# Sharing Pressure and Involuntary Giving in Social Networks:

# Lab-Evidence from Tanzania*

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**Abstract**

We experimentally document the pressure for income sharing in social networks in developing countries. We find that the redistributive pressure exterted via the possibility of receiving a claim increases sharing while the possibility of hiding reduces it. Our results indicate that giving is largely involuntary and based on strong sharing social norms. We also find that the sharin pressure has a detrimental effect on the likelihood of undertaking profitable but risky investments.

**Keywords**: Social networks, kinship, laboratory experiment, social capital, social norms, Tanzania

**JEL classification**: O12, C90, Z13

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## 1. Introduction

Sharing of resources is a strong norm in many social networks in developing countries where cash, goods and in kind services are transferred to other members either voluntary or as a response to a direct request (Platteau, 1991; Townsend, 1994; Udry, 1995; Lund and Fafchamps, 2003; Angelucci and De Giorgi, 2009; Angelucci et al., 2010 Barr, Drekker and Fafchamps, 2012; Attanasio et al., 2012).[1] An important issue is whether the act of giving is a voluntary act, or the result of strong sharing norms that migh be amplified by pressure from others (Alger and Weibull, 2008, 2010; DellaVigna et al., 2012). There is, indeed, empirical evidence supporting the view that giving is involuntary and that people even engage in costly activities to reduce their giving by hiding their wealth and income. Baland et al. (2011), for instance, find in Cameroon that a significant portion of the individuals in their sample borrowed money at cost even if they had available savings. They argue that the reason for this costly behaviour was to avoid the pressure from others to share their resources by signalling financial difficulties by borrowing. Unfortunately, observational data have the drawback that it is difficult to identify causality between costly hiding activity and giving. The objective of this paper is to investigate how sharing norms and costly hiding activities affects giving by using an experimental approach conducted in rural Tanzania. To this end, we provide a novel experimental design where we can explicitly observe how sharing pressure and the possibility to hide from the pressure affect the redistribution of resources within network members. We framed the experiment in typical social network in the developing world (kinship or extended family). We designed a modified dictator game with multiple recipients where we allowed a claiming stage. Thus, members of the network could if they wanted explicitly ask for

[1] Risk pooling, besides resource redistribution, is also a key mechanism behind this pattern.

resources from other members (senders).[2] To our knowledge this is a novel exercise. To explicitly test if giving is voluntary and people engage in costly activities to hide income, we included treatments in which subjects had the possibility of hiding one's resources from the kinship network at a cost.[3] Moreover, we also investigate how investment decisions are affected by sharing norms. We thus fully exploit the benefit of a laboratory environment to characterize and quantify the extent of social pressure and possibility to hide on the decision to invest in a profitable but risky prospect.

Our main results are as follows. First, we find that sharing pressure results in a significant increase in giving. The highest level of giving is, indeed, found when subjects are in the treatment where they are exposed to others claims and they have not the possibility to hide their resources. In this situation the subjects have no possibility to avoid disclosure by hiding and hence are exposed to explicit redistributive pressure from the others, who are perfectly informed. They are in what game theorists call a perfect knowledge setting: I know that you know that I know, and so on. Hiding allows giving less to all the different members of the network conditional on receiving a claim.[4] This result is consistent with existing findings highlighting the importance of hiding, even at one's own cost, as a strategy to reduce involuntary giving (Dana et al., 2006; DellaVigna et al., 2012; Jakiela and Ozier, 2016). When individuals can hide at a cost, they redistribute a smaller fraction of their resources. They, thus, take advantage of the possibility of hiding and give less.[5] This p[attern seems very general and applies irrespective of the closeness of the relationship. Second, we find that the income affects giving decisions only when redistributive pressure is higher: thus when subjects are in the claim and not hiding treatment. This suggests that behavior is based on

[2] It is important to note that the experiment is played one in shot and in an anonymous setting. In this way we replicate the context where social norms may apply but not the complex reciprocal interaction that happens in the real world kinship networks.
[3] This is in the spirit of Dana *et al.* (2006) and DellaVigna et al. (2012). Both experiments allow for the possibility to opt out from a situation of giving.
[4] More than 96% of the receivers in the claim treatment made a claim on others resources.
[5] This can also be interpreted as they to externalize this cost and redistribute a smaller fraction of their resources.

social norms and it is not mainly driven by altruistic preferences. They, therefore, do not have an inbuilt component in their utility function that depends on others endowments (as originally defined and discussed by Becker, 1976, and Simon, 1990, 1993). Third, we find experimental evidence that the degree of the relationship does matter in the decision of how much to give. Subjects share more with those that are presented to them as closer relatives (Bowles and Posel, 2005). Fourth, we find some evidence that investments are smaller when the possibility of redistributive pressure is larger and that individuals use hiding (at a cost) to fend off requests from other members of the network.

Our results are relevant for two broad strands of literature. The most obvious is the literature on involuntary giving and social pressure. By allowing the possibility of hiding one's resources at a cost, our experiment is closely related to the design proposed by Dana et al. (2006) in the experimental laboratory setting. They show in a standard dictator game, where a sender is endowed with a sum of money and she can give as much as she likes to a receiver who knows the size of the endowment that sender has received. After the sender had made her decision she is offered the possibility to pay a fixed payment, which in their case was equal to 10 % of endowment, to avoid that the receiver would know that they were receivers in a dictator game with the subsequent consequence that they would receive the amount sent by the sender. 28% of the senders (dictators) choose to opt-out at a cost of 10% of endowment and this should be considered in the light of that they actually could have decided in the first stage not to send anything. The authors' conclusion is that giving is to a nonneglible part is involuntary. Differently from this approach we modify the design by explicitly inserting a claiming and hiding stage and in the experiment and that income is result of an investment decsision. This allows us to distinguish sharing behaviour from coerced altruism and how the investment decsion is affected.

The second strand of related literature is the expanding literature on coerced altruism in social networks in developing countries. Households anticipating that their income will be subject to sharing pressure may try to avoid redistributive pressure by making ill-suited economic decisions. They may for instance change their consumption, saving and investment decisions (Anderson and Baland, 2002; Di Falco and Bulte, 2011; Goldberg, 2013). Duflo et al. (2011) purports that farmers in Kenya underinvest in fertilizer since they fear claims of income from increased yield. Di Falco and Bulte (2013) using data from rural Ethiopia showed that individuals belonging to larger networks are less likely to adopt some agricultural technologies. Jakiela and Ozier (2016) provided some experimental evidence showing that females are less likely to undertake profitable but risky prospects when observed by their relatives. While avoiding sharing pressure is the key mechanism suggested behind all the results above, the empirical evidence supporting it is not existent. We, therefore, add to this strand of literature by providing explicit lab evidence quantifying how sharing pressure in the network affects investment decisions.

This paper proceeds as follows. Next section will provide a brief background to the role of kinship networks in Africa. Section 3 presents the experimental design and the general procedures. Section 4 provides the results. Section 5 investigates the nature of the norms followed by subjects. Finally, Section 6 concludes the paper by providing some final remarks.

## 2. A brief background to kinship in Sub Saharan Africa

Kinship is a primary principle of social organization and a key provider of social capital in Sub Saharan Africa. Differently from other types of networks (e.g., friendships), membership is determined via bloodlines or marriage and it is not "the result of individual choice" (La Ferrara, 2007). Ties created by bloodlines promote altruism (Hamilton, 1964) and regulate

access to resources and services, govern social relationships and marital customs. Redistribution and sharing of resources within the kinship network is a mean to provide economic and social security (Platteau, 1991; Cox and Fafchamps, 2008). In the absence of formal insurance and credit markets these network provide opportunities for risk sharing and safety net for the unlucky (Townsend 1994, Coate and Ravallion 1993, Fafchamps and Lund 2003, Attanasio et al., 2012).[6]

Kinship may also matter because "the ties of common experience, altruism and heritage among family members enable families to transcend some of the information problems barring the development of impersonal markets" (Rosenzweig, 1988, p.1167). Moreover, blood relations promote altruism (e.g. Hamilton, 1964; Alger and Weibull 2010). Foster and Rosenzweig (2001) extend the basic mutual insurance under imperfect commitment model, and consider the implications of altruism entering in sharing relations. Altruism tends to ameliorate commitment problems, and increases the potential gains from income pooling and mutual insurance (Greif, 2006). Members of the social network may thus claim assistance from others when necessary. Networks may help to restrain opportunistic behavior of members for the common good, lower transaction costs, facilitate the exchange of information, and enable communities to overcome social dilemma situations. Societies characterized by kinship relationships are refereed as "moral economy" (Scott, 1976). Emphasizing the strength of the moral obligations towards the less lucky member of the network Baland et al. (2011) refer to the concept of "forced solidarity" while Hoff and Sen (2006) mention "social contracts." Social stigma, sanctions may be faced by those who defect the moral imperative to share their resources (Barr and Stein, 2008). Platteau (2000), for instance, discusses the role of witchcraft, ostracism and other social sanctions to support them. These are very important sanctioning mechanisms that make it unlikely to avoid the requests

[6] For an exhaustive review of the role of social networks in Africa see Chuang and Schechter (2015).

of the network. Social stigma as well as retaliation "can thus fall on the defectors as well as on other members of their clan, increasing the cost of breaching the contract" (La Ferrara, 2003, p.1733).

## 3. Experimental design and procedures

The key features of our experimental design is to replicate the situation where people determine their endowement, but potentially face a situation where others might claim resources from them. The objective of this structure is to mimic a typically dense Sub Saharan village. We created social networks where each network consists of 6 people as described in Table 1. There are 2 types of individuals in the network: (i) 3 type A subjects (ii) 3 type B subjects who are linked to the A types through their network. The relationship between type As and Bs artificially varies in the degree of closeness but draws on people's actual relationship (e.g., a kinship can be represented as an extended family). Every subject in a network is, therefore, interacting with what corresponds to a close family member, a member of the extended family and neighbour. The networks are described in Table 1. Every network is composed by 6 individuals has the same size. It is a ring structure where networks partially overlap. So, for instance, B2 is close member of the family of A2, member of the extended family of A1 and neighbour of A3. To differentiate the level of altruism for different strength of kinship ties we restricted the maximum amount subject A could give to the three type B's with whom they were linked. She can share up to 50% of her money with a member of the close family (e.g. siblings) while maximum sharing with a member of the extended family maximum is set to 30%. The maximum amount of sharing with a neighbour is equal to 20%. This ensures that the maximum given to the social network is 100% of her income. This is consistent with the view that altruistic behaviour is increasing with the closeness of the

relationship (Bowles and Posel, 2005).[7] This is particularly true in rural societies where cooperation is much more likely to happen among relatives rather than non-relatives (Bertè, 1988). This view is also consistent with the notion of altruism towards kin in evolutionary biology and psychology: individuals will preferentially assist their close relatives (Hamilton, 1964; Masden et al., 2007). During the experiment, a chart of the structure of the network was displayed in each room to facilitate the understanding of the matching process. The general structure of the network is the same for all subjects, but they were randomly assigned into one of the 4 treatments (described below) as well as to the role of being subject A or subject B.

[Table 1. About here]

Subject A is endowed with 5000 ECU (Experimental Currency Units) corresponding to 5000 Tanzanian Shillings, while subject B is endowned with 2000 ECU. The daily wage for a college student in Morogoro is about 7000 shillings a day. The first decision in all conditions of the experiments was that Subject A had to make a decision on how much of the endowment to invest in a risky project. If the project was successful, the amount invested will be tripled and if unsuccessful no return from the project that means that the initial investment is lost. The probability of a successful outcome is 50%. After the outcome from the investment, subject A decides how much she would like to give to the three subjects Bs who are related to her through the network as described in Table 1. Our experimental design is summarized in Table 2. There are two key parameters in our design, (i) claim – whether subject B can claim money from subjet A and (ii) hide – whether subject A can hide her income if there is a positive outcome from the risky investment. This is a 2*2 design and hence we have 4 treatments in total. In the baseline treatment, subject B is assigned the role of being passive, i.e., they cannot ask for money. This resambles a standard dictator game and is used to measure pro-sociality without any eternal pressure from members of their network. At the

[7] They showed the importance of genetic relatedness on remittance decisions among South African migrant workers.

time of their investment decision, the subject know the social network as shown in Table 1 and to which of the four conditions shown in Table 2 she was randomly allocated to, but no information about the the other conditions was of course not given. A related finding from dictator games is that the more distant social relationships are the less is given (e.g., Buchan and Eckel, 2004; Branas-Garza et al., 2010).

We make the pressure for sharing explicit by introducing the possibility for subject B to make a claim on resources from any other A member of their network. This is a very important treatment as it allows capturing the extent of the network pressure. In the claim treatment, the difference to baseline treatment is that subjects B can make a claim before subject A will spontaneously give any of her resource. The maximum amount to claim from a close family, the maximum claim is 50% of her money, while from extended family maximum is set to 30% and from a neighbour 20%. Again, this ensures that the maximum redistribution to the social network is no more than her full income.

In the baseline treatment the individuals in subject A's network will know her total income after the risky decision is made and the outcome is known together with informations about subject A's initial endowment. To allow explicitly for a possible evasive response we introduced a hide treatment. In this treatment player A can hide her positive income from the investment decision at a cost of 500 ECU if from close family, 300 ECU from extended family and 200 ECU from neighbour. This decision is made before the outcome of the risky investment is known, and so the two choices can be thought as simultaneous.[8] If subject A decides to hide, subject B will be informed that the outcome equals to the initial endowment in case of successful investment (e.g., generating an experimental income larger than 5000 ECU). If subject A on the other hand makes a loss the income after the loss is observed by subjects B.

[8] This in order to prevent possible strategic behavior.

We also introduce a fourth treatment where subject A can hide and subject B can make a claim. We call this treatment hide and claim. This is very relevant, as it will allow testing if hiding at a cost is a viable strategy to buffer against the explicit sharing pressure exerted by the network. We summarize our experimental design in Table 2 and this allows us to investigate both separate and joint effect of hiding and claims on investment decsions as well as on sharing behaviour.

[Table 2. About here]

Following from above discussion, we expect subject A to share less with subjects B in hide and claim treatment than in claim treatment, but to share less to subjects B in hide and claim treatment than in claim treatment. The timing of the experiment is as follows. Subject As make a decision to hide their final income from any or all the Bs related to them. Then they decide how much (if any) of their initial resources to invest in a risky prospect and how much to save. Once their final income is determined it will be communicated to the Bs (in the no hiding treatment). In case As decide to hide, Bs will be told that their network members have 5000 only, unless a negative outcome of the investment where the actual amount is told. This replicates the real life situation where the initial investment has been hidden, but at the time the loss is realized no effort, probably the opposite, is taken to hide the loss. Hiding, however, comes with a cost. The rest of the experiment will follow with or without the hide and the claim stage according to the different treatments, in total we have 4 different experimental conditions. The complete game theoretical representation of conditions is presented in Figure 1.

[Figure 1 – about here]

*Procedures*

A total of 240 undergraduate students were recruited at the Sokoine University of Agriculture (SUA) in Morogoro, Tanzania, which is the second largest university in Tanzania. The university gives courses in a wide range of subjects such as agriculture, business, geography and planning. Students participated voluntarily in response to advertising for a paid decision making experiment. Upon arriving at the experiment location participants took a seat based on a lottery in a large aula. When the experiment began they received the instructions in both Swahili and English. The instructions were also read aloud in both languages. A short quiz was then distributed to ensure that the tasks were fully understood. The correct answers were written subsequently on the black board. Then they had to possibility to ask any remaining questions they had to the experimentlists in privacy. After this part, which was the same for all subjects, they were randomly assigned to a different role and sent to a specific room. Each subject would share the room with other playing the same role and they could not see with whom they were paired with. In the room subjects were given some additional time to read the instructions and they were then asked to fill a small questionnaire to collect some basic socio-economic data. A very simple risk experiment à la Binswanger was also provided to elicit individual risk preferences before the experiment began.

**4. Results**

Table 2a report the results for the total amount of income that is shared within the network. Sharing pressure seems to play a very important role in determining the amount of resources that will be shared with the rest of the network. In general, we find that subjects that redistributive pressure results in increased sharing. Subjects indeed send thee largest amount (about 24% of their resources) with the network if they are exposed to explicit claims and cannot hide their income at a cost. In this situation the subjects are exposed to explicit redistributive pressure from the others and have no possibility to avoid it by hiding. While the lowest amount of resources in sent when individuals face the polar opposite situation: hide

and not claim treatment. In this situation subjects sent only ECU 418 corresponding to the 5% of their income. We find that when hiding is possible subjects share a smaller proportion of their income with the network. This is a remarkable difference. Hiding is the mechanism that allows lower giving by preventing redistributive pressure.

[Table 2a – about here]

[Table 2b – about here]

[Table 2c – about here]

[Table 2d- about here]

A social network is a set of different relationships characterized by different degree of ties. One could argue that the degree of the relationship should matter in the giving decision. Responses to sharing from say a brother or a sister may be different from those from a cousin or a neighbour. Individuals may therefore show higher levels of altruism when dealing with a request from a member of the close family rather than a neighbour. This is a pattern that is usually well observed in biology (Hamilton, 1964). In Tables 2b, 2c and 2d, we present the results of the different treatments distinguishing for the closeness of the relationship.

[Table 3 – About here]

We also run a set of regressions where we controlled for some basic socio-economic variables including age, gender, year of study, marital status, and elicited risk preferences. Table 3 shows that results are qualitatively consistent with the simple testing of difference in means.[9] The reference group is the hiding and no claim treatment. This is the situation when individuals are exposed to the lower level of pressure from the network. Their income is not

[9] Standard errors were clustered at the session level. Cameron and Miller (2015) correction for small number of cluster was applied. We provide the results using not clustered corrected standard errors in the appendix. Results are qualitatively very consistent.

fully observed and explicit claims cannot be made. Column (3) shows the role of hiding one's income. This specific conditios allows individuals to deal in a different way with redistributive pressure and reduce their giving by 15%. Table 4 provides the giving analysis distinguishing for the degree of the relationship. We find that the patterns are the same irrespective of the type of the relationship. Social pressure binds and pushes individual towards involuntary giving. Hiding however offset this force and allow individual to fend off some of the redistributive pressure.

[Table 4 – About here]

Table 5 investigates the possible economic implications of redistributive pressure. We find that the likelihood of making larger investments is larger when individuals are in the baseline treatment (hiding and no claims). In this treatment, participants display a 66% probability of undertaking a risky investment by investing more than half of their endowment. The lack of the possibility of hiding their income and the possibility of facing claims reduces the probability of making investments.

[Table 5 – about here]

**5. What is the social norm?**

There can be in general three sources for what we observe as altruism. First, it could be the manifestation of the Nash equilibrium of what is actually a repeated game, possibly unobserved by the researcher: so, people are not fully selfish because of reciprocal interaction. Second, it can be an intrinsic specification of subjects' utility function: people are rational but feel better when sharing. Third, it can be the result of a social norm that people follow not because it is a coordination scheme towards one possible Nash equilibrium of the game, but just as a rule of thumb: this third case can be seen as a social evolution of the first case, but

now subjects do not always behave rationally because the social rule is general and does not apply exactly to every real life situation. [10]

It is important to distinguish from experimental data what is the main force at work. Our experimental setup excludes the first hypothesis, because identities are anonymous. So, we want to compare the other two cases, real altruism or social norm. If subjects seem to follow a social norm, it is also important to find evidence on how this rule of thumb actually works in the cognitive process of subjects.

To have a first hint on the behavior of people, let us consider Figure 2 below. In this figure, each dot indicates a sum up of the behaviour of one A type, in the x-axis we have the aggregate wealth after the lottery has been played (minus the cost of hiding, if that choice was possible and was taken), in the y-axis we have the aggregate amount of giving to the three B-types that subject A choses, possibly after claims have been made. First of all, note that while in the "hide, no claim" treatment, all A subjects decided to hide, in the "hide, claim" this choice was split. Overall, what is mostly remarkable in this plot comes from the linear fits of these dots: only those A subjects that are facing simultaneously the 'no hide' (possibly chosen by themselves) and the 'claim' condition seem to condition the amount given to B subjects on the outcome of the lottery. All the others seem indifferent.11 This outcome seems to suggest that mentally A subjects who are not expecting a claim on hard evidence (that is, a request based on the real outcome of the lottery) decide how much to donate even before knowing the outcome of the lottery and stick to that choice.

[10] List (2007) is among the first to distinguish the causes of observed altruism in the context of the dictator game. Alger and Weibull (2008, 2010) discuss this at length in motivating their model of *coerced altruism*. More recently, Genicot (2016) proposes a model based on pure altruism and shows how giving is affected by income. Cain et al. (2016) distinguish between *giving* (moved by pure altruism) and *giving in* (moved by compliance to social norms).

[11] We ran regression with the same battery of controls used in Tabels 6 and 7. For the 30 A subjects in the 'nhc' case the coefficient of income on quantity given is .25, positive at the 99% confidence level. For all the 44 subjects that are either in the 'hc & no hide' case or in the 'nhc' case, the coefficient is .26, positive above the 99.9% confidence level. As is evident from Figure 3, in all the other cases (72 A subjects) we have that this coefficient is only .02 and is not statistically different from 0.

[Figure 2 – about here]

This hypothesis seems even more evident if we consider the case 'hide, claim', where 16 subjects choose no hide (among them 11 lost the lottery) while 14 choose hide (among them 7 lost the lottery). The amount given by the 11 unlucky subjects who decided not to hide was around 2% (2% to external, 1% to neighbors, 3% to close), instead the amount given by the 7 unlucky subjects who decided to hide was around 10% (10% to external, 7% to neighbors, 13% to close).12 This outcome shows that those subjects who decided to hide stick to a 'fair' proportion of their wealth to give out, even if they have incurred the cost of hiding. The concept of 'fairness' that they adopt is social, and is independent on the (privately known) outcome of the lottery, because they have chosen not to show this outcome to the B subjects.

Finally, it is worth comparing the cases where the combination of no hiding and claim is not present at a cost for the subjects (i.e., all the subjects in the treatment 'no hide, claim' and the 14 subjects who decided to hide in the treatment 'hide, claim') with those 30 A subjects who cannot hide but receive no claim. In all these cases the A subjects are indifferent to the lottery outcome in the giving, however the first 44 have paid for hiding and they seem to externalize this cost to the B subjects giving less to them. The amount given by the 44 subjects who pay for hiding was around 3% (2% to external, 2% to neighbors, 5% to close), instead the amount given by the 33 subjects who receive no claims for free was around 6% (6% to external, 3% to neighbors, 8% to close).[13]

Summing up, there is supporting evidence for the following conjecture: A subjects decide ex-ante to base their giving on the outcome of the lottery only if they face claims that are based on hard evidence on this outcome. Otherwise, they decide before the lottery is played how

[12] Even with these low numbers, applying Kruskal-Wallis equality-of-populations rank test, the average outcomes are statistically different at 99%, even independently in the 3 separated cases of external, neighbors and close.

[13] Applying Kruskal-Wallis equality-of-populations rank test, this average outcomes are statistically different at 90%, even if they are not independently in the 3 separated cases.

much to give. If they have spent money to hide, and so to avoid the 'no hide and claim' situation, they externalize this cost on the amount they give. This conjecture seems to describe a rule of thumb behavior, based on social norms, and seems to exclude the possibility that subjects are moved mostly by rational altruism, in the form of utility derived from the actual allocation of resources among themselves and their peers.

## 6. Conclusions

Social networks in the developing world, such as kinship networks, are characterized by high level of prosociality of their members. Individuals share resources and obtain a wide range of important services, from insurance and credit to labour inputs, when markets are imperfect or absent. Important feature of these networks is that they are characterized by the moral imperative to share resources among their members. In this paper we used an experimental approach to document the role of social pressure on income sharing in kinship networks in Tanzania. We create in the laboratory social networks with different degrees of closeness. We mimic the interplay of sharing pressure and possibility of hiding from it. We thus use a between sample 2x2 design, and compare the amount shared when hiding and claiming are possible. We find that individuals share more when the extent of social pressure is higher. We find that when (costly) hiding is possible individuals share less in proportion in response of the claims of the other members of the network. Hiding, thus, provide the possibility to reduce the amount of giving and reduce social network pressure to redistribute resources. Our results are consistent with Dana et al. (2006; 2007). A crucial determinant of sharing within network is main driver of generous behavior is that people "dislike appearing unfair, either to themselves or others" (Dana et al., 2007: 67). Results are also consistent with Andreoni et al. (2011) who found that shoppers choose to take longer routes when exiting a supermarket to avoid being approached by a solicitor who asked to donate to charity and with Knutsson et al. (2013) who found that introduction of recycling machines for bottles and cans with an added

option to donate the returned deposit to charity resulted in a gradually decline in amount recycled. In our context, hiding provides a way to shelter against giving in response to redistributive pressure Sharing within the network seems in fact mostly involuntary. We also find that sharing resources is, in many treatments, not strongly correlated with income and that subject share more with those that are presented to them as closer relatives.

From a societal perspective, the pressure of involuntary giving may result in a significant negative impact on economic development, either directly through less investment and costly hiding activities or indirectly since less resources are available for investment due to sharing or both (Platteau, 2000; Hoff and Sen, 2006; Barr and Stein, 2008). In a recent paper, Jakiela and Ozier (2016) presented some experimental evidence showing that female are less likely to make profitable investments when observed by the members of their kinship network. Our results are constistent with this finding. We further clearly establish a link between hiding and pressure avoidance in the context of risky investments. The propensity to make investment can thus be negatively affected by the redistributive pressure. Future research is needed to document and generalize our results in variety of different settings (e.g., different countries, lab in the field etc.). There are also promising future research steps that need to be considered. It would be extremely important to observe if underinvestment would be observed when the riskiness of the prospect changes or if the size of the network affects quantitatively or qualitatively the results.

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**Table 1. Social network in the experiment.**

| | Subject B1 | Subject B2 | Subject B3 |
|---|---|---|---|
| Subject A1 | Close family | Neighbour | Extended family |
| Subject A2 | Extended family | Close family | Neighbour |
| Subject A3 | Neighbour | Extended family | Close family |

**Table 2. Experimental design.**

| | Hiding income is possible | Hiding income is not possible |
|---|---|---|
| Give without claims | Hide | Baseline |
| Give in response to claims | Hide and claim | Claim |

**Table 2a. Income sent to network members (t test, difference in means).**

| | Hiding income is possible | Hiding income is not possible | P-values |
|---|---|---|---|
| Give without claims | 418 | 1093 | 0.01 |
| Give in response to claims | 558 | 1806 | 0.019 |
| P-values | 0.48 | 0.1 | |

**Table 2b. Income sent to close family (T-Test; difference in means).**

| | Hiding income is possible | Hiding income is not possible | P-values |
|---|---|---|---|
| Give without claims | 211 | 521 | 0.03 |
| Give in response to claims | 290 | 964 | 0.003 |
| P-values | 0.5 | 0.06 | |

**Table 2c. Income sent to extended family (T-test; Difference in means).**

| | Hiding income is possible | Hiding income is not possible | P-values |
|---|---|---|---|
| Give without claims | 91 | 356 | 0.008 |
| Give in response to claims | 133 | 494 | 0.001 |
| P-values | 0.38 | 0.32 | |

**Table 2d. Income sent to neighbours (T-test; Difference in means).**

| | Hiding income is possible | Hiding income is not possible | P-values |
|---|---|---|---|
| Give without claims | 115 | 215 | 0.21 |
| Give in response to claims | 135 | 347 | 0.03 |
| P-values | 0.77 | 0.2 | |

**Table 3. Income sent to network members – OLS estimates.**

| | (1) | (2) | (3) |
|---|---|---|---|
| | **No Controls** | **Controls** | **Controls + claims** |
| **Baseline: Hiding and not claims** | | | |
| Hiding and claims | 71.35** | -314.5** | -1075.7*** |
| | (29.68) | (135.7) | (228.1) |
| | | | |
| No hiding no claims | 740.0*** | 642.9*** | |
| | (16.20) | (102.2) | |
| | | | |
| No hiding claims | 1307.4*** | 1209.4*** | |
| | (25.13) | (123.5) | |
| | | | |
| Experimental Income | | 0.126 | 0.155*** |
| | | (0.0789) | (0.00760) |
| | | | |
| Age | | -18.48 | -34.20 |
| | | (23.62) | (37.53) |
| | | | |
| Male | | -25.99 | 181.8*** |
| | | (235.9) | (48.93) |
| | | | |
| Christian | | 8.388 | -705.0*** |
| | | (300.1) | (197.3) |
| | | | |
| Help parents | | 300.5* | 245.5*** |
| | | (160.0) | (64.05) |
| | | | |
| Land | | 0.779*** | -4.797 |
| | | (0.0594) | (5.897) |
| | | | |
| Risk | | 53.49 | 66.92*** |
| | | (71.08) | (11.84) |
| | | | |
| Married | | 710.2*** | 406.4*** |
| | | (273.4) | (14.00) |
| | | | |

| | | | |
|---|---|---|---|
| Claims from network | | | 0.0900 |
| | | | (0.152) |
| | | | |
| *N* | 120 | 120 | 60 |
| adj. $R^2$ | 0.182 | 0.399 | 0.545 |

Session clustered standard errors in parentheses $^{*}$ $p < 0.10$, $^{**}$ $p < 0.05$, $^{***}$ $p < 0.01$. Small cluster correction applied (Cameron and Miller, 2015).

All specifications include year of study fixed effects. Constant not reported.

**Table 4. Income sent to network according to their degree of relationship**

| **Dep Var** | **Income sent to close family** | | | **Income sent to extended family** | | | **Income sent to neighbor** | | |
|---|---|---|---|---|---|---|---|---|---|
| | No Controls | Controls | Controls + claims | No Controls | Controls | Controls + claims | No Controls | Controls | Controls + claims |
| **Baseline: Hiding and not claims** | | | | | | | | | |
| | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** | **(9)** |
| Hiding and claims | 29.20 | -100.9 | -512.2** | 31.91*** | 76.36*** | -242.4*** | 10.24*** | -289.9*** | -273.9*** |
| | (22.25) | (83.91) | (254.0) | (7.366) | (25.59) | (65.70) | (0.249) | (109.2) | (59.19) |
| | | | | | | | | | |
| No hiding no claims | 352.0*** | 319.0*** | | 269.4*** | 225.7*** | | 118.6*** | 98.19*** | |
| | (13.93) | (57.16) | | (3.309) | (21.64) | | (3.971) | (37.53) | |
| | | | | | | | | | |
| No hiding claims | 696.6*** | 657.6*** | | 393.4*** | 366.8*** | | 217.4*** | 185.0*** | |
| | (20.12) | (89.29) | | (5.353) | (37.43) | | (1.766) | (3.955) | |
| | | | | | | | | | |
| Experimental Income | | 0.0675 | 0.0550* | | 0.0274 | 0.0230 | | 0.0315** | 0.0305** |
| | | (0.0436) | (0.0320) | | (0.0199) | (0.0204) | | (0.0161) | (0.0133) |
| | | | | | | | | | |
| Age | | -9.537 | -10.71 | | 5.073 | 3.303 | | -14.01** | -15.81*** |
| | | (11.53) | (37.82) | | (8.768) | (3.608) | | (6.465) | (0.198) |
| | | | | | | | | | |
| Male | | -22.32 | 100.2*** | | -52.18 | -71.07 | | 48.51 | 115.6 |
| | | (139.4) | (12.19) | | (34.54) | (66.45) | | (106.8) | (104.3) |
| | | | | | | | | | |
| Christian | | -23.55 | -455.3*** | | 0.296 | -183.0*** | | 31.64 | -83.79 |
| | | (150.6) | (125.2) | | (89.23) | (9.062) | | (93.45) | (163.0) |
| | | | | | | | | | |
| Help parents | | 138.5 | -15.90 | | 94.05* | 114.1 | | 67.98 | 80.29*** |
| | | (93.08) | (57.30) | | (52.37) | (84.53) | | (65.74) | (27.51) |
| | | | | | | | | | |
| Land | | 0.287*** | -3.078 | | 0.327*** | 1.863 | | 0.165*** | -2.606*** |
| | | (0.0420) | (4.636) | | (0.00906) | (2.323) | | (0.0235) | (0.982) |
| | | | | | | | | | |
| Risk | | 37.13 | 29.17 | | 18.16 | -2.449 | | -1.806 | 8.209 |
| | | (53.72) | (54.50) | | (20.01) | (18.03) | | (7.455) | (16.71) |
| | | | | | | | | | |
| Married | | 299.0** | 161.2 | | -14.16 | -30.76*** | | 425.3*** | 243.2** |
| | | (132.8) | (208.0) | | (75.75) | (5.073) | | (138.2) | (113.1) |
| | | | | | | | | | |
| Claims from close | | | 0.189 | | | | | | |
| | | | (0.215) | | | | | | |
| | | | | | | | | | |
| Claims from extended | | | | | | 0.130* | | | |
| | | | | | | (0.0728) | | | |
| | | | | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Claims from neighbors | | | | | | | | | 0.147*** |
| | | | | | | | | | (0.0168) |
| | | | | | | | | | |
| *N* | 120 | 120 | 60 | 120 | 120 | 60 | 120 | 120 | 60 |
| adj. $R^2$ | 0.183 | 0.352 | 0.585 | 0.157 | 0.362 | 0.395 | 0.117 | 0.357 | 0.574 |

Session clustered standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Small cluster correction applied (Cameron and Miller, 2015). All specifications include year of study fixed effects. Constant not reported.

**Table 5. Probability of investing more than 50% of endowement – linear probability model**

| | (1) | (2) |
|---|---|---|
| | | |
| Hiding and claims | -0.108*** | 0.0262 |
| | (0.0144) | (0.0637) |
| | | |
| No hiding no claims | -0.196*** | -0.249*** |
| | (0.0125) | (0.0329) |
| | | |
| No hiding claims | -0.141*** | -0.148*** |
| | (0.0156) | (0.0412) |
| | | |
| Experimental Income | | 0.0000388*** |
| | | (0.0000131) |
| | | |
| Age | | 0.0159 |
| | | (0.00973) |
| | | |
| Male | | 0.167 |
| | | (0.121) |
| | | |
| Christian | | 0.412*** |
| | | (0.0440) |
| | | |
| Help parents | | -0.125* |
| | | (0.0686) |
| | | |
| Land | | 0.000155*** |
| | | (0.0000208) |
| | | |
| Risk | | -0.0369 |
| | | (0.0276) |
| | | |
| Married | | -0.110 |
| | | (0.131) |
| | | |

| | | |
|---|---|---|
| $N$ | 120 | 120 |
| adj. $R^2$ | 0.030 | 0.231 |

Session clustered standard errors in parentheses $^{*}$ $p < 0.10$, $^{**}$ $p < 0.05$, $^{***}$ $p < 0.01$.

Small cluster correction applied (Cameron and Miller, 2015).

All specifications include year of study fixed effects. Constant not reported.

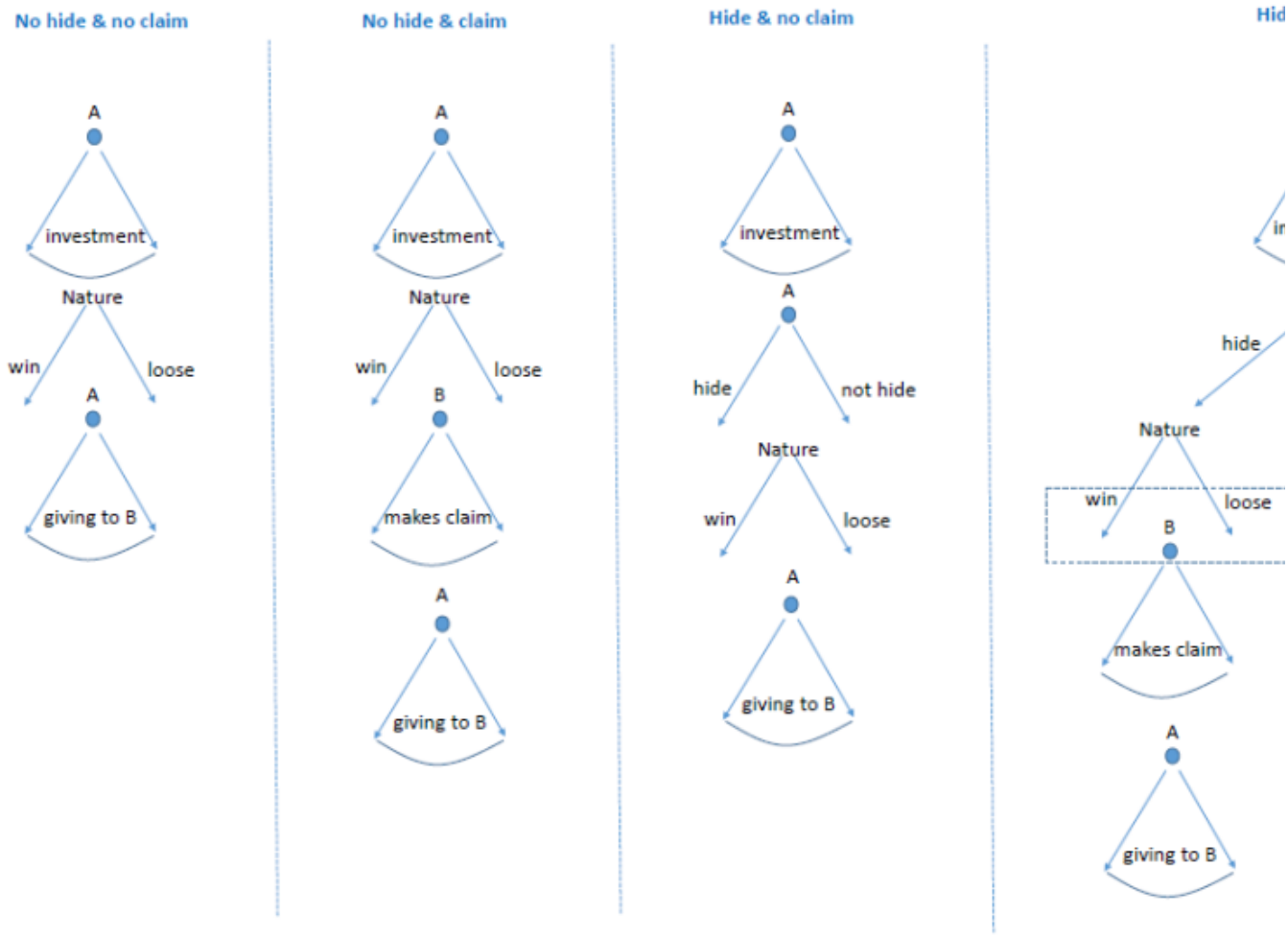


**Figure 1.** Game theoretical representation of the four treatments. Note first that from a game theoretical perspective the moves of B are irrelevant information for A, even if she has other regarding preferences (i.e., this is just 'cheap talk'). So, from a theoretical perspective, these four games in extensive form are equivalent, however we define payoffs. Note also that B moves only in the 'claim' treatments, but her information set is different in the two cases. In the 'no hide & claim' case, B has perfect knowledge of the history of the game when she makes the claim. In the 'hide & claim' case, when B has to move, she faces uncertainty if A has chosen to hide (in the left arm), and in that position (in that information set) she also does not know the investment that A made.

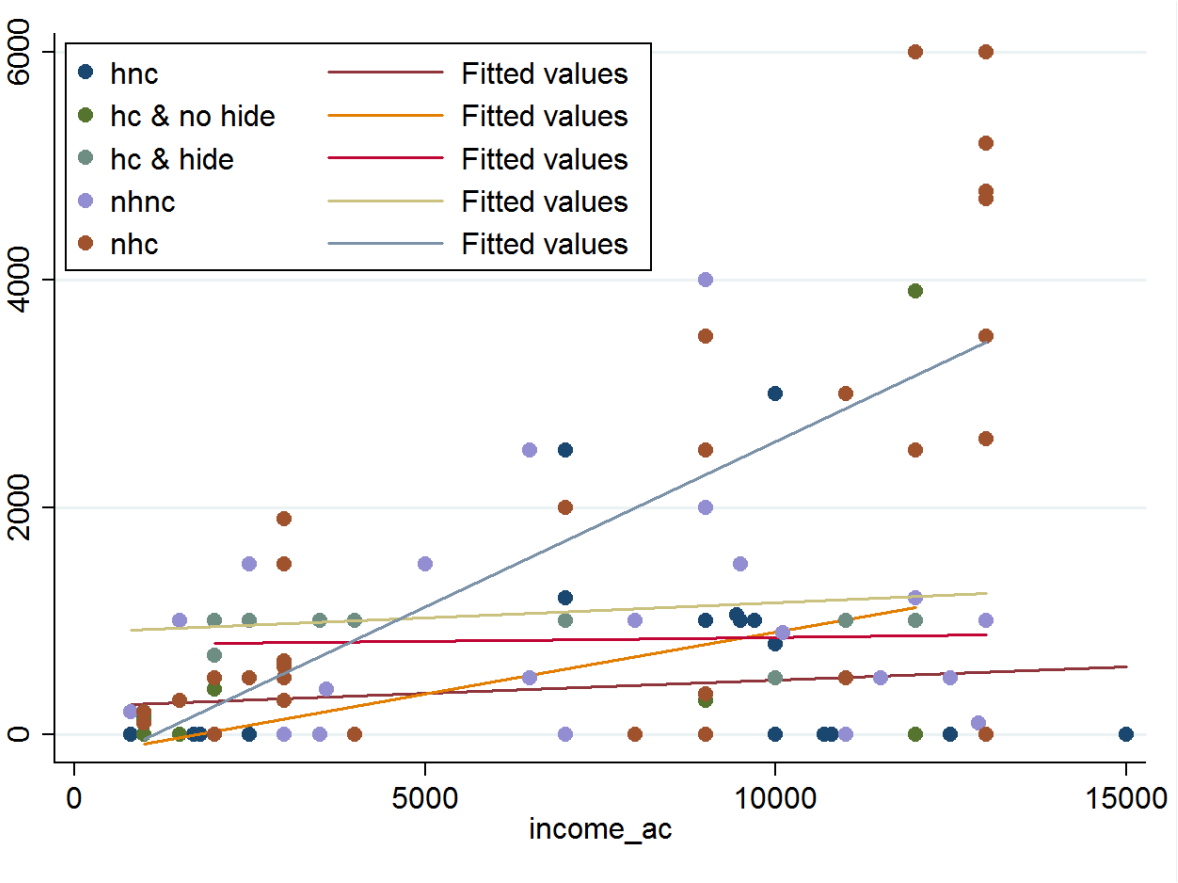


**Figure 2.** income before giving vs aggregate amount given of all A types. Colors and linear fits are for the different treatments: hnc is "hide, no claim" (in this case all 30 A subjects decided to hide), nhnc is "no hide, no claim", nhc is "no hide, claim", and finally hc is "hide, claim". In the fourth case 14 A subjects decided to hide, while the other 16 decided not to.

## Appendix

**Table A.1** Summary statistics of control variables

| Variable | Definition | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Age | Age of the participant | 25.31 | 5.01 | 19 | 49 |
| Male | Gender of the participant; 1=male; 0=otherwise | 0.72 | 0.44 | 0 | 1 |
| Religion | Religion of the participant; 1=Christian; 0=otherwise | 0.89 | .308 | 0 | 1 |
| Help parents | Do you help your parents in their business activities? 1=yes; 0=otherwise | 0.707 | 0.455 | 0 | 1 |
| Land | How much land your family owns in hectares? | 6.53 | 10.71 | 0 | 80 |
| Married | Are you married? 1=Yes; 0=otherwise | 0.46 | 0.49 | 0 | 1 |
| Risk Aversion | Scale from 1 (risk averse) to 6 (extremely risk lover). | 3.71 | 1.37 | 1 | 6 |

**Table A2. Giving analysis – standard errors not clustered**

| | (1) | (2) | (3) |
|---|---|---|---|
| | No Controls | Controls | Controls + claims |
| Baseline Hiding and no claims | | | |
| Hiding and claims | 71.35 | -314.5 | -1075.7* |
| | (339.1) | (502.9) | (628.0) |
| | | | |
| No hiding no claims | 740.0** | 642.9** | |
| | (336.0) | (316.5) | |
| | | | |
| No hiding claims | 1307.4*** | 1209.4*** | |
| | (339.3) | (330.8) | |
| | | | |
| Experimental Income | | 0.126*** | 0.155** |
| | | (0.0262) | (0.0727) |
| *N* | 120 | 120 | 60 |
| adj. $R^2$ | 0.139 | 0.319 | 0.431 |

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Small cluster correction applied (Cameron and Miller, 2015). All specifications include year of study fixed effects. Constant not reported.