Insurance and Solidarity*

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Abstract

People often exhibit strong solidarity with their peers and transfer money when others are in need. We investigate whether or not such solidarity is conditional on the insurance uptake of the needy. We conduct a lab-in-the field experiment in Cambodia. Half of the subjects, called the recipients, face the risk to lose a large proportion of their endowment. We vary whether or not recipients can purchase an insurance before the loss is determined and whether or not they are aware that someone else, called the providers, might transfer money to them. We find a significant reduction in solidarity when the recipients can be held accountable for not avoiding their loss: providers transfer 28% less when the recipients forewent the insurance. This response is unaffected by the awareness among recipients about the potential transfer from the providers. Our findings point to a subtle form of crowding out that is of great concern, especially for low-income countries where insurance markets are rapidly evolving: solidarity can potentially be crowded out by the mere existence of insurance.

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1 Introduction

In low-income countries where credit and insurance markets as well as social safety nets are widely lacking, people often support others when those are in need. Relatives, neighbors, friends and sometimes even strangers provide monetary and in-kind transfers, shelter and labor assistance (Ligon, Thomas, and Worrall 2002; Fafchamps and Lund 2003; De Weerdt and Dercon 2006; De Weerdt and Fafchamps 2011). Such support has been shown to be motivated by innate social preferences and by economic incentives, often by a combination of both (Ligon and Schechter 2012; Binzel and Fehr 2013). When support is driven by social preferences, the provider is concerned about the welfare of the person in need. When support is motivated by economic incentives, the provider responds to a system of rewards and punishments (Ligon and Schechter 2012); for example she reciprocates past transfers or she provides support in order to avoid social sanctions.

Over the last years, the governments of low-income countries, the private sector and the donor community have made considerable efforts to expand formal insurance into previously unattended markets (Churchill and McCord 2012). A growing literature deals with the consequences for informal support when formal insurance is introduced. The main objective of this literature is to determine the extent of crowding out: If formal insurance crowds out informal support and delivers only incomplete risk coverage (for example, because not everybody gets insured, formal insurance does not fully compensate losses, or not all risks are insurable), formal insurance may not necessarily improve the welfare of people. The evidence collected so far points to significant crowding out being possible (Attanasio and Rios-Rull 2000; Landmann, Vollan, and Frölich 2012; Boucher and Delpierre 2014; Lin, Liu, and Meng 2014; Klohn and Strupat 2015). These studies generally argue that the introduction of formal insurance changes the economic incentives to provide informal support; they implicitly assume that social preferences are unaffected. With the present study we challenge this assumption.

In this paper, we focus explicitly on the effect of formal insurance on support motivated by social preferences, called solidarity transfers henceforth. We are concerned with crowding out that may take its toll when people cannot or do not want to buy insurance. We investigate whether solidarity transfers are reduced when the individual in need could have avoided her loss by purchasing insurance. We also analyze how this reduction in solidarity transfers is affected by whether or not the individual in need was aware of the possibility to receive transfers by someone else when making her insurance choice. We address these two research questions with the help of a lab-in-the-field experiment conducted in Cambodia, a low-income country in Southeast Asia.

With regard to our first research question, there is considerable evidence from behavioral economics suggesting that people condition their solidarity transfers to another person on this person's prior choices.[1] In particular, people are found to reduce their solidarity when the other person could have avoided her neediness - by participating in the labour market (Fong 2007), by choosing a safe amount over a risky lottery (Trhal and Radermacher 2009; Cappelen et al. 2013), by choosing a lottery that is less risky than another (Bolle and Costard 2015), or by purchasing insurance (Mollerstrom, Reme, and Sørensen 2015).[2] Given that all these studies were conducted with students in university labs of high-income countries, it is unclear whether the choice conditional solidarity determined among

[1] There is also substantial survey-based evidence along these lines. By linking beliefs about the sources of inequality to preferences for governmental redistribution, it was shown that individuals who perceive inequality to be the result of luck rather than of effort or of deliberate choice are most supportive of redistribution (Fong 2001; Corneo and Grüner 2002; Alesina and Angeletos 2005).

[2] The study by Mollerstrom, Reme, and Sørensen (2015) differs greatly from the present study. The authors implement games in which they ask third-party spectators to equalize incomes between two subjects. The income inequality is either the result of brute bad luck or of bad luck that could have been avoided by purchasing insurance.

students also holds for populations of low-income countries. We thus conduct our experiment with villagers in Cambodia. Different from the previous studies, our experiment is played with high stakes. The average payout amounts to more than twice the average per capita income in rural Cambodia.

Our second research question is based on recent studies which show that, under certain circumstances, individuals deliberately do not take up formal insurance and instead free-ride on the support of their peers (De Janvry, Dequiedt, and Sadoulet 2014; Janssens and Kramer 2016). We analyze how the peers react to such free-riding. We argue that if individuals know that solidarity transfers may be forthcoming, the foregoing of insurance can be interpreted by peers as free-riding on their solidarity. If, in contrast, individuals do not know about potential solidarity transfers, such an interpretation is implausible. We thus expect that people respond to an informed decision against insurance with a stronger withdrawal of solidarity, making crowding out more extensive. Previous studies on choice conditional solidarity do not allow for disentangling such an information effect. In these studies, all subjects were either informed (Trhal and Radermacher 2009; Cappelen et al. 2013; Bolle and Costard 2015) or uninformed (Fong 2007; Mollerstrom, Reme, and Sørensen 2015) about the later redistribution before they made their choices.

We designed a novel game, the transfer game, that borrows both from the dictator game and the solidarity game. Players are randomly assigned the role of provider or recipient. Each provider is anonymously matched with one recipient. Both receive the same endowment. The recipient can lose a large proportion of her endowment due to a random idiosyncratic shock. The provider is asked how much of her endowment she would transfer in case the recipient lost. Transfers are only enacted if the recipient experienced the shock. The transfer game is a one-shot game, in which transfers should not be driven by economic incentives. We vary whether or not the recipient has the option to purchase an insurance which avoids the loss from the shock and whether or not the recipient is informed about the potential transfer from the provider. In a first step, we investigate the prevalence of *choice conditional solidarity*; i.e., to what extent does the provider reduce her transfers when the recipient could have avoided her loss by purchasing insurance. In a second step, we analyze the *information effect*; i.e., does the provider react differently to the insurance option depending on whether or not the recipient is aware of the provider's potential transfer.

In our experiment, providers transfer, on average, 13% of their endowment to recipients who lost most of their endowed money and had no option to insure. We find a significant reduction in transfers when the recipients can be held accountable for the evolution of their neediness: providers reduce their transfers by 28%, on average, when recipients forewent the option to insure. This result confirms the choice conditionality in solidarity found in previous studies; in fact, the proportion of individuals who condition their solidarity on the peers' choices is similar among our Cambodian villagers and the student populations of these studies. To our surprise, providers equally reduce their transfers towards recipients who were informed about the potential transfer from the providers and towards recipients who were not informed. Hence, the extent of crowding out of solidarity does not appear to depend on the level of information available to the individuals in need. In other words, free-riding is not sanctioned; in fact, foregoing insurance may not be perceived as free-riding.

We conducted the experiment in Cambodia as the context of this country proved to be of particular relevance for our research question. Formal insurance is not well established (UNDP 2013). According to information from the Microinsurance Network (2016), only 300,000 out of a population of 15 million are covered with some form of insurance. Informal support arrangements therefore play a major role in coping with the consequences of shocks and misfortunes. Villages are characterized by strong

reciprocal relationships and solidarity between the households (Kim 2011). Villagers support each other in farming, building houses, lending money and rice, caring for the sick, and in several other ways (Crochet 2011). In recent years, the Cambodian government, international donors, private insurance companies and non-governmental organizations (NGOs) have started to establish different forms of social and private insurance. Efforts are most widely developed in the area of health insurance. In 2005, a French NGO initiated the first health insurance for rural Cambodians (SHPA 2013). Local NGOs and international donors have been promoting health insurance since then; yet, coverage is far from complete. Health insurance is currently offered in less than half of the 24 provinces, covering between 5 and 40 percent of the target group per province. Several NGOs plan to expand the supply of health insurance into the still unattended provinces. Also, supply of life insurance, accident insurance and crop insurance is rapidly evolving (UNDP 2013).

The remainder of this paper is structured as follows. In Section 2, we introduce the transfer game and present the experimental design. We derive two hypotheses. First, people condition their solidarity on the choices of their peers (Hypothesis 1). And second, people condition their response to the choices of the peers on the level of information that the peers have about the support they may receive (Hypothesis 2). In Section 3, we introduce the data that we use in our empirical analysis. The results are presented in Section 4. We test Hypothesis 1 and Hypothesis 2, separately. We first present average treatment effects and then turn to the heterogeneity in the treatment effects. Lastly, we address a number of potential limitations of our study, such as the external validity, the plausibility of the assumed preferences, and the strategic game design. Section 5 discusses our findings and concludes.

2 Conceptual Framework and Experimental Design

2.1 The Transfer Game

We designed a game, which we call the transfer game, to investigate the extent to which people condition their solidarity on the choices of others. The transfer game is a one-shot game. There are two player types, type A and type B, with income x_A and x_B, respectively. The players have the same initial income, i.e. $x_A^e = x_B^e$. However, B faces the possibility of an income shock that occurs with probability π; with $0 < \pi < 1$. If a shock occurs B's income is reduced to x_B^s, with $x_B^s < x_B^e$. A does not face the possibility of an income shock. In case B experiences a shock, A can decide to transfer part of her income, t_A, to B (with $0 \leqslant t_A \leqslant x_A^e$).

In the transfer game, treatments vary in two dimensions:

1. Information of B

   B is uninformed about A [$I = 0$]
   B is informed only about her role in the game. She is not informed about the existence of another player A who might transfer to B in case of an income shock.

   B is informed about A [$I = 1$]
   At the beginning of the game, B is informed about the existence of A. She is also informed that A has the possibility to transfer to B in case B experiences an income shock.

2. Option of insurance

B has no insurance option [$O = 0$]
B has no option to avoid the potential loss. Her income is x_B^s in case the shock occurs and x_B^e in case no shock occurs.

B has an insurance option [$O = 1$]
Before the shock is determined, B has the option to purchase insurance which covers the loss resulting from the income shock. The price of the insurance is p with $p \leq \pi \cdot (x_B^e - x_B^s)$; i.e. the insurance is not more expensive than the actuarially fair price. If B purchases the insurance, her income is $x_B^e - p$ independent of whether a shock occurs or not. If B does not purchase the insurance, her income is x_B^e in case no shock occurs and x_B^s in case the shock occurs.

Note that A always has full information and that a transfer from A to B can only take place if B's income is reduced to x_B^s.

We assume that when making her transfer decision A is motivated by her own income as well as the desire to behave in line with her solidarity norm. We specify A's utility as follows:[3]

$$U_A(\cdot) = v(x_A - t_A) - f(\phi_A - t_A) \tag{1}$$

$v(\cdot)$ is A's utility from her material payoff after the transfer, with $v'(\cdot) > 0$ and $v''(\cdot) < 0$. ϕ_A describes A's solidarity norm; it depends on the income allocation, (x_A, x_B), and the context under which this income allocation was achieved, C. Specifically, $\phi_A = \phi_A(x_A, x_B|C)$ specifies the amount that A perceives to be the adequate transfer to B, given the income allocation (x_A, x_B) and the context C. The context captures the information and insurance treatments of the transfer game. $f(\cdot)$ describes the cost that A incurs when her transfer t_A deviates from the level of solidarity she perceives as adequate. Following the literature (Cappelen et al. 2007; Konow 2010), we assume $f'(\phi_A - t_A) \cdot (\phi_A - t_A) > 0$ for $\phi_A \neq t_A$, and $f''(\cdot) > 0$. A maximizes her utility with respect to t_A. With the assumed utility specification in equation (1), A's solidarity norm has a direct impact on her optimal transfer decision, as $0 < \frac{dt_A^*}{d\phi}|_{x_A=cons.} < 1$ (see Konow 2010).

Combining the information and the insurance treatments, there are four different states in which B's income is reduced to x_B^s and a transfer from A to B can take place. For each state, A has a corresponding solidarity norm. This solidarity norm can be affected both by personal and by solidarity norms. Note that the income allocation that initiates the transfer remains the same across states (i.e. (x_A^e, x_B^s)). It is only the context that varies. For simplicity, we thus use the following notation for the four corresponding solidarity norms: $\phi_A^{I=0,O=0}$, $\phi_A^{I=0,O=1}$, $\phi_A^{I=1,O=0}$ and $\phi_A^{I=1,O=1}$.[4]

Any differences in solidarity norms across the four states describe the extent to which A conditions her solidarity on the insurance option and on the information of B.

1. Choice Conditionality
   We assume that individuals differ in the extent to which they condition their solidarity on other individuals' choices (regardless of whether the choices were made informedly or not). We differentiate between the following solidarity types:

[3] We assume a specification of social preferences that is common in the literature, modeled as a trade off between self-interest and fairness norms (e.g. see Cappelen et al. 2007; Konow 2010; Cappelen et al. 2013).

[4] For example, $\phi_A^{I=0,O=0} = \phi_A(x_A^e, x_B^s|I = 0, O = 0)$ describes the transfer that A perceives as adequate if B is not informed and has no insurance option.

1i) Unconditional solidarity. A's level of solidarity is unconditional on whether or not B could have avoided her loss. Hence, the transfer that A perceives as adequate in case B's income is reduced to x_B^s is not affected by B's option to purchase insurance.

$$\begin{aligned} \phi_A^{I=0,O=0} &= \phi_A^{I=0,O=1} \qquad \textit{if } B \textit{ not informed} \\ \phi_A^{I=1,O=0} &= \phi_A^{I=1,O=1} \qquad \textit{if } B \textit{ informed} \end{aligned}$$

1ii) Choice conditional solidarity. A's level of solidarity is conditioned on B being able to avoid her loss. The transfer that A perceives as adequate in case B's income is reduced to x_B^s depends on whether B had the option to purchase insurance or not.

$$\begin{aligned} \phi_A^{I=0,O=0} &\neq \phi_A^{I=0,O=1} \qquad \textit{if } B \textit{ not informed} \\ \phi_A^{I=1,O=0} &\neq \phi_A^{I=1,O=1} \qquad \textit{if } B \textit{ informed} \end{aligned}$$

2. Choice Conditionality and Information
   Furthermore, we allow individuals' choice conditionality to depend on whether or not a choice was made informedly. We differentiate between the following types:

2i) The level of choice conditionality is independent of B's information about the transfer possibility. A does not respond differently to the choice of B when B made her choice informedly compared with when B made her choice uninformedly.

$$(\phi_A^{I=0,O=1} - \phi_A^{I=0,O=0}) = (\phi_A^{I=1,O=1} - \phi_A^{I=1,O=0})$$

2ii) The level of choice conditionality depends on B's information about the transfer possibility. A responds differently to the choice of B when B made her choice informedly compared with when B made her choice uninformedly.

$$(\phi_A^{I=0,O=1} - \phi_A^{I=0,O=0}) \neq (\phi_A^{I=1,O=1} - \phi_A^{I=1,O=0})$$

Given that the solidarity norm affects the optimal transfer ($0 < \frac{dt_A^*}{d\phi}|_{x_A=cons.} < 1$), the observed transfers from A to B provide an indication of the solidarity type of A. We can thus analyze the prevalence of the mentioned solidarity types by analyzing the differences in actual transfers t_A when the context of information and insurance option is varied. For this, our transfer game is played as depicted in Figure 1. Case 1 and Case 2 of the game differ in the level of information given to B. From now on, we distinguish between players who receive information about A and players who do not receive information about A by referring to them as $B1$ and $B2$ players (with information) and $C1$ and $C2$ players (without information), respectively. We also call these players recipients and the A players providers henceforth. Recipients $B2$ and $C2$ have the option to insure themselves against the income shock while recipients $B1$ and $C1$ do not have this option.

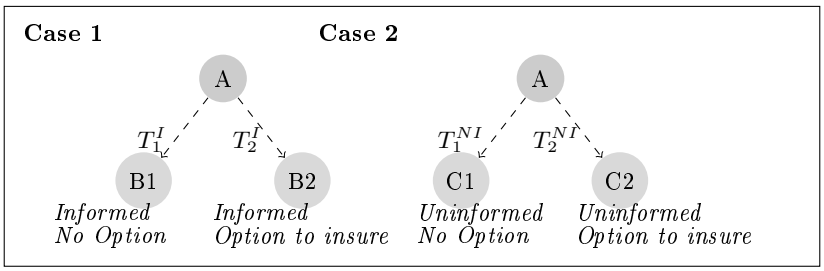

Figure 1: Varying the recipients' option to insure and level of information

In Case 1, the provider A is asked to make two strategic transfer decisions:

1. The amount she would transfer to recipient $B1$ in case this recipient experiences an income shock and is left with x_B^s $[T_1^I]$.
2. The amount she would transfer to recipient $B2$ in case this recipient experiences an income shock and is left with x_B^s $[T_2^I]$.

A is then randomly matched with either recipient $B1$ or recipient $B2$. If the matched recipient indeed experiences a shock, the respective transfer decision is implemented.

Respectively in Case 2, the provider A is asked to make the following strategic transfer decisions:

1. The amount she would transfer to recipient $C1$ in case this recipient experiences an income shock and is left with x_B^s $[T_1^{NI}]$.
2. The amount she would transfer to recipient $C2$ in case this recipient experiences an income shock and is left with x_B^s $[T_2^{NI}]$.

A is then randomly matched with either recipient $C1$ or recipient $C2$. If the matched recipient experiences a shock, the respective transfer decision is implemented.

Table 1 provides an overview of the four possible states. Each of the transfer decision is considered to be dependent on the providers' solidarity norm for a given state.

Table 1: Transfer Decisions of Provider A

		Recipient informed of provider	
		no	***yes***
Recipient had option to insure	***no***	T_1^{NI}	T_1^I
	yes	T_2^{NI}	T_2^I
Hypothesis 1		$T_2^{NI} - T_1^{NI} < 0$	$T_2^I - T_1^I < 0$
Hypothesis 2		$(T_2^{NI} - T_1^{NI}) > (T_2^I - T_1^I)$	

The difference between T_2^{NI} and T_1^{NI} is the change in transfers when an uninformed recipient could have avoided the loss by purchasing insurance. The difference between T_2^I and T_1^I is the change in

transfers when the recipient could have avoided the loss by purchasing insurance *and* made the choice to forego insurance informedly. Assuming the utility of the providers follows equation (1), $T_2^I - T_1^I$ reflects the extent to which the providers' solidarity is conditioned on the *informed* choice of the recipient, and $T_2^{NI} - T_1^{NI}$ reflects the extent to which the providers' solidarity is conditioned on the *uninformed* choice of the recipient, or the choice *per se*.

Based on previous findings on choice conditionality (e.g. Mollerstrom, Reme, and Sørensen 2015), we expect that the providers disapprove the choice of foregoing insurance. We should thus observe provider A to transfer less to recipient $B2$ than to recipient $B1$ in Case 1 and less to recipient $C2$ than to recipient $C1$ in Case 2.

Hypothesis 1 - Choice Conditional Solidarity
Providers condition their solidarity on choice, in particular

$$\begin{aligned} \phi_A^{I=0,O=1} &< \phi_A^{I=0,O=0} \qquad \textit{if B not informed} \\ \phi_A^{I=1,O=1} &< \phi_A^{I=1,O=0} \qquad \textit{if B informed.} \end{aligned}$$

On average a lower transfer is provided to a recipient who forewent the option to insure than to a recipient who had no option of insurance (regardless of the level of information of the recipient); i.e.

$$\begin{aligned} T_2^{NI} - T_1^{NI} < 0\,, \qquad & \textit{if B not informed} \\ T_2^{I} - T_1^{I} < 0\,, \qquad & \textit{if B informed.} \end{aligned}$$

The difference in the transfer differences, $(T_2^I - T_1^I) - (T_2^{NI} - T_1^{NI})$, then reflects to which extent a provider's choice conditionality depends on the level of information available to the recipient. Whereas an uninformed recipient is not aware that she might receive a transfer from the provider when she foregoes insurance and then loses, an informed recipient has full information. A provider may thus perceive the informed foregoing of insurance of the recipient as deliberate reliance on her support, or free-riding on her solidarity, and may not approve of this intention. In line with Falk and Fischbacher (2006)'s theory of intention-based reciprocity, we hypothesize that the provider's solidarity norms are influenced by distributional outcomes as well as by intentions; hence, the provider does not necessarily withdraw her support to an informed recipient who foregoes insurance completely. We merely expect that the provider A in Case 1 reduces her transfer by more in response to foregoing insurance than the provider A in Case 2.

Hypothesis 2 - Information Effect
Providers condition their response to choice on the recipients' level of information; in particular

$$(\phi_A^{I=0,O=1} - \phi_A^{I=0,O=0}) > (\phi_A^{I=1,O=1} - \phi_A^{I=1,O=0}).$$

On average, the reduction in transfers to a recipient who forewent the option to insure informedly is larger than to a recipient who forewent the option to insure uninformedly; i.e.

$$(T_2^{NI} - T_1^{NI}) > (T_2^I - T_1^I).$$

2.2 Experimental procedure

We conducted the experiment in 21 villages (one session per village) in Cambodia. In each village, the experiment was run with 32 subjects: 16 providers and 16 recipients. There were two groups of providers (with 8 subjects per group) and four groups of recipients (with 4 subjects per group). All subjects played two rounds of the transfer game. Before the game was played, subjects were randomly allocated to one of the six groups; the group determined the role each subject would play in Round 1 and Round 2 (see Table 2). In Round 1, one of the provider groups ($A1$) played the game of Case 1, i.e. with informed recipients, and the other provider group ($A2$) played the game of Case 2, i.e. with uninformed recipients. In Round 2, they switched the roles. This means that all providers made all four transfer decisions depicted in Figure 1 over the course of the two rounds. The recipient groups played the role of player $B1$, $B2$, $C1$ and $C2$ in Round 1 and the role of player $B2$, $B1$, $C2$ and $C1$ in Round 2, respectively.

Table 2: Overview of player roles

		Groups of Providers		**Groups of Recipients**			
		1	**2**	**3**	**4**	**5**	**6**
Round 1	Role	**A1**	**A2**	**B1**	**B2**	**C1**	**C2**
	Transfer decisions	T_1^I and T_2^I	T_1^{NI} and T_2^{NI}	-	-	-	-
	Insurance option	-	-	no	yes	no	yes
	Information	-	-	yes	yes	no	no
Round 2	Role	**A2**	**A1**	**B2**	**B1**	**C2**	**C1**
	Transfer Decisions	T_1^{NI} and T_2^{NI}	T_1^I and T_2^I	-	-	-	-
	Insurance Option	-	-	yes	no	yes	no
	Information	-	-	yes	yes	no	no
	No. of subjects per session	8	8	4	4	4	4
	Total no. of subjects (21 sessions)	168	168	84	84	84	84

Each group played in a separate room and subjects only observed the treatment of the group they belonged to. Neither communication nor interaction between the subjects within a room and between the rooms was allowed. Subjects were at no time told the purpose of the experiment and no feedback was provided to the subjects between the rounds. The experiment was implemented in an anonymous setting. Subjects did not know the identity of the subjects they were matched with;[5] and the research assistants supervising the games did not observe the subjects' decisions. Those research assistants that could link the subjects' decisions in the game to their identity did not interact with the subjects until the final payout. This setting was explained to the participants during the introduction.
The parameters of the game were specified as follows:

- Initial Income $x_A^e = x_B^e = 16,000$
- Probability of shock $\pi = 0.5$
- Income after shock $x_B^s = 2,000$
- Price of insurance $p = 6,000$[6]

[5] Subjects saw each other during introduction before the game, but they did not know who played which role except for those who were in the same room. Thus, if providers wished to form expectations about the identity of the recipient, they had to take into account the pool of all subjects who were not in their group.

[6] Note that this price is below the actuarially fair insurance price which would be 7,000 Riel. We intended to put a value on the insurance such that in expectation 50% of the recipients would purchase insurance. Pilot tests conducted

Figure 7 in Appendix A illustrates the resulting outcome tree for the different variations of the game. The detailed procedure for recipients **B1**, **B2**, **C1** and **C2** was as follows:

1. Each recipient received an initial income of 16,000 Riel in sixteen 1,000 Riel bills in play money.[7]
2. Recipients were explained that each of them would roll a dice. The outcome would determine how much she could keep of the initial income. If the dice showed 1, 2 or 3, she would lose 14,000 Riel; if the dice showed 4, 5 or 6, she would keep the 16,000 Riel.
3. Recipients of type $B2$ and recipients of type $C2$ were explained the insurance option: they had the option to privately purchase an insurance for the price of 6,000 Riel.[8] If a recipient decided to purchase the insurance, she would keep 10,000 Riel independent of the outcome of the dice.
4. Recipients of type $B1$ and recipients of type $B2$ were informed that each of them were matched with a player in a different room, that these players had a safe endowment of 16,000 Riel, but could decide to transfer part of it to their partner (i.e., to the $B1$ and $B2$ recipients) in case this person lost.
5. Each recipient was asked questions to test her understanding of the game.
6. Each recipient of type $B1$ and type $B2$ was asked to note down how much transfer she expected from her partner player in case of loss. The beliefs were noted down in private behind a cardboard and then collected. Recipients were told that their partner would never see these beliefs and that the beliefs had thus no impact on the actual transfer decisions.
7. Recipients of type $B2$ and recipients of type $C2$ were asked to go outside the room one by one to make their insurance purchase decision with a research assistant sitting outside.[9] Recipients were not allowed to reveal their decision to the other subjects when they came back into the room.
8. Each recipient rolled the dice. The outcome was noted down. In case a recipient lost, she handed 14,000 Riel of her play money to a research assistant. The remaining money was inserted in an envelope and collected; recipients were told that this money would be transferred to their personal 'game accounts'. This money together with any potential transfer of the provider determined the payout of the recipients for this round.

Then groups switched rooms and roles for the second round.

with villagers as well as students in Cambodia suggested a price of 6,000 Riel for 50% uptake. However, in the actual experiment insurance uptake was higher.

[7] 4,000 Riel are worth approximately 1US$. As a benchmark: The average per capita income in rural Cambodia was about 2US$ in 2014, according to the 2014 Cambodia Socio-Economic Survey (National Institute of Statistics 2015). For the participants in our experiment, the average daily income per household was slightly more than 5US$ (including the income of all household members, remittances, state assistance etc.), the median daily household income was below 2US$.

[8] For the insurance option, we intentionally did not use the Khmer word for 'insurance' but the more general word *'bankapie'* ('guarantee') in order to not evoke any associations with existent insurance schemes.

[9] Note that this was the only decision that was not made in private. However, the research assistants responsible for the insurance sale were not part of the team of research assistants who supervised and explained the game, and they had not interacted with the subjects before.

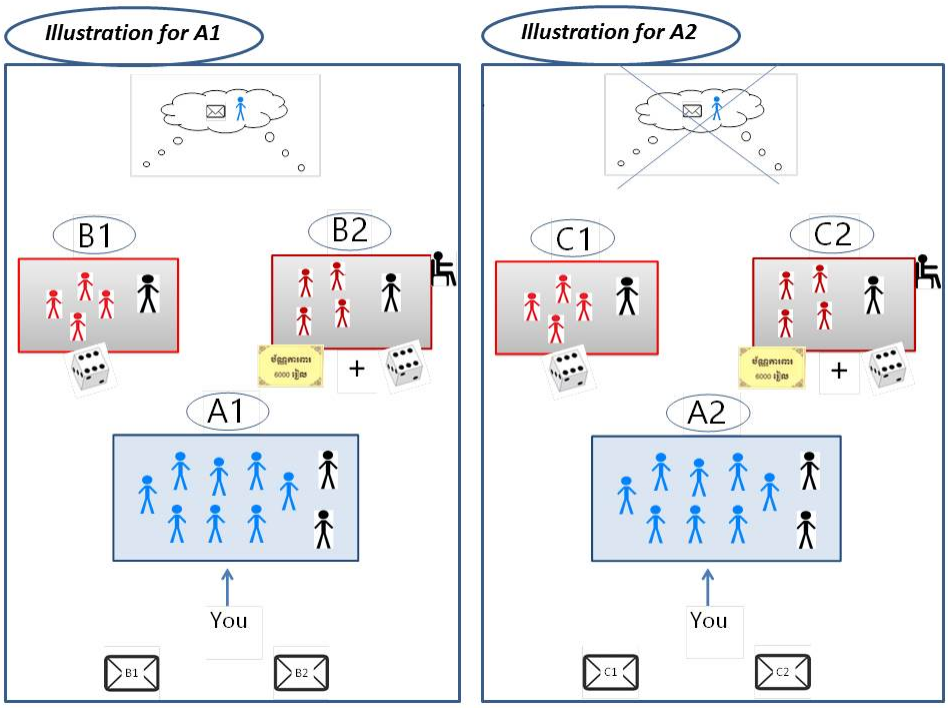

Figure 2: Illustrations for A1 and A2 providers (player roles not in the original)

The procedure for providers **A1** and **A2** was as follows:[10]

1. Each provider received an initial income of 16,000 Riel in sixteen 1,000 Riel bills in play money.
2. Providers were explained the situation of the recipients. Specifically, providers of type $A1$ were explained the situation of $B1$ and $B2$ recipients, and providers of type $A2$ were explained the situation of $C1$ and $C2$ recipients. Providers were shown one of the overview illustrations depicted in Figure 2 as well as a detailed illustration for each player type (see Figures 8-11 in Appendix B.4).
3. Providers simulated the situation of the recipients, first of type $B1$ [$C1$], then of type $B2$ [$C2$]. During this simulation, each provider was asked questions to test her understanding of the game.
4. Providers were explained the random partner matching and the following transfer procedure. It was emphasized that transfers would only take place in case the partner lost money after rolling the dice and, for a recipient of type $B2$ and $C2$, had not bought insurance. Again, each provider was asked questions to test her level of understanding of the transfer procedure.
5. Each provider was asked to write down in private (behind cardboards) on two separate sheets the following transfer decisions (see decision sheets in Figures 12-15 in Appendix B.5):
   - In case your partner was of type $B1$ [$C1$] - how much of your 16,000 Riel would you transfer if your partner lost?
   - In case your partner was of type $B2$ [$C2$] - how much of your 16,000 Riel would you transfer if your partner lost?

[10] For the script of the instructions for providers $A1$ and $A2$, see Appendix B.2 and B.3, respectively.

6. After decisions were noted down, providers had time to check both decisions and to make final changes; then, pencils were collected.
7. Each provider was asked to draw an envelope from a box. On the envelope was a sign indicating the player type of the partner and a unique ID for the partner (unidentifiable to the providers). Each provider was asked to insert in the envelope the relevant decision sheet and the amount of bills she had noted on the sheet.[11]
8. Providers were given a second envelope in which they placed the remaining amount of bills. They were told that this money would be transferred to their personal 'game accounts' and that in case their partner had not lost they would also receive back the amount they had transferred. This money would determine their payout for this round.
9. All decision sheets and envelopes were collected by the research assistants.

Then the two provider groups switched rooms and roles for the second round. They did not receive any feedback about the actual outcome of their partner. The procedure of Round 2 was the same as the procedure of Round 1. Only the simulation of the recipients' situation and the related test questions for the providers were skipped.

3 Data

3.1 Implementation of the Experiment in the Field

We ran the experiment in 21 villages in Northwestern Cambodia between August and October 2015. The villages are located along the river Stong-Sreng which separates the two provinces Banteay Meanchey and Siem Reap (see Figure 3).[12] Two weeks before the experiment took place in a village, a detailed household survey was conducted with approximately 60 randomly selected households of the village as well as a community survey with the village head. In total, 1,272 households were interviewed. The survey focused on basic socio-economic information, employment, support networks within and outside the village, labor migration, access to formal risk management tools, such as insurance, savings and credit, as well as perceptions of solidarity and accountability.

At the end of each interview, the respondent was asked whether he or she was able and willing to participate in an upcoming experiment. If the respondent answered affirmatively, he or she was included in the pool of potential experimental participants for this particular village. Our original target participant was literate and between 18 and 65 years old. However, as the literacy rate in this region is very low and labor migration of the young in some villages particularly high, illiterate and older respondents had to be included. We sorted the list of potential participants according to their age and literacy level and sampled from this list in the resulting order. Thus, our group of experimental participants is not representative of the village population, the participants are younger and more educated than the average villager.

[11] Providers were told that the amount they inserted would be double-checked with the amount indicated on the decision sheet and that, in case there was a difference, the amount indicated on the decision sheet would determine the transfer.

[12] The experiment was conducted in eleven villages in Siem Reap province and in ten villages in Banteay Meanchey province. Villages were selected to be comparable within and across the two provinces. Selection criteria included the size of the village, the level of migration and remoteness.

Figure 3: Map of Cambodia (United Nations, 2004)

The experiment took place in a school building either in the village itself or in a neighboring village. It was conducted with the assistance of 10 Khmer research assistants, who were different from those that had conducted the household survey. The experiment had five parts: registration and introduction; the first game (with two rounds) which is the focus of this study; a network questionnaire and a short break; a second game (with four rounds) which is analyzed in a separate paper; closing remarks and payout.

At the registration, each participant drew blindly a participant badge from a bag: a colored card with a number from 1 to 32, the participant ID. The color determined the group the participant was allocated to. After the registration, all participants were gathered in one room for a brief introduction where the general rules of the games and the payout modalities were laid out and the research team was introduced (for instructions for the introduction, see Appendix B.1). In particular, participants were explained that each of them would receive a show-up fee of 4,000 Riel; and that they could earn additional money over the course of the experiment which consisted of several rounds. How much they would keep at the end of each round would be dependent on their luck, their choices and the choices of others. Participants were told that they would not receive any feedback between the rounds. At the end, only one round would be selected for payout by the draw of a ball; hence, their decisions in one round should not be affected by their decisions or their outcomes in other rounds. Participants were ensured that their decisions would be kept anonymously and would not be observed by any of the other participants or the research assistants they interacted with. Participants were told that they were not allowed to communicate with each other during the course of the workshop, and that if they disobeyed the rules they would need to leave. After making sure that the rules were understood, the participants split into their groups according to the colors of their participant badges and were accompanied by the research assistants to their rooms.

The first game was conducted as described in Section 2.2. The four rooms with the recipients were each supervised by one research assistant (with two additional assistants sitting outside the room for insurance sale), the two rooms with the providers by two research assistants, respectively. The explanation of the game was done in front of all participants of each group. However, participants wrote their decisions in private and unobserved by the research assistants behind cardboard boxes.

Although the literacy rate was low, most of the participants could read and write numbers. 13% of the providers needed help from the research assistants in writing their transfer decisions. We control for this in the analysis. Low literacy constituted a challenge for us to explain the game in such a way that it could be understood by the participants. We employed several measures, such as using graphical illustrations and simulating the role of the other players, to increase the level of understanding. We also asked different sets of test questions during the instructions, the results of which can be regarded as an indicator for the level of understanding.[13] Given that we are interested in the providers' behavior, it is important to us that they clearly understood the game and the implications of their transfer decisions. 44% of the providers gave correct answers to all test questions, and another 22% made only one mistake (see Table 13 in Appendix C.1). Part of the analysis below will be restricted to these subjects.

At the end of the experiment, all participants were gathered in one room for the closing remarks. One participant was asked to draw blindly one ball from a bag that contained six different balls (one for each round). The drawn ball determined which round would be paid out. The participants were then asked one by one to a separate room where they received their payout which consisted of the outcome of the round that was drawn and their show-up fee. The average payout amounted to 17,000 Riel, equivalent to US$ 4.25 or slightly more than twice the average per capita income in rural areas (National Institute of Statistics 2015). The full experiment lasted, on average, 4.5 hours.

3.2 Participants' Characteristics

Table 3 provides an overview of the socio-economic characteristics of the experimental participants. The information is based on the data collected in the survey that was conducted two weeks before the experiment. The participants are a homogenous group in terms of ethnicity and religion, with all but a few being Khmer and Buddhists (not displayed in the table). 68% of the participants are female. In all but two villages, the female participants outweigh the male participants. The imbalance is largely due to the fact that men are more likely to work outside the village (either abroad or within Cambodia); furthermore, at the time of the survey many rice farmers were engaged in rice transplantation which is typically done by men. Participants are between 18 and 77 years old with a mean age of 39 and a median age of 37. Most participants (86%) are married and about half (45%) head their respective households. Two thirds were born in the village where they are now living. The level of education is rather low. The majority of the participants went less than three years to school; 30% never attended school. Correspondigly, only 66% of the participants report to be able to read and write in Khmer. Most of the participants (86%) are self-employed, the majority as rice farmers.

A household consists on average of six people. Many of the participants are poor. One in two participants report a household income of US$50 or less in the last month. 21% of the participants come from a household that is officially classified as poor.[14] There is a substantial amount of formal and informal borrowing. 60% of the participants' households have outstanding loans. 44% report to have borrowed money from another household in the village in the last 2 years; 33% borrowed from a financial institution, typically a microfinance institution. Only a small proportion (5%) have

[13] For the instructions of the test questions, see Appendix B.6. Research assistants recorded the correctness of the response on a four-point scale.

[14] The so-called IDPoor program was established in Cambodia in 2006 and was meant to provide information on the poor population to facilitate targeting of state programs and NGO assistance. The poverty status is determined based on observable assets, familiy composition and exposure to shocks and is renewed every 3-4 years. Being identified as poor provides, in particular, free access to basic health services.

Table 3: Characteristics of the experimental participants

	mean	sd	min	max	p50
Individual Characteristics					
Female	0.68	0.47	0	1	1
Age	39.46	12.15	18	77	37
Married	0.86	0.34	0	1	1
Household Head	0.45	0.50	0	1	0
Born in this village	0.67	0.47	0	1	1
Literate	0.66	0.47	0	1	1
Schooling years	2.91	3.02	0	16	2
Self-employed	0.86	0.35	0	1	1
Household Characteristics					
Household size	5.65	2.34	1	18	5
Monthly income (US$)	160.66	363.05	0	5,000	50
ID Poor status	0.21	0.41	0	1	0
Indebted	0.60	0.49	0	1	1
Borrowed from other households	0.44	0.50	0	1	0
Borrowed from financial institution	0.33	0.47	0	1	0
Bank account	0.05	0.21	0	1	0
Member in a saving group	0.20	0.40	0	1	0
Insurance	0.08	0.28	0	1	0
Migrant	0.57	0.49	0	1	1
Remittances	0.51	0.50	0	1	1
Landownership (ha)	2.67	2.26	.016	30	2
No electricity	0.71	0.45	0	1	1
Observations	672				

a bank account but one fifth participate in an informal savings group. 9% have a formal insurance (mostly, health insurance). The majority of participants (57%) live in a household where at least one household member either worked abroad in the past 2 years or is currently working abroad. 51% of the households receive remittances. The households of all participants own land, with greatly varying land sizes. Average land size is 2.7 hectares. More than two thirds of the participants live in a household without access to electricity.

In the empirical analysis below, we study the transfer decisions of the providers and pool the decisions of the two provider groups $A1$ and $A2$. When we compare the socioeconomic characteristics of these two groups (Table 14 in the Appendix C.2) we find overall no significant differences.[15] This is an indication that randomization was successful and that we can pool the transfer decisions for the analysis.

4 Results

4.1 Treatment Effect Analysis

Over Round 1 and Round 2, each of the 336 subjects that played the role of the provider made four transfer decisions, two as an $A1$ provider (to an *informed* recipient with and without insurance option) and two as an $A2$ provider (to an *uninformed* recipient with and without insurance option). Hence, there are 1,344 observations in total (4×336).

[15] The only exception is *bank account*. Providers that played type $A1$ first are slightly more likely to have a bank account than providers that played type $A2$ first.

Figure 4 and Figure 5 depict the frequency distribution of the transfer decisions. We separately show the transfer decisions to recipients that were informed about the transfer possibility (Figure 4) and to those that were not informed (Figure 5). For simplicity, the transfers are divided by 1,000 in these figures and in all following tables. The amount of transfer varies considerably; with the majority of providers transferring 1,000 or 2,000 Riel. Only a very small number of providers are willing to transfer 7,000 Riel, which would result in an equal split of the endowment such that both provider and recipient ended up with 9,000 Riel. There is a considerable shift to zero transfers when the recipients had the option to insure: the number of $A1$ providers who transfer zero when insurance is available increases more than fivefold, the number of $A2$ providers more than threefold. The distribution of transfers to informed recipients is not much different from the distribution of transfers to uninformed recipients, with a slightly higher proportion of $A2$ providers transferring zero.

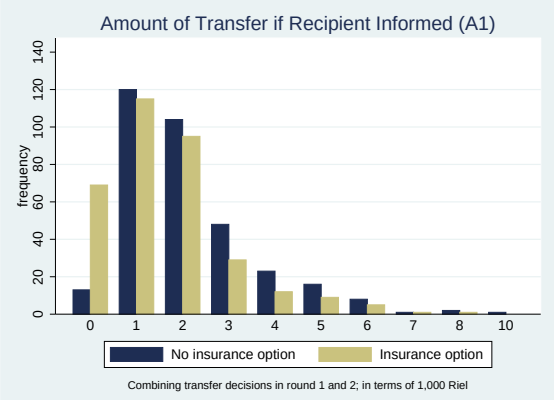

Figure 4: Transfer distribution for provider A1

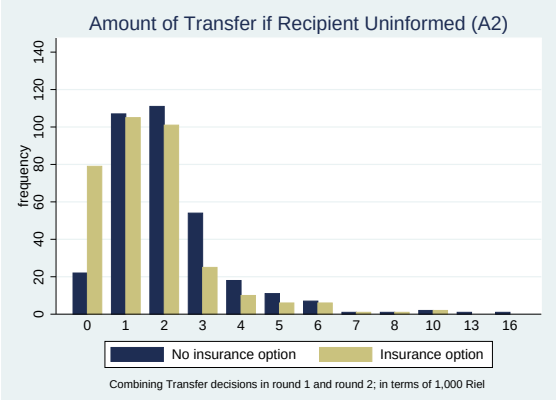

Figure 5: Transfer distribution for provider A2

What is the average treatment effect? In order to test for the prevalence of choice conditional solidarity and the information effect as outlined in Hypothesis 1 and Hypothesis 2 we exploit the within-subject and orthogonal treatment design and specify the transfer decision of provider i in treatment t as follows:

$$transfer_{i,t} = \theta + \beta Inf_t + \gamma Opt_t + \eta InfOpt_t + \epsilon_{i,t} \tag{2}$$

Opt_t is equal to one if recipients had the option to insure and zero otherwise. Inf_t is equal to one if recipients were informed about the transfer possibility and zero otherwise. $InfOpt_t$ is an interaction term, equal to one if recipients were informed about the transfer possibility *and* had the option to take up insurance and zero otherwise. We include a dummy to control for round effects, i.e. level changes in transfer decisions when providers played the transfer game a second time.

We can break down the transfer decisions of each provider i as depicted in Table 4 (mirroring Table 1). In line with Hypothesis 1, we expect $\gamma < 0$ and $\gamma + \eta < 0$; and in line with Hypothesis 2, we expect $\eta < 0$.

Table 4: Treatments and transfer decisions of provider i

		Recipient informed of provider	
		no	***yes***
Recipient had option to insure	***no***	θ_i	$\theta_i + \beta_i$
	yes	$\theta_i + \gamma_i$	$\theta_i + \beta_i + \gamma_i + \eta_i$
Hypothesis 1		$\gamma < 0$	$\gamma + \eta < 0$
Hypothesis 2		$\eta < 0$	

We estimate specification (2) using OLS with standard errors clustered at the village level (using the wild cluster bootstrap).[16] To account for corner solution response and for unobserved heterogeneity at the individual level, we also conduct a Tobit random effects estimation with the outcome variable censored at zero (see Table 15 in Appendix D.1). We here report the results of the OLS estimation for the ease of interpretation.

Table 5: Option of Insurance, Information and Transfers - Pooled OLS

	(1) Transfer	(2) Transfer	(3) Transfer	(4) Transfer	(5) Transfer	(6) Transfer
Inf (β)	0.003	0.003	0.008	0.014	0.092*	0.097
	(0.121)	(0.121)	(0.140)	(0.122)	(0.050)	(0.059)
Opt (γ)	-0.598***	-0.598***	-0.596***	-0.670***	-0.738***	-0.533***
	(0.102)	(0.102)	(0.107)	(0.102)	(0.115)	(0.081)
InfOpt (η)	0.018	0.018	-0.048	-0.013	-0.007	-0.024
	(0.078)	(0.078)	(0.097)	(0.078)	(0.058)	(0.053)
Constant (θ)	2.155***	2.275***	2.318***	2.360***	2.272***	2.117***
	(0.121)	(0.132)	(0.146)	(0.177)	(0.135)	(0.089)
Round effects	No	Yes	Yes	Yes	Yes	Yes
Observations	1344	1344	1168	908	596	1320
r2_a	0.034	0.039	0.039	0.052	0.074	0.046
F	15.146	20.016	19.414	20.438	26.259	19.701

Pooled OLS estimator; s.e. in paranthesis, clustered on village level
(1)-(2) for all subjects; (3) excluding subjects who needed support in writing;
(4) excluding subjects who made at least two mistake at test questions;
(5) excluding subjects who made at least one mistake at test questions;
(6) excluding subjects who made at least one transfer above 7,000 Riel.
Transfers in terms of 1,000 Riel

The estimation results are reported in Table 5. In column (1), we report the basic results without controlling for round effects. In columns (2)-(6), we control for round effects. In column (3), the sample is restricted to those providers that did not need support in writing their transfer decisions (292 out of 336 providers). In column (4), the sample is restricted to those providers that made none or only one mistake in the test questions which were asked before transfer decisions were made (227 providers). In

[16] Due to the orthogonal treatment design, fixed effects and random effects models come to the same results as standard OLS (Oaxaca and Dickinson 2005).

column (5), we further restrict to providers that answered all test questions correctly (149 providers). In column (6), we exclude the 24 providers that made extreme transfer decisions; these are providers that indicated to transfer more than 7,000 Riel in at least one treatment.

The average baseline transfer (θ), i.e. how much is sent to recipients who experienced a shock but had no insurance option and were not informed, is 2,155 Riel in column (1). Hence, the providers transfer 13.5% of their initial income. Introducing the insurance option has a significantly negative effect on the transfers. Providers reduce their transfers to recipients who forewent the insurance option by 28% in case the recipient is uninformed (γ as a proportion of θ) and by 27% in case the recipient is informed ($\gamma + \eta$ as a proportion of $\theta + \beta$). Both γ as well as the joint effect of $\gamma + \eta$ are significantly negative; a support of our first hypothesis.

We find no evidence that the extent to which solidarity is conditioned on the insurance choice depends on the level of information available to the recipients. η is close to zero and statistically insignificant. On average, information does not seem to matter. There is neither a significant change in transfers in response to information per se (β) nor a change in the response to foregoing insurance (η).

Introducing round effects in column (2) and restricting the sample in columns (3)-(6) does not change the results by much.[17] The baseline transfer varies between 2,100 Riel and 2,400 Riel (13%-15% of the initial income) across these columns. γ as well as $\gamma + \eta$ are always significantly negative; but η alone is statistically insignificant. The magnitude of γ and $\gamma + \eta$ amounts to between 25% and 32% and is thus comparable to that in column (1).

In sum, we find support for Hypothesis 1, but no support for Hypothesis 2. On average, providers reduce their transfers significantly when recipients had the choice of insurance and hence the option to avoid the loss. The reduction in transfers to recipients who forewent the option to insure informedly is *not* larger than that to recipients who forewent the option to insure uninformedly. These results are stable across all columns in Table 5 (OLS results) and Table 15 (Tobit random effects results). In the context of the framework developed in Section 2.1, this finding is an indication that people tend to condition their solidarity on the choices of their peers, i.e. they hold others accountable for prior decisions; yet it seems irrelevant whether or not the peers knew about the potential support before making their choice.

4.2 Heterogenous Treatment Effects

Are the observed average transfer changes driven by just a few providers in our sample or do they represent a pattern common to the whole provider sample? To answer this question, we investigate the distribution of treatment effects across providers. We first take a look at choice conditionality (γ and $\gamma + \eta$) and then look at the information effect (η). Five providers (i.e. 1.5%) transferred zero in each treatment. We exclude them from the following analysis because they behave purely payoff maximizing and do not show any sign of solidarity.

Table 6 depicts the distribution of the change in transfers to an uninformed recipient in response to foregoing insurance (γ). Table 7 shows the respective distribution for an informed recipient ($\gamma + \eta$). Column (1) reports the distribution for all providers; column (2) restricts the sample to providers that made at most one mistake at the test questions; and column (3) is for providers that responded

[17] There are round effects. Subjects reduce their baseline transfers from Round 1 to Round 2; yet, the treatment effect of the insurance option as well as the information remain unchanged. We analyze the rounds separately in Table 16 in Appendix D.2.

correctly to all test questions.

Table 6: Change in transfers when recipient forewent insurance uninformedly (*Response to the choice per se*)

	(1) Proportion (*all subjects*)	(2) Proportion (*Most test questions correct*)	(3) Proportion (*All test questions correct*)
$\gamma = 0$	42.30	43.05	45.21
$\gamma < 0$	44.71	47.53	47.95
$\gamma > 0$	12.99	9.41	6.85
Observations	331	223	146

Excluding subjects who always transferred zero
Column (2) subjects who made at most one mistake at test questions
Column (3) subjects who made no mistake at test questions

Table 7: Change in transfers when recipient forewent insurance informedly (*Response to the informed choice*)

	(1) Proportion (*all subjects*)	(2) Proportion (*Most test questions correct*)	(3) Proportion (*All test questions correct*)
$\gamma + \eta = 0$	42.90	43.50	41.31
$\gamma + \eta < 0$	44.71	47.09	51.37
$\gamma + \eta > 0$	12.39	9.42	7.53
Observations	331	223	146

Excluding subjects who always transferred zero
Column (2) subjects who made at most one mistake at test questions
Column (3) subjects who made no mistake at test questions

Indeed, not all providers exhibit choice conditional solidarity. 45% of providers reduce their transfers when recipients had the option to insure ($\gamma < 0$ or $\gamma + \eta < 0$); in fact, these providers reduce their transfers by 65%. In contrast, 42% (Table 6) or 43% (Table 7) of providers do not condition their transfers on the choice of recipients ($\gamma = 0$ or $\gamma + \eta = 0$). This means these subjects transfer the same amount independent of whether recipients had the option to insure. Interestingly, 13% (Table 6) or 12% (Table 7) of the providers transfer *more* when recipients forewent the insurance ($\gamma > 0$ or $\gamma + \eta > 0$). This proportion reduces to 9% when we restrict the sample to subjects who responded mostly correctly to the test questions and further to 7% when we restrict to only correct answers. This reduction suggests that some of the observations are caused by erratic decisions by providers that did not clearly understand the experiment.[18]

The proportion of providers that condition their transfers on the choices of others in our study is

[18] In order to better understand the reasoning behind the transfer behavior, we conducted qualitative interviews with participants after the experiment in one third of the villages. Of the interviewed providers, 19 increased their transfers when the recipients had had the option to take up insurance. The majority of these providers seemed to not have understood the situation of the recipients or confused the order of the two decisions. Four providers stated they felt more pity with recipients who decided against the insurance and lost, than with recipients who just lost due to pure misfortune. One provider responded she expected the recipient would take up the insurance anyway and thus did not care about the transfer. And one provider stated he 'just did not care about the money'.

comparable to the proportions in Trhal and Radermacher (2009), Cappelen et al. (2013), Mollerstrom, Reme, and Sørensen (2015) and Bolle and Costard (2015). In these studies, between one third and two thirds of experimental participants conditioned their transfers on the past decisions of the co-players. Hence, choice conditionality does not seem to be a phenomenon specific to high-income countries where the other studies were implemented but appears to be prevalent in low-income countries to a similar extent.

The distribution of responses to the information of recipients (η) is illustrated in Table 8. Again, there is considerable heterogeneity. The majority of providers (61%) do not condition their response to foregoing insurance on the information available to recipients ($\eta = 0$); i.e. providers adjust their transfers by the same amount for informed and uninformed recipients. It seems that either they do not regard the informed recipients' behavior as free-riding on their solidarity or they do not consider that free-riding on solidarity should be punished.[19]

Table 8: Change in conditionality when recipient forewent insurance informedly (*Response to Information*)

	(1) Proportion (*all subjects*)	(2) Proportion (*Most test questions correct*)	(3) Proportion (*All test questions correct*)
$\eta = 0$	60.73	64.12	67.12
$\eta < 0$	20.24	17.45	17.12
$\eta > 0$	19.03	18.39	15.75
Observations	331	223	146

Excluding subjects who always transferred zero
Column (2) subjects who made at most one mistake at test questions
Column (3) subjects who made no mistake at test questions

20% of the providers behave in line with our Hypothesis 2 ($\eta < 0$). They reduce their transfers by *more* to recipients who forewent insurance informedly. Surprisingly, the proportion of providers that respond positively ($\eta > 0$), is approximately as high as the proportion of providers that respond negatively. 19% reduce their transfers by *less* when the recipients made their choice informedly. This share reduces only slightly to 18% (16%) when we restrict the sample to those providers that responded mostly correctly (only correctly) to all test questions. Thus, problems with understanding the experiment do not seem to be the root cause of this behavior. These providers may instead be driven by different motives than the others. Possibly, they wish to reward the foregoing of insurance of the informed recipients as they advocate the institution of informal support.[20] Such behavior is still in line with intention-based reciprocity but providers apply a positive, rather than a negative, reciprocal response. An indication for this interpretation may be that providers with $\eta > 0$ have considerably higher baseline transfers (θ) of 2,651 Riel compared with 2,150 Riel among providers with $\eta < 0$ and 1,701 Riel among providers with $\eta = 0$. Given that they are willing to make larger transfers than others, they seem to value informal support highly. An alternative motive is guilt aversion (Charness and Dufwenberg 2006; Battigalli and Dufwenberg 2007): Providers may wish to comply with the

[19] In fact, the insurance uptake of the uninformed recipients is only slightly higher than that of the informed recipients: 79% vs. 71%. This indicates that there is some free-riding among recipients but not very much. If providers expect little free-riding, it seems reasonable that they do not make a difference between foregoing insurance informedly and foregoing insurance uninformedly.

[20] We thank Jean-Philippe Platteau for making us aware of this potential explanation.

expectations of recipients, who made the choice against the insurance in reliance on their support. With the data at hand, we are unable to distinguish between these motives.

4.3 Limitations

Our study shows that, on average, experimental participants condition their solidarity on the insurance choice of their peers and do not vary their behavior according to the peers' awareness of potential monetary support. A number of features of our experimental design may raise concerns over the generalizability and interpretation of our findings. In the following, we address such concerns, in particular the external validity of the experiment, the validity of the presumed underlying preferences, and the implications of the strategic transfer design.

4.3.1 Limitation 1: External Validity

In order to investigate our research question, we chose to conduct a lab-in-the-field experiment because it would have been difficult, if not impossible, to cleanly analyze choice conditionality in combination with the information effect through survey questions. A major limitation of lab experiments is, however, that they are artificial. As laid out by Levitt and List (2007), several characteristics of lab experiments make extrapolation of behavior in the lab to behavior outside the lab questionable. We designed our experiment in such a way that it eases extrapolation to the extent possible. For example, the decisions of the providers and recipients were not observed by the research assistants who interacted with them. The level of scrutiny was thus minimized, which should have reduced the pressure to act pro-socially. Moreover, we played with relatively high stakes, which may have further reduced the extent of unnatural pro-social behavior. Still, our subjects played anonymously and were not allowed to communicate with each other, which is far from real-life interactions.

We address the external validity of our experiment in two ways. First, we contrast the providers' transfer decisions in the experiment with their survey response to a vignette situation on accountability.[21] Second, we study the beliefs of the recipients in the experiment. In a first step, we analyze whether the recipients' beliefs about providers' transfers match the actual transfer decisions of the providers. In a second step, we correlate average recipients' beliefs and providers' transfer decisions per village.

Providers' behavior outside the lab

In the survey, we confronted the respondents with a vignette situation in order to analyze their perceptions of accountability in a situation which was familiar to them. Respondents were asked to consider two different situations:

- Situation 1 (S1): *"The household head of a poor household in this village dies of sudden illness. All other households are asked once to support the household. How much money would you contribute?"*
- Situation 2 (S2): *"The household head of a poor household in this village dies after a motorbike accident. He had behaved very risky on the road. All other households are asked once to support the household. How much money would you contribute?"*

[21] Note that the survey was conducted two weeks before the experiment. It is therefore highly unlikely that the participants' behavior in the experiment was diluted by their response to the survey questions.

Table 9: Contributions reported in Survey

	pct
$(S1 > S2)$	19.35
$(S1 = S2)$	79.46
$(S1 < S2)$	1.19
Observations	336

Table 9 depicts the responses of the providers in the experiment to these survey questions. Nearly 80% of them report in the survey that they would contribute the same amount in both situations $(S1 = S2)$. 19% report to provide less in Situation 2, where the outcome is the result of choice, i.e. careless driving $(S1 > S2)$. Only 1% (4 providers) indicate to provide more in Situation 2.

Of course, the situation that individuals face in the experiment is very different from the situation they face in the survey. Death is a much more severe circumstance than the loss of money due to the roll of a dice. Furthermore, death plays a special role in Buddhist culture, and money collection after the passing of a village member has a long standing tradition in Cambodia. Finally, in the vignette situations the help goes to the family of the deceased and not to the person liable for the loss. These differences may explain the high proportion of providers who report to contribute the same amount in both situations. Nevertheless, we expect that those providers who reported lower contributions in case of irresponsible behavior in the survey to also reduce their transfers by more when recipients could have avoided their loss in the experiment.

Table 10: Transfer differences and reaction to accountability in survey - Pooled OLS

	(1) Trnsf $(S1 = S2)$	(2) Trnsf $(S1 > S2)$	(1) - (2) Effect Comparison
Inf (β)	-0.007	0.046	-0.054
	(0.095)	(0.138)	(0.204)
Opt (γ)	-0.528***	-0.908***	0.380**
	(0.087)	(0.238)	(0.212)
InfOpt (η)	-0.004	0.108	-0.111
	(0.092)	(0.174)	(0.210)
Baseline (θ)	2.139***	2.292***	-0.154
	(0.105)	(0.238)	(0.244)
Observations	1068	260	
r2	0.030	0.067	
F	21.508	7.810	

Pooled OLS; s.e. in paranthesis, clustered on individual level

(1) Participants who report in survey to contribute the same, independent of recipient's accountability

(2) Participants who report in survey to contribute less if recipient accountable

Transfers in terms of 1,000 Riel

We split the sample according to whether providers report in the survey to contribute less in Situation 2 than in Situation 1 (column (2)) or the same (column (1)) and analyze specification (2).[22] Table 10 reveals that providers that report in the survey to transfer less in case the outcome was affected by deliberate choice reduce their transfers significantly more (by 34%-40%) in response to foregoing insurance in the experiment than subjects who report to transfer the same amount (by 25%). We see this as an indication that the transfer behavior observed in the experiment is motivated

[22] The four participants, who reported in the survey to contribute more in Situation 2 than in Situation 1, are not considered.

by solidarity norms that are applied in real-life decision making.

Recipients' expectations

Those recipients that were informed about the transfer possibility (recipients of type $B1$ and $B2$) were asked to write down how much transfer they expected from the providers. We are interested in whether or not these beliefs change with the insurance option. If the recipients with the insurance option expected lower transfers from the providers than the recipients without the insurance option, the providers' behavior as illustrated above would be directly reflected in the recipients' beliefs.

Table 11: Expected transfer by recipients

	Proportion
No Insurance Option	3.837
	(0.234)
Insurance Option	3.392
	(2.638)
Difference in Expected Transfers	0.446**
(between rounds)	(0.194)
Observations	166

Response to Belief Questions in Round 1 and Round 2; s.e. in parentheses
Transfers in terms of 1,000 Riel

Among all recipients who were informed, the average expected transfer amounts to 3,840 Riel without the option to insure and to 3,390 Riel with the option to insure (column (1) of Table 11). The difference in the expected transfer of about 450 Riel is significantly larger than zero at the 5% level. Notably, this difference is close to the actual reduction in transfers by the providers when insurance becomes available, i.e. the roughly 600 Riel reduction in Table 5. This finding indicates that the recipients anticipated that providers condition their solidarity on insurance choice.

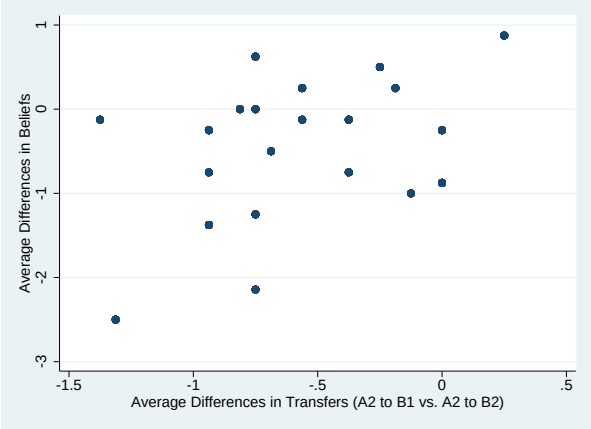

Figure 6: Differences in Beliefs and Transfers in Response to Insurance (Across Villages)

We now relate the average changes in providers' transfers to the average changes in recipients' beliefs at the village level. Figure 6 illustrates a strong correlation between these two measures. The Pearson correlation coefficient is 0.41 with a p-value of 0.06. A simple regression without controls for village characteristics (results unreported) finds that the average change in transfers explains more than

one sixth of the average change in beliefs. We argue that this correlation of providers' transfers and recipients' expectations at the village level is likely driven by the existence of village-level social norms on solidarity. Social norms, according to Bicchieri (2005), guide individuals' behavior through the expectation that others behave in line with the norm and also expect oneself to do so. If social solidarity norms, which generally guide villagers' behavior in real life, are here applied to the less familiar situation of the experiment, the correlation between providers' and recipients' behavior provides support for the external validity of our findings.

4.3.2 Limitation 2: Underlying Preferences

Up to this point, we assumed the utility function in equation (1) to represent the preferences of our experimental participants. However, a different specification of preferences can lead to similar findings. Let us assume that providers are motivated by social preferences that involve both their own utility as well as the perceived utility of the recipient. Let us further assume that individuals differ in their risk preferences and that risk preferences tend to be personal information. Providers generally do not know the risk preferences and hence the utility of the recipients in the transfer game. If there was a selection of recipients into insurance based on risk preferences, recipients who choose not to take up insurance would signal their risk lovingness.[23] Providers may then act upon this signal and adjust their transfers accordingly. They would provide less transfers to recipients for whom they have reason to believe to be risk loving and thus not to suffer much from a loss. Given that this information becomes available only with the option of insurance, providers give less with the insurance option than without the insurance option. The reduction in transfers would then not be driven by the recipients' choice of foregoing insurance but by the signal that this choice provides about the recipients' utility curvature. We can provide some insight into the selection to insurance and the possibility of providers' acting on risk preferences in the following way.

We model the insurance uptake decision of the recipients in our experiment as a function of risk preferences as well as other characteristics that should determine insurance uptake according to the literature (Giné, Townsend, and Vickery 2008; Giesbert, Steiner, and Bendig 2011). For recipients that were uninformed about the transfer possibility, insurance uptake appears to be completely random (see Table 17 in Appendix D.3). For informed recipients, risk preferences matter at a marginal level of significance. This indicates that risk preferences are unlikely to explain the insurance uptake per se. They rather seem to influence the recipients' willingness to rely on the providers' solidarity. Even so, the providers may nevertheless use the insurance uptake decision as a signal of risk preferences and respond accordingly.

Under the assumption that the knowledge of another person's risk preferences increases with the level of familiarity, we should expect that the signal in the experiment is of little value when providers transfer to people they know well. To gain insight into this idea, we can use information from the second game in our experiment in which the transfer game was played non-anonymously. If providers reacted solely to the risk preference rather than conditioning their transfers on choice, providers should be *less likely* to reduce their transfers in response to foregoing insurance, the *better* they know the recipient.

The second game in our experiment was similar to the first game with three main differences: 1) All subjects played both the role of the provider and the role of the recipient; 2) providers knew the

[23] Note that the price of the insurance was set relatively low, such that only risk loving people should forego the insurance.

name of the recipient they were matched with; recipients, in turn, were always informed that there was a provider but they did not know her identity; 3) the matched recipient for any provider remained the same for the treatment with insurance and for the treatment without insurance. Between the first game and the second game, participants had to report for each of the other 31 participants per village whether they knew each other and, if so, whether they were relatives or close friends. In 9% of the matched pairs in the second game, the provider did not know the recipient; in 49% the provider knew the recipient but they were neither relatives nor friends; in 33% provider and recipient were related; and in 9% the provider reported to be a close friend with the recipient.

Table 12: Response to foregoing Insurance in Game 2 and Relationship to Respondent

	Unknown	Known	Relative	Friend	Total
Reduction in Transfers	27.12	32.83	27.85	29.23	30.36
No Change	59.32	54.71	55.25	58.46	55.65
Increase in Transfers	13.56	12.46	16.89	12.31	13.99
Total	100.00	100.00	100.00	100.00	100.00

We analyze whether providers responded differently to the insurance uptake decision depending on how well they knew the recipient. We report the share of providers who transferred less, the same or more when insurance became available, separately for the different categories of acqaintance with the recipient. Table 12 illustrates that a comparable share of providers transferred less (the same, more) to the recipients in response to the insurance option across the categories. Most importantly, providers in the knowledge, blood relation and friendship categories are *not* less likely to reduce their transfers in response to the foregoing of insurance compared with providers in the first category (no knowledge). To the extent that our argument about knowledge of risk preferences among close acquaintances is true, this implies that providers do not regard the insurance uptake decision solely as a signal of risk preferences. We do not mean to say that none of our experimental participants reacted on the perceived risk preference, but we can rule out that this is the only explanation for their behavior. They also or even dominantly respond to the insurance choice per se.

4.3.3 Limitation 3: Strategic Transfer Design

Another potential concern arises from the fact that providers made their transfer decisions strategically: They knew the transfer would only be enacted if recipients actually lost. In the transfer game, the probability of a transfer being implemented varies across the treatments with and without the insurance option. When recipients have no insurance option, there is a 50% probability of losing and thus of transfers. When recipients have an insurance option, the probability decreases as soon as some recipients take up insurance and thus have a zero probability of a loss, making transfers impossible. In our experiment, insurance uptake was relatively high, namely 75%. Hence, the probability of a transfer was 0.75*0+0.25*0.5=12.5% in the treatment with the insurance option. If providers expected high insurance uptake, they may have indicated a relatively high transfer amount in the treatment with the insurance option because they did not expect a transfer would take place. Such behavior would be particularly likely if providers were not only motivated by solidarity norms but also by a desire to 'look good' in the eyes of the research assistants, the other experimental participants or themselves; i.e. by their social or self image. As described in Section 2.2, we tried to limit concerns for social image by using an anonymous setting in which neither the research assistants nor the other participants could

observe the transfer decisions. Nevertheless, providers might still be motivated by their self image (Dana and Kuang 2007). If this was the case, then differences in transfers would be larger in a non-strategic setting. The transfer differences that we observe should thus be interpreted as a lower bound for the true extent of choice conditionality.

5 Discussion of Results

In this study, we focused on transfers between peers which are motivated by solidarity. We investigated whether or not transfers to individuals who lost most of their income are reduced when these individuals could have avoided the loss by purchasing insurance. We formulated two hypotheses. First, individuals condition their solidarity on the choices of others (Hypothesis 1). And second, individuals condition their response to the choices of others on whether or not the others knew that they might receive support (Hypothesis 2). To test these hypotheses, we conducted a lab-in-the-field experiment in rural Cambodia.

We found unequivocal support for Hypothesis 1. The providers in our experiment transferred an average of 13%-15% of their endowment to the recipients that had lost most of their endowed money and had not had an option to insure. When recipients had foregone the option to insure, providers reduced their transfers by 25%-32% on average. Even though not every provider conditioned her solidarity on the recipient's insurance choice, close to one in two did so. Our results thus confirm the findings from previous studies that a substantial proportion of individuals make their help to others dependent on the past decisions of the others.

Our results differ from previous studies, such as Cappelen et al. (2013) and Mollerstrom, Reme, and Sørensen (2015), in that we do not observe a tendency of the providers to equalize income. Only few providers gave a transfer of 7,000 Riel, which would have resulted in an equal split between the provider's income of 16,000 Riel and the recipient's remaining income of 2,000 Riel. Most providers transferred no more than 2,000 Riel. It is important to note that our experimental design is quite different from that of Cappelen et al. (2013) and Mollerstrom, Reme, and Sørensen (2015). These studies rely on dictator games, in which dictators or third-party spectators had to decide how to distribute the *total* amount of two incomes (i.e. of the dictator and of the recipient). It is likely that this procedure makes the norm of an equal split more salient. In contrast, studies that use solidarity games, rather than dictator games, to analyze choice conditionality, also do not observe an equalization of incomes (Bolle and Costard 2015; Trhal and Radermacher 2009).

Most providers whom we interviewed after the experiment explained that they had made a positive transfer because they had felt pity for the recipient; they did not refer to fairness concerns. The solidarity norms (ϕ_A) of our subjects thus seem to be shaped by empathy.[24] Then, why do providers feel less empathy with a recipient who forewent insurance? As pointed out by Bowles (2008), economic incentives have a framing effect: they affect how a decision situation is represented and may imply appropriate behavior. The introduction of insurance may thus be interpreted as a signal that economic security becomes an individual responsibility, which reduces the moral obligation to support others (Landmann, Vollan, and Frölich 2012). This idea relates to findings by Hintz (2010) who analyzes the implementation of a life-insurance product in rural Indonesia. Hintz finds that in villages where the insurance was introduced, the willingness to provide help declined substantially after the insurance

[24] A number of studies suggest that empathy is one of the driving motives explaining pro-social behavior (e.g. see Andreoni and Rao (2011)).

scheme was established. Hintz describes a paradigm shift: the insurance led to an "individualization of risk management ... (furthering) the erosion of social cohesion" (Hintz 2010, p. 232).

To our surprise, we found no evidence for Hypothesis 2. The providers' response to foregoing insurance did not depend on the level of information available to the recipients.[25] The providers equally reduced their transfers by 25%-32%, on average, towards recipients who had been informed about potential support from the providers and towards recipients who had not been informed. As above, not all providers behaved the same way. A large group (60%) of providers did not react to information at all; it seems that they did not regard the foregoing of insurance by the informed recipients as free-riding. Two small groups (20% each) of providers withdrew their transfers to informed recipients by either more or less than to uninformed recipients. We suggested that while some providers may perceive the foregoing of insurance as a bad intention, others may perceive it, in fact, as a good intention. Alternatively, the desire to avoid feelings of guilt may explain the behavior of part of our providers. With the data currently at hand, we cannot say anything about the plausibility of these interpretations. We did not elicit the perception of intentions or the second-order beliefs of the providers in our experiment. Hence, we do not know whether the providers regarded the recipients' insurance decision as intentionally good or bad and whether they took the recipients' expectations into account when making transfer decisions. We plan to conduct further research along these lines.

Possibly, individuals behave in line with our Hypothesis 2 only if formal insurance is common: Familiarity with insurance may be a necessary condition to make people regard the reliance on others as free-riding. In one of the provinces where we conducted our experiment, Siem Reap, health insurance had been introduced in 2012, whereas there was no health insurance available in the other province, Banteay Meanchey. As a consequence, considerably more experimental participants were insured with any kind of insurance in Siem Reap than in Banteay Meanchey (13% vs. 3%). Providers' behavior in the experiment did not differ significantly across these two provinces; but participants that had purchased insurance in real life reduced their transfers by significantly more when insurance was foregone informedly than participants that had no insurance in real life. As a follow-up, it would be desirable to think about an experimental design that varies the familiarity with insurance.

In sum, we illustrate in this study that formal insurance can crowd out informal support which is motivated by social preferences. Our findings indicate that the extent of solidarity within low-income communities decreases when formal insurance becomes available as people seem to expect each other to get insured. Policy-makers should be concerned for at leat two reasons. First, in real life, some people will not take up formal insurance, simply because they are too poor to pay insurance premiums. In order to minimize adverse consequences for these people, the introduction of formal insurance would ideally be complemented with the introduction of social safety nets targeted at them. Second, formal insurance typically covers only specific risks. If the decrease in solidarity is not restricted to the insured risk but extends beyond it (as shown by Mollerstrom, Reme, and Sørensen 2015), people - and not only the poorest - may be worse off with formal insurance when the uninsured risk materializes: There is no formal insurance cover and less informal support than without formal insurance.

Our findings should not be understood as a pledge against formal insurance in low-income countries. We acknowledge the potential of insurance to improve the welfare of the previously uninsured. Still, we underline the message of previous studies (Attanasio and Rios-Rull 2000; Lin, Liu, and Meng 2014):

[25] This finding is in line with Koch and Normann (2008) and Dreber et al. (2013). These authors play dictator games, in which the recipients either know about the existence of a dictator who may transfer money to them or do not know about it. In both studies, the authors find that information on the side of the recipients is irrelevant for the dictators' transfer decisions. Dana, Cain, and Dawes (2006) come to different results.

Welfare improvements are not automatic. The ultimate welfare effect of insurance depends on how many people purchase insurance, the extent of loss compensation, and the magnitude of crowding out of informal support. Policy-makers should be aware of possible, unintended externalities of insurance, such as the ones indicated here, and respond; and researchers should take external effects into account when evaluating the impact of insurance.

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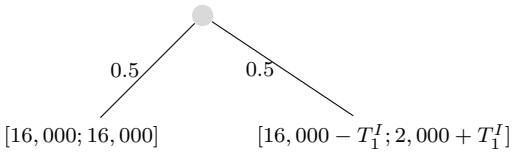
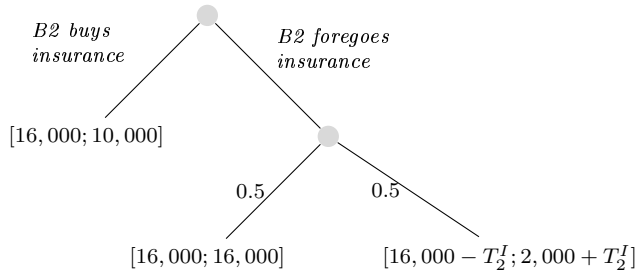
A Game Design

Case 1

Outcome [A1;B1]

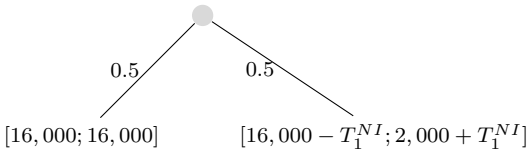


Outcome [A1;B2]



Case 2

Outcome [A2;C1]



Outcome [A2;C2]

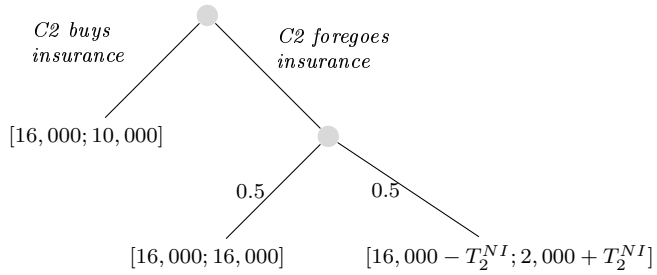


Figure 7: Outcome Tree for Case 1 and Case 2

B Instructions

B.1 Instruction for the 'General Introduction'

[All 32 participants sit, at the front two RAs, the other RAs stand ready with their color sign boards]

Thank you all for coming today. My name is XXX. Let me briefly introduce our team to you. [*Introduce each RA.*] And this is Friederike who is a researcher at a university in Germany.

This workshop today has 2 games and 6 rounds in total. During the workshop you can earn a considerable amount of money that you are permitted to keep and take home. In the six different rounds you will have to make decisions that will influence your personal earning, but each of you will be given a show-up fee of 4,000 Riel at the end for sure. [*Show money.*] The remaining procedure, from now on, will last around three hours. Thank you in advance for your effort and time.

You should understand that the money you can earn in this workshop is not Friederike's own money. It is money given to her by the German government to do a research study. Friederike is working together with other researchers who are carrying out similar workshops all around the world.

If at any time you find that this is something that you do not wish to participate in for any reason, you are of course free to leave whether we have started the game or not. If you already feel uncomfortable, or you already know that you will not be able to stay for the three hours, then you should tell us now.

It is very important that you understand each round. Therefore we will check your understanding by asking each of you test questions about the rules. If you do not understand the rules you may ask the assistants to explain them. But if you cannot answer the test questions after explaining them twice, we will have to exclude you from the workshop and you receive only the show-up fee. But don't worry: we will do our best to help you understand.

The workshop is structured as follows: we have one game with two rounds, then a break during which you will be asked to answer a short questionnaire and then a second game with four rounds. After this there will be the payout. It is very important for our research that you answer all questions of the questionnaire seriously.

After knowing these rules, is there anybody who does not like to participate? [*Wait some moments.*]

There will be six rounds that are slightly different from each other. At the beginning of each round, each of you will be given 16,000 Riel as endowment. These 16,000 Riel are play money. But they will be exchanged to real money at the end of the workshop. In each round you might lose some of this money. How much you keep and eventually your final earnings of this workshop depend on your decisions, decisions of others and luck. The show-up fee of 4,000 Riel is always untouched. We will inform you about your outcome in a specific round only at the end of the workshop. We will at no time inform you about the outcome of other participants.

Friederike administers the accounts for each participant. [*Show template sheet with accounts for each participant.*] After each round, the amount each participant earned will be reported to Friederike. We play 6 rounds. Each round is named after a fruit. We have Mango, Pineapple, Orange 1, Orange 2, Apple 1, Apple 2. But you might play them in a different order. Only one of the 6 rounds determines the final payout for you. At the end of the workshop, we will draw a ball to determine which of the 6 rounds will be paid out to you. [*Show 6 balls with the fruit names.*] Just one of the 6 rounds is finally paid out. [*Shows example sheet with accounts for each participants.*] This is an example for the account sheet. Each row specifies the outcome for a specific participant in each round. [*Show.*] Let us assume we draw this ball. [*Draw a ball, show the name on it.*] How much will be the payout of this

participant? [*Show participant number on sheet.*] And how much of this? [*Show a different number.*] Let us assume we draw this ball. [*Draw a ball, show the name on it.*] How much will be the payout of this participant? [*Show participant number on sheet.*] And how much of this? [*Show a different number.*] [*Repeat until understood.*]

The outcomes in one round have absolutely no influence on the outcomes of another round or another game. They are completely independent from each other. So, if you make your decision in one round, don't worry what happened in the rounds before or what will happen in the following rounds. Just take each round seriously on its own, because it might be the one that is paid out.

In the rounds you have to make decisions about small sums of money. Each decision you make is good – there are no wrong decisions. Your decisions will be kept in private, so just choose the option YOU like best!

After we finished the six rounds, one by one will come to Friederike, who will hand out the earnings of the round drawn plus the show-up fee to you and you sign the receipt.

You all received a colour badge and a participant number. The participant number is your personal number. You keep this number for all six rounds of the workshop and have to show it at the end in order to get paid. So always remember to take the color badge with you.

There are some more rules for communication. During the rounds talking is strictly prohibited. You cannot ask questions to the other participants or talk about the rules with other participants while we are in the process of the round. If you have any questions, please raise your hand and wait until someone comes to answer your question in private. If you do not follow the rule you cannot participate in the workshop anymore and get no earnings from the workshop.

We will now start. Please go to the assistant that shows a signboard with your colour. This is your group. For all 6 rounds of this workshop you will stay in this group.

[*RAs collect the participants, go with them to the respective rooms.*]

B.2 Instruction - Providers A1

Welcome again. I am YYY and this is ZZZ. We will assist you in this round. Let me reiterate what XXX stated in the introduction: Talking is strictly prohibited. You must not ask questions to the other participants or talk about the rules with other participants while the round is in progress. If you have any questions, please raise your hand and wait until I or my colleague comes to answer your question in private. If you do not follow the rule you cannot participate in the workshop anymore and get no earnings from the workshop.

Let me first hand out your endowment. [*Hand out bags with money to each participant.*] You will find in the bag 16,000 Riel in play money. This is your endowment. Remember, while we use play money now, this translates to real money later.

You are lucky; you can keep all your money. This was determined through a random draw that allocated participants to their roles. People in the other rooms are less lucky. They also receive 16,000 Riel in play money. But then each of them rolls the dice – like this [*Show.*]. If the dice shows 4, 5 or 6, they can keep their 16,000 Riel. But if the dice shows 1, 2 or 3 they lose 14,000 Riel and can keep only 2,000 Riel.

Each of you will be matched randomly with one partner from the other rooms. You can support your partner in the case that she loses 14,000 Riel. Thus, you can decide whether you want to transfer part of your money to your partner if she rolls a 1, 2 or 3, and therefore suffers a loss of 14,000 Riel. Please note that you will *never* be informed about the name of your partner.

Your partner knows that she might receive support from someone in this group in case of a loss. They are asked how much they expect to receive. But they, too, will *never* be informed about your name.

There are two different groups [*Show on illustration.*] and your partner is in one of the two groups:[26]

In the group *'khâ'* the participants have the possibility to purchase a guarantee before they play the dice game. The guarantee costs 6,000 Riel. They receive a guarantee certificate. [*Show example.*] If they purchase the guarantee, they have only 10,000 Riel left, but they will not lose anything in the dice game. That is, nothing happens to them if the dice falls on 1, 2, or 3.

In the other group, *'kâ'*, participants do not have the possibility to buy a guarantee. They just play the dice game and they will either lose money or not.

[*Round 1: Test Questions Simulation Group 'khâ' and Test Questions Simulation Group 'kâ'*]

Each of you will be matched randomly with a partner in either the 'khâ' group or in the 'kâ' group. Before the partner matching is determined, you are therefore asked to make two independent decisions: "Suppose you have your partner in group *'kâ'* and your partner loses 14,000 Riel in the dice game, thus she has only 2.000 Riel left. Will you transfer part of your money to your partner? If so, how much?" You will note this down in private on a sheet. [*Show the sheet.*]

And then: "Suppose on the other side, your partner is not in group 'kâ', but in group *'khâ'*. Thus your partner had the option to purchase a guarantee. However, your partner decided *not* to purchase the guarantee and loses 14,000 Riel in the dice game, thus she has only 2,000 Riel left. Will you transfer part of your money to your partner? If so, how much?" You will note this down in private on another sheet [*Show sheet*]. You will then still have time to look through both decisions.

For each of you we then determine in which group your partner is. You will receive an envelope. You put the amount of money that you decided to transfer to your partner into the envelope. The amount of money must be the exact same as noted on the decision sheet. The amount will be double checked. In case there is any difference the amount you indicated on the sheet will determine the transfer. After you put the amount in the envelope, we will collect the envelopes. The money in the envelope will be transferred to your partner in case she loses part of her endowment. If she does not lose anything, you will keep the money in the envelope. All remaining money will determine your personal earnings for this game.

[*Round 1 and Round 2: Test Questions Transfers*]

Your decisions are anonymous in two ways: First, your name will never be revealed to your partner and your partner's name will never be revealed to you. Second, you will do your transfer decision in private using this cardboard [*Show cardboard.*]. We will not look at the decision sheets or on the envelopes. In fact, we will not even touch the sheets or envelopes. You will put them in this basket [*Show basket.*] and we will bring the basket directly to Friederike. Hence your transfer decisions will not be observed by the other participants and not by us.

Remember, that the transfer decision is yours and only yours – there are no wrong decisions. You can transfer nothing or 1,000 Riel, 2,000 Riel, 3,000 Riel, etc. as you wish. Your transfers will be kept in private, *so just choose the amount YOU like best! And remember it's real money!*

Let us start. [*Hand out the decision sheet for each participant and pencils.*] Please assume your partner is in Group *'kâ'*, thus your partner has no possibility to buy a guarantee. She rolls the dice and loses 14,000 Riel. She has only 2,000 Riel left. Would you like to transfer part of your 16,000 Riel?

[26] We used two Khmer letters to refer to the recipients without the insurance option and to those with the insurance option, letter 'kâ' for recipients of type $B1$ and $C1$ and letter 'khâ' for recipients of type $B2$ and $C2$.

Please write in the box how much money you would like to transfer. If you do not want to transfer anything, you write 0. [*Wait.*] Please put the sheet next to you.

[*Hand out the other decision sheet to each participant.*] Now, please assume your partner is in Group *'khâ'*, your partner decided *not* to purchase the guarantee, she rolls the dice and loses 14,000 Riel. She only keeps 2,000 Riel. Would you like to transfer part of your 16,000 Riel? Please write in the box how much money you would like to transfer. If you do not want to transfer anything you write 0. [*Wait.*]

Now, please have a look at your two decisions. One of the two decisions will be enacted in case your partner loses 14,000 Riel. Are you satisfied with your decisions? Then please fold the sheets and lay them in front of you like this [*Show with name on the top.*]. [*Collect pencils.*]

I will now hand out the partner envelope. [*Go from one participant to the other, each draws one white envelope with the partner's group name and a player id written on it.*] Please look at the envelope. It tells you in which group your partner is. Please now take your decision sheet for this group [*Collect the other decision sheet which is not relevant with a basket.*], look at it and add the money exactly according to your decision in the envelope. This amount will be transferred to your partner if she loses. [*Wait. Then ask each participant to put the envelope in a basket and hand out brown envelopes with the player number of the A player.*] Now, here you put your remaining money. This will be transferred to your account.

[*Ask each participant to put the envelope in the other basket. Finish.*]

B.3 Instruction - Providers A2

Welcome again. I am YYY and this is ZZZ. We will assist you in this round. Let me reiterate what XXX stated in the introduction: Talking is strictly prohibited. You must not ask questions to the other participants or talk about the rules with other participants while the round is in progress. If you have any questions, please raise your hand and wait until I or my colleague comes to answer your question in private. If you do not follow the rule you cannot participate in the workshop anymore and get no earnings from the workshop.

Let me first hand out your endowment. [*Hand out bags with money to each participant.*] You will find in the bag 16,000 Riel in play money. This is your endowment. Remember, while we use play money now, this translates to real money later.

You are lucky; you can keep all your money. This was determined through a random draw that allocated participants to their roles. People in the other rooms are less lucky. They also receive 16,000 Riel in play money. But then each of them rolls the dice – like this [*Show.*]. If the dice shows 4, 5 or 6, they can keep their 16,000 Riel. But if the dice shows 1, 2 or 3 they lose 14,000 Riel and can keep only 2,000 Riel.

Each of you will be matched randomly with one partner from the other rooms. You can support your partner in the case that she loses 14,000 Riel. Thus, you can decide whether you want to transfer part of your money to your partner if she rolls a 1, 2 or 3, and therefore suffers a loss of 14,000 Riel. Please note that you will *never* be informed about the name of your partner.

Your partner *does not know* that she has a partner. She *does not know* that she might receive support from someone in case of a loss. If you decide to transfer something in case you partner loses, this amount will be added to her account. But she will *never* be informed about you and your name.

There are two different groups [*Show on illustration.*] and your partner is in one of the two groups:

In the group *'khâ'* the participants have the possibility to purchase a guarantee before they play the dice game. The guarantee costs 6,000 Riel. They receive a guarantee certificate. [*Show example.*] If they purchase the guarantee, they have only 10,000 Riel left, but they will not lose anything in the dice game. That is, nothing happens to them if the dice falls on 1, 2, or 3.

In the other group, *'kâ'*, participants do not have the possibility to buy a guarantee. They just play the dice game and they will either lose money or not.

[*Round 1: Test Questions Simulation Group 'khâ' and Test Questions Simulation Group 'kâ'*]

Each of you will be matched randomly with a partner in either the 'khâ' group or in the 'kâ' group. Before the partner matching is determined, you are therefore asked to make two independent decisions: "Suppose you have your partner in group *'kâ'* and your partner loses 14,000 Riel in the dice game, thus she has only 2,000 Riel left. Will you transfer part of your money to your partner? If so, how much?" You will note this down in private on a sheet. [*Show the sheet.*]

And then: "Suppose on the other side, your partner is not in group 'kâ', but in group *'khâ'*. Thus your partner had the option to purchase a guarantee. However, your partner *decided not* to purchase the guarantee and loses 14,000 Riel in the dice game, thus she has only 2,000 Riel left. Will you transfer part of your money to your partner? If so, how much?" You will note this down in private on another sheet [*Show sheet*]. You will then still have time to look through both decisions.

For each of you we then determine in which group your partner is. You will receive an envelope. You put the amount of money that you decided to transfer to your partner into the envelope. The amount of money must be the exact same as noted on the decision sheet. The amount will be double checked. In case there is any difference the amount you indicated on the sheet will determine the transfer. After you put the amount in the envelope, we will collect the envelopes. The money in the envelope will be transferred to your partner in case she loses part of her endowment. If she does not lose anything, you will keep the money in the envelope. All remaining money will determine your personal earnings for this game.

[*Round 1 and Round 2: Test Questions Transfers*]

Your decisions are anonymous in two ways: First, your name will never be revealed to your partner and your partner's name will never be revealed to you. Second, you will do your transfer decision in private using this cardboard [*Show cardboard.*]. We will not look at the decision sheets or on the envelopes. In fact, we will not even touch the sheets or envelopes. You will put them in this basket [*Show basket.*] and we will bring the basket directly to Friederike. Hence your transfer decisions will not be observed by the other participants and not by us.

Remember, that the transfer decision is yours and only yours – there are no wrong decisions. You can transfer nothing or 1,000 Riel, 2,000 Riel, 3,000 Riel, etc. as you wish. Your transfers will be kept in private, *so just choose the amount YOU like best! And remember it's real money!*

Remember, you partner does not know that she has a partner. She is not expecting anything.

Let us start. [*Hand out the decision sheet for each participant and pencils.*] Please assume your partner is in Group *'kâ'*, thus your partner has no possibility to buy a guarantee. She rolls the dice and loses 14,000 Riel. She has only 2,000 Riel left. Would you like to transfer part of your 16,000 Riel? Please write in the box how much money you would like to transfer. If you do not want to transfer anything you write 0. [*Wait.*] Please put the sheet next to you.

[*Hand out the other decision sheet to each participant.*] Now, please assume your partner is in Group *'khâ'*, your partner decided *not* to purchase the guarantee, she rolls the dice and loses 14,000 Riel. She only keeps 2,000 Riel. Would you like to transfer part of your 16,000 Riel? Please write

in the box how much money you would like to transfer. If you do not want to transfer anything you write 0. [*Wait.*]

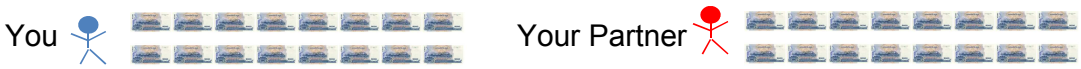
Now, please have a look at your two decisions. One of the two decisions will be enacted in case your partner loses 14,000 Riel. Are you satisfied with your decisions? Then please fold the sheets and lay them in front of you like this [*Show with name on the top.*]. [*Collect pencils.*]

I will now hand out the partner envelope. [*Go from one participant to the other, each draws one white envelope with the partner's group name and a player id written on it.*] Please look at the envelope. It tells you in which group your partner is. Please now take your decision sheet for this group [*Collect the other decision sheet which is not relevant with a basket.*], look at it and add the money exactly according to your decision in the envelope. This amount will be transferred to your partner if she loses. [*Wait. Then ask each participant to put the envelope in a basket and hand out brown envelopes with the player number of the player.*] Now, here you put your remaining money. This will be transferred to your account.

[*Ask each participant to put the envelope in the other basket. Finish.*]

B.4 Illustrations

Figure 8: Illustration for provider A1 - recipient B1



Your Partner

1. Explained the dice game

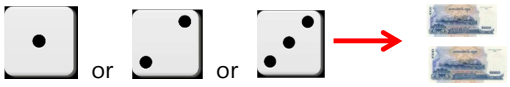
   Informed that she has a partner who might support her in case she loses

   Asked, how much she expects that the partner transfers to her in case she loses

2. Rolls the dice

   If the dice shows **"4", "5"** or **"6",** she keeps all her money, she keeps **16.000 Riel**

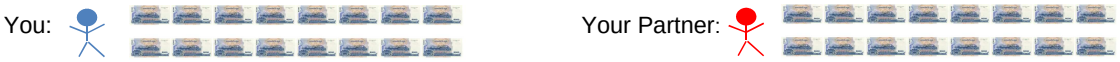
   If the dice shows **"1"** or **"2"** or **"3",** she loses **14.000 Riel** and has only **2.000 Riel** left



You :

Can decide how much money to transfer to your partner in case your partner has only **2.000 Riel** left

Figure 9: Illustration for provider A1 - recipient B2

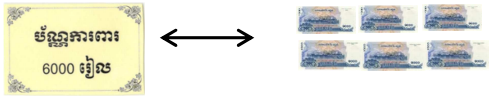


Your partner:

1. Explained the dice game
2. Informed that she has a partner who might support her in case she loses

Asked, how much she expects that the partner transfers to her in case she loses

3. Decides whether to purchase protection for **6.000** Riel...



...if yes she receives the protection certificate and she has 10.000 Riel left.

4. She rolls the dice:

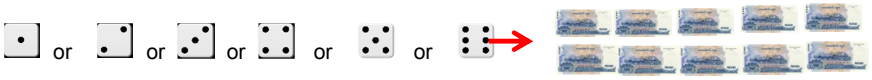
A.

If the dice shows **"4", "5"** or **"6",** she keeps all her money, she keeps **16.000 Riel**

If the dice shows **"1"** or **"2"** or **"3",** she loses 14.000 Riel and has only **2.000 Riel** left

B.

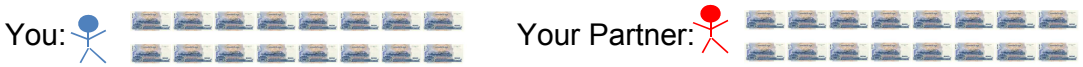
Independent of the dice, she keeps **10.000 Riel**



You:

Can decide how much money to transfer to your partner in case your partner has only **2.000 Riel** left.

Figure 10: Illustration for provider A2 - recipient C1



Your partner

1. Explained the dice game
2. Rolls the dice

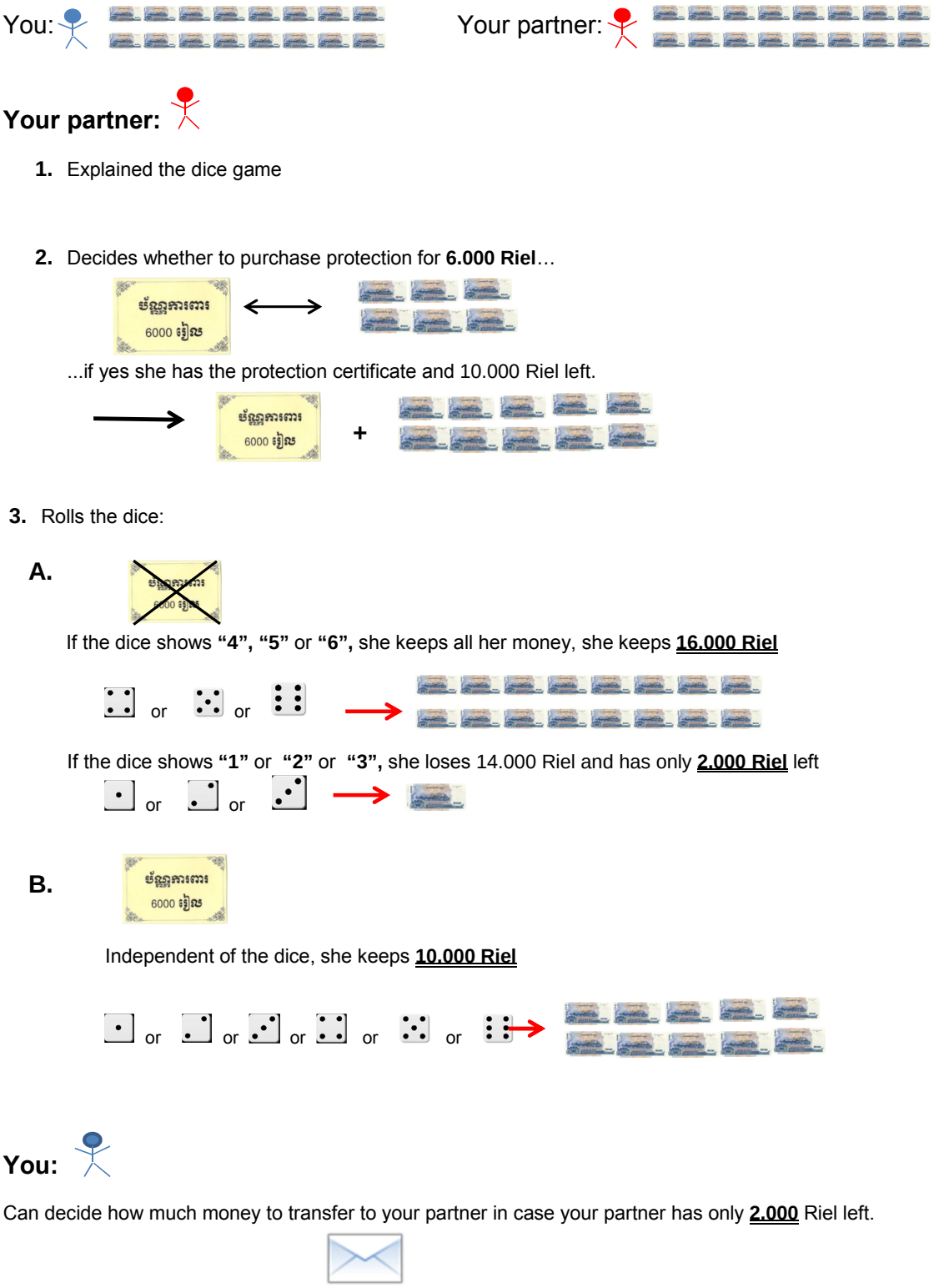
If the dice shows **"4", "5"** or **"6",** she keeps all her money, she keeps **16.000 Riel**.

If the dice shows **"1"** or **"2"** or **"3",** she loses **14.000 Riel** and has only **2.000 Riel** left

You:

Can decide how much money to transfer to your partner in case your partner has only **2.000 Riel** left

Figure 11: Illustration for provider A2 - recipient C2



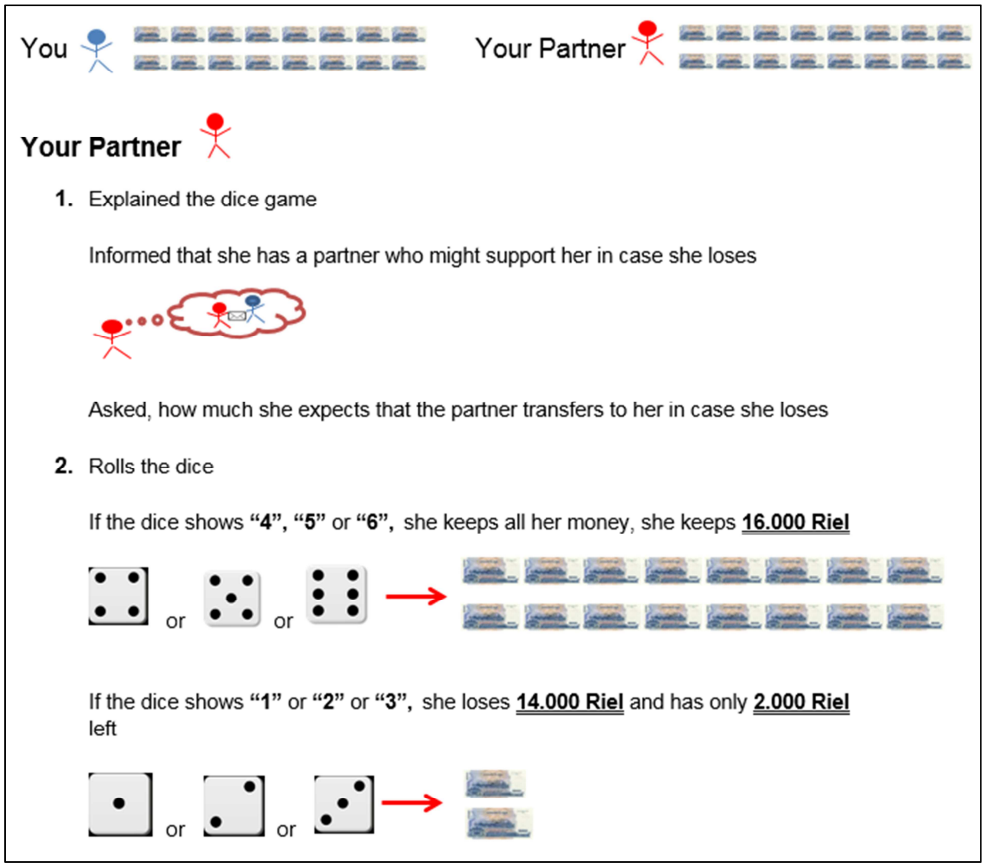
B.5 Decision sheets

Figure 12: Decision sheets for provider A1 - recipient B1

Game 1 - DS_NG - Decision Sheet - ⛩ - Room 5 - Group 1a and 1b - Blue and Purple - RA 5, RA 6

Participants ID:___

Your Partner is in **Group** ⛩



Decision:

Suppose you partner rolls the dice and loses 14.000 Riel. She only keeps 2.000 Riel. Would you like to transfer part of your money?

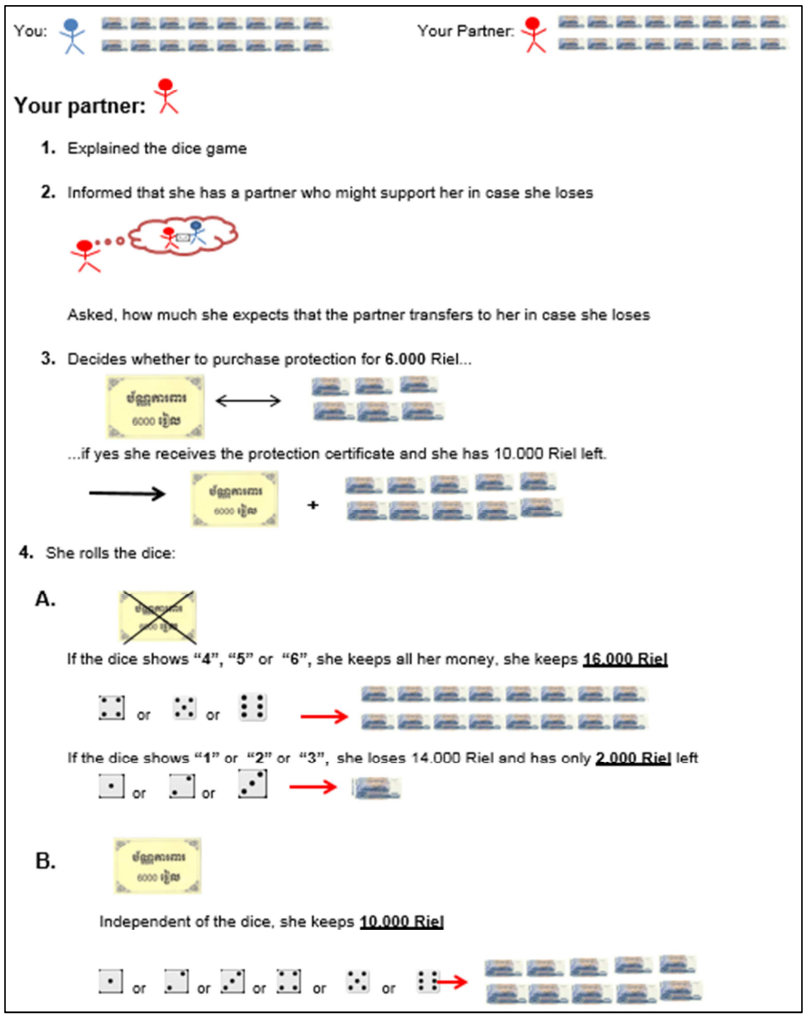
Please write in the box how much you would like to transfer (write in terms of 1.000 Riel). If you do not wish to transfer anything, you write "0". Remember, this is real money!

Figure 13: Decision sheets for provider A1 - recipient B2

Game 1 - DS_G - Decision Sheet - 2 - Room 5 - Group 1a and 1b - Blue and Purple - RA 5, RA 6

Participants ID:___

Your Partner is in **Group 2**



Decision:

Suppose you partner did **not** purchase protection. She rolls the dice and loses 14.000 Riel. She only keeps 2.000 Riel. Would you like to transfer part of your money?

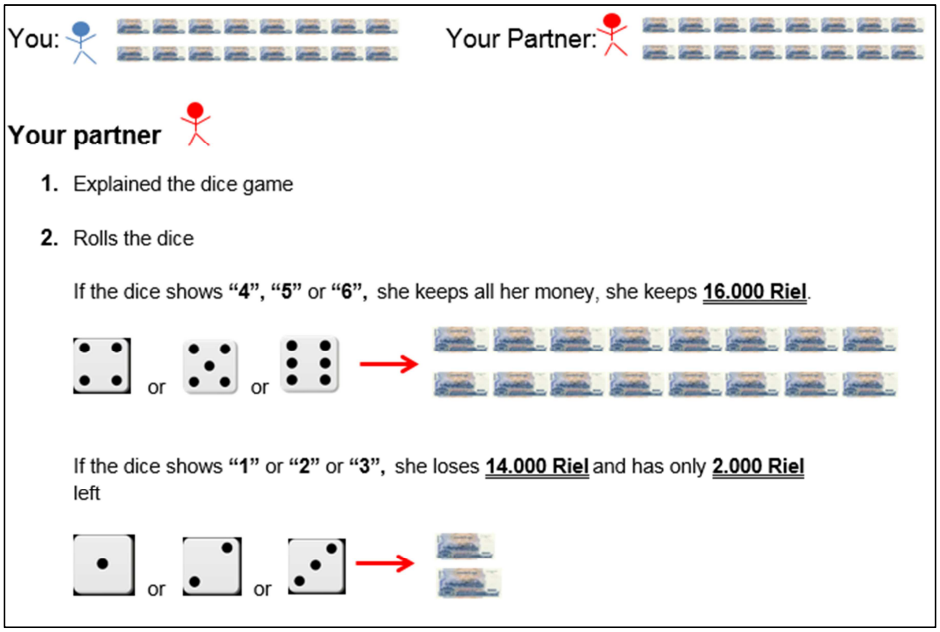
Please write in the box how much you would like to transfer (write in terms of 1.000 Riel). If you do not wish to transfer anything, you write "0". Remember, this is real money!

Figure 14: Decision sheets for provider A2 - recipient C1

Game 1 - DS_NG_C - Decision Sheet - ⛩ - Room 6 - Group 1c and 1d - Rose and Orange - RA 7, RA 8

Participants ID:___

Your Partner is in **Group** ⛩



Decision:

Suppose your partner rolls the dice and loses 14.000 Riel. She only keeps 2.000 Riel. Would you like to transfer part of your money?

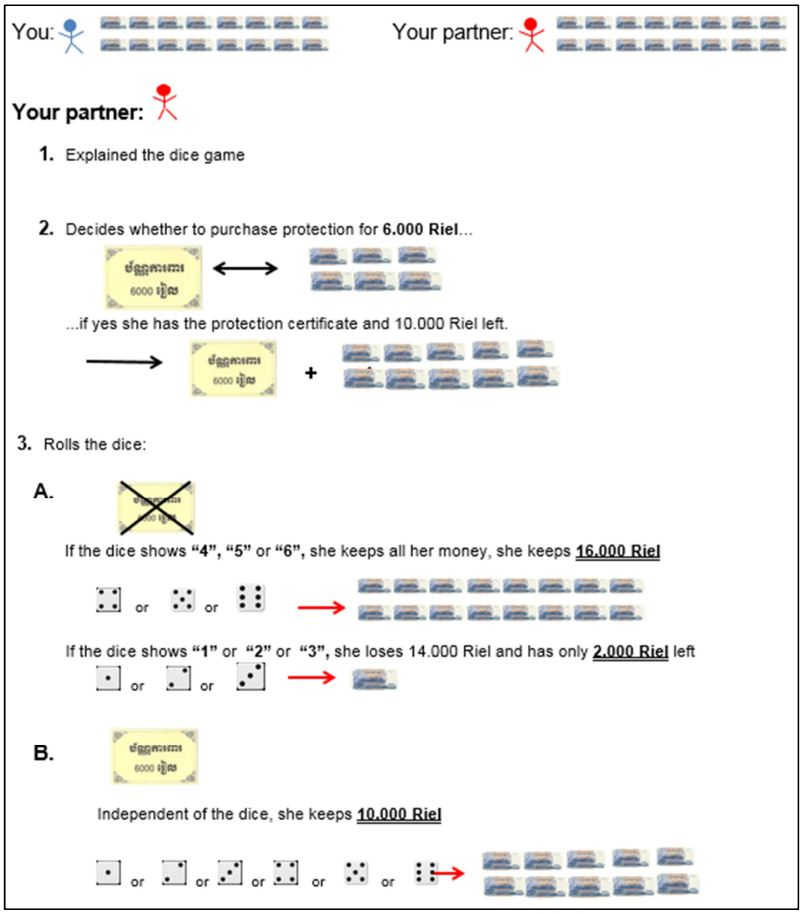
Please write in the box how much you would like to transfer (write in terms of 1.000 Riel). If you do not wish to transfer anything, you write "0". Remember, this is real money!

Figure 15: Decision sheets for provider A2 - recipient C2

Game 1 - DS_G_C - Decision Sheet - 2 - Room 6 - Group 1c and 1d - Rose and Orange - RA 7, RA 8

Participants ID:___

Your Partner is in **Group 2**



Decision:

Suppose your partner did **not** purchase protection. She rolls the dice and loses 14.000 Riel. She only keeps 2.000 Riel. Would you like to transfer part of your money?

Please write in the box how much you would like to transfer (write in terms of 1.000 Riel). If you do not wish to transfer anything, you write "0". Remember, this is real money!

B.6 Instruction - Test questions

All providers (participants playing the role of A1 or A2) were asked the following test questions. Group 'kâ' refers to the recipients without the insurance option (B1 and C1); group 'khâ' to the recipients with the insurance option (B2 and C2).

B.6.1 Test Questions Simulations [Round 1 only]

Test Questions Simulation Group 'kâ'

Imagine you are a player in Group 'kâ'. Please roll the dice. [*Participant rolls dice.*]. What does this mean, how much of your money will you keep? If your dice shows this number [*Show dice number of opposite situation.*], what does this mean? How much money would you keep? [*Write down dice number and level of understanding of dice question.*]

Test Questions Simulation Group 'khâ'

Imagine you are a player in Group 'khâ'. Would you wish to purchase the guarantee? If yes, how much money would you keep? If not, how much money would you keep? [*Write down insurance decision and level of understanding of insurance question.*] If you now roll the dice and the dice shows 2, how much money would you keep with guarantee? How much without guarantee? If you now roll the dice and the dice shows 4, how much money would you keep with guarantee? How much without guarantee? [*Write down level of understanding of dice question.*]

B.6.2 Test Questions Transfers [Round 1 and Round 2]

Imagine your partner is in group 'kâ' and you decided to transfer 0 (2,000; 4,000; 6,000) and your partner rolls a 2. How much will your partner have at the end? How much will you have? What if your partner rolls a 4. How much will your partner have at the end? How much will you have? [*Write down level of understanding of transfer question, Group 'kâ'.*]

Imagine your partner is in group 'khâ' and has not bought the guarantee; you decided to transfer 0 (2,000; 4,000; 6,000) and your partner rolls a 2. How much will your partner have at the end? How much will you have? What if your partner bought the guarantee and rolls a 2. How much will your partner have at the end? How much will you have? [*Write down level of understanding of transfer question, Group 'khâ'.*]

C Descriptive Statistics

C.1 Test questions

Table 13: Correct Responses to Test Questions in Round 1 and Round 2 (A1 and A2 players)

	mean	sd
Test question dice (recipient with option)	.738	.44
Test question dice (recipient without option)	.777	.417
Test question insurance (recipient with option)	.798	.402
Test questions transfer (2 in Round 1)	.711	.454
Test questions transfer (2 in Round 2)	.765	.425
All test questions correct	.443	.498
All transfer test questions correct	.548	.498
Observations	336	

Avg. proportion of participants responding correct to test questions

All test questions correct - based on seven questions

All transfer test questions correct - based on four questions

C.2 Characteristics of Insurance Providers

Table 14: Mean comparison test: Difference in characteristics for A1 and A2 providers

Individual Characteristics		
Female	0.02	(0.64)
Age	2.07	(0.12)
Married	-0.02	(0.64)
Household Head	0.02	(0.66)
Born in this village	0.01	(0.91)
Literate	-0.02	(0.64)
Schooling years	-0.15	(0.64)
Self-employed	-0.04	(0.33)
Household Characteristics		
Household size	-0.37	(0.17)
Monthly income (US$)	-24.73	(0.55)
ID Poor status	-0.05	(0.27)
Indebted	-0.04	(0.44)
Borrowed from other households	-0.05	(0.33)
Borrowed from financial institution	-0.01	(0.91)
Bank account	0.05**	(0.03)
Member in a saving group	0.02	(0.58)
Insurance	-0.03	(0.35)
Migrant	0.04	(0.51)
Remittances	0.07	(0.31)
Landownership (ha)	-0.08	(0.77)
No electricity	-0.01	(0.81)
Observations	336	

p-values in parentheses

Player types are based on the roles in Round 1

D Treatment Effect Analysis

D.1 Tobit Estimation

Table 15: Option of Insurance, Information and Transfers - Tobit Random Effect

	(1) Transfer	(2) Transfer	(3) Transfer	(4) Transfer	(5) Transfer	(6) Transfer
Transfer						
Inf (β)	0.022	0.023	0.035	0.037	0.118	0.114
	(0.090)	(0.089)	(0.099)	(0.106)	(0.103)	(0.072)
Opt (γ)	-0.751***	-0.751***	-0.747***	-0.830***	-0.878***	-0.653***
	(0.092)	(0.091)	(0.101)	(0.108)	(0.106)	(0.074)
InfOpt (η)	0.024	0.026	-0.060	-0.006	-0.005	-0.016
	(0.130)	(0.128)	(0.142)	(0.152)	(0.149)	(0.104)
Constant (θ)	2.102***	2.237***	2.272***	2.324***	2.239***	2.086***
	(0.093)	(0.098)	(0.109)	(0.118)	(0.128)	(0.084)
sigma_u						
Constant (θ)	1.247***	1.250***	1.298***	1.277***	1.208***	1.125***
	(0.060)	(0.060)	(0.067)	(0.074)	(0.082)	(0.053)
sigma_e						
Constant (θ)	1.160***	1.149***	1.184***	1.117***	0.883***	0.922***
	(0.028)	(0.028)	(0.031)	(0.033)	(0.033)	(0.023)
Round effects	No	Yes	Yes	Yes	Yes	Yes
Observations	1344	1344	1168	908	596	1320
ll	-2253.435	-2244.583	-1977.033	-1499.709	-882.897	-1992.970
rho	0.536	0.542	0.546	0.567	0.652	0.599

Tobit Random effect estimator; bounded at 0

(1)-(2) for all subjects; (3) excluding subjects who needed support in writing;

(4) excluding subjects who made at least two mistake at test questions;

(5) excluding subjects who made at least one mistake at test questions;

(6) excluding subjects who made at least one transfer above 7,000 Riel.

Transfers in terms of 1,000 Riel

D.2 Round Effects

In Section 4.1, we noticed that there are round effects in our experiment but these round effects did not seem to influence our coefficients of interest. To provide further evidence, we here split our sample by rounds and run the OLS estimation of specification (2) separately for Round 1 (column (1)) and Round 2 (column (2)). Table 16 reports the results.

Table 16: Effect of insurance option and information on transfers, split by Round - OLS

	(1)	(2)	(1) - (2)
	Transfer Round 1	Transfer Round2	Effect Comparison
Inf (β)	-0.268	0.274	0.542**
	(0.172)	(0.180)	(0.250)
Opt (γ)	-0.565***	-0.631***	0.065
	(0.102)	(0.133)	(0.168)
InfOpt (η)	-0.048	0.083	-0.131
	(0.146)	(0.167)	(0.222)
Baseline (θ)	2.411***	1.900***	-0.512***
	(0.124)	(0.144)	(0.190)
Observations	672	672	
r2	0.043	0.048	
F	24.92	23.04	

Pooled OLS; s.e. in paranthesis; clustered on individual level

(1) Participants who played Round 1

(2) Participants who played Round 2

Transfers in terms of 1,000 Riel

There is a substantial round effect in the baseline transfer (i.e. θ). Providers with an uninformed recipient without the insurance option send on average 500 Riel less in Round 2 than in Round 1. Yet, there is no significant difference in the transfer sent to informed recipients without the insurance option (i.e. $\theta+\beta$) between Round 1 and Round 2. Most importantly for our analysis, the coefficients of interest, γ and η, do not change significantly across rounds. Thus, a within-subject analysis combining the two rounds is unproblematic.

D.3 Determinants of Insurance Uptake

Table 17: Determinants of Insurance decision

	(1)	(2)	(3)	(4)
	Insured (not inf.)	Insured (not inf.)	Insured (inf.)	Insured (inf.)
Age	0.002	0.001	0.001	0.000
	(0.003)	(0.003)	(0.003)	(0.004)
Female	0.070	-0.050	0.036	0.021
	(0.063)	(0.081)	(0.088)	(0.080)
Schooling years	0.001	-0.016	0.001	0.006
	(0.014)	(0.017)	(0.016)	(0.014)
Born in this village	0.139*	0.156*	-0.042	-0.109
	(0.080)	(0.084)	(0.078)	(0.088)
Insurance	-0.260	-0.168	0.209***	0.254**
	(0.169)	(0.137)	(0.069)	(0.104)
Asset Index	0.049	0.013	-0.585**	-0.492
	(0.315)	(0.337)	(0.239)	(0.303)
Remittances	-0.115	-0.025	0.033	0.095
	(0.068)	(0.067)	(0.077)	(0.086)
Personal Shock	-0.010	-0.015	0.002	0.020
	(0.083)	(0.070)	(0.050)	(0.061)
Agriculture Shock	0.038	0.056	-0.007	0.012
	(0.070)	(0.061)	(0.085)	(0.102)
Trust in Village	0.005	-0.007	0.014	0.020
	(0.025)	(0.023)	(0.020)	(0.026)
Risk Preference	-0.006	-0.006	-0.016	-0.021*
	(0.011)	(0.010)	(0.012)	(0.012)
No. of known participants	0.004	0.012	-0.002	0.005
	(0.010)	(0.013)	(0.010)	(0.010)
No. of related participants	-0.001	-0.003	-0.007*	-0.007*
	(0.005)	(0.007)	(0.003)	(0.004)
Village fixed effects	No	Yes	No	Yes
Observations	168	168	168	168
r^2_a	-0.010	0.130	0.031	0.104
Mean of DV	0.786	0.786	0.714	0.714

Pooled OLS estimator; standard errors in paranthesis, clustered on village level

(1)-(2) Uninformed Recipients; (3)-(4) Informed Recipients