(0.038)	(0.034)	(0.034)	(0.033)
Trust alter	-0.012	-0.012	-0.012	-0.013	-0.015
	(0.035)	(0.036)	(0.035)	(0.036)	(0.037)
Agree alter	0.043*	0.049**	0.042*	0.047**	0.048**
	(0.025)	(0.024)	(0.024)	(0.024)	(0.023)
Constant	-0.471	-0.195	-0.285	-0.200	-0.188
	(0.457)	(0.420)	(0.461)	(0.438)	(0.426)
R^2	0.075	0.089	0.075	0.092	0.095

Notes: N = 428. OLS regressions with the difference in ego's effort between FD and AN as dependent variable. ***, **, * indicate two-sided significance levels at 1, 5, and 10%, respectively; robust standard errors (in parentheses). Experimenter fixed effects included in all models. AND-ties of the friendship network used.

A.5.3. Order Effects

The main analysis ignores in which order the AN and FD decisions were taken. For the experiment, we randomly varied the order of the two disclosure conditions. Randomization took place at the session level, such that in some sessions AN and in other sessions FD decisions were taken first.

These differences in the decision order might influence results via a consistency bias. If the AN decision is taken first, no information can spill over from a prior FD decision into the AN decision. If the FD decision is taken first, information from the FD decision could at least partially influence the AN decision. Order could, however, matter for two different reasons.

Out of 394 observations in the difference-based data set, in 210 cases the AN decision was taken first and in 184 cases the FD decision was taken first. Out of those cases where the same effort is exerted in FD and AN, 134 times the FD decision was taken first and 127 times the AN decision was taken first. Out of those cases where the effort in FD and AN differs, 75 times the FD decision was taken first and 58 times the AN decision was taken first. The two-sided p-value of a Chi square test for differences in these frequencies is 0.342. This coarse test does hence not reveal any difference in consistency between effort in AN and FD depending on the order of decisions.

Table A.13 displays detailed information on the way in which the order of decisions affects the difference between effort in FD and AN, depending on cost condition. The average and standard deviation of effort in FD-AN is displayed for LEC and HEC, depending on which decision was taken first ('AN first' or 'FD first'). Panel a) displays all observations, panel b) shows NoTie, and panel c) Tie. According to a Mann-Whitney U test, the difference between 'AN first' and 'FD first' is not significant in any of these panels. Hence, based on pure descriptive statistics, no difference between effort in AN and FD depending on the order of decisions can be detected.

Table A.13: *Effort in FD-AN depending on Order of Decisions*

	LEC			HEC		
	N	average	st.dev.	N	average	st.dev.
a) All						
AN first	144	0.10	0.88	66	0.24	0.79
FD first	48	-0.10	0.72	136	0.15	0.96
p-value^{+}		0.187			0.173	
b) NoTie						
AN first	89	0.15	0.89	44	0.16	0.61
FD first	26	-0.08	0.69	98	0.07	0.94
p-value^{+}		0.300			0.129	
c) Tie						
AN first	55	0.02	0.87	22	0.41	1.05
FD first	22	-0.14	0.77	37	0.38	0.98
p-value^{+}		0.466			0.970	

+ reports two-sided p-values of an independent-sample Mann-Whitney U test between effort in FD-AN when AN decision is taken first ('AN first') and when FD decision is taken first ('FD first').

We then include order as a control into our main regressions. Table **??** displays results. The coefficient of ‘Order’ is not significant in any of the models, and the main effects we observed without controlling for ‘Order’ also stay significant when including it as control.

Table A.14: *Effort and Social Proximity (controlling for order effects)*

	(1)	(2)	(3)	(4)	(5)
HEC	0.231**	0.075	0.290	0.252	0.297
	(0.114)	(0.118)	(0.319)	(0.306)	(0.259)
Tie		-0.181		-0.201	0.061
		(0.145)		(0.157)	(0.246)
HEC × Tie		0.471***		0.527***	-0.565*
		(0.182)		(0.177)	(0.302)
Common			0.010	0.084	0.114
			(0.145)	(0.146)	(0.161)
HEC × Common			-0.073	-0.244	-0.302
			(0.377)	(0.360)	(0.333)
Tie × Common					-0.286
					(0.346)
HEC × Tie × Common					1.140***
					(0.356)
Educ ego	0.032	0.035	0.032	0.033	0.032
	(0.026)	(0.026)	(0.024)	(0.025)	(0.024)
Age ego	0.003	0.003	0.003	0.003	0.003
	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)
Wealth ego	-0.009	-0.009	-0.009	-0.009	-0.008
	(0.026)	(0.026)	(0.026)	(0.027)	(0.027)
Gender ego	0.113	0.098	0.119	0.114	0.111
	(0.157)	(0.159)	(0.157)	(0.158)	(0.155)
Risk ego	0.064	0.061	0.063	0.060	0.059
	(0.068)	(0.067)	(0.069)	(0.068)	(0.068)
Trust ego	-0.012	-0.014	-0.012	-0.015	-0.017
	(0.057)	(0.055)	(0.057)	(0.055)	(0.055)
Agree ego	-0.047*	-0.041	-0.047*	-0.041	-0.039
	(0.028)	(0.026)	(0.029)	(0.026)	(0.027)
Educ alter	-0.003	-0.002	-0.003	-0.003	-0.003
	(0.014)	(0.015)	(0.014)	(0.015)	(0.015)
Age alter	0.005	0.004	0.005	0.004	0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Wealth alter	-0.009	-0.010	-0.008	-0.009	-0.010
	(0.019)	(0.019)	(0.019)	(0.020)	(0.021)
Gender alter	0.002	-0.012	0.007	-0.000	-0.006
	(0.096)	(0.094)	(0.096)	(0.094)	(0.096)
Risk alter	-0.098**	-0.091**	-0.100**	-0.096**	-0.099**
	(0.046)	(0.045)	(0.041)	(0.040)	(0.039)
Trust alter	-0.010	-0.007	-0.010	-0.007	-0.009
	(0.038)	(0.037)	(0.039)	(0.038)	(0.040)
Agree alter	0.042*	0.047**	0.041*	0.045*	0.046**
	(0.025)	(0.024)	(0.025)	(0.023)	(0.023)
Order	-0.142	-0.118	-0.144	-0.123	-0.125
	(0.087)	(0.086)	(0.093)	(0.091)	(0.088)
Constant	-0.536	-0.190	-0.305	-0.225	-0.204
	(0.516)	(0.477)	(0.516)	(0.500)	(0.482)
R^2	0.075	0.091	0.076	0.094	0.097

Notes: N = 393. OLS regressions with the difference in ego’s effort between FD and AN as dependent variable. ***, **, * indicate two-sided significance levels at 1, 5, and 10%, respectively; cluster-robust standard errors (in parentheses) to control for non-independencies at village level, experimenter effects. AND-ties of the friendship network used.

A.5.4. Role of Degree

Table A.15: *Effort and Social Proximity (role of degree)*

	(1)	(2)	(3)	(4)	(5)
HEC	0.206**	0.038	0.258	0.235	0.303
	(0.102)	(0.100)	(0.292)	(0.273)	(0.239)
Tie		-0.362***		-0.388***	0.197
		(0.127)		(0.125)	(0.250)
HEC × Tie		0.540***		0.605***	-0.613**
		(0.163)		(0.151)	(0.289)
Common			-0.150	-0.042	0.018
			(0.184)	(0.178)	(0.189)
HEC × Common			-0.050	-0.260	-0.351
			(0.368)	(0.340)	(0.327)
Tie × Common					-0.646**
					(0.290)
HEC × Tie × Common					1.290***
					(0.343)
Educ ego	0.034	0.037	0.034	0.034	0.033
	(0.025)	(0.026)	(0.024)	(0.024)	(0.023)
Age ego	0.003	0.002	0.003	0.002	0.002
	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)
Wealth ego	-0.013	-0.013	-0.013	-0.014	-0.012
	(0.026)	(0.026)	(0.026)	(0.026)	(0.025)
Gender ego	0.090	0.067	0.097	0.085	0.085
	(0.154)	(0.155)	(0.155)	(0.156)	(0.154)
Risk ego	0.075	0.073	0.074	0.071	0.072
	(0.068)	(0.067)	(0.067)	(0.067)	(0.067)
Trust ego	-0.016	-0.018	-0.015	-0.018	-0.019
	(0.055)	(0.055)	(0.055)	(0.055)	(0.054)
Agree ego	-0.037	-0.030	-0.037	-0.029	-0.027
	(0.029)	(0.027)	(0.030)	(0.028)	(0.029)
Degree ego	0.012	0.017	0.017	0.020	0.022
	(0.013)	(0.014)	(0.014)	(0.015)	(0.015)
Educ alter	-0.002	-0.002	-0.004	-0.004	-0.003
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Age alter	0.004	0.003	0.004	0.003	0.003
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Wealth alter	-0.012	-0.015	-0.011	-0.013	-0.014
	(0.019)	(0.020)	(0.019)	(0.020)	(0.021)
Gender alter	-0.008	-0.028	0.007	-0.005	-0.015
	(0.092)	(0.090)	(0.093)	(0.090)	(0.092)
Risk alter	-0.086*	-0.080*	-0.088**	-0.085**	-0.088**
	(0.045)	(0.044)	(0.041)	(0.040)	(0.040)
Trust alter	-0.010	-0.006	-0.009	-0.006	-0.009
	(0.039)	(0.038)	(0.039)	(0.039)	(0.041)
Agree alter	0.052**	0.060**	0.051**	0.058**	0.061***
	(0.026)	(0.023)	(0.026)	(0.023)	(0.023)
Degree alter	0.018	0.024**	0.023*	0.030**	0.032**
	(0.011)	(0.011)	(0.013)	(0.014)	(0.014)
Constant	-0.752	-0.390	-0.473	-0.371	-0.379
	(0.501)	(0.492)	(0.518)	(0.514)	(0.496)
R^2	0.082	0.103	0.087	0.111	0.115

Notes: N = 393. OLS regressions with the difference in ego's effort between FD and AN as dependent variable. ***, **, * indicate two-sided significance levels at 1, 5, and 10%, respectively; robust standard errors (in parentheses). Experimenter fixed effects included in all models. AND-ties of the friendship network used.

A.5.5. Ordered Logit

Table A.16: *Effort and Social Proximity (ordered logit)*

	(1)	(2)	(3)	(4)	(5)
HEC	0.405	-0.055	0.248	0.157	0.295
	(0.314)	(0.294)	(0.579)	(0.562)	(0.509)
Tie		-0.633**		-0.715**	0.221
		(0.321)		(0.348)	(0.672)
HEC × Tie		1.467***		1.551***	-1.228*
		(0.427)		(0.418)	(0.692)
Common			0.038	0.312	0.431
			(0.394)	(0.388)	(0.473)
HEC × Common			0.201	-0.314	-0.503
			(0.802)	(0.758)	(0.749)
Tie × Common					-1.026
					(0.883)
HEC × Tie × Common					2.934***
					(0.920)
Educ ego	0.074	0.083	0.076	0.081	0.079
	(0.049)	(0.051)	(0.049)	(0.052)	(0.051)
Age ego	0.010	0.009	0.010	0.008	0.008
	(0.012)	(0.012)	(0.012)	(0.012)	(0.011)
Wealth ego	-0.021	-0.023	-0.021	-0.023	-0.020
	(0.068)	(0.067)	(0.068)	(0.067)	(0.066)
Gender ego	0.139	0.101	0.117	0.111	0.108
	(0.382)	(0.394)	(0.376)	(0.389)	(0.373)
Risk ego	0.095	0.099	0.100	0.101	0.099
	(0.169)	(0.167)	(0.172)	(0.171)	(0.165)
Trust ego	-0.056	-0.057	-0.057	-0.060	-0.064
	(0.135)	(0.132)	(0.135)	(0.132)	(0.129)
Agree ego	-0.109	-0.096	-0.106	-0.093	-0.089
	(0.077)	(0.070)	(0.077)	(0.070)	(0.069)
Educ alter	-0.026	-0.024	-0.024	-0.023	-0.024
	(0.036)	(0.038)	(0.036)	(0.039)	(0.041)
Age alter	0.015*	0.014**	0.016*	0.014*	0.013*
	(0.008)	(0.007)	(0.008)	(0.008)	(0.007)
Wealth alter	-0.006	-0.010	-0.008	-0.012	-0.014
	(0.044)	(0.046)	(0.046)	(0.048)	(0.050)
Gender alter	0.010	-0.031	-0.007	-0.034	-0.055
	(0.222)	(0.221)	(0.224)	(0.224)	(0.230)
Risk alter	-0.216**	-0.201*	-0.208**	-0.205**	-0.214**
	(0.106)	(0.105)	(0.102)	(0.100)	(0.104)
Trust alter	0.007	0.010	0.006	0.009	0.001
	(0.083)	(0.079)	(0.085)	(0.082)	(0.090)
Agree alter	0.073	0.090	0.076	0.090	0.095
	(0.061)	(0.058)	(0.060)	(0.057)	(0.060)
cut1	-4.729***	-5.570***	-5.079***	-5.375***	-5.414***
	(1.181)	(1.067)	(1.165)	(1.167)	(1.189)
cut2	-2.402**	-3.245***	-2.753**	-3.051***	-3.091***
	(1.083)	(0.990)	(1.076)	(1.081)	(1.082)
cut3	-0.487	-1.321	-0.839	-1.127	-1.162
	(1.019)	(0.928)	(1.011)	(1.016)	(1.005)
cut4	2.913***	2.158**	2.566**	2.358**	2.333**
	(1.083)	(0.967)	(1.033)	(1.067)	(1.067)
cut5	4.089***	3.354***	3.744***	3.555***	3.534***
	(1.123)	(1.027)	(1.091)	(1.134)	(1.140)
cut6	5.552***	4.830***	5.208***	5.031***	5.011***
	(0.918)	(0.776)	(0.819)	(0.864)	(0.864)
cut7	6.416***	5.696***	6.071***	5.897***	5.878***
	(1.003)	(0.837)	(0.869)	(0.918)	(0.926)

Notes: N = 393. Ordered logit with the difference in ego's effort between FD and AN as dependent variable. ***, **, * indicate two-sided significance levels at 1, 5, and 10%, respectively; robust standard errors (in parentheses). Experimenter fixed effects included in all models. AND-ties of the friendship network used.

A.5.6. Panel Perspective

The main analysis works with a difference-based perspective, taking the FD-AN difference as dependent variable. In the following we change perspectives to work with individual effort in FD and AN, based on a panel perspective that takes into account ego's AN and FD decisions.

Our main specification for the analysis of social proximity under this perspective is a linear fixed effects regression:

$$\begin{aligned} y_{ij} = \beta_0 + \beta_1 \text{ LEC} \times \text{FD} + \beta_2 \text{ HEC} \times \text{FD} + \beta_3 \text{ LEC} \times \text{FD} \times P_{ij} \\ + \beta_4 \text{ HEC} \times \text{FD} \times P_{ij} + \beta_5 \text{ X}_i \times \text{FD} + \beta_6 \text{ X}_j + \mu_i + \varepsilon_{ij} \end{aligned} \tag{5}$$

where y_{ij} is i's effort when matched with j. AN is the reference category. LEC×FD denotes the treatment effect relative to AN for the LEC treatment, and HEC×FD denotes the treatment effect relative to AN for the HEC treatment. The coefficients LEC×FD×P_{ij} and HEC×FD×P_{ij} show the additional effect on y_{ij} that is induced by i and j's social proximity. P_{ij} can stand for 'Tie' and/or 'Common'. As before, X_j stands for alter's characteristics, including education, age, wealth, gender, risk aversion, trust, and agreeableness. X_i stands for ego's characteristics, which are interacted with FD. μ_i denotes ego fixed effects. These are included to account for ego taking decisions in AN and FD. ε_{ij} captures any remaining idiosyncratic error. Clustered standard errors are used to adjust for potential dependencies at the village level. A bootstrap with 2000 repetitions is performed.

Table A.17 displays results based on this specification. In Model (2), P_{ij} represents a direct friendship tie between i and j. P_{ij} is denoted as 'Tie'. In Model (3), we consider the effect of having common friends. P_{ij} then is denoted by 'Common'. 'Tie' and 'Common' are dummy variables that can take values 0 or 1. In Model (4), we combine Tie and Common. We omit Model (5) of the main analysis as this would require four-way interactions. Results are largely in line with the analysis in the main text. A positive effect of HEC×FD×Tie mirrors the positive effect of having a tie in HEC in the main analysis. Additionally, Common has a positive effect in Table A.17, which is lost when looking at the difference approach used in the main text. The difference approach has, however, two important advantages. First, ego controls can be included in a more straightforward way. Under a panel perspective, only an interaction with FD can be included due to the ego fixed effects. Second, the difference approach allows for analyzing the interaction of Tie and Common as considered in Model (5) of the main analysis. We judge these advantages as crucial to our analysis.

Table A.17: *Effort and Social Proximity (Panel)*

	(1)	(2)	(3)	(4)
LEC × FD	-0.658*	-0.570	-0.617*	-0.501
	(0.362)	(0.368)	(0.357)	(0.353)
HEC × FD	-0.517	-0.560	-0.567*	-0.507
	(0.354)	(0.349)	(0.335)	(0.340)
LEC × FD × Tie		-0.203*		-0.306***
		(0.109)		(0.061)
HEC × FD × Tie		0.179**		0.186**
		(0.078)		(0.085)
LEC × FD × Common			0.043	0.074*
			(0.037)	(0.038)
HEC × FD × Common			0.073**	0.061*
			(0.035)	(0.036)
Educ alter	0.006	0.006	0.009	0.008
	(0.010)	(0.010)	(0.010)	(0.010)
Age alter	0.005	0.004	0.005*	0.005*
	(0.003)	(0.003)	(0.003)	(0.003)
Wealth alter	-0.002	-0.003	-0.004	-0.006
	(0.014)	(0.015)	(0.014)	(0.014)
Gender alter	0.036	0.018	0.020	-0.003
	(0.083)	(0.081)	(0.080)	(0.081)
Risk alter	-0.035	-0.032	-0.039	-0.038
	(0.032)	(0.032)	(0.034)	(0.033)
Trust alter	-0.003	-0.002	-0.006	-0.006
	(0.026)	(0.026)	(0.027)	(0.027)
Agree alter	0.014	0.017	0.013	0.016
	(0.016)	(0.016)	(0.016)	(0.016)
Degree alter	-0.004	-0.002	-0.019*	-0.019*
	(0.007)	(0.008)	(0.010)	(0.011)
Educ ego	0.042*	0.044*	0.047**	0.045*
	(0.025)	(0.025)	(0.024)	(0.024)
Age ego	0.003	0.002	0.003	0.002
	(0.005)	(0.005)	(0.006)	(0.006)
Wealth ego	-0.012	-0.012	-0.017	-0.016
	(0.027)	(0.027)	(0.026)	(0.025)
Gender ego	0.079	0.063	0.073	0.048
	(0.137)	(0.141)	(0.134)	(0.136)
Risk ego	0.084	0.082	0.083	0.074
	(0.064)	(0.064)	(0.063)	(0.064)
Trust ego	-0.013	-0.015	-0.008	-0.012
	(0.052)	(0.051)	(0.051)	(0.051)
Agree ego	-0.041	-0.036	-0.042	-0.037
	(0.029)	(0.028)	(0.028)	(0.027)
Degree ego	0.019	0.020	-0.007	-0.008
	(0.015)	(0.015)	(0.013)	(0.014)
Constant	3.156***	3.165***	3.232***	3.251***
	(0.235)	(0.249)	(0.248)	(0.258)
R^2	0.060	0.073	0.073	0.091

Notes: N = 590. OLS regressions with ego's effort as dependent variable. Individual fixed effects used. ***, **, * indicate two-sided significance levels at 1, 5, and 10%, respectively; robust standard errors (in parentheses) to control for non-independencies within villages. Models with controls include education, age, wealth, gender, risk aversion, agreeableness, and trust of ego and alter. Ego controls are interacted with FD. AND-ties used.

B. Experimental instructions

[When people enter the meeting room, they are asked for their name. We have a list of invited candidates. Their name is marked and they are given a sticker with an identity number, which we ask them to stick on their shirt. It is explained that this identity number is unique and allows us to identify them during the experiment while treating their decisions confidentially. This is important, as they are able to earn real money in the exercise. They are asked to take a seat in the meeting room in order of their ID and keeping sufficient distance among them. Explain them that it is best to go to the toilet before the start of the session, as leaving the venue during the session might be disturbing. Further instructions are given once sufficient people have shown up.]

FORMAL INTRODUCTION

Welcome. Thank you for taking the time to come today. [Introduce Experimenters and Assistants]. We are working for the University of East Anglia. Later, you can ask any of us questions during today's programme. For this raise your hand so that we can come to you and answer your question in private. We have invited you here today because we want to learn about how people take decisions. With your decisions you can earn money. The money that results from your and others' decisions will be yours to keep.

What kind of decisions we ask you to make will be explained fully in a few minutes. Before that we want to clarify a couple of things. First, the money you can earn is not our money. We belong to a university and this money has been given to us for research. Second, your participation is voluntary. You can still choose not to participate in today's programme. Third, this research is about your private decisions. Therefore you cannot talk with others. This is very important. I'm afraid that if we find you talking with other participants, we will have to send you home, and you will not be able to earn any money here today. But if you have questions, you can of course ask one of us. We also ask you to switch off your mobile phones.

Make sure that you listen carefully to us. You have the chance to make a good amount of money here today, and it is important that you follow our instructions. During today's programme, you will be asked to make 8 decisions in total. These decisions are divided in 2 parts and you will only be paid if you make all decisions in both parts. Only one decision will be selected for payment. Which decision this is will be decided randomly at the end of the experiment. For this, one volunteer will draw a slip of paper from a bag with his/her eyes closed. This slip of paper states a number that refers to the selected decision. The selected decision determines your final payment. As each of your decisions has an equal chance to be selected it is important that you take each single decision very seriously. Any money you earn will be paid out to you privately and confidentially after all parts of today's programme have been completed.

Before we explain to you what you need to do precisely, it is important to bear one more thing in mind. You will be asked to take decisions that are not a matter of getting it right or wrong; they are about what you prefer. However, it is important to think seriously about your decisions because they will affect how much money you can take home.

THE GAME

Low Effort Costs

[Stick poster on the wall that shows both activities and the money they could earn with each.] You will be paired with one other person in this room. Both of you will be asked to make a decision. Your decision as well as the decision of the other person will determine how much you can earn. These earnings depend on your own decision and the decision of the other person.

Your earnings will be determined in the following way. Each of you has 4 days at your disposal. You have to decide how many days you want to work at home, and how many days you want to work on a project. We assume that the days that you don't work at home, you will work for the project. So, if you decide to work 2 days at home, you will spend 2 days on the project. If you decide to work 1 day at home, you will work 3 days for the project, etc. [Show on the poster with both activities and the money they could earn]

For each day that you work at home you gain 500 UGX for sure. If you decided to work 2 days at home you would get 1000 UGX, if you worked 3 days you would get 1500 UGX from working at home.

The income you get from the project is calculated in the following way. For each day you decide to work on the project you gain 2,000 UGX, but only if the other person decides to work for at least as many days on the project as you do. For any day you work more on the project than the other person you will earn 0. [Emphasize the underlined] In other words, the amount of income from the project is determined by the person who spends least days on the project, as both of you are needed to get income out of the project. For example, if you worked 2 days for the project and the other person worked 2 days for the project, you would earn 4000 UGX from the project and the other would also earn 4000 UGX from the project.

For example, if you worked 3 days for the project and the other person worked 2 days for the project, you would again earn 4000 UGX from the project, and the other would also earn 4000 UGX from the project.

Let me check whether you understood [Ask the following questions in public]

- How much income would you earn from the project if you worked 3 days for the project and the other person worked 3 days for the project? (6000 UGX). How much would the other earn from the project? (6000 UGX)
- How much income would you earn from the project if you worked 2 days and the other person worked 3 days? (4000 UGX). How much would the other earn? (4000 UGX)

To calculate your total income you need to add the income from your own activities at home and the income obtained from the project.

Spending a day at home gives you a certain income of 500 UGX, which you would forego if you decided to spend that day on the project. This income will be foregone independently of whether your partner works on the project. However, spending this day on the project may generate an income of 2000 UGX, but only if the other also spends at least as many days on the project.

For example, if you worked 2 days on the project (and 2 days at home) and the other person worked 2 days for the project (and 2 days at home), you would get 5000 UGX, and the other would get 5000 UGX as well.

If you worked 3 days on the project (and 1 day at home) and the other person worked 2 days for the project (and 2 days at home) you would only get 4500 UGX, while the other would still get 5000 UGX.

Let me check whether you understood how to calculate your total income [ask the following questions in public and explain how we got to the answers.]

- What would be your final income if you worked 3 days on the project (and 1 day at home) and the other person worked 3 days for the project (and 1 day at home)? (6500 UGX). How much would the other person get? (6500 UGX).
- What would be your final income if you worked 2 days on the project (and 2 days at home) and the other person worked 3 days for the project (and 1 day at home)? (5000 UGX). How much would the other person get? (4500 UGX).

[Stick poster of pay-off table on the wall, and give the participants an individual copy of it] To help you better understand how much income you and the other would get for the different decisions we use a table. The table shows your total income, which is the income you get from working at home and the income you get from the project. It is very important that you understand this table very well.

It is important to remember that at the time you take your decision you do not know the decision of the person you are paired with. Similarly, the other person does not know your decision, when taking his/her own decision. You can of course have beliefs about how many days the other will spend on the project and how many days he will spend at home.

As your income depends on the decision of the other person, you will have to go to the column that corresponds to the other's decision. You don't know the other's decision, but imagine the other decides to work 0 days on the project. In that case, you will have to go to the column that starts with 0. To find your income for a certain decision you make, you need to find the row that corresponds to your own decision.

Imagine you decide to spend 0 day on the project. In that case you need to use the row that starts with number 0. You will find your income in the cell at the intersection of column 0 (that corresponds to the decision of the other) and row 0 (that corresponds to your decision). In this example, your income will be 2000 UGX (first amount in the cell) and the income of the other will be 2000 UGX (second amount in the cell). [Explain the other examples on the diagonal: 1/1, 2/2, 3/3, 4/4]

[After this also explain the examples 1/0 and 0/1; 1/3 and 3/1; 2/4 and 4/2]

[Ask the following questions in public and ask the participants to respond. Show for each question how they can find the correct answer in the table.]

1. Imagine that you believe the other person will work 2 days for the project (and 2 days at home). How much would you earn if you worked 2 days for the project as well? (5000 UGX). How much would the other earn? (5000 UGX)
2. Imagine that you believe the other person will work for 2 days for the project (and 2 days at home). How much would you earn if you worked 1 day for the project? (3500 UGX). How much would the other earn? (3000 UGX)

3. Imagine that you believe the other person will work for 2 days for the project (and 2 days at home). How much would you earn if you worked 3 days for the project? (4500 UGX). How much would the other earn? (5000 UGX)

4. Imagine that you believe the other person will work 3 days for the project. How much would you earn if you worked 3 days for the project as well? (6500 UGX) How much would the other earn? (6500 UGX)

5. Imagine that you believe the other person will work 3 days for the project. How much would you earn if you worked 4 days for the project? (6000 UGX). How much would the other earn? (6500 UGX)

6. Imagine that you believe the other person will work 3 days for the project. How much would you earn if you worked 2 days for the project? (5000 UGX). How much would the other earn? (4500 UGX)

As you can see in the table you will get a higher income if you both spent more days on the project. If you both spend 3 days on the project you will get more (6500 UGX) than when you both spend 2 days on the project (5000 UGX), or than when you both spend 1 day on the project (3500 UGX). However, you don't get more income when you spend more days on the project than the other person. If you increase your days on the project from 2 days to 3 days but the other keeps on spending 2 days on the project your final income will actually decrease from 5000 UGX to 4500 UGX. [Stick poster of decision card to the wall and distribute empty decision card]

To make decisions, we will proceed in the following way. First, we will ask you to specify on the decision card what you believe the other would decide, that is the number of days he would work for the project. [Use the poster to explain how to use the decision card] After this, you will be asked to mark your decision on your decision card, that is the number of days you want to work on the project. [Use the poster to explain how to use the decision card]

Remember that by deciding the number of days one works for the project one also determines the number of days one works at home. [We start a role-play to clarify the pairing and how the decision card is used. Two experimenters have a decision card.]

You will make several decisions in which you will be paired with different persons in this room. At the end of today's programme we select one pair for your payment and you will get to know the identity of the other person in the selected pair and the other person in this pair will get to know your identity. However, at the moment when you will be asked to make a decision, you won't always know the identity of the person you are paired with.

In some pairs you won't know the identity of the other person, and neither will the other person know your identity. In this case the two boxes under "YOU" and "Other person" will be empty. The other person could be from the same village where you live or from another village. This will be indicated on the decision card. [Show on the poster of the investment decision card where it will be indicated whether 'same/different village'].

In other pairs, both you and the other person will know the identity of each other. In that case, you will find the name and photograph of the person you are paired with on your decision card. The person you are paired with will also find your name and photograph on his/her decision card. [Show on the poster of the decision card where they can find the names and photographs of both persons]

In other words, if you get to see a photograph and name in the box under "Other person", you get to know the identity of the person you are paired with. If you see your photograph on your decision card, the other will know your identity and name. If your photograph/name does not appear on your decision card, the other won't know your identity.

For each of the pairs you are involved in you will receive a new decision card. You may make the same decision or you may make a different decision.

High Effort Costs

[Stick poster on the wall that shows both activities and the money they could earn with each.] You will be paired with one other person in this room. Both of you will be asked to make a decision. Your decision as well as the decision of the other person will determine how much you can earn. These earnings depend on your own decision and the decision of the other person.

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For each day that you work at home you gain 1500 UGX for sure. If you decided to work 2 days at home you would get 3000 UGX, if you worked 3 days you would get 4500 UGX from working at home.

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For example, if you worked 2 days for the project and the other person worked 2 days for the project, you would earn 4000 UGX from the project and the other would also earn 4000 UGX from the project.

For example, if you worked 3 days for the project and the other person worked 2 days for the project, you would again earn 4000 UGX from the project, and the other would also earn 4000 UGX from the project.

Let me check whether you understood [Ask the following questions in public]

- How much income would you earn from the project if you worked 3 days for the project and the other person worked 3 days for the project? (6000 UGX). How much would the other earn from the project? (6000 UGX)
- How much income would you earn from the project if you worked 2 days and the other person worked 3 days? (4000 UGX). How much would the other earn? (4000 UGX)

To calculate your total income you need to add the income from your own activities at home and the income obtained from the project.

Spending a day at home gives you a certain income of 1500 UGX, which you would forego if you decided to spend that day on the project. This income will be foregone independently of whether your partner works on the project. However, spending this day on the project may generate an income of 2000 UGX, but only if the other also spends at least as many days on the project.

For example, if you worked 2 days on the project (and 2 days at home) and the other person worked 2 days for the project (and 2 days at home), you would get 7000 UGX, and the other would get 7000 UGX as well.

If you worked 3 days on the project (and 1 day at home) and the other person worked 2 days for the project (and 2 days at home) you would only get 5500 UGX, while the other would still get 7000 UGX.

Let me check whether you understood how to calculate your total income [ask the following questions in public and explain how we got to the answers.]

- What would be your final income if you worked 3 days on the project (and 1 day at home) and the other person worked 3 days for the project (and 1 day at home)? (7500 UGX). How much would the other person get? (7500 UGX).
- What would be your final income if you worked 2 days on the project (and 2 days at home) and the other person worked 3 days for the project (and 1 day at home)? (7000 UGX). How much would the other person get? (5500 UGX).

[Stick poster of pay-off table on the wall, and give the participants an individual copy of it] To help you better understand how much income you and the other would get for the different decisions we use a table. The table shows your total income, which is the income you get from working at home and the income you get from the project. It is very important that you understand this table very well.

It is important to remember that at the time you take your decision you do not know the decision of the person you are paired with. Similarly, the other person does not know your decision, when taking his/her own decision. You can of course have beliefs about how many days the other will spend on the project and how many days he will spend at home.

As your income depends on the decision of the other person, you will have to go to the column that corresponds to the other's decision. You don't know the other's decision, but imagine the other decides to work 0 days on the project. In that case, you will have to go to the column that starts with 0. To find your income for a certain decision you make, you need to find the row that corresponds to your own decision.

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[After this also explain the examples 1/0 and 0/1; 1/3 and 3/1; 2/4 and 4/2]

[Ask the following questions in public and ask the participants to respond. Show for each question how they can find the correct answer in the table.]

1. Imagine that you believe the other person will work 2 days for the project (and 2 days at home). How much would you earn if you worked 2 days for the project as well? (7000 UGX). How much would the other earn? (7000 UGX)

2. Imagine that you believe the other person will work for 2 days for the project (and 2 days at home). How much would you earn if you worked 1 day for the project? (6500 UGX). How much would the other earn? (5000 UGX)

3. Imagine that you believe the other person will work for 2 days for the project (and 2 days at home). How much would you earn if you worked 3 days for the project? (5500 UGX). How much would the other earn? (7000 UGX)

4. Imagine that you believe the other person will work 3 days for the project. How much would you earn if you worked 3 days for the project as well? (7500 UGX) How much would the other earn? (7500 UGX)

5. Imagine that you believe the other person will work 3 days for the project. How much would you earn if you worked 4 days for the project? (6000 UGX). How much would the other earn? (7500 UGX)

6. Imagine that you believe the other person will work 3 days for the project. How much would you earn if you worked 2 days for the project? (7000 UGX). How much would the other earn? (5500 UGX)

As you can see in the table you will get a higher income if you both spent more days on the project. If you both spend 3 days on the project you will get more (7500 UGX) than when you both spend 2 days on the project (7000 UGX), or than when you both spend 1 day on the project (6500 UGX). However, you don't get more income when you spend more days on the project than the other person. If you increase your days on the project from 2 days to 3 days but the other keeps on spending 2 days on the project your final income will actually decrease from 7000 UGX to 5500 UGX. [Stick poster of decision card to the wall and distribute empty decision card]

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For each of the pairs you are involved in you will receive a new decision card. You may make the same decision or you may make a different decision.

CONTROL QUESTIONS

Low Effort Costs

We will now ask some questions to see whether you understood the instructions. [The experimenters call each participant one by one. First, they explain the different options again. Then, they ask the following two questions making reference to the decision cards that they carry with them.]

1. What would be your total income if the other worked 2 days for the project and you worked 2 days for the project? (5000 UGX). How much would the other person get? (5000 UGX).

2. What would be your total income if the other worked 1 day for the project and you worked 3 days for the project? (2500 UGX). How much would the other person get? (3500 UGX).

3. What would be your total income if the other worked 4 days for the project and you worked 2 days for the project? (5000 UGX). How much would the other person get? (4000 UGX).

4. What would be your total income if the other worked 3 days for the project and you worked 2 days for the project? (5000 UGX). How much would the other person get? (4500 UGX).

[For each of the questions, record on the control question card whether they answered it correctly. If the participant gave a wrong answer for at least one of the questions, ask him/her to have a careful look at it once more and ask what was not clear. Answer their questions as clearly and accurately as possible. If necessary, clarify the instructions; but not more than once. Write down additional comments if you think the participants did not get enough understanding. Retain their decision cards.]

High Effort Costs

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1. What would be your total income if the other worked 2 days for the project and you worked 2 days for the project? (7000 UGX). How much would the other person get? (7000 UGX).
2. What would be your total income if the other worked 1 day for the project and you worked 3 days for the project? (3500 UGX). How much would the other person get? (6500 UGX).
3. What would be your total income if the other worked 4 days for the project and you worked 2 days for the project? (7000 UGX). How much would the other person get? (4000 UGX).
4. What would be your total income if the other worked 3 days for the project and you worked 2 days for the project? (7000 UGX). How much would the other person get? (5500 UGX).

[For each of the questions, record on the control question card whether they answered it correctly. If the participant gave a wrong answer for at least one of the questions, ask him/her to have a careful look at it once more and ask what was not clear. Answer their questions as clearly and accurately as possible. If necessary, clarify the instructions; but not more than once. Write down additional comments if you think the participants did not get enough understanding. Retain their decision cards.]

DECISIONS

[Give each participant a pen.] If you have no further questions, we will now begin. Remember, there are no wrong decisions, so you should choose the option as you prefer.

We emphasize that it is important that you make your decision in private. Do not show your decision card to the other participants. If you need assistance, please raise your hand so that one of us can come to assist you. Once you have made your decision, please fold the decision card and raise your hand so that we can come by to collect your decision card.

[The participants remain seated. We give decision card with 'pair no 1' to the participants. Clarify publicly the treatment (same/different village, anonymous/non-anonymous). After the participants have made their decision, they fold their decision card. When collecting the decision cards we check whether their answer is readable and consistent. Add comments if the participant was struggling (e.g. if he/she was helped with filling in the decision card). After all cards have been returned, we give them the decision card for pair no 2. Explain that it is a new pair and clarify publicly important elements such as the name/photograph of the involved participants (if relevant) including whose identity is known to whom, and whether they belong to the same village. Follow the same procedure for the other pairs. Make sure that distribution cards are distributed in the correct order 1 – 4.]

[When all participants have made their 4 decisions, the experiment is complete. Control that all decision cards have been returned. Collect pay-off table cards and remove poster]

B.1. Coordination and altruism

For the MEG game, Monderer and Shapley (1996) propose an equilibrium refinement based on the concept of potential functions. The set of all strategy profiles that maximize the potential function of the MEG is a subset of the full set of Nash equilibria. If $a > 2c$, the potential function is maximized at the strategy profile satisfying $e_i^* = e_j^* = e_{max}$. On the other hand, if $a < 2c$, the potential function is maximized at the strategy profile satisfying $e_i^* = e_j^* = e_{min}$. If $a = 2c$, any equilibrium profile maximizes the potential. This implies that the Pareto-optimal choice of effort levels is part of the refined set of equilibria whenever $a \geq 2c$. Put differently, given a benefit parameter a, there is a threshold cost $\tilde{c} = \frac{1}{2}a$ up to which the Pareto-efficient outcome is attainable.

Chen and Chen (2011) show that higher altruism means that the Pareto-optimal equilibrium can be reached for a larger set of underlying cost (and benefit) parameters. To demonstrate this, they assume that a player (ego) maximizes a weighted sum of their own and the other's (alter's) payoff, where weighting depends on how close ego (i) feels to the other player, that is, on their social proximity. The closer she feels to the other player (j), the more weight she assigns to this player's payoff. More formally, ego's utility function can be expressed as a convex combination of their own and the other's payoff, given by

$$u_i(e) = \alpha_i \times \Pi_j(e) + (1 - \alpha_i) \times \Pi_i(e) \qquad (i \neq j) \tag{6}$$

where $\Pi_i(e)$ and $\Pi_j(e)$ stand for the players' individual payoffs as defined in expression 1, depending on the vector of effort choices $e = (e_i, e_j)$. The constant $\alpha_i \in [0,1]$ reflects the weight that ego assigns to the other's payoff. It reflects the strength of their other-regarding preferences as given by the two players' social proximity. If $\alpha_i = 0$, all weight is on ego's own payoff, that is, $u_i(e) = \Pi_i$. The higher α_i, the more weight is assigned to alter's payoff.

Under the assumption of interdependent utility as in expression 6, Chen and Chen (2011) show that, for a given benefit parameter, the threshold cost, up to which the strategy profile pertaining to the Pareto-optimal outcome maximizes the potential function of the game, increases with an increase in the other-regarding parameter α.[17] Hence, higher social proximity means that the Pareto-optimal equilibrium can be reached for a larger set of underlying cost (and benefit) parameters.

Building on this result, and following Anderson et al. (2001) in using a logit equilibrium approach, Chen and Chen (2011) further show that an increase in α should result in higher effort levels. Specifically, they state that "increases in the [...] social preference parameter, α, result in higher equilibrium effort (in the sense of first-order stochastic dominance)" (Proposition 4 of Chen and Chen, 2011). That is, higher social proximity between two individuals should increase their effort exertion.

[17] In particular, it can be expressed as $\tilde{\tilde{c}} = \frac{1}{2-(\alpha_i+\alpha_j)}a$. If α_i or α_j increase, $\tilde{\tilde{c}}$ also increases. If $\alpha_i = 0$ and $\alpha_j = 0$ it holds that $\tilde{\tilde{c}} = \tilde{c}$

Figure B.1: Decision Card in FD

ID no		**YOU**	**Other person**
Pair no	**SAME** village	 [redacted]	 [redacted]
Session no			

Expected decision of the other: ________________

Your decision: __________