Bringing the Lab to the Field and the Field to the Lab:
More than Changing Subjects

Juan-Camilo Cardenas
jccarden@uniandes.edu.co
Economics Department - CEDE
Universidad de Los Andes - Bogota, COLOMBIA.

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Abstract.

This paper argues that when conducting experiments in the field it is equally valuable to bring the lab to the field as well as bringing the field to the lab, that is, there might not be such trade-off between control and relevance. The paper offers a series of reflections and lessons from conducting economic experiments outside of the campus laboratory where one finds richer contexts, more variable demographics among the experimental participants, and more complex dynamics and interactions ex-ante and ex-post the experiment itself. These lessons are based on the author’s experience of seven years of conducting experiments in the field, with about three hundred sessions and some 1,800 participants, mostly on common-pool resource and public goods games conducted in rural villages in Colombia, and replications with college students. Among the main lessons are i) the actual environment and institutions outside of the field lab can help explain experimental behavior and therefore there is need for better understand of such contextual factors that the participants usually face. Thus, greater variation in the demographics across subjects within a field site, and replicating experiments across field sites can provide major gains in explaining variation in behavior; ii) replicating experiments with participants in the field and students can enrich the analysis, strengthen the internal validity of the experiments, but also when differences are found, it can provide elements for interpreting results from experiments with students; and iii) re-visiting the same field lab can bring unexplored elements about the long run dynamics in social exchange situations that can rarely be created in short-run experiments. Further, the paper invites experimentalists to improve their observation in the field lab by complementing the experimental data with other tools and dialogues with the experimental participants –called ‘subjects’ by others- to better interpret results.

1 Samuel Bowles, Jack Knetsch and Andreas Ortmann have enriched the arguments with their comments to previous drafts. Many discussions with Jeff Carpenter, Abigail Barr, and Justine Burns have polished these ideas greatly and it would be hard to distinguish from their authorship sometimes. Ernst Fehr generously helped to part of the experimental design generating data used in this paper. Diana Maya and Maria Claudia Lopez provided important input and analysis of qualitative data within various projects, and most of the field work during the 2000-2003 years could not have been done without them. Special thanks to Pablo Ramos, Ana María Roldán and Liliana Mosquera and their help in the field. Also, I wish there was room in our papers to list the names of the almost two thousand participants in the field that offered insights about human behavior through their discussions and participation in the experiments. Funding for much of the field work supporting the paper is from a Research & Writing Grant from the John D. and Catherine T. Macarthur Foundation, the Preferences Network headed by Rob Boyd and Herb Gintis, and the Santa Fe Institute. A previous version of the paper was presented at the 2005 American Economics Association meetings, Philadelphia and at the 2003 International Meeting of the Economic Science Association, Pittsburgh.
1. **Introduction.**

In the late 1970s Hans Binswanger conducted the first economic experiment in a rural setting with 330 villagers in six villages in India. The experiment was designed to measure risk attitudes in peasant societies, and involved substantial stakes to resemble the level and type of risks faced by farmers who were asset constrained and could enter the credit market and adopt different but riskier technologies and outcomes. Binswanger (1980, 1981) also collected household data on wealth and human capital, and data on how prone the farmer was towards innovative technologies, among others. Further, he was apparently aware that each village may have had a different history of prior droughts that affected farmers’ chances. He was interested in studying the relation between poverty and risky behavior given the inconclusive literature about innovation, risk and poverty, and the crucial policy implications from assumptions about these.

Clearly for that early experiment in the field lab, the researcher was interested in conducting a sufficiently controlled but also salient, familiar, and relevant experiment, where the ‘subjects’ were in fact the same people at the core of his research and policy concerns.

Experimental economics has never been absent from the concern about real world applications, and has been designing experiments inspired by observation of the world. Interestingly however, the practice to run experiments with subjects other than students and in contexts more familiar to the participants remained mostly ignored in the literature over the following two decades. Only during the mid 1990s there was a return of field
researchers interested in conducting controlled economic experiments in the field lab\(^6\). The literature on experiments in the field has produced in the last couple years a volume in the “Research in Experimental Economics” series (Carpenter, Harrison and List, 2005), a JEL survey article (Harrison and List, 2004), and a there is now a growing number of experimental studies in several developing countries (Cardenas and Carpenter, 2005b).

This paper argues that bringing the lab to the field is as valuable as bringing the field to the lab. It will reflect on issues of control, relevance, saliency and familiarity in experiments conducted in the field lab, based on the proposition that it is valuable to study and incorporate in the analysis the surrounding elements of the experimental lab and of the experiment participants.

People that participate in any economic experiment do not come naked to the lab. We can ask them to leave in the front door as much as possible, have them read unframed instructions that lack or even wash out any context or cue, and yet they will be looking for clues to mentally represent the game they are facing using something they are familiar with, so that they can, by optimizing their strategies in the game, walk out with some cash or other reward in their pockets.

If the participants are familiar with the task or the context in our experiment, if they can use historical information about their previous relations with the rest of players in their own session, or even with the experimenter, they may bring such information and use it strategically for their decisions along with the incentives and strategy set of the experimental design. It is therefore in our best interest to capture and study such information to better understand the behavior of our experiment participants. This can thus help us face the two major challenges of experimentalists, namely, internal and

\(^6\) There are a very few exceptions reported in Harrison and List (2004) with papers during the late 1970s to the 1990s reporting experiments with professional casino gamblers, wool traders, electricity consumers, and business people. There are no reported papers with experiments in rural settings between Binswanger (1980) and the experiments conducted by Cardenas et.al. (2000) in Colombia and Henrich et.al. (2000) in the Amazon.
external validities, and therefore contribute to the understanding of the micro economic systems we observe in the outside world.

A natural response to the external validity question (Loewenstein, 1999, Loomes, 1999a, 1999b) has in a great deal been to create experiments richer in context and frame\textsuperscript{7}, as well as conducting experiments with non-student subjects\textsuperscript{8}. The recent volume by Carpenter, Harrison and List (2005) collects experimental exercises in diverse areas of economics. This growing experimental work is surveyed—and such strategy is praised—by Harrison and List (2004) who collect and classify a vast array of experiments based on the nature of not only the subject pool but also the nature of the frame or task, the environment in which the players are immersed, the commodity and stakes used in the experiments, and information the participants may bring. Both Harrison (2005) and Ortmann (2005) argue however that conducting experiments in the field, outside of the campus lab, brings a trade-off between the losses in experimental control which is required for internal validity and the gains from capturing more realistic aspects of the world.

Conducting experiments bringing the lab to the field, however, is more than just changing the subjects’ pool, the commodity or stakes, or the frame of the game, as I will develop through the paper. I will agree, in fact, with Harrison and List (2004) who argue that creating a very abstract experiment in terms of frame, commodity and tasks could in fact create greater losses in experimental control. But further, I will argue that bringing the lab to the field is more than moving along the efficiency frontier of such trade-off between relevance and control. It is about shifting the frontier. By bringing the lab to the field we can enrich greatly our understanding of the cognitive process that our participants face in the experiment or outside in their natural world and minimize the costs of control that Ortmann (2005) is concerned about. Further, these goals can be achieved by bringing also

\textsuperscript{7} One line of research responding to some of the validity criticisms is to introduce more “natural” tasks within the experiment. An example is Gneezy (2002) who has replicated most of the gift exchange and reciprocity results, by asking the “employees” to undertake a more “real effort” task of solving mazes and based on their performance being paid by the “employers”.

\textsuperscript{8} I recall a major methodological discussions when designing my first experiments for the field, in 1997, when concerns were raised after the choice of i) creating a framed experiment for a common-pool resource game in which the choice variable was to allocate “time into extracting the commons” rather than “allocating tokens”, and ii) to run such experiment with people with very poor levels of literacy but who daily perform exactly that choice for a living.
to the field other techniques and do something one rarely see in the traditional experimental work, namely, talking to the participants after the experiment is conducted\(^9\).

In this paper I will attempt to offer some lessons resulting from seven years of running economic experiments in the field and more recently in the campus labs, focusing mostly on the problem of social dilemmas, and particularly on the so called ‘tragedy of the commons’ in the use of natural resources and the provision of public goods. During these years I have conducted close to 300 experimental sessions (usually ~20 rounds each) with about 1,800 villagers in more than 10 different rural villages of Colombia. The greatest share of these experiments was based on cooperation dilemmas using variations of public goods and common-pool resource games.

Interestingly, however, my interest on using experiments to study economic behavior came from the opposite direction than the current trend of inviting experimentalists to get out of their labs and run experiments in the field (Harrison and List, 2004; Carpenter, Harrison and List, 2005). The so called ‘non-conventional’ or ‘non-standard’ subjects that experimentalists refer to, were in fact the people I was more familiar with before getting involved in experimental economics when using other ethnographic and field tools for research on the issues of natural resource management. The natural step to use experiments came from the limitations to understand the behavioral motivations and micro foundations behind the decision-making of the people I had been having dialogues in the field about their use of natural resources.

There are at least two main lessons to be shared in this paper. One, on learning from the actual environment, institutions and incentives outside of the lab. The second from replicating experiments in the Field Lab and the Campus Lab.

\(^9\) At this point the reader may have noticed that I have purposely chosen to name “participants”, and not “subjects”, the individuals we interact with, before, during and after an economic experiment. The methodological proposal includes that a change in attitude by the experimentalists can be beneficial if we consider them as participants in the research and open the possibilities that they contribute to the interpretation of the data we collect from their own behavior, especially if such behavior is similar or related to what they face daily.
The actual context, experience and familiarity of the participants with the experimental decision making environment and incentives can help us explain the behavioral variation we usually observe within and across sessions. In fact, field experiments may provide greater variance in terms of the demographics of the population sampled, and therefore help us understand the more complex set of factors affecting individual choices additional to the conventional game theoretical prediction based on a purely selfish payoff maximizers model. I will provide evidence on such claims, where the actual experience, wealth or occupation of villagers can explain variation in levels of group cooperation because of the easiness to find socially optimum solutions, or because of the social distance among the players. Differently to the students’ samples, there are prior historical dynamics, ties, or differences among the participants in one single session, and ex-post possible effects of experimental decisions and outcomes, that can provide a more complex and rich context for the experiment in itself. Now, such richness that the students population lacks, is in fact very much frequent and critical in the actual context of economic decisions being studied, e.g. in the case of rural communities using natural resources and therefore such ‘loss’ of control becoming ‘gain’ in richness for understanding the problem. Also, drawing samples across different locations with variations in the connections or similarities between the experimental task and the actual context could also provide the experimenter with greater variance for explaining experimental behavior.

Secondly, careful replications of the same experiments in the field with students can be greatly beneficial to verify the internal validity and control of our experiments. In our own studies on group dilemmas, data from the field lab are consistent with experiments with students in the campus lab in various dimensions, while also showing shifts in the distributions that can be of value for our understanding of the problem. In general, the group outcomes in both the field labs and the campus labs show similar patterns of socially sub-optimal behavior but without achieving the individualistic Nash equilibrium prediction. Nevertheless, in the baseline case, villagers that are familiar with the common-pool resource dilemma seem to behave closer to the socially optimum solution while students’ distributions are closer to the Nash prediction. Also, the distributions of
behavioral responses to different treatments involving institutional solutions to the group dilemma show parallel patterns among students and villagers, yet shifts in the distributions are again significant on several cases. For example we have found significant differences between students and villagers when facing the possibility of external but imperfect regulations sanctioning over extraction of the common-pool (students prefer externally imposed sanctions while villagers prefer more endogenous solutions); meanwhile, face-to-face communication varies much greatly in the field while extremely effective among students (Cardenas, 2005).

2. Bringing the lab to the field, the field to the lab, and changing subjects.

In many cases our experiments involve complicated tasks or levels of uncertainty and asymmetries of information regarding outcomes or expected behaviors by others, which will force players to find rules of thumb that help them beyond the elimination of dominated strategies or the backward induction, based on the material payoff maximizing rationale. Emotions will also play a role during the experimental decision process just as they do in uncontrolled economic settings (Elster, 1998; Rabin, 1998), and how those emotions affect choices would be part of a personal history that might not be affected by an experimental institution or environmental variable. Instead, the experimental design might trigger or inhibit some of these elements and therefore their role needs be studied. McCabe and Smith (2001) explore a cognitive model of exchange that encompasses several factors that humans will not be able to turn off when coming into the lab, but rather will use to educate their decisions, as will be discussed later. The cognitive model of McCabe and Smith includes modules that would apply to the inside and the outside of the experimental laboratory. These include steps for detecting “friends from foes”, a module for “mind reading”, another for “good-will accounting” and another for “cheater detection”. Before choosing to trust or reciprocate, individuals will combine information and these modules to educate their decision. In some cases the experimental design will provide the information, but in many cases much of the information may come from outside the laboratory, and be accumulated through long periods of time before the
experiment happens. Thus the initial reference to Smith’s remark about instructions, context and autobiographical experience. As will be shown below, these elements also include those instructions and context that the outside of the lab gives to the participants to help the cognitive process.

When we run experiments with people from non-students subject pools, we sometimes recruit them from subsets of people that are somehow familiar with the task and the model or question we are asking as researchers. Workers make part of experiments on gift-exchange relationships (Carpenter, Burks and Verhoogen, 2003), managers make experimental decisions about planning and production (Cooper et.al, 1999); or about trust (Fehr and List, 2004), bike messengers participate in experiments where effort affects wage similar to what they face for their performance based payroll (Fehr and Gottle, 2002), rural villagers are invited to games where they face risky decisions (Binswanger, 1980, 1981), face the incentives to cooperate vs. defect, or the possibility of sharing or trusting at a personal cost, just as they do when a fishing or crop harvest turns out well or not (Barr, 2001; Barr and Kinsey, 2002; Henrich et.al 2001; Ensminger, 2000; Cardenas et.al 2000; 2002; Cardenas, 2002, 2003).

The survey by Harrison and List (2004) reviews a large amount of experiments where different dimensions involve greater relevance from the field, including the subject pool, the nature of the task, the commodity used, the framing of the experiment, among others. Unfortunately for our arguments here, it makes rather little reference to issues of social preferences in the field lab and to the conducting of experiments on social dilemmas associated with the use of natural resources and local public goods within a context of poverty or institutional contexts like those in poor countries. Nevertheless, the experimental evidence surveyed in Cardenas and Carpenter (2004) of more than 50 papers with experiments conducted on developing countries or with development issues in mind shows that experimentalists are increasingly bringing the lab to the field for conducting replications of dictator, ultimatum, trust, cooperation, public goods and risk and uncertainty experiments.
One particular case of interest is that of rural groups, highly dependent on self-governed institutions and local natural resources. Theoretical and empirical support for the so-called ‘tragedy of the commons’, starting with Hardin (1968) proposition, has been for decades debated in the literature and still without conclusive results from Ostrom’s seminal work (1990) to the recent volume by the National Research Council (Ostrom et al. 2002). The observed empirical evidence offers enough variation, from cases of hundreds of years of successful management of resources under self-governed institutions to formal institutional solutions that within decades collapsed entire resource stocks. Therefore, an area of promising work should be the use of economic experiments to explore the micro foundations of observed outcomes in the campus lab and the field lab. Interestingly, the seminal work by Ostrom, Gardner and Walker (1994) and the work thereafter by many confirms that aggregate outcomes and individual strategies also vary greatly, from socially oriented to individually oriented strategies and outcomes, and that changes in the institutions, even without material payoff changes, could help correcting the coordination failures. The experimental work with students could not be conclusive about the game-theoretical prediction using the homo-economicus model, and the observed data could not confirm neither reject the tragedy, although it systematically confirmed that, for instance, face-to-face communication was a powerful device to induce cooperation. But then, if in the field most rural villages facing the possibility of the tragedy when managing their forests, firewood, water, or fisheries, could have a rather low cost environment for face-to-face communication, why in some cases it did not suffice for solving the tragedy? Once again, experiments in the field lab would be an attractive approach to better understand these questions from a microeconomic system perspective, but this time in the field. Maybe individuals bring several other elements to the game—in the lab or in their own natural daily game—that explain behavior and outcomes.

In the next section I will expand in a simple manner Smith’s (1982) model of a microeconomic system by identifying examples of elements brought by players from outside the lab which, if accounted for, may enrich the understanding of what happens within the experiment. Then the paper will present some regularities observed in
experiments run by the author and others, which support the argument that participants may use information from outside of the lab to guide their decision making and then there will be a much deeper exploration from a large data set of group experiments run in the field with about 1,500 villagers in different rural communities that face the commons dilemmas, with the exact same experimental design. By using additional tools in the field, in which the villagers also participated to discuss the experimental data the institutional setting as well as the environment, and by exploring some household data gathered with conventional survey methods, I will explore the possibility of such information expanding the understanding of experimental data in these settings. Further, the analysis of replications of these experiments with students will also provide some lessons and paradoxes that along the previous sections open new questions and lines of research that will be discussed at the end in the conclusions.

3. **The lab and the field as an expanded microeconomic experimental system (EMES): From Smith (1982) to Smith (2002).**

Smith (1982) offered a basic framework with the sufficient conditions for a microeconomic experiment to yield analytically valuable results. Institutions, Environment, Messages and Outcomes were the main components represented within the dotted line in Figure 1, labeled as “Laboratory boundaries”. The individual decision which we observe as behavior in our experiments is expressed as a message that produces outcomes -also observable- and such behavior is a function of the institution and the environment, which we design within in our experiment. The step further proposed here is to expand the framework and claim that those boundaries cannot isolate the lab boundaries from the outside. The fact that we create control and laboratory conditions does not detach the participants from previous or outside conditions that provide supra-frames or additional incentives to the experimental environment, institutions and action set. I will label such framework as an Expanded Micro-Economic Experimental System (EMES) and it incorporates elements outside the lab but that are brought eventually to the decision making.
The “institutions” and the “environment” variables of our experiments will have attached some that are brought by individuals from outside as prior individual experiences, or as norms of behavior that are common in the local context in which the lab is brought to. In various instances we can not avoid these attachments. Again, as said twenty years later by the same Smith (2002), “instructions can be important because they define context, and context matters because memory is autobiographical”.

![Figure 1. An expanded framework for experimental microeconomic systems (EMES) (adapted from Smith (1982).)]

By carefully controlling the privacy and confidentiality of decisions, and by avoiding strong framing in the instructions, laboratory experiments with students have been quite
successful in understanding how these institutional and environmental variables introduced in the design, explain regularities in behavior and outcomes, observed throughout many replications of experiments. This control and isolation has served successfully the purpose of consolidating the internal validity of experimental economics. But isolation has also been subject to interesting debates, including that of external validity (Loewenstein, 1999, Loomes, 1999a, 1999b). Such question has been effectively addressed, for instance, by the clarity and replicability of competitive market settings where theory, field observation and experimental data seem to converge. But also, the design of a competitive market institution involves in itself –in the lab or in theory- that with minimum conditions of information and rationality the socially desirable outcomes emerge naturally and in a decentralized manner with no central planner. The contracts are complete and no coordination failures exist, which is not the case of, for instance, institutions and environments with social dilemmas.

Other experimental settings have shown, however, that behavior can be very sensitive to manipulation of conditions, and divergences with the original theories have created a demand for new alternative models. Ultimatum, Dictator, Trust, Public Goods, Common-Pool Resource games have shown among other i) divergence from predictions provided by the game theoretical models of maximization of material rewards, ii) sensitivity to experimental conditions such as information available, framing of the instructions and composition of the environmental variables, and nonetheless, iii) certain regularities in behavior across settings or even subject pools that may suggest that other elements may be affecting how the experimental environmental and institutional components determine outcomes. The equal split observed in many replications of Ultimatum and Dictator games is an example. However, the larger variation in behavior that the widely study on the 15 small scale societies (Henrich et.al. 2001) found for the dictator and ultimatum games across sites, and which could be correlated with certain characteristics that the ethnographers found varying across the 15 groups, is a clear example of the gains from bringing the lab to the field.
In many of these games that involve trade-offs between one’s payoffs and payoffs of others, we can infer that preferences are interdependent and therefore the externalities within the experiment open the question for other-regarding preferences playing a role in explaining deviations from the canonical model prediction (Bowles, 1998; 2004). Reciprocity, fairness and altruism are examples of better predictors of behavior when preferences are interdependent within experimental groups.

In fact Smith (1982) had discussed this issue within his Precept 4 (Privacy) by exploring the case of interpersonal utilities, but suggests that we provide subjects with less information about outcomes of others to avoid the problem. In the field, however, we cannot avoid always this information problem, or it would be unrealistic to do so, depending on our research question. In fact many modern institutions and cultural changes offer now more information about the impact of one’s actions on others’ well-being. Environmental or consumer groups, research centers, political advocacies and the press are examples of institutions that affect the exchange of private goods into a world different from the anonymity of impersonal market exchange to one with more connections across individuals’ preferences.

In the framework proposed, the environment encompasses a set of characteristics of the agents and their preferences, endowments, resource constraints, and information available to them that are usually private to the player. These may include more “natural” elements such as his prior experience in these tasks or biases created by his social status. Likewise, the experimentally created institutions can also be augmented or even affected by institutions from outside the lab that govern similar contexts, specially if the experiment relates to tasks that are familiar and salient to the participants.

Furthermore, the outcomes from an experiment in the field might bring consequences out of the lab boundaries and the participants may take into account when making their choices. Despite the confidentiality and anonymity maintained by the researcher, experiments in small scale social groups will imply processes of dissemination of information among the participants that is out of the control of the experimenter. Social
comparisons are very common, and certain characters with particular roles in the society will often be under the eyes of others. Further, the experimenter may play a key role as well in influencing the choices of the participants, depending on previous contacts and the possibility and type of future contacts between the experimenter and the village. These elements will be supported with experimental and field evidence in the literature and from the author in the remaining of the paper.

How these factors affect experimental behavior may be controlled for within the experimental design, but individuals who participate in the experiments surely have had prior experiences in related situations and may have internalized norms of behavior that could become handy when facing the task presented in the lab. Further, participation in the experiment may have ex-post effects that can be part of the information that the individuals use for their decisions. As opposed to college students\textsuperscript{10} where anonymity and privacy before, during, and after the experiment are more common, experiments in the field lab involve groups of people that have a better good-will accounting (McCabe and Smith, 2001) of each other as they share the same company, trading floor, warehouse, village, or fishing lake. Therefore, information that comes from the field into the experiment, and information that leaves the experimental lab back into the field should be part of the microeconomic system and should be accounted for when studying experimental data, specially if the lab goes to the field where the boundaries of the experiment are more permeable, as it has been discussed.

The expanded microeconomic system will therefore imply a time frame that involves a longer period of time than the actual experiment itself. Guth, Kliemt and Peleg (1999) have a clear understanding when suggesting that ‘...in the real world human decision-making is located somewhere between the extremes on which standard models focus. It is influenced by the expected future and by the experienced past’. An economic experiment, being itself also a real world situation, just a more controlled and less common one, will be compatible with this reasoning.

\textsuperscript{10}Unless there are experiments run within a same class where students know each other and where they may use information afterwards about behavior or outcomes in an experiment.
4. **Evidence of field determinants of lab behavior.**

One of the major advantages of running experiments in locations different from the campus lab, and in settings different from industrialized western settings is that a greater variability of conditions can help explain the role of institutions in behavior. Some of the reported experimental data, even if gathered from students as the subjects, can provide some light on the kind of information people bring into the lab to help them make their decisions. Such information is autobiographical, as suggested by Smith, and comes from individual experiences or from the local context of the person and the others within the same experimental session. The personal experience can be with similar tasks or with institutions, rules or languages similar to that replicated in the experiment. Also, the good-will accounting (McCabe and Smith, 2001) players may have about the other players in their experimental session, can come from pre-experimental situations and in many cases seem to be playing a role in their behavior within the experiment, as well as affecting the updating of the same good-will accounting that may happen outside and after the experiment\(^\text{11}\).

Henrich et.al (2001) study 15 small-scale societies through a set of experiments and argue that group level information about returns from cooperation in similar tasks, and integration to the market help explain more pro-social behavior by participants in their experiments, measured by mean offers in an Ultimatum game. They argue, however, that individual level data about the players does not help explain variations in behavior. In any case, the local context around the lab setting is playing a role in suggesting norms to the players, and also in giving cues of how to play the game. Ensminger (2000) reports in

\(^{11}\) Privacy, although guaranteed by the experimenters through consent forms, cannot be sustained long when villagers, neighbors, coworkers, share information about earnings and even decisions. I have observed this phenomenon systematically in many villages when we invite people to discuss the results.
her public goods experiment in Kenya that once players recognized it as the *harambee*\(^{12}\) game, a Swahili term representing an event to raise money or join labor for a common cause, such norm of more cooperative behavior emerged within the game.

Cooper et al. (1999) created an experimental design where planners and firms interact in an economic system heavily planned, and they had students as well as Chinese managers and white collar workers participate in the games. They find among others that when the context was explicitly posed as a case of planners partially informed and firms choosing outputs, actual managers from China behaved more strategically than under the unframed experimental design, and argue that their bringing prior experience about planned economies and economic decisions induced a different behavior. However that was not the case for students participating in the experiment.

Another study with differences found between students and non-students is reported in Potters and van Winden (2000) who conducted a signaling experiment to explore the lobbying process with 142 students and 30 professional public affairs and public relations officers from the private and public sectors. The authors’ justification for such design is centrally valid here, students do not have experience with lobbying and one could learn from observing professionals in a more controlled setting. In their case, professional lobbyists behaved much closer to the theoretical prediction but also obtaining higher earnings than students.

Studies where certain demographic characteristics of participants provide also support for the expanded microeconomic experimental system. Gender has been part of the explanatory variables to be tested, with ambiguous results though. Eckel and Grossman (1999) provide a survey of the literature studying gender. Croson and Buchan (1999) explore the role of gender in a Trust game and compare results by gender across a sample of subjects from China, Japan, Korea and the United States, and find no significant differences across countries, and slightly higher levels of reciprocity by women.

\(^{12}\) Similar terms exist in the Latin American context (*Minga, Convite, Mandato*) for tasks where voluntary contributions, mostly in labor and kind, produce a public good such as maintaining a road, an irrigation system, building a school, etc.
In the field, Barr and Kinsey (2002) argue that the role women play in social sanctioning is more effective than in the case of males, and such behavior is clearly expressed in their experiments where also women show more cooperative behavior. Ruffle and Sosis (2002) explore cooperation and in-group effects for Israeli cities and Kibbutz, suggesting from his data on one-shot game anonymous cooperation experiments that members of the latter were more likely to cooperate with another anonymous member than with an anonymous person from the city. However, he finds that the longer the person has stayed within a Kibbutz, the less level of cooperation is observed with another fellow member.

Accounting for the particular major of the student participating has also been a focus of attention. Early experiments in the 1980s asked whether economics majors showed higher levels of free-riding with modest strong results (Gerald Marwell and Ruth E. Ames, 1980; R. Mark Isaac et al., 1985, reported in Ledyard, 1995). More recently, Charles Cadsby and Elizabeth Maynes (1998) reported that nurses showed higher levels of cooperation than economics and business students in a threshold public goods game. These results would also be consistent with the work by Robert H. Frank et al. (1993) on the behavior of economics majors being closer to game theoretical predictions. In another study, Axel conducted an experiment with a unique opportunity historically by observing behavior of university students in a now unified Germany, but taking into account that some of them were raised at one or the other side of the Berlin wall. They found that East German participants behaved less cooperatively than West German ones in both public goods (ten rounds, 5 person) and solidarity (one-shot, 3 person) games, and attribute this to students raised in East Germany being raised at the end of a centrally but inefficient economic system where opportunistic behavior regarding public goods was more frequent.

Peter Kollock (1998) provides data from a set of prisoners dilemma experiments studying how group identity has a direct effect on cooperative behavior. The behavior of college students changed depending on the information they received about the other players (being from the same fraternity, from any other fraternity, from the same campus, from
another campus, from the police department). Significant changes in behavior were found consistent with the existence of strong in-group/out-group effects (see John Orbell et al., 1988).

5. **Lessons and paradoxes from cooperation experiments in the field.**

A closer look to some experimental data from the field and the campus labs will offer more detailed evidence suggesting the existence of such relationships between the basic microsystem and the field context of the participants which form the expanded microeconomic system. In some cases the relationships are clear explanatory variables of experimental behavior observed, but in others the relationship is more of a puzzle to be explored.

a. Cooperation in the campus and the field labs.

The original work by Ostrom, Gardner and Walker (1994) on Common-Pool Resources opened a major area of experimental research. Replication of similar experiments in the field has confirmed, among other results, the basic finding that under a non cooperative game setting in which players cannot communicate with each other and where decisions remain private and confidential, average decisions do not confirm the prediction of rent dissipation or the so called “tragedy of the commons” (Hardin, 1968), neither they achieve a socially optimal solution. A major part of the literature on CPR and VCM experiments also suggests that if the game is repeated, a significant fraction of players are willing to cooperate in the initial stages, but that such cooperation seems to erode over time as there are no coordination mechanisms, and negative reciprocity induces those same players to start increasing their level of appropriation of the common-pool, or for the case of public goods, they reduce their individual contributions (OGW, 1994; Ledyard, 1995).
Previous experiments in the field conducted by the author also provide support for the arguments discussed before. Group composition and task experience were found to be associated with experimental outcomes in a set of experiments where groups of eight participants went to a sequence of non-communication and then face-to-face communication rounds in a CPR experiment. In Cardenas (2000) I show that the fraction of players that reported an extractive activity (e.g. fishing, wood logging) as main economic activity was positively correlated (Pearson coefficient = 0.5732, p-value=0.0832) with the gains in group efficiency achieved in the communication stage as compared to the previous stage. Likewise, the fraction of players reporting land as their main income source, was negatively correlated (Pearson = -0.7156, p-value=0.0200) with the same group level outcome. The data is shown in the following table from that article, for the ten sessions (groups). The last two columns show respectively the % of the eight participants that reported extracting a natural resource as his/her main occupation, and the % of players reporting private own land as the main income source, which would measure the inverse of income dependence on a common-pool resource. The first two columns show the social efficiency achieved during the experiments for the last 3 rounds of the stage 1 and the stage 2 where face-to-face communication was allowed.

<table>
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<tr>
<th>Group</th>
<th>Social Efficiency (End of stage I)</th>
<th>Social Efficiency (End of stage II)</th>
<th>Change in Social Efficiency</th>
<th>% of players with extraction of resources as main occupation</th>
<th>% of players with land as main income source</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEW42</td>
<td>62.35%</td>
<td>29.09%</td>
<td>-33.26%</td>
<td>0.00%</td>
<td>87.50%</td>
</tr>
<tr>
<td>CES12</td>
<td>70.85%</td>
<td>77.16%</td>
<td>6.31%</td>
<td>0.00%</td>
<td>75.00%</td>
</tr>
<tr>
<td>CES11</td>
<td>49.66%</td>
<td>72.48%</td>
<td>26.53%</td>
<td>0.00%</td>
<td>25.00%</td>
</tr>
<tr>
<td>CNW42</td>
<td>68.39%</td>
<td>48.95%</td>
<td>12.50%</td>
<td>0.00%</td>
<td>50.00%</td>
</tr>
<tr>
<td>CNS12</td>
<td>49.55%</td>
<td>59.52%</td>
<td>12.50%</td>
<td>0.00%</td>
<td>25.00%</td>
</tr>
<tr>
<td>Avg 10</td>
<td>61.16%</td>
<td>62.50%</td>
<td>1.34%</td>
<td>0.00%</td>
<td>37.50%</td>
</tr>
<tr>
<td>groups</td>
<td>57.74%</td>
<td>68.52%</td>
<td>10.78%</td>
<td>0.00%</td>
<td>37.50%</td>
</tr>
<tr>
<td>CNW41</td>
<td>37.93%</td>
<td>76.05%</td>
<td>38.11%</td>
<td>37.50%</td>
<td>25.00%</td>
</tr>
<tr>
<td>CNS11</td>
<td>53.17%</td>
<td>53.92%</td>
<td>0.75%</td>
<td>37.50%</td>
<td>50.00%</td>
</tr>
<tr>
<td>CQW41</td>
<td>81.82%</td>
<td>84.83%</td>
<td>3.01%</td>
<td>50.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>CQS11</td>
<td>42.55%</td>
<td>93.49%</td>
<td>50.94%</td>
<td>75.00%</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

Coefficients of Correlation with % change in Social efficiency:

| (Pearson Correlation test p-values: | 0.5732 | -0.7156 |
| (p-values:                         | 0.0832 | 0.0200  |

Source: Cardenas (2000).
Also, in Cardenas (2002, 2003) an exploration at group and individual levels of how the actual wealth of the participants may explain the willingness to cooperate in the experiment. In these experiments, wealth inequality within groups seemed to constrain the possibilities of the group to increase social efficiency through communication. In particular, greater average wealth within the group, and greater inequality in the distribution of wealth within the 8 participants in the game were negatively correlated with the social efficiency achieved by the group in the face-to-face communication rounds in the game.

Notice that in these experiments involving group externalities, individuals face a more difficult task in the sense that there is uncertainty regarding the behavior of others in their group, and a wider set of possible outcomes which depend on a non-linear payoffs function, as opposed to Ultimatum or Dictator games where the range of choices are simpler and there is more information about the distribution of possible outcomes. According to our audio and video data from these experiments, experience in previous similar tasks, seems to guide the behavior and agreements during the communication rounds, but also the prior information they have about themselves and others in the group may enhance or inhibit the willingness to cooperate as it seems to be used to administer the good-will accounting they have about the others and therefore judge their best response in the next round.

b. A larger data set of a non-linear public goods game (field vs students). After the experiments mentioned before, we developed a new experimental design\textsuperscript{13} for a group dilemma, where the payoffs structure had some non-linear properties of a common-pool resource game but also with a dominant strategy as in the case of public goods, for analytical simplicity. The design again included two stages of 10 rounds each, and groups of 5 players who had to decide their individual level of extraction of a resource or common-pool (discrete choices were between 1 and 8 units). For this design

\textsuperscript{13} Developed with Ernst Fehr and field work funded by the Preferences Network.
the social optimum solution occurs when every player chooses 1 unit of extraction and the symmetric Nash equilibrium prediction is when every player chooses her maximum allowed extraction, i.e. 8 units, being a dominant strategy for every player to extract 8 units. The data, during the first 10 rounds of the same incentives, experimental institution and environment, shows that in average, the group outcome confirms similar results from the campus lab, although the decay in cooperation (increase in appropriation in our case) is not as severe as in other works. About 200 sessions were conducted, for the first 10 rounds exactly equally in terms of design, incentives, rules, etc. The sample was then divided in different treatments for the second stage of the game where we introduced different institutions on self-governance and external regulations that are beyond the scope of this paper.

If we focus on the large data set for the first ten rounds, and compare the data between villagers and students behavior, we can derive some interesting results. The following Figure 2 shows data for rounds (1-10) during 187 sessions x 5 players (i.e. 935 people) under same design in stage 1. 145 of the sessions were run in the field with villagers and the remaining 46 sessions with students. Recall that if players follow the prediction of the Nash equilibrium the average extraction should be of 8 units, while the social optimum would be achieved if the total extraction was of 1 unit.

The average extraction (choice variable) and one standard deviation above and below the means are graphed over the ten rounds. Clearly, and statistically different, villagers maintained their extraction below the students and with no sign of trends towards more free-riding over time. Notice, for instance, that the last round effect is clearly marked for the students while inexistent for the villagers.
Figure 2. Group extraction during the first 10 rounds (no-communication) for students and for villagers. (Two-sample Wilcoxon rank-sum (Mann-Whitney) test, n=9350 observations, \( z = 12.698 \), \( p = 0.0000 \).)

Further, for 13 of these sessions we conducted a baseline treatment for the next stage, i.e. the entire set of 20 rounds remained under the same treatment conditions. The average behavior is shown in the next Figure 3. The trend and patterns are similar (less smooth as sample is smaller), but also, for the second stage one observes two phenomena previously reported in the literature of public goods. On the one hand, the “repeat” effect in round 11 (Andreoni), much more marked for the case of students, but with very short term effects, and the trend towards more free-riding over rounds for students while flatter for villagers.
Figure 3. Baseline treatment for 20 rounds (students vs villagers). 8 sessions x 5 players + 3 sessions x 5 players. 20 rounds in each session. Two-sample Wilcoxon rank-sum (Mann-Whitney) test, for the 1100 observations, $z = 4.693$, p-value = 0.0000.
Although the differences may look small, a look at the individual data and distributions can provide additional lights. As shown in figure 4 with the distribution of individual decisions for the same sample, the students’ data suggests a unimodal skewed distribution where most of the decisions approach the Nash equilibrium prediction and fewer decisions are closer to the lower extraction levels. Meanwhile, the data from the field experiments suggests a bimodal distribution where there are two peaks, one closer to the cooperation level and another close to the maximum extraction. This difference yielded a higher level of group and individual earnings for the villagers as free-riding was less frequent in their sessions.

Figure 4. Distribution of decisions across the strategy set (villagers vs students).

A look at the evolution of such distributions over rounds (Figure 5) shows that students seem to behave much closer to previous experimental work in campus labs, with an increasing number of decisions over time towards the highest level of extraction. However the right panel of the figure shows how the data from the villagers is, if we can say, noisier and more difficult to analyze. Although the frequency of decisions that are closer to the maximum extraction in this case seems to be non negligible, the fraction of decisions that are closer to the social optimum levels is much more frequent in the field lab.
Debriefing of decision making with the villagers suggests that there was a permanent tension between trying to reduce extraction to see earnings increase, and responding with higher extraction levels when they observed that the rest of the group was increasing theirs. However, it is also interesting, looking at the individual data, that there seems to be an upper threshold – well below the Nash equilibrium – of aggregate extraction that induces an immediate reduction by the majority of players without any coordination or communication during this first stage. Notice that increasing individual extraction, at any level of group extraction, is a dominant strategy in this experimental design\textsuperscript{14}. It is the case also that a lower threshold also induced most players to increase their extraction when the level of cooperation was sufficiently high as the gains from free-riding seemed higher.

For a subset of sessions where we introduced external regulations during the second stage, and compared different behavioral responses between students and villagers and also allowed them to vote in favor or against the implementation of such regulations, we found again differences across subject pools (See Cardenas 2005 for more details). The villagers were found more opposed to external regulatory interventions than the students and reject such regulations more often than do the students. But they were more inclined to cooperate under a non-regulated setting than students during the second stage.

\textsuperscript{14} I have moved away here from the classical common-pool resource design (OGW, 1994; Cardenas et.al, 2000) with interior Nash equilibrium solutions and Nash strategies that are non dominant. However, this design shares with the CPR the non-linearity of the payoffs surface and thus a non constant MPCR.
Replications of experiments with students and non-students have also been the subject of attention. Burns (1985) and Bohm (1997, 2000) have reported no differences between these subject pools. Their studies involve market institutions where individualistic strategies might not be in conflict with social efficiency and therefore the robustness and easiness of conducting experiments in the campus lab can be of value. But there are instances in which we need to judge experimental data from students with care and thus the gains from conducting the experiments in the field and with participants whose reality is familiar with the experimental design. For instance, in a second phase of the cross-cultural project headed by Jean Ensminger and Joe Henrich\textsuperscript{15} Dictator (DG) and Ultimatum (UG) games were conducted in 16 small-scale societies around the world, and the design allowed us to measure, for the same player, the difference between the DG and UG offers\textsuperscript{16}. While these experiments in the campus lab have shown worldwide that DG offers are significantly smaller than those from the UG, such difference is almost insignificant in these 16 small-scale villages, for hundreds of participants. Across studies a similar trend is found. A survey of experiments in developing countries (Cardenas and Carpenter, 2005b), provides further evidence of these systematic differences across subjects pools. In the following table are the mean offers reported for these games across 31 papers surveyed, supporting the same proposition. In brief, one can observe that with non-student participants the offers in the Dictator and the Ultimatum are much closer.

<table>
<thead>
<tr>
<th></th>
<th>Students DG</th>
<th>Non-Stud DG</th>
<th>Students UG</th>
<th>Non-Stud UG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Offers</td>
<td>25%</td>
<td>40%</td>
<td>42%</td>
<td>40%</td>
</tr>
<tr>
<td>Observations (No. of papers)</td>
<td>9</td>
<td>5</td>
<td>2</td>
<td>15</td>
</tr>
</tbody>
</table>

Carpenter, Burks and Verhoogen (2005) also report in their study with students and workers in the U.S. that for the latter the offers were closer as well. Such stronger norm

\textsuperscript{15} \url{http://www.hss.caltech.edu/roots-of-sociality/phase-ii}

\textsuperscript{16} Players 1 made their DG offers, Players 2 were not informed of the DG offers, and each of the Players 1 were asked to make then their offers in the UG game. Players 2 were then asked to elicit their acceptance/rejections to every possible offer from Players 1, followed by the realization of the actual offers.
of generosity among non-students may be explained by many different factors, but the lack of information about the context in which the experiments were conducted impede supporting them. Recall the study by Fehr and List (2004) in Costa Rica with students and CEOs where the latter showed higher levels of reciprocity and argued this to be founded on their greater experience in rewarding higher efforts from employees. A similar argument is made by Hannan, Kagel and Moser (2002) showing that MBA students showed higher efforts in a gift exchange experiment than undergraduates. They support this difference on the prior labor experience by each group but did not account for this in their sample size, although report a similar previous study by one of the authors with evidence of more labor experience by MBA students than undergraduates.
6. Conclusions and the research ahead.

Isolating the lab from the field context can be not only difficult but counter productive. The participants in an experiment will bring in cues to help their decisions, and those cues will be based on their prior experience in similar settings. Surely they will evaluate the payoffs and action sets of the experiment, they will respond to the environmental and institutional variables created by the experimenter, but they will also bring in past experiences to educate their choices.

This paper has emerged from a set of phenomena observed by the author in the last few years of running experiments in the field, and from the increasing literature on experimental work in the field. The intention has been to derive lessons for researchers in both campus and field labs, so that we can understand better what we observe on behavior and outcomes as a result of designing and controlling for institutions and environmental conditions in our experiments. The need to continue strengthening the internal and external validity of experimental economics is the main justification for the effort, and given that there are still variations in the experimental and field data to be explained by our models in many settings of economic and social exchange.

A major proposal along the paper is to expand our basic microeconomic system (Smith, 1982) into a more complete one -which I have called Expanded Micro-Economic System- that encompasses information that may flow as a result of participants bringing their own prior experience, rules, norms, prejudices and other information that could be used strategically within the lab, as well as information that may flow from the lab to the outside field, and which may influence the decision-making as well as a result of players’ expectations about the effects of their decisions outside of the lab, which might be significant at least for the case of experiments run in the field. Such expansion of the microsystem can also involve our campus labs, as students also bring elements from outside the lab to help in their rationality and task. Experiments in which there is less risk and uncertainty or less conflict between one’s preferences and consequences to others,
such as competitive markets e.g. double-auctions, there will probably be less information used by the players to guide their experimental decision-making.

Ortmann’s (2005) concerns with field experiments creating a trade-off and an extra cost in losing control for gaining realism can however be qualified. He highlights possible losses of control from translation of protocols, experimenters’ effects in the field, and uncontrolled variations from different experimenters across sites, among others. In the experiments conducted and reported above, all sessions in all villages were conducted by the same experimenter or his team of research assistants, all of which had the same affiliation, same mother language and same as instructions and participants’. The exact same scripts from the protocols were read to the participants in the original language they were written, namely Spanish; instructions were read out loud to all participants in the same session and all questions were solved to the entire session group in order to avoid one-on-one possible differential effects on players. These are not costly measures to take in order to maintain the costs in experimental control while increasing the gains in relevance and realism for purposes of external validity.

There are concerns being raised from other methodological approaches involving hypothetical or experimental elicitation methods of individual preferences, mentioned by Harrison and List (2004) but also carefully analyzed in a meta-analysis of the problem of hypothetical bias in stated preference valuation methods using hypothetical and actual values (Murphy et.al, 2004) who suggest that studies based on students may have some biases and shifts in the distributions than with other populations.

The results reported above also show differences between students and villagers that daily face the dilemma of the experiment. The latter seem to behave in a manner that is slightly closer to a more socially desirable behavior, although not yet optimal, while students seem to behave closer to the homo-economicus model of individually oriented strategies. However, most of the experimental literature on common-pool resources is still based on student populations. Thus, possibilities for calibrating results using
replications of experiments and sampling across sites with different backgrounds or contexts may seem to be a natural next step in the research agenda.

In Cardenas and Carpenter (2005a) we discuss in more detail the few systematic evidence available on studying the question of experienced vs fresh students. This should be also matter of careful research, and in the same line of research suggested here, it would benefit if those students were more actively involved in the discussion of how their evolving rationality and rules of thumb when returning to the lab for one more session.

In summary, the paper offers a set of evidence suggesting that players, students or not-students, bring elements of information to guide their decision, and such information can be about their individual, group or context characteristics. Examples mentioned here include cultural background, group identity, gender, prior experience, wealth or social status, all of which come from the outside of the experiment, and enter to the environment (E) and institutions (I) that our experimental micro system involves. Further, there might be information (messages) that our experimental micro system sends to outside of the lab, and that can provide additional information to participants when entering the experiment either as ex-ante information or in future participation in similar or different experiments. Thus, the instructions that individuals receive in the experiment include not only what researchers read to them, but ‘instructions’ they have read before coming into the lab. How they combine them remains unsolved.

Similar reflections deserve attention with regard to ex-post effects un accounted for in our conventional experimental designs. Privacy and anonymity which we guard with great care in our protocols does not necessarily remain when our participants walk out of the lab and interact with others in the community. Strategic decisions in the lab may bring other non-monetary payoffs to participants in later situations, such as prestige, social recognition or political capital. Either at individual or group levels, there might be incentives for the participants to create a “warm glow” effect towards others or even the experimenter in case there are possibilities for future experiments being conducted. Once again, these are deviations from the canon in experimental designs, but are very common
factors in how the social interactions happen within certain communities throughout the world, e.g. with development or funding agencies, donors, or the local government agents.

At least three major future research questions result from bringing the experimental lab to the field and which might become interesting areas of inquiry in the coming future. One emerges from the fact that people we invite to participate in our experiments bring into the lab important information that they combine with the experimental institutions (I) and environmental (E) variables we induce in our design. How much of the external I and E they leave out of the field lab, and how much they use into their decision making should be matter of detailed research. We need to continue designing tools to separate and study external and lab factors that explain behavior, particularly if they are confounded in people’s decisions in the lab. Framing of experiments can be enhancing or contradicting with what the actual context of the players is. Such was the case with the experiments in the People’s Republic of China (Cooper et.al, 1999) where the managers who faced instructions framed as a planned economy for firms decisions, they chose more strategic actions.

Bringing elements from the individual autobiographical context, as well as elements from the group or village level context should also be part of the future research agenda and statistical treatment of the data. In the early experiment in India by Binswanger (1980, 1981), individual attitudes towards innovation as well as village prior history of droughts could both be explaining individual choices in his risk experiment, apart from the payoffs structure and the frame. Such confounding factors could be separated out using better estimation methods and carefully designing experiments to collect precise data across villages, and within villages across individuals. The use of Hierarchical Lineal Models or Multilevel Models (Goldstein 1995, Bryck and Raudenbusch, 1992), now vastly used in psychology and education to disentangle individual and group level effects should become part of the statistical tools for experimental data where round choices are nested within individuals, and individuals nested within sessions and sessions within villages.
A second lesson for those interested in field experimental work emerges from the fact that our participants may well be part of the research analysis as they possess private information researchers do not have about their lab behavior, as well as their field behavior, and that cannot be fully observed in the behavior they show in the experiment\(^\text{17}\). Even in the case of campus labs, students participating in experiments could become part of the research process, provided that a well controlled design and assuring the privacy of decisions do not induce certain strategic behavior by participants ex-ante, based on their expectations about participating in the discussion and the revealing of certain information that may impose social costs such as we have observed in the field. Such invitation should be made, I would argue, after the experimental sessions were concluded and either at random or as a voluntary activity once the researcher has a fair idea of certain patterns in the data and remaining questions.

One example came from the experience in explaining the game to students and to villagers. While the former often had to raise their hands to ask for “clues” on how to play, asking questions like “but… what are we supposed to do?”, villagers often commented me that although the payoffs tables were confusing, they tried to use their personal experience in “not extracting too much” to maintain the resource stock for the next round, but when the resource seemed to be in good shape, slight increases in extraction were often chosen. Notice, however, that the game did not have dynamic stock effects, but they used their prior experience as a clue for solving the group dilemma.

A third line of inquiry is that of meta-games where experimenters become players in the game as their bringing endowments of research cash induces certain strategic behavior that might not happen if such external resources were not brought from outside. The

\(^{17}\) An example of the need to establish dialogues between participants and researchers to better understand not only behavior and outcomes but also experimental designs. Abigail Barr (personal communication), in her experiments on risk pooling in Zimbabwe, had to drop the mechanism of flipping a coin to select a 50/50 lottery, because women do not know how to flip a coin like men do and therefore argued it would not provide a fair toss. Further, Barr also mentioned how her “public shame” experimental design (Barr and Kinsey 2002) emerged from a discussion with people in the field after the canonical public goods game was conducted.
concern on what kind of role experimenters may play in these experiments is still an open question. Although Frank (1998) reports that the experimenter effect in UG might not exist, when he compared cases in which he burned in front of players payoffs not earned to the control case, there is still room for players being influenced by other possibilities for an experimenter effect. For instance, participants may assume that researchers can link behavior data to individuals within a certain group where they play a certain role, or there are possibilities for players assuming that the field experimental data may have a future use for government or donor agencies now that the notion of social capital for development has become central. Further, many of the experimenters working in rural areas have maintained or plan to maintain a long run relationship with the communities which may impose a supra-level set of non-material incentives that must not be at least ignored in our analysis.
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