

Report of Research in Progress

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My fields of interest are Behavioral and Experimental Economics within the scope of Development Economics. I focus on the study of the efficacy and the efficiency of policy interventions for poverty alleviation with a social component in developing countries. The bulk of my research to date has concentrated on evaluating the impact of monetary incentives on individual behavior that enhances the common good within a community or group. Additionally, I have explored applications of experimental economics in the field, in particular understanding economic decision-making by low income populations in order to enhance the efficiency of social interventions. Early childhood education for the poor and leadership are the two main areas of application.

I have now completed my two PhD degrees in Economics, one from University College London and one from University of Siena. Having worked under different faculty and in different academic communities has allowed me to develop a rich research agenda.

Some of the mechanisms through which social forces are at work in economic decision-making are social norms, cooperation, reciprocity and trust. In my job market paper, still in progress, Disentangling Social Capital: Lab-in-the-Field Evidence on Coordination, Cooperation and Networks. I analyze the individual behavior by 714 beneficiaries of a Conditional Cash Transfer (CCT) program in Colombia. I conducted and designed an artefactual field experiment that included a 'Weak-link' Coordination game and Public Goods game with communication. I examine the role of the program on the ability to coordinate, by accounting for different dimensions of social capital: cooperation is an individual other-regarding preference; social norms stem from beliefs about others' behavior; and individual connections arising in networks allow us to build such beliefs. I estimate a structural choice model of the individual decision to coordinate, which highlights the role of beliefs about others' behavior: high effort is only sustained under high beliefs. The analysis suggests that the CCT program helps overcome the coordination failure through different channels, and the structural model points to the beliefs channel.

In addition, I am currently working on four projects. First, I analyze individual behavior of 500 beneficiaries of a CCT in Colombia in a public goods game that I designed and conducted in 2014. I examine whether how powerful leaders are determines their decision to free ride and the relationship between individual willingness to cooperate and the presence of an empowered leader in the group. The preliminary results show that the presence old leaders are a positive influence to the followers' behavior but these old leaders free ride more than new leaders.

Second, economic research examining how parent-child interaction intervention programs affect economic wellbeing focuses largely on quantitative outcomes; instead, attitudes of the

beneficiaries that may determine the impact of these programs across children remain unexplored. Although this has been identified as one of several behavioral channels, it has been acknowledged that it presents a measurement challenge. In Parental generosity and early child development: an experimental approach. I design an economic experiment (based on the Becker-DeGroot-Marschak Mechanism) to measure parents' willingness to make a specific human capital investment (WTI) on their 3 to 5-year old child, of which the positive effect on the child's development has been acknowledged by the literature. Then, relate this measure to an Early Childhood Development (ECD) intervention with a known positive impact and obtain the ex-post correlation between WTI and the ECD impact. The main hypothesis is that parent attitudes towards the child's human capital, taking into account their expectation about children's future returns, explain heterogeneity in ECD program outcomes across children. We will look at impacts of the program on WTI that could be one of the mechanisms that delivers the impact.

Third, I examine a cognitive mechanism in a common renewable resource setting. The experimental data consist of laboratory experiments conducted in the field to study renewable resource management. The experimental design is complex: not only participants face a social dilemma in extracting from a renewable stock, but the problem is also dynamic. There is a dynamic effect -the lower the stock, the lower the capacity for renewal- and a social dilemma effect -group level extraction affects my payoffs and the resource stock.

The last project aims to measure the impact of a social intervention on individual behavior related to ethics and team effort in a private organization. I developed a set of three games that would capture the presence of a social norm on team effort, willingness to cooperate and willingness to share risk: a public goods game, a coordination game, and a risk pooling game.

Project 1. Parental generosity and early child development: an experimental approach

Key Research Questions addressed

- Is it possible to measure parent's willingness to invest in their child's human capital?
- Does parent's generosity towards their child determine the impact of such human capital investment decision?
- If so, does it explain the differential among human capital accumulation across children?

Abstract

The purpose of the study is to capture what motivates human capital investment decisions. In particular poor parents' investments in the development of human capital of their child. We use a laboratory experimental methodology in the field to elicit the preferences and observe the choices of the target population of an Early-Child Development (ECD) program. We aim to recruit 300 subjects in rural Colombia. All of them are mothers of 3-5-year-old children. The combination of survey measures and actual decisions allows us to examine individual heterogeneity in responses to different goods that promote Early-Child development whose demand different levels of time invested by the parent. Participants choose between various cash alternatives and goods, for their child, and goods such as a coloring book, a storybook, an EDC manual and a one-time ECD expert visit. This novel measure allows us for the construction of willingness to invest in ECD (WTI) or parental generosity towards their children (in the form of

human capital investment). We control for this behavioral attribute, social networks and expectations on future outcomes, as it is key to understand the determinants of ECD investment. We expect to find that participants with high WTI are more likely to have a positive impact by the ECD program on their child.

Motivation

Generosity refers to the virtue of giving good things to others freely. Parents offer both tangible and intangible things (e.g. time, effort and attention) to enhance the true wellbeing of a vulnerable and dependent being, their very young children, a behavior that embodies generosity. Because generosity encompasses intangible resources, it can transcend material constraints.

Households make investment decisions that have important consequences for both the short- and long-run development of their children. For poor households such decisions are subject to material constraints in resources, knowledge, the environment and available markets. Economic research examining how parent-child interactions and how parents' intrahousehold allocation decisions affect children's economic wellbeing focuses largely on quantitative investments; instead, attitudes of the parents (which may determine the impact of these investments across children) remain unexplored.

Among these attitudes, generosity towards their children during their early age is an important one. Although this has been identified as one of several behavioral channels, it remains a qualitative one. The measurement challenge this presents (which explains why it remains unexplored) can be overcome by using an appropriate experimental measure of parental preferences. We provide a novel, incentive-compatible measure of parental generosity in human capital investments. The combination of survey measures¹ and actual decisions allows us to better understand individual heterogeneity in responses to different levels of investment by the parents within an **Early Child Development (ECD)** intervention.

In that way we can tackle the question: when investing in their child's human capital, taking into account their expectation about future returns, does the parent's generosity explain heterogeneity in human capital accumulation across children?

Relevance

Parent generosity, a topic within the SPI scope of research, has been recognized as an important mechanism delivering human capital returns (Attanasio et al 2013). Although parents' giving to their children is the central construct in theories of child development and human capital formation (Becker, 1981), this study is the first of its kind that provides a *measure* of parental generosity.

Despite the consensus about the importance of investments in early childhood development, little is known about which specific types of interventions are likely to be most effective in very poor

¹ Includes information on children's development and family characteristics, including the quality of the home environment and parental caregiving practices. In addition, parents' valuations of future outcomes as first implemented by Cunha et al. (2013). Human capital is measured as children's motor and mental development, children's nutritional status and children's language development.

environments. This study contributes to implement efficacious interventions in home-based early stimulation, which substantially improve cognitive development and school performance.

In spite of its relevance, little is known about the economic role of generosity in the most important of kinship relationships in what is now considered by policymakers as the most important stage in human development: the early years. The economic experiment we propose exemplifies the Foundation's motto, "How little we know, how eager to learn".

Our main research question is relevant to the Templeton Mission since it explores the motivation for giving more than just the 'necessary'. In that sense this study provides a possibility of acquiring "new spiritual information" on the most important human endeavor: parenthood.

Contribution

Most studies on ECD find that the outcome of the interventions exhibits substantial heterogeneity². Studies on how parents' intrahousehold allocation decisions (i.e. human capital) determine the children's outcome mainly use the quality of time as measured by parenting skills (Todd and Wolpin, 2007, Cunha, Heckman, and Schennach, 2010). Few have considered time devoted to the child's early development (Aizer and Cunha, 2012)³, and none the *value* assigned by the parent to such time (Hsin, 2009) as measures of parental quality.

Although this has been identified as one of several behavioral channels, it has been acknowledged that it presents a measurement challenge. To overcome this challenge we introduce an incentivized elicitation method to measure the value each parent assigns to the time spent with the child. It uses a simple adaptation of the Becker-DeGroot-Marschak mechanism (BDM). The contribution of this adaptation of the BDM is twofold: it also provides a prime source of heterogeneity when evaluating treatment effects and the causal effect of prices when we link our measure to the intervention outcomes (Heckman and Vytlačil, 2005, Heckman, Urzua, and Vytlačil, 2006, Chassang, Padro i Miquel, Snowberg, 2012: 1480).

Although there is consensus about the importance of investments in early childhood development (Cunha, et al. 2006, Cunha, and Heckman, 2007, Hanushek and Woessmann, 2008, Almond and Currie, 2011), little is known about which specific type of intervention is likely to be most effective in very poor environments. This study may contribute to unveil one of the mechanisms at work on those interventions through home-based early stimulation and parent-child interaction that are known to have substantial improvements in economic outcomes such as cognitive development and subsequent school performance (Grantham-McGregor et al. 1991, 1997; Walker et al. 2000; Powell et al. 2004).

Approach⁴

² Across different children outcomes: school achievement (Wolfe and Behrman, 1986, Hanushek, 1992), nutrition (Behrman, 1988; Duflo, 2003, Behrman et al. 2009), cognitive development (Paxson and Schady, 2007, Macours, et al. 2012) and psychological traits (Heckman et al. 2013).

³ The time that parents devote to their children is key to their healthy educational, social and psychological development (Hsin, 2009, see Monna and Gauthier, 2008 for a review).

⁴ © 2013 Sandra Polania-Reyes. All rights reserved. Email: sandra.polania-reyes.09@ucl.ac.uk. Department of Economics, University College London. I thank Nelson Escalante and Frank Strussberg for their support in the

Our goal is to measure parents' willingness to make a specific human capital investment (WTI) on their 3 to 5-year old child, of which the positive effect on the child's development has been acknowledged by the literature. The main hypothesis is that parent attitudes towards the child's human capital, taking into account their expectation about children's future returns, explain heterogeneity in an ECD intervention outcomes across children. We will look at impacts of the intervention on WTI that could be one of the mechanisms that delivers the impact.

The mechanism. We use a laboratory experimental methodology in the field to elicit parental preferences. In order to measure parents' willingness to make a specific human capital investment (WTI) on their toddler -whose the positive effect on the child's development has been acknowledged by the literature-, we conduct an economic experiment based on the Becker-DeGroot-Marschak mechanism (BDM, 1964). Four activities are implemented using four different goods that imply different levels of human capital investment from the parent to the child, in terms of time spent with the child and money⁵. In each activity, the individual is asked to state her preference between a good that builds human capital for her child, and varying amounts of cash. At some point the cash offer will reach an indifference point, the mother's valuation of the object (which we denote by b). The price p of the good is then drawn from a discrete uniform distribution. The individual is then informed of p . If the price exceeds the reservation price b ($p \geq b$) then she is paid the amount in cash. Otherwise, she receives the good.

Truth-telling is a dominant strategy and therefore independent of risk attitudes and even of whether the individual is an expected utility maximizer. In this study, the good is non-random⁶, thus the BDG mechanism assures that individuals have a robust incentive to report their true maximum willingness-to-invest, despite social-regarding concerns such as morale, reputation or experimenter bias. In addition, it provides precision in demand estimation, quasi-experimental variation in treatment (see Berry et al., 2012) and random variation in price paid (conditional on willingness to invest).

Some concerns about the incentive-compatibility of the BDM mechanism in practice have been raised. First, subject bids are sensitive to the boundaries of the distribution for the market price. In our design the upper bound is set to a subject's potential income⁷, which is the maximum price she can bid, so the WTI won't be inflated and the bids won't be sensitive to the underlying price distribution (Bohm et al. 1997). Second, subjects' preferences may not conform to expected

recruitment process in the pilot. I am especially grateful to Orazio Attanasio, Ned Augenblick, Juan Camilo Cardenas, Syngjoo Choi and Costas Meghir for their useful comments.

⁵ We incorporate two examples to facilitate learning of the perfect information dominant strategy. Parents participate in an auction run as a one-shot game. This limits possibilities for subjects to learn adaptively about optimal bidding behavior. The instructions illustrate concretely why overstating or understating their true WTI could make subjects worse off and would never make them better off. Participants also have two practice rounds before the start of the experiment. In order to assess whether the participants understood, we go through several practice questions and review the answers with all losing respondents to check that they don't wish they had bid more.

⁶ For evidence of the BDM mechanism as a truth-telling method with non-random goods look at Davis and Holt, 1993: 461, Kahneman et al., 1990: 1336, Rutström, 1998: 428, and Shogren et al. 2001: 98 and for bias in the elicitation method for risk preferences and the lowest noise when pairwise choice is used Hey et al. 2009.

⁷ As recommended by Bohm et al. (1997), we tell the participants that the upper bound of the buying price is set at a level corresponding to the maximum reasonable valuation of the cost of giving up 1 hour.

utility theory and their bid may depend on the distribution of the random number (Horowitz, 2006a). Although there is no conclusive empirical research (Horowitz, 2006b), the game is played in the WTI for gains domain and the exogenous discrete uniform distribution is known by the subjects; its simplicity is also helpful for the participants to compute their optimal bid (for a discussion see Buckley et al 2012). In addition, as in previous applications the participants are informed about the incentive compatibility properties of the BDM mechanism and we also reassure ourselves that parents have understood the game.

There is a substantial literature dealing with the implementation and behavior of BDM in university economics labs (Keller et al. 1993, Noussair, et al 2004, Broberg, Ellingsen and Johannesson, 2007, Ellingsen and Johannesson, 2009). The most important challenge of using the BDM mechanism is that little is known about the practical applicability of BDM in the field (Hoffmann, 2009, Berry, et al 2012, Siren et al 2013) and nothing on measuring the *value* of time spent with children.

Sample. 300 parents of 3-5 year-old children. 150 parents belong to the control group and 150 belong to the treatment group within an ECD program.

Treatments. The experiment includes two treatment variables: First, the ECD treatment (a group of parents that belong to an ECD intervention and a group of parents that do not receive any Early Childhood Education by any entity) and second, the quality of the ECD activity treatment, an activity designed by us.

Activities. Let π_i be the return on child's development by using good i , p_i be the market price of good i , t_i the time spent by the parent when using the good i ; e_i the effort by the parent when using the good i , d_i be the degree of difficulty by the parent to obtain the good i , where $i = A, B, C, D$ so every participant faces four different situations in which a different quality good is offered (see appendix with information on the pilot results).

- A. A coloring book plus colors (whose market price is US\$15). It is presented with the following framing: "This good is useful for child development and requires a small amount of your attention and your time while the child is using it".
- B. A storybook (whose market price is US\$20). It is presented with the following framing: "This good is useful for child development and requires a medium amount of your attention and your time while the child is using it".
- C. An ECD manual (whose market price is US\$30) i.e. a guidebook for toddler stimulation showing the parent how to stimulate their child's development with easy, playful activities at home. It is presented with the following framing: "This good is useful for child development and requires a large amount of your attention and your time while the child is using it".
- D. A ONE one-hour visit by a person qualified on Early Childhood Stimulation who will teach the parent on how to stimulate child's development with easy activities to implement at home. The market price of this good I US\$40. It is presented with the following framing: "This good is useful for child development and requires a large amount of your attention and your time while the child is using it".

It is acknowledged by the literature that the impact of each good on ECD is

- (1) $\pi_D \geq \pi_C > \pi_B > \pi_A$
 and the market price is
- (2) $p_D > p_C > p_B > p_A$.
 Our initial assumptions are the following:
- (3) $t_D \geq t_C > t_B \geq t_A$
- (4) $e_D \geq e_C > e_B \geq e_A$
- (5) $d_D > d_C > d_B > d_A \rightarrow$ (2) and (5) should coincide

Hypotheses. Our hypotheses are summarized as follows: children whose parents have a high valuation for time spent with them will see a larger effect of the ECD program on cognitive development; parents with a high valuation will also show a positive and larger effect among parents within the treatment group.

Identification strategy. Although our experimental measure can be implemented in any household with young children, our first best identification strategy would work within an existing home-based ECD intervention for which we know it has positive impact so we are able to relate our measure to this outcome and obtain the ex-post correlation between WTI and the ECD impact. The second best identification strategy would work within any existing ECD intervention. In the latter we would use its sample of the control and the treated to see whether parental generosity may explain the heterogeneity in outcomes⁸.

Other data. Non experimental data is key for this research, not only for validity but also to be able to implement a structural estimation of the effect of parental generosity on children outcomes. These data consist on 1) information about children's outcomes (health, nutrition, cognitive development) 2) Stimulation at home (Family Care Indicator) (Hamadani, et al 2010), 3) parents' characteristics including maternal knowledge of child rearing practices and 4) household socioeconomic characteristics and time use data.

In addition, recent advances show the relevance of heterogeneous child endowments and parental preferences in improving child human capital investments (Aizer and Cunha, 2012). Parents' valuations of future outcomes and their expectations play a key role on their investment in children (Carneiro, et al 2012, Cunha et al, 2013).⁹ We also apply the instrument designed by Carneiro, et al (2012) to obtain parent's beliefs about children's future returns.

⁸ Originally, we mean to use an existing ECD intervention since that would give us an advantage in terms of non experimental data collection costs. ECD interventions usually have an impact evaluation that includes non experimental data collection on key children and parents' characteristics. By using an existing intervention we would only need funds to implement our experimental measure, otherwise we would have to assume the non experimental data collection costs. See Budget proposal in the Appendix.

⁹ For example, parents do care about equity as well as productivity. Behrman (1988) estimates an optimizing model of parental allocation of health-related (i.e. nutrients) investments (Behrman, Pollak and Taubman, 1982) in response to changes in the expected health returns or expected wage differentials by gender. In addition, Datar et al. (2010) find that parental investment increases with endowment so there is a reinforcement of endowment differences during early childhood and Ayalev (2005) finds similar results on education investments. This redistribution of resources within the family may depend on parents' level of education (Hsin, 2012).

Fieldwork logistics. An individual session is 45 minutes long approximately. With a team of 3 surveyors and fieldwork would take 3 weeks in total. Surveyors will visit parents' home. See Tables 1 and 2.

Table 1. Information on the experimental sessions and sample

| | | |
|----------------------|--------------------------------------|-----|
| Sample Size | Goal Sample size | 300 |
| Information | Recruitment sample size ^a | 390 |
| Fieldwork procedures | Number of sessions per day | 6-7 |
| | No. days of fieldwork | 23 |
| | Session size | 1 |

^a Attendance attrition rate 30% based on the pilot results (Pilot attrition rate was 20%)

Table 2. Experimental procedures and stages of an experimental session

| Stage | Objective | Time / Duration |
|-------------------------------|--|------------------------------|
| Phase 0 Recruitment | Invitation to parents to participate in the study, measurement of social preferences (we will obtain 50% sample's social preferences after the game) | 1 week before sessions start |
| Phase 1 | | Session day |
| Welcome (all) | Introduction, Oral consent, Explanation of the game | 15 min |
| Game decisions (Individual) | Practice questions, quiz to the participant. Actual decision by the participant. Selection of random activity to be paid. | 30 min per parent |
| Phase 2 | | |
| Post-game survey ^a | Mood data+ Expectations | 30 min per parent. |
| Payment | | At the end of the day |

^a Information about children's outcomes (health, nutrition, cognitive development) would be obtained from the ECD program coordinator. Otherwise, we add 2 hours to the Post-game survey.

Payment. For the payment, the activity to be paid (that is one parent and one of his decisions is implemented) is randomly allocated. All participants receive monetary incentive of US\$10 for their attendance. One in five parents will receive an additional average gain of \$25. See Budget proposal.

Appendix

1. Pilot

Since our experimental measure is a novel approach to examine parental generosity, we conducted a pilot with 17 poor mothers with 1-5-year-old children in Cartagena, Colombia in August 2013. All mothers are/were beneficiaries of a Conditional Cash Transfers –CCT program *Familias en Acción*. The recruitment process was done through the Coordinators of program. The subjects were recruited from different parts of the city. All participants received a show-up

fee and a snack but only one mother was chosen to be paid for her decisions¹⁰. After the session, we talked about socio-economic conditions of the household and received feedback from the experiment.

For each subject we captured the monetary equivalent of a good that is useful for their child's development. Nearly all mothers preferred the good to any amount of money, contrary to the prediction that subjects will prefer the money to any kind of investment on their child. In Table 3, on average, mothers are willing to pay 72.7% of the market price for the coloring book and 66.5% of the market price of an ECD visit. The indifference point between money payable and an ECD manual, which demands a high amount of time by the parent, was 85.6% of the market price. These results highly contrast with the self-regarding preferences prediction in which any poor parent would prefer the money to any good regardless of the effect on their child human capital investment.

Table 3. “Do You prefer to receive a good ... whose market price is ... or to receive \$X?” (N=11, 44 observations)

| Scenario | \$US | | As % of market price | |
|--------------------------|------|------|----------------------|------|
| | Mean | s.d. | Mean | s.d. |
| A (\$15 - coloring book) | 11.5 | 5.6 | 72.7 | 35.2 |
| B (\$20 - storybook) | 11.8 | 8.1 | 55.7 | 38.5 |
| C (\$30 -ECD manual) | 27.2 | 7.9 | 85.6 | 25.0 |
| D (\$40 -ECD visit) | 28.1 | 14.9 | 66.5 | 35.2 |

Figure 1 shows the distribution of participants' maximum value they are willing to sacrifice for the good.

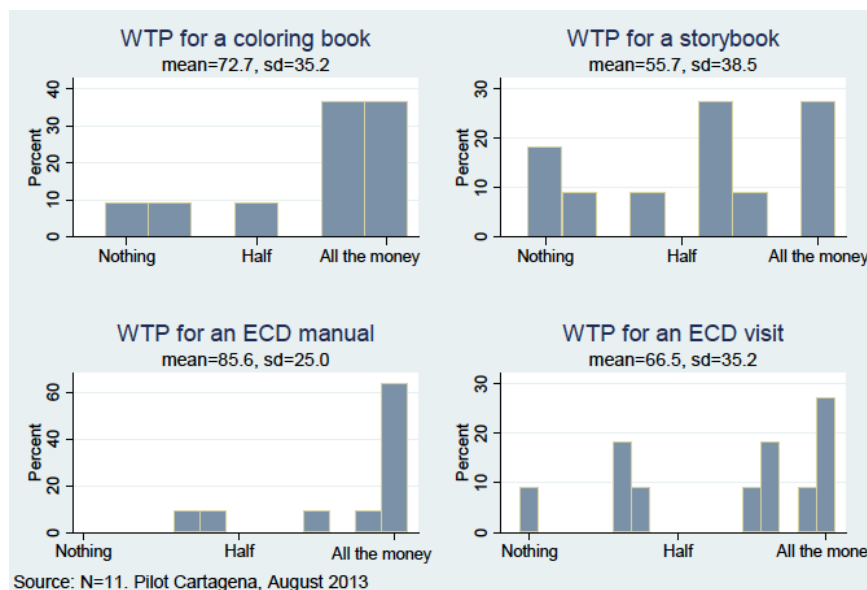


Figure 1. WTI. Mean is the average of the Maximum willingness to pay/invest.

¹⁰ We piloted two designs. For the first one, with 5 mothers, we gave them money and asked them to choose an amount of money to pay for the good. Once the participants offer an amount of money, if they don't get the good, will instead keep all the money. The second one is explained in the text. Although we obtained variation in responses in Pilot 1, we decided to discard that design since it is a win-win situation.

Pilot anecdotal evidence. In the discussion after the experiment, mothers commented on their following perceptions on their children's development:

1. It is better to choose the good instead of the money because the money goes away fast and you don't even realize where it went.
2. It is better to choose the good instead of the money because some family members may want to spend the money in useless things.
3. If the child shows signs that he/she is very smart, parents should look for these kind of good even if they don't have the money.
4. It is good to have that kind of goods but many times you don't know how to find them.
5. The coloring book and the storybook are easy to find but it is not the case for the manual and the visit.
6. The visit would really help them to know what to do with their child because most of the time parents really don't know how to interact with the child.

2. About Framing

The amount of time and attention required are assumed to be large enough to produce an impact on the child's development. We must have some preconception about the amount of time and attention on each activity. We check whether subjects will have similar ideas about each activity. Subjects don't have similar ideas about each activity. Their idea depends on how they understand the question about the time or attention each good will require (i.e. are they thinking about a one-shot situation or about establishing a routine, each way might yield a different answer)¹¹.

We will ask the subjects to rank the goods from 1 to 4 (where 1 is the highest amount and 4 is the lowest amount) according to: i) how much time they have to spend when using it; ii) how much effort they have to put when using it; and iii) how difficult it is to get these goods somewhere else. We will examine the average rank and its volatility. In table 4, we see from our pilot subject pool that (3), (4) and (5) hold. The most consistent rank is the degree difficulty of obtaining the good, which coincides with the price (although the error bands overlap¹²). Some observations (against our assumptions):

- For some mothers the coloring book may require more effort than the storybook because the parent has to be with the child and explain to him the colors, the drawings, etc.
- The manual may require less time for some moms who thought about what time it takes to read the manual, in contrast to other moms that foresee a higher time requirement since they consider not only reading the manual but also doing the activities with the child. The same occurs with the visit.

Table 4. Perceptions about the goods by the mothers

| Ranking index (average) | Good | | | |
|-------------------------|------|------|------|------|
| | A | B | C | D |
| 1. Effort required | 2.82 | 2.82 | 2.27 | 2.09 |

¹¹ For a few mothers, the ECD visit did not require much effort or time because they only thought about the hour-long visit but not about the activities they have to do with their child once they receive the visit.

¹² With only 11 observations none of the means are significantly different, but also a t-test is not very powerful. It is mostly indicative.

| | | | | |
|-------------------------|------|------|------|--------------------|
| Standard deviation | 1.17 | 0.75 | 0.90 | 1.51 |
| 2. Time required | 3.45 | 2.55 | 2.36 | 1.64 |
| Standard deviation | 0.82 | 0.93 | 0.92 | 1.12 |
| 3. Difficulty to obtain | 3.36 | 2.73 | 2.00 | 1.91 |
| Standard deviation | 1.03 | 0.47 | 0.89 | 1.38 ¹³ |

3. Possibility of arbitrage in second-hand markets of goods

Parents might have a desire of trading any goods from the experiment to outside-lab second-hand markets or might notice such a possibility. When we are far below the market price of the object, there may be an arbitrage (especially if it is an object difficult to obtain) our instrument is only precise within a certain neighborhood of the market price. However, even in that bottom region any chance of arbitrage will reveal that in expectation there exists a true valuation (the intended final buyer's) for the object will be above the amount considered.

The arbitrage story has a flip side: there is risk of not being able to resell the good. When the amount is getting close to the market price that risk increases. Those mothers that would like to re-sell the good might not be able to do so: as the amount offered increases, any bid for the object reveals a true preference for the good.

In fact, any mother who states their true value has also a market value / shadow price in mind. Those who wanted the good and “paid” for it, though they may have obtained a coloring book elsewhere (maybe for less?) they did not have the money to buy it. No matter how much they value the investment on my child, a rational mother will not make a suboptimal investment. Under certain circumstances, cash might be more child-regarding compatible than receiving the actual good (e.g. if the object is overpriced and they know it).

When talking to the mothers during the pilot, I did not sense any resale interest. These are very poor households and to find someone to buy the good such as a coloring book or a storybook is difficult. They may want to sell it in the street, but the amount of time and effort when trying to sell it makes the option infeasible. Other business opportunities can be thought of, e.g. renting the manual, but none of them seem truly feasible given their restrictions.

4. Contamination of treatment and control groups when using an ECD intervention: risk assessment

The real risk of contamination by conducting our experiment with a sample within an ECD intervention is very low. The economic experiment is about four situations in which we ask the mothers to reveal their preferences between a good and cash. Among these cases, contamination arises only with the acquisition of goods C and D since goods A and B are not directly linked to ECD (comparable to e.g. monetary payments).

¹³ The error bandwidth for good D is the largest, the reason being that for some mothers the difference between a psychologist and an ECD expert was unclear; they only thought about the ease of access to the former given their health insurance coverage.

Every mother will receive a show-up fee so we motivate her to participate. But **only one of the five mothers** will actually receive either the additional cash or the good, and only for one of the situations (chosen at random). Of these, only a fraction will have chosen the good over the money. The following table shows the numbers.

Table 5. Risk assessment

| Payment | Group Control | Treatment |
|---|--------------------------|------------------|
| Show-up fee | 150 | 150 |
| Show-up fee + decision | 30 | 30 |
| Show-up fee + decisions C or D | 15 | 15 |
| Expected number that actually will get goods C or D | 11 | 11 |
| As a % of total sample ^a | 2.2% | 0.6% |

^a Assuming a universe of 500 observations for controls and 2000 observations for the treated,

The table describes that from each group we will have 150 mothers. Of these only 30 mothers will be given a reward for their decision; among the rewarded decisions, outcomes 3) and 4) are expected to happen for 15 mothers in each group. Of these, approx. 11 mothers in each group will be effectively given the good.¹⁴ This represents 2.2% of the control sample (assuming 500 obs.) and 0.6% of the treatment one (assuming 2000 obs.).

Contamination is thus an event with low probability. With respect to the intervention, receiving these goods is a random (exogenous) shock. The probability that anyone (relative, friend, NGO) could have approached that mother to provide a guidebook on stimulation or a one-hour visit by a practitioner might well be close to 3%. It is a very small shock whose contaminating effect (if there is one) could be accounted for in the data analysis.

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¹⁴ That is obtained by using the estimated willingness to pay in the pilot: on average mothers are willing to sacrifice 85% of the cash amount in order to obtain the good 3) and 66% of cash in order to obtain good 4), leading to a combined estimate of $(15/2*0.85)+(15/2*0.6)=11$.

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Project 2. Leading by non-example: do leader's social preferences matter for cooperation? Experimental evidence from Colombia

Abstract

Leaders play a key role in overcoming collective action dilemmas, yet how they use their power, defined as the ability to motivate others to behave prosocially, is still poorly explored. Leaders are hoped to have other-regarding preferences, look for the common good and motivate followers to imitate them. However, if impunity is an option, a leader could use her power in order to achieve her self-interest and obtain monetary benefits, sometimes imposing a negative impact on the common good.

Attanasio et al (2009, 2012b) conduct a public goods game with 1679 participants in two communities in Colombia. They find that voluntary contributions increased when democratically elected local leaders were present. Nevertheless, leaders contributed significantly less than others. We propose to go back to the field and disentangle these effects by conducting an artefactual field experiment with 640 beneficiaries and examining, first, whether how powerful leaders are determines their decision to free ride; second, the relationship between individual willingness to cooperate and the presence of an empowered leader in the group; and third, which socioeconomic and social engagement factors might be driving the results.

Motivation

Leaders play a key role in overcoming collective action dilemmas, yet how they use their power, defined as the ability to motivate others to behave prosocially, is still poorly explored. Leaders are hoped to have other-regarding preferences, look for the common good and motivate followers to imitate them. And indeed, much of the literature agrees to both the importance and prevalence of leadership by example. It also points to reputation as the main underlying mechanism to such behavior.

Yet reputation might not be enforceable when the monitoring costs are high. If impunity is an option, a leader could use her power in order to achieve her self-interest and obtain monetary benefits, sometimes imposing a negative impact on the common good. Leaders' preferences are not observable, and self-interest is possible. In fact, the self-interested preference might arise as a consequence of the leadership position itself.¹⁵

This type of impunity is present in many developing countries, yet little is known about the impact of non-exemplifying leadership on the efficiency of voluntary public good provision. The presence alone of a leader (perhaps a non-exemplifying one) may entail a state of confidence, group identity and direction by the followers that is effective in motivating prosocial behavior. Attanasio et al (2009, 2012b) conduct a public goods game with 1679 participants in two communities in Colombia. They find that voluntary contributions increased when democratically elected local leaders were present. Nevertheless, leaders contributed significantly less than others. We propose to go back to the field and disentangle these effects by conducting an

¹⁵ The moral tension involved is not straightforward. Leadership is sometimes bitterly rewarded, and the leader might be left to her own devices. This is the case of developing countries such as Colombia, where the costs of being a leader often overcome its benefits. Between January and December 2010, the Information System of Aggressions against Human Rights Defenders – ISAAHRD – from the We are Defenders program reported 174 community leaders attacked. In 2011, there were 239 cases. In 2012, the number of aggressions increased to 357. For the first semester 2013, the number of aggressions was 153. (SD 2012, 2013a, 2013b) <http://www.somosdefensores.org/>

artefactual field experiment with 640 beneficiaries and examining, first, whether how powerful leaders are determines their decision to free ride; second, the relationship between individual willingness to cooperate and the presence of an empowered leader in the group; and third, which socioeconomic and social engagement factors might be driving the results.

To our knowledge this is the first study that aims to understand leaders' behavior when reputation is not a concern, and the first to relate their impact on efficiency of voluntary public good provision. This research has a considerable impact in public policies that look for community leaders to be promoters of prosocial behavior in order to solve collective action problems. The results will be used in policy, in order to leverage on a different attribute of leadership, one that doesn't depend on monitoring and reputation. This could prove especially valuable in cases where leadership by example is either scarce or eroded. Efficiency gains don't arise only from exemplifying leadership; they also arise from powerful leadership.

Relevance

This is a novel research project that explores the motivation for giving by people in situations where giving it is not an incentive-compatible choice and is not monitored. In developing countries, the poorest communities lack institutional infrastructure to solve collective action problems or provide public goods. To do so they rely mostly on their local leaders.¹⁶

A leader is a person who is gifted with the ability to influence others to the point of transforming social outcomes. Arguably, the strongest leader is the one who can motivate. Motivation is at the heart of philanthropic initiatives, and leadership is arguably the main lever for its impact on their target population. It is therefore of special interest for the philanthropic community to understand leader behavior and impact given their specific situation and challenges.

In spite of its importance, little is known about how leadership operates in a context as relevant for philanthropic initiatives as that of impunity. The study of leadership we propose exemplifies the Foundation's motto, "How little we know, how eager to learn".

Contribution

This study contributes in several forms to the existing literature on leadership and voluntary cooperation. First, we use an artefactual field experiment with non-students to investigate the effect of leadership on the voluntary provision of a public good. Most field studies on leadership and its influence on the public good provision focus on public goods that are provided by the government at the local level (Chattopadhyay & Duflo 2004, Reinikka & Svensson 2004, Humphreys et al. 2006, Besley et al. 2012, Olken, & Singhal, 2011) but less is known about the role of leadership on voluntary public good provision (D'Adda 2012). Most experimental studies use student samples (Van der Heijden, et al. 2009, Guth et al 2007, Gächter, et al 2010, Potters et al 2005, 2007). To our knowledge Grossman & Baldassarri (2012) is the only experimental study that uses an *experimental economic game* in the field to examine the role of leadership. My study will shed light on whether leadership effects that are observed in the laboratory with student samples are empirically relevant in real settings. Our study also contributes to the literature on the external validity of public goods experiments by providing evidence of a correlation between

¹⁶ This is in fact the main reason why leaders in Colombia are systematically targeted by criminal groups. See footnote 2.

behavior within a lab-type public goods game and behavior in naturally occurring decision-contexts within which inter-personal cooperation is also salient (Barr et al 2013).

Second, this is one of few studies that use existing leaders (D’Adda 2012, Grossman & Baldassarri 2012, Kelsey & Recalde 2013). Exogenously assigned leadership is useful to identify the effect of leaders on behavior, contrary to laboratory experiments on leadership that typically assign status to participants.

Third, this study examines two mechanisms, the physical presence of the leader at the session and the power of the leader in convincing others to cooperate to the public good. The latter is an almost unexplored mechanism (for an exception see Levy et al 2011) that may be closely related to group identity. The most studied mechanisms by which leaders affect cooperation are leading by example and signaling (Kelsey & Recalde 2013, Hermalin, 1998, Potters et al 2005, 2007, Gächter et al 2012, see Arbak & Villeval 2013 for a review). Other mechanisms are central monitoring (Van der Heijden, et al. 2009, Vyrastekova & Van Soest 2003) and leading by sacrifice (Meidinger & Villeval 2002). Overall, the key findings are that there is a significant improvement in group performance if either the leader’s contribution is made public before others decide or in the presence of asymmetric information on the return or quality of the good.

Finally, exploring leader’s social regarding preferences and characterizing leaders who free ride may shed light on which local authorities would choose to keep the money from public goods for themselves (Besley et al. 2012, Reinikka & Svensson 2004, Beekman et al. 2011). Most importantly, we explore whether the only option is to search for bulletproof virtuous leaders, or whether powerful leaders can get the job done.

Approach: How exogenous leadership emerges

Familias en Acción (FA) is a Conditional Cash Transfer program in Colombia and the flagship program of the Colombian government’s social policy¹⁷. The program aims to reduce extreme poverty in the medium term by providing resources to improve the nutritional status of poor children as well as their school enrolment. Beneficiary households have to comply with a number of requirements¹⁸ to obtain access to the program’s grants.

The beneficiaries **elect** a representative, called *Madre Líder* (ML) who is in charge of communicating with the local office, organizing the social activities and educational meetings¹⁹ in

¹⁷ This program targets the poorest 20% of Colombian households. It started in 627 relatively small towns and in August 2007 it included 1.5 million beneficiary households, including those living in large cities.

¹⁸ FA has three components: a nutritional and health component aimed at households with children less than five, an education grant for children in primary school and an education grant for children in secondary school. The health and nutrition grant, roughly equal to US\$25, independently of family size, is conditioned on attending regularly growth and development check-ups for children, a vaccination program and some ‘classes’ on hygiene, diet and contraception. The educational grants, aimed at households with children aged seven to seventeen, are conditional on enrolment and regular attendance in school. Each child in primary (secondary) school entitles the household to about US\$8 (16) per month.

¹⁹ The program also includes an important social component, articulated around periodic meetings of beneficiaries, called Encuentros de Cuidado (EC) [Meetings on caring]. Conversations with program’s officials and with beneficiary mothers indicate that these social aspects are indeed an important feature of the program: beneficiary mothers start new activities, get to know each other better and improve their ability to act as a group. This means

which the beneficiaries are supposed to participate. A ML would generally be in charge of coordinating a group of 50-70 beneficiaries. Therefore, the MLs often assume a prominent and visible role in the community. Among the benefits, MLs attend training courses where they learn about health care and bureaucratic procedures. However, MLs are not paid.

Hypotheses and theoretical approach

The social optimum of the public goods game is for everyone to contribute the maximum amount, but the self-interest-maximizing strategy is not to contribute anything. When a leader is present, every individual's strategy is to free ride (Bianco et al 1990, Varian 1994). Theoretical insights in economics and social psychology have been provided by studies on identity (Levy et al 2011, Drouvelis et al 2012, De Cremer et al 2002). Group identity is important; in fact, when there are outside leaders, contributions might decrease (Ibanez & Schaffland 2013, Drouvelis & Nosenzo 2012, Kranton et al. 2013).

Social preferences such as conditional cooperation see leadership as a common signal that all group members know they all receive (Camerer 2003), which translates into contributing to the public good. Another type of motivation underlying the ability of leaders to gain cooperation in groups is people's internal attitudes and values (Tyler 2002), which shape what people want or feel they ought to do. In the day-to-day interaction, leaders can draw on these internal motivations by appealing to or creating attitudes and values. Thus, people voluntarily follow those leaders even when information is absent and leader's decisions are private.

Our design provides the contrast necessary to distinguish the importance of leaders and their presence in contributing to a public good with private information. The key hypotheses are:
H1a. Followers will exhibit more cooperation when their leader is present than (i) followers whose leader is not present but another leader is present and (ii) followers with no leader present.

H1b. Leaders will contribute less than followers.

H2a. After communication, the effect described in H1a is enhanced.

H2b. After communication, the effect described in H1b is enhanced.

H3 Members of groups with their own leader will earn more than (i) members of groups without their own leader and (ii) members of groups with no leader at all.

Experimental design and Identification strategy

In order to identify whether the physical presence of a leader at the session (in the first round) and their power to lead (in the second round) are mechanisms through which leaders influence others, we generate a direct measure of individuals' propensities to cooperate with others to solve collective action problems, we implement a very simple public goods game, a dichotomous 8-people Voluntary Contribution Mechanism (VCM) with communication between rounds²⁰. We

that FA may create networks and improve trust among beneficiaries, promote leadership and motivate to work as a "group" by perceiving a strong identification with the program, facilitating group decision making and finally, overcoming social dilemmas.

²⁰ A dichotomous VCM design has first used by Cardenas et al (2007) and then adapted by Cardenas et al (2008), Attanasio et al (2009, 2012), Barr et al (2012), and Barr et al (2013).

use a representative sample of beneficiaries of FA at the neighborhood level in the city of Cartagena, Colombia.

In November 2013 the FA program authorities called for elections of **new** MLs. Thus, we have exogenous variation in the role of the MLs. Our experiment employs a between-subject design with two treatments and a control group. In the New Leader treatment (N-L) and Old leader (O-L) treatment the participants are one New (Old) leader and some of her beneficiaries²¹. In both treatments, the leader visibly makes her decision before everyone else, but information about the decision is not disclosed. In the control group (C), there are no leaders, but only beneficiaries and one subject is asked to make a private decision before other subjects (See Tables 1a and 1b on sample details).

Table 1a. Information on the experimental sessions and sample

| | | | | | |
|---------------------------|--------------------------------------|-----|-----------------------------|------------------------------------|----|
| Sample Information | Goal Sample size | 640 | Fieldwork procedures | Number of sessions per day | 7 |
| | Recruitment sample size ^a | 704 | | No. days of fieldwork ^b | 7 |
| | Treatment | 320 | | Session size | 16 |
| | Control | 320 | | Surveyors | 9 |
| | Number of groups | 80 | | Coordinators | 2 |

^a Attendance attrition rate 10% based on the previous studies

^b One day of training and 6 days of sessions. A session of 16 people will last 2 hours.

Table 1b. Treatments

| Treatment Old-New | Treatment with / without | |
|-------------------|--------------------------|----------------|
| | With Leader | Without Leader |
| No leader | | C |
| New Leader | N-L | F-N-L |
| Old Leader | O-L | F-O-L |

We call F- the foreign treatment in which a leader but not the leader of the participants is in the group.

When the subjects arrive they will be randomly assigned participants to a treatment. Each participant is given an indivisible voucher and has to decide whether to invest their voucher either in a group account or a private account. If an individual invests in the group account, he/she will get $\pi_i^g = 1000 + 500N_j^g$, with $j \neq i$, where π_i^g indicates the earnings of individual i from investing in the group account, and N_j^g indicates the total number of other participants who invested in the group account. If an individual invests in the private account, he/she will get $\pi_i^p = 2500 + 500N_j^g$, with $j \neq i$. It follows that the marginal per capita return ratio (MPCR) from investing in the group account is set equal to 0.20. The experimental parameters are such that at least 4 investors in the group account are needed for each investor to earn at least as much as he/she would earn by investing in the private account with all the other participants doing

²¹ We may include a foreign leader treatment (FL) in which the participants are one leader and beneficiaries who aren't hers, that is, whose leader is not present.

likewise. The dominant strategy is to invest in the private account, since it yields higher earnings.

Before the subjects make their decision, we elicit individuals' beliefs about others' contribution. After the first round, subjects will have 10 minutes of cheap talk before the play the second round. Results of the first round will be announced at the end of the session. We also include two non-experimental secondary components: a post-experiment survey that includes information on household socio economic characteristics, social engagement, understanding of the game and links (relatives and friends) among the participants to the sessions and data on the *leaders* (i.e. performance, trustworthiness) (see Table 2 for the timeline).

In addition to including previous round behavior and beliefs in the analysis (Grujić et al 2012, Rustagi et al 2010), we consider data on how well connected the leaders and the followers are by using a dyadic regression analysis (Attanasio et al. 2012a).

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Project 3. Lab in the field experimental evidence of diversity and cognition on sustainable development

Abstract

I use experimental and survey data to study the causes and solutions of mismanagement of common renewable resources. The experimental data consist of laboratory experiments conducted in the field to study renewable resource management. The experimental games are complex: not only participants face a social dilemma in extracting from a renewable stock, the problem is also dynamic. Thus individuals face a twofold problem: the dynamic effect -the lower the stock, the lower the capacity for renewal- and the social dilemma effect -group level extraction affects my payoffs and the resource stock. There is a cognitive mechanism as users may not anticipate the dynamic consequences of depleting the resource stock. The contribution of the study is twofold: First, it examines the value of diversity and its role on individual decision making which is key for environmental and resource economic policy design. Second, it uses data from real common pool resource users to analyze the role of cognition and individual attitudes towards a sustainable use of natural resources.

Motivation

The analysis of complex adaptive systems requires the application of multiple methods and disciplines (Ostrom, 2009, Poteete, et al. 2010, Jansen et al 2011). We use an experimental approach by conducting laboratory experiments in the field to study renewable resource management by real common pool resource users. The data show that participants neither play the own-payoff-maximizing strategy nor manage the resource in a sustainable way. There is debate in the literature on the determinants of such behavior.

Goals

- I. Examine the value of diversity and its role on individual decision making which is key for environmental and resource economic policy design.
- II. Analyze the effect of a dynamic or intertemporal component on individual extraction decision as we explore the role of cognition and individual attitudes towards a sustainable use of natural resources.

Relevance

There is a current interest in understanding the causes and solutions of mismanagement of common renewable resources to design more accurate policies. The complex environment comes close to real life decisions, allowing us to study previously neglected channels such as cognition, on one hand, and how the level of diversity shapes preferences, on the other hand.

Contribution

1. This study contributes to the discussion about methods for valuing biological diversity that are used by environmental economists.
2. The experimental literature on dynamic games in the field to study renewable resource management is scarce.
3. We explore a cognitive mechanism as users may not anticipate the consequences of depleting the resource stock (Moxnes, 2000, Castillo, 2012)

Approach

We are interested in advancing towards a multidisciplinary approach to the study of the relationships between society and environment.

Experimental game

We conduct two dynamic Common Pool Resource games. The experimental games are more complex since participants face a social dilemma which is designed as a dynamic problem of extracting from a renewable stock. The analysis of the economic decisions is not only more difficult but also useful to explore different models of individual behavior and social preferences. Individuals face a twofold problem: the dynamic effect – the lower the stock the less renewable capacity and the social dilemma effect – group level extraction affects my payoffs and the resource stock.

Data and Sample

Experimental and survey data of 410 fishermen, collected in 2010 in Cispatá, Colombia (See Cardenas et al 2010).

Other data

We use survey data on socio-economic characteristics (i.e. age, education, income) and social capital measures (i.e. trust, membership in associations, cooperation).

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Appendix: Treatments (Spanish version)

| Experimento | Diseñado para | Tratamiento | | | | | | | | | |
|--|-------------------------|-------------|--|---------------------------|--------------|---------------|--------------------|-----------------------------|--------------|---------------|--------------------|
| | | Código | Descripción | Etapa I: Rondas de 1 a 10 | | | | Etapa II: Rondas de 11 a 20 | | | |
| | | | | Comunicación | Regeneración | Incertidumbre | Precios diferentes | Comunicación | Regeneración | Incertidumbre | Precios diferentes |
| A) Recurso con una sola especie: cambios en su tasa de regeneración o efecto de un horizonte inter-temporal incierto | una especie | A1 | Línea base | ☑ | 10% | No | NA | ☑ | 10% | No | NA |
| | | A2 | Regeneración rápida | ☑ | 10% | No | NA | ☑ | 5% | No | NA |
| | | A3 | Regeneración lenta | ☑ | 10% | No | NA | ☑ | 20% | No | NA |
| | | A4 | Incertidumbre en el horizonte temporal | ☑ | 10% | No | NA | ☑ | 10% | Sí | NA |
| B) Diversidad de Especies | cuatro especies | B1 | Línea base | ☑ | 10% | No | No | ☑ | 10% | No | No |
| | | B2 | Precios diferentes | ☑ | 10% | No | Sí | ☑ | 10% | No | Sí |
| | | B3 | Especie Invasora | ☑ | 10% | No | No | ☑ | 10% | No | No |
| C) Diversidad de Paisajes | cuatro usos del paisaje | C1 | Línea base | ☑ | 10% y 0% | No | No | ☑ | 10% y 0% | No | No |
| | | C2 | Precios diferentes | ☑ | 10% y 0% | No | Sí | ☑ | 10% y 0% | No | Sí |

Project 4. Measuring the effect of a social intervention on cooperation, coordination and risk preferences

The social intervention is a set of different ‘social actions’, designed by the NGO called Corpovisionarios whose aim is to change individual behavior in a private organization towards higher levels of team effort, ethical behavior and less risky actions in the workplace. All the economic games are designed for groups of four people.

In the linear public goods game (based on Marwell and Ames (1979)) an individual has an endowment of 8 units and has to decide how many units to contribute to the group account and how many units to keep to herself.

Table 1. Payoff matrix (Experimental units)

| Average units contributed to the group account by others in the group | My units contributed to the group account | | | | | | | | | |
|--|---|------|------|------|------|------|------|------|------|--|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| 0 | 8.0 | 7.4 | 6.8 | 6.2 | 5.6 | 5.0 | 4.4 | 3.8 | 3.2 | |
| 1 | 9.2 | 8.6 | 8.0 | 7.4 | 6.8 | 6.2 | 5.6 | 5.0 | 4.4 | |
| 2 | 10.4 | 9.8 | 9.2 | 8.6 | 8.0 | 7.4 | 6.8 | 6.2 | 5.6 | |
| 3 | 11.6 | 11.0 | 10.4 | 9.8 | 9.2 | 8.6 | 8.0 | 7.4 | 6.8 | |
| 4 | 12.8 | 12.2 | 11.6 | 11.0 | 10.4 | 9.8 | 9.2 | 8.6 | 8.0 | |
| 5 | 14.0 | 13.4 | 12.8 | 12.2 | 11.6 | 11.0 | 10.4 | 9.8 | 9.2 | |
| 6 | 15.2 | 14.6 | 14.0 | 13.4 | 12.8 | 12.2 | 11.6 | 11.0 | 10.4 | |
| 7 | 16.4 | 15.8 | 15.2 | 14.6 | 14.0 | 13.4 | 12.8 | 12.2 | 11.6 | |
| 8 | 17.6 | 17.0 | 16.4 | 15.8 | 15.2 | 14.6 | 14.0 | 13.4 | 12.8 | |

In the minimum effort coordination game (based on Van Huyck, Battalio & Beil, (1990)), each individual has to decide how many units of effort put in a team task.

Table 2. Payoff matrix (experimental units)

| My effort decision | Minimum effort level in the group | | | | | | | |
|--------------------|-----------------------------------|----|----|----|----|---|---|---|
| | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
| 8 | 14 | 12 | 10 | 8 | 6 | 4 | 2 | 0 |
| 7 | | 13 | 11 | 9 | 7 | 5 | 3 | 1 |
| 6 | | | 12 | 10 | 8 | 6 | 4 | 2 |
| 5 | | | | 11 | 9 | 7 | 5 | 3 |
| 4 | | | | | 10 | 8 | 6 | 4 |
| 3 | | | | | | 9 | 7 | 5 |
| 2 | | | | | | | 8 | 6 |
| 1 | | | | | | | | 7 |

I use the experimental designed by Cardenas et al. (2009), Cardenas et al. (2013) and Attanasio et al. (2012) to capture risk preferences. In addition, once the participants choose their favorite lottery, they also have to decide whether to be part of a group of four people and in which the earnings of all members of the group are divided equally.

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