

Chapter 16

Social Preferences Among the People of Sanquianga in Colombia

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The Afro-Colombian groups that have for many centuries occupied the Pacific Coast of Colombia have always been involved in one way or another with the social dilemma of extracting natural resources through mining and making use of the region's forests, mangroves, and fisheries. Over the centuries, urban and rural settlements in this coastal region have been separated from the experience of state intervention and Western development more typical of the Andean regions of Latin America. The differences in basic social indicators within the country reflect the lack of formal institutions and actions to address social needs through the provision of public goods such as health, education, and employment, among others.¹ Further, the majority of ecological settings are mangrove and catival forests, which provide adverse conditions for the emergence of individual property rights over productive assets such as land and livestock.

Under joint access and in the absence of the state, these groups are more highly dependent on natural resources. Thus, there are grounds for the hypothesis that these groups would maintain a set of social preferences for endogenously solving the kind of coordination failures that emerge in many small-scale groups through more informal mechanisms or institutional arrangements at the community level. Preferences that are more prosocial can be valuable in solving the coordination, bargaining, and cooperation problems typical of groups facing, for instance, the joint use of a common-pool resource or the voluntary provision of other basic needs (for instance, social insurance using informal safety nets through generosity and reciprocal gifts).

Using the same set of experimental methods described in chapter 3 to measure mechanisms and traits such as altruism, reciprocity, and endogenous punishment of antisocial behavior, we explored the presence of social preferences in a community of Afro-Colombians occupying the mangrove forest of the Colombian Pacific Coast and the mechanisms involved in their maintenance. We compare the validity of these experiments to examples from outside of this field-site context. In this respect, our exploration of whether poverty and wealth based on private assets are associated with more or fewer social preferences within these groups is of particular interest. Previous experimental work in other rural settings of Colombia suggests that people who are more dependent on common-pool resources or households with fewer private assets such as land and livestock find it more difficult to solve a local-commons dilemma through endogenous mechanisms (Cardenas 2003; Cardenas et al. 2002).

This chapter starts with a brief description of the background of the population from which the sample was drawn. It then enumerates the basic experimental design and gives details about

the sample. The chapter closes with a discussion of the results in terms of the experimental design, the institutions tested, the incentives constructed, and the socioeconomic data collected.

THE SANQUIANGA COMMUNITIES AND THEIR ENVIRONMENT

The extraction of natural resources has long marked the human occupation of the southern part of the Pacific Coast in Colombia. During the seventeenth and eighteenth centuries, gold mining led to the establishment of settlements for gold extraction and trading. Over the centuries, the economic activities of these settlements have changed to other resource extraction—like rubber, tagua, and naidi palm—and logging, while the fisheries and other mangrove forest resources have continued to be exploited for the subsistence of the communities (Restrepo 1996a; del Valle et al. 1996).

The Sanquianga people are Afro-descendent communities. They have occupied the sea-level mangrove and catival forests of the Pacific Coast and the tropical humid forest of the Nariño region (photo 16.1) since the abolishment of slavery in Colombia in the 1850s. Most of these groups spread through the forest and along the natural canals of the forest in small settlements, alternating small farming with extractive activities, initially gold mining. They then began logging for the logging mills established in the main settlements of the region. In the coastal areas today, much of the economic activity centers on extracting resources from the mangrove forest (firewood, logging, mollusks, crabs) and from the coast (shrimp, fish) while benefiting from other goods and services from this ecosystem (for instance, protection from natural disasters such as high tides and tsunamis).

In 1977 a large portion of this region (about eighty thousand hectares) was declared the Sanquianga National Park for conservation purposes. Today about eleven thousand people live within the boundaries of the park (Ministry of Environment and Sustainable Development 2013). The two settlements where the experiments were conducted, Bazán and Amarales, are located within the park and are similar to other settlements in the five municipalities that overlap with the park area. The region is accessible by boat from the nearby urban centers (Guapi or Tumaco) and by airplane or secondary road from the south-central part of the country.

The area is located within longitude $2^{\circ} 22'$ to $2^{\circ} 04'$ north and $78^{\circ} 76'$ and latitude $75^{\circ} 37'$ west. Humidity is around 80 percent, annual rainfall is between 3,000 and 3,500 millimeters, and the mean temperature is 26 degrees Celsius. June and July are the months with the highest rainfall, and November is the month with the lowest; there is no deficit of water throughout the year.

The two arrows in the map in figure 16.1 show the location of the two settlements where the experiments were conducted. The darker area corresponds to the mangrove forest along the coast and crossing the border with Ecuador. The thick line is the border of the national park within which the settlements are located. The map also shows the main municipalities in the region.

Table 16.1 provides demographic data for the urban and rural populations in the region. Most of the participants in the experiments lived in the municipalities of El Charco and La Tola. The demographic projections for the five main municipalities show that, on average, two-thirds of the population lives in the rural areas.

Their dependence on extractive resources has always been a major challenge for these communities. Likewise, the challenges of resource extraction put a greater pressure on solving the social dilemma of a common-pool resource. Extraction of the piangua clam (*Anadara tuberculosa*) is mostly the work of women, who use the clams for home consumption as well as for sale in local markets. In the last few years, however, many changes have resulted from the decrease in the piangua clam supply in neighboring Ecuador and the decrease in shrimp and fish stocks in the coastal fisheries of the region. Extraction has increased, market size has decreased, and

PHOTO 16.1 *Mangrove Forest in the Pacific South, Nariño*

Source: Author's photograph.

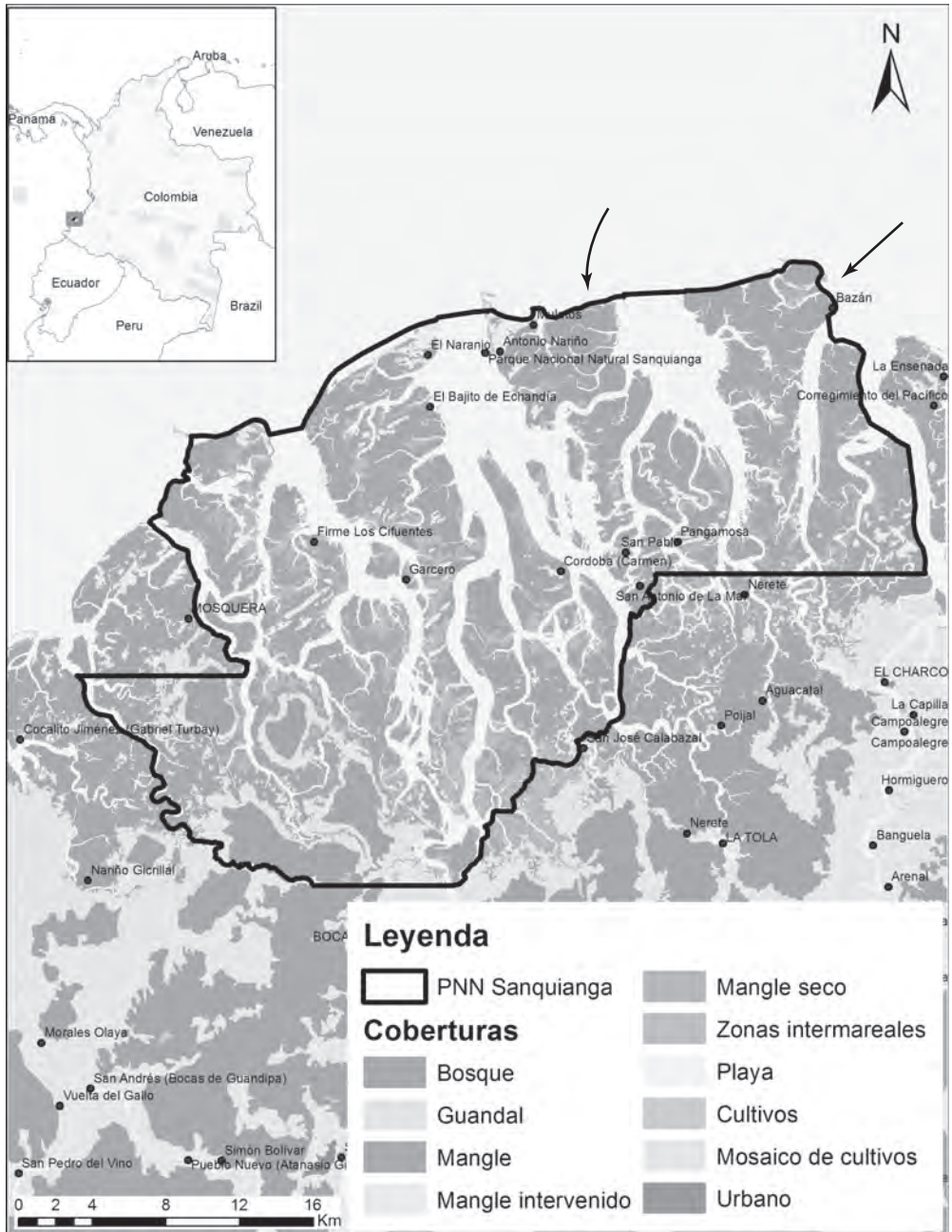
the population devoted to its extraction has changed to include men. State regulation of natural resource use by the officers of the Sanquianga National Park is weak: they provide minimal monitoring and have few enforcement resources, and few rules have been issued by the national and regional environmental authorities. Recently, however, attempts have been made to formalize agreements with local communities and organized groups to limit haul sizes, as well as net types and sizes, and to enforce a closed season for some resources, according to biological cycles.

Demographic Data on Experimental Game Participants

The demographic and socioeconomic data on the participants in our experiments in Sanquianga provide a fair representation of the context in which these communities operate with respect to the ecosystem and the markets. Participants lived in two settlements, Amarales and Bazán, which are a few miles apart and have very similar ecological and economic conditions (see figure 16.1). Because the settlements are small, it was difficult to recruit the entire sample from one settlement. Thus, 62 percent of participants were recruited in Bazán and the remaining 38 percent in Amarales. Later we describe the process by which we recruited subjects. Here a summary of the demographics for the entire sample is provided in table 16.2.

The tenure demographic, obtained by dividing the number of years a participant had lived in the present settlement by his or her age, is about 53 percent (table 16.2). About one-third of the respondents had lived their entire life in this location, while the rest of the respondents were spread across the spectrum. There has been mobility across settlements and across regions for various reasons, including political violence and labor market fluctuations.

FIGURE 16.1 *Location of Sanquianga Field Site on the Pacific Coast of Colombia*



Source: World Wildlife Fund, WWF-Colombia Program, available at: www.panda.org/who_we_are/wwf_offices/colombia.

TABLE 16.1 *Urban and Rural Populations of the Main Municipalities in the Coastal Region of Nariño*

Municipality	Total	Urban	Rural	Percentage Rural
El Charco	21,464	5,827	15,637	73%
Mosquera	11,167	3,279	7,888	71
La Tola	6,659	3,613	3,046	46
Olaya Herrera	28,697	9,305	19,392	68

Source: Projections based on the 1993 census (Departamento Nacional de Estadística 2013).

TABLE 16.2 *Demographic Variables for the Sanquianga Sample*

Variable	N	Mean	Standard Deviation	Minimum	Maximum
Gender (Female = 1)	186	0.56	0.497	0	1
Age (years)	185	36.19	15.027	16	77
Education (years)	186	4.05	3.140	0	13
Household wealth (U.S. dollars)	186	\$2,234.98	\$4,383.50	0	\$46,862.31
Individual income (U.S. dollars)	186	\$1,894.74	\$2,321.70	0	\$14,803.85
Household individual year income	186	6.68	2.93	2	16
Tenure (as percentage of age)	185	0.53	0.35	0.004	1

Source: Author's surveys conducted during experiments.

Market Integration

Five indices of market integration (MI) were developed for this study to describe the socio-economic characteristics of this group and communities:

MI1: Percentage of household diet purchased in the market

MI2: Income from wage labor, rental, and trade (in Colombian pesos)

MI3: Frequency of wage labor in the last month (in days)

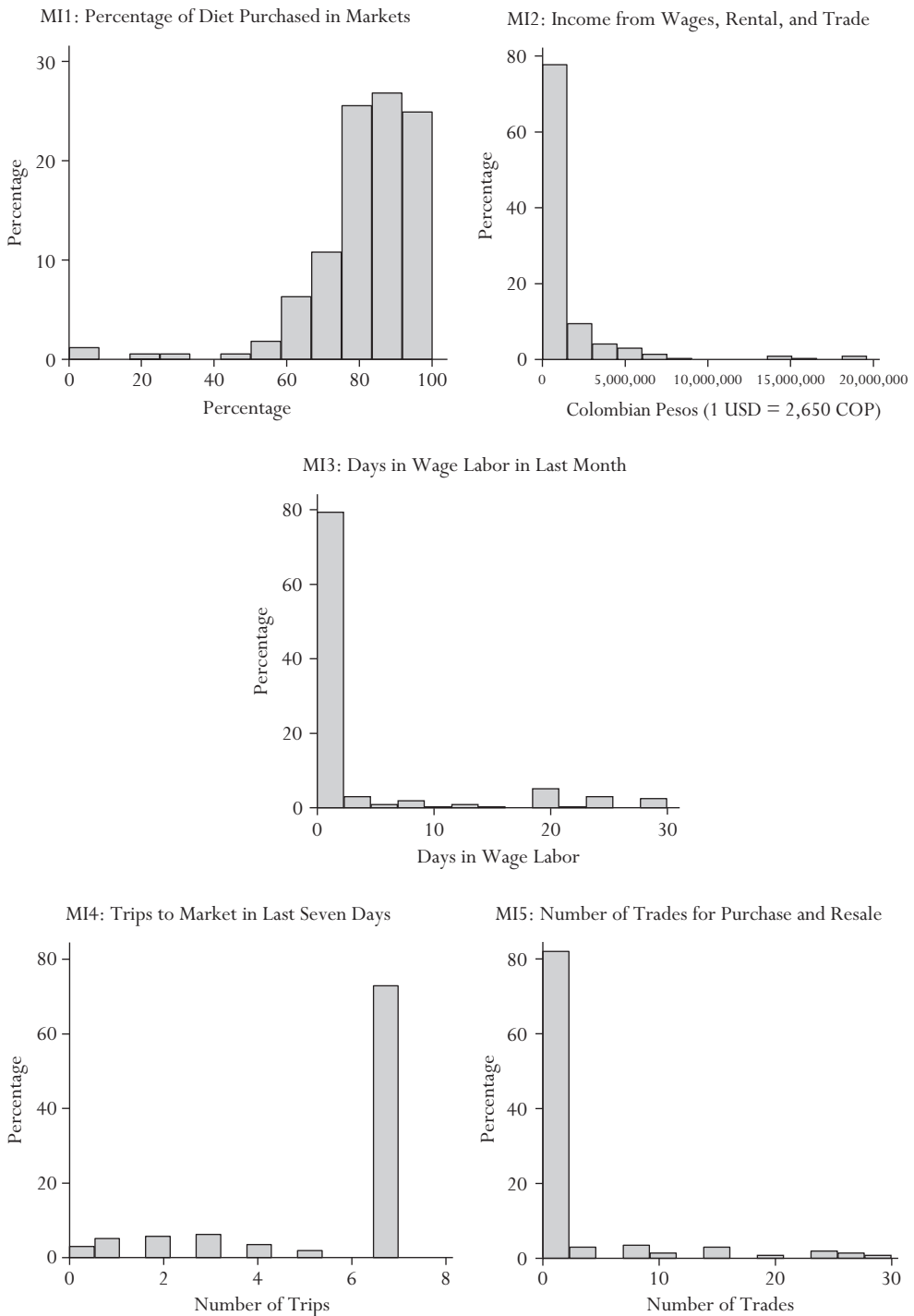
MI4: Trips to market in the last seven days

MI5: Frequency of trading goods for purchase/resale during the last month (in trades)

These measures were estimated based on the survey data gathered in the individual and household surveys conducted with the entire sample of 186 participants. Figure 16.3 compiles the MI variables for the Sanquianga sample.

As we can see in figure 16.2, a large percentage of the participants acquired more than 80 percent of their diet from the market, primarily from small local stores and trading boats that passed by regularly. These people interacted very frequently with the market on a daily and weekly basis to purchase very small amounts of staple food—usually rice, oil, salt, plantains, and canned food—to complement their catch from fishing and piangua clam gathering. Very few people owned or farmed land for subsistence but rather bartered “sea for land” weekly when farmers from the upper stream settlements on the Tapaje, Sanquianga, and Satinga rivers came down with their plantains and other crops to acquire fish and other coastal resources.

FIGURE 16.2 *Distributions in Sanquianga for the Five Market Integration Indices (N = 186)*



Source: Author's surveys conducted during experiments.

TABLE 16.3 Correlation Coefficients for Market Integration Variables

	MI1	MI2	MI3	MI4	MI5
MI2	0.0642 0.4260 156	1.0000			
MI3	-0.0698 0.3867 156	0.3965* 0.0000	1.0000		
MI4	-0.0271 0.7371 156	-0.0932 0.2058	-0.1864* 0.0109	1.0000	
MI5	0.0123 0.8791 156	0.0639 0.3863	0.1684* 0.0216	-0.0772 0.2952	1.0000
		186	186	186	186

Source: Author's calculations based on author data.

Note: *p*-values and sample size are under correlation coefficients.

*Significant at 10 percent

However, a very small fraction of Sanquianga income is earned through labor markets, as also seen in figure 16.2. These people very rarely engage in wage labor, which includes being hired to repair fishing nets, build houses, or work on the local government's sporadic infrastructure or maintenance projects. Therefore, correlations among these market integration indices are very weak, as shown in table 16.3. As expected, only income from market exchanges involving wages and frequency of participation in the labor market are correlated.

Wealth and Income

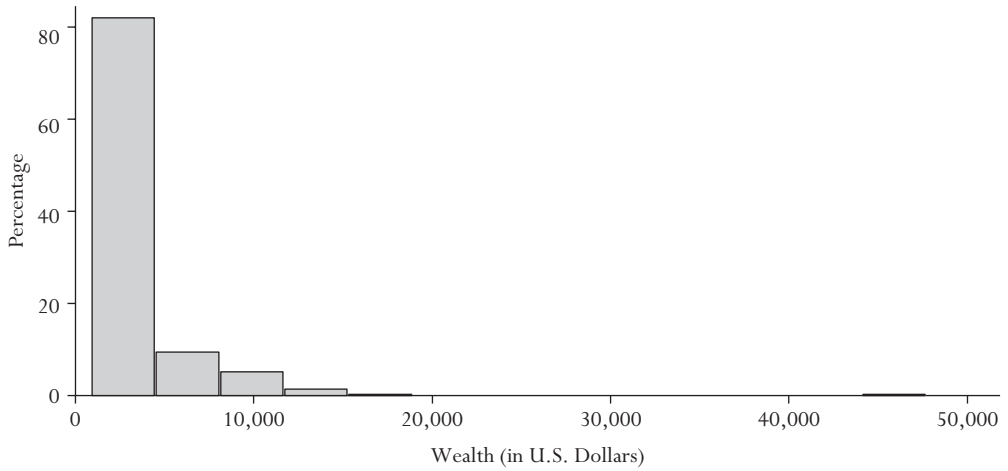
Material wealth as represented in productive assets with a market or exchange price was rather rare among our participants (see figure 16.3). More than 80 percent of them reported owning no assets that could be accounted as material wealth with some market exchange value, such as farmland, livestock, or other productive equipment. A few people reported owning boats, some animals, a few hectares of land, or an outboard motor.

About half of the participants reported earning no income from the following activities: wage work, trading profits, selling home-produced items, rental income, and cash remittances. About 25 percent of the participants reported earnings of about \$1,000 per year (in 2003 U.S. dollars), 10 percent reported earnings of between \$1,000 and \$2,000, and the remaining 15 percent were spread across the rest of the range, with very few earning even up to \$15,000 per year (see figure 16.4).

Further tests on the sample data show no significant correlations among education, wealth, and income variables. Gender does seem to be negatively correlated with income and wealth—namely, women earned a substantially lower income (based on our measure) and owned fewer assets, as measured by the protocol used. However, no significant difference exists in years of education by gender, which oscillates around 3.5 and 4.5 years of primary school for the sample.

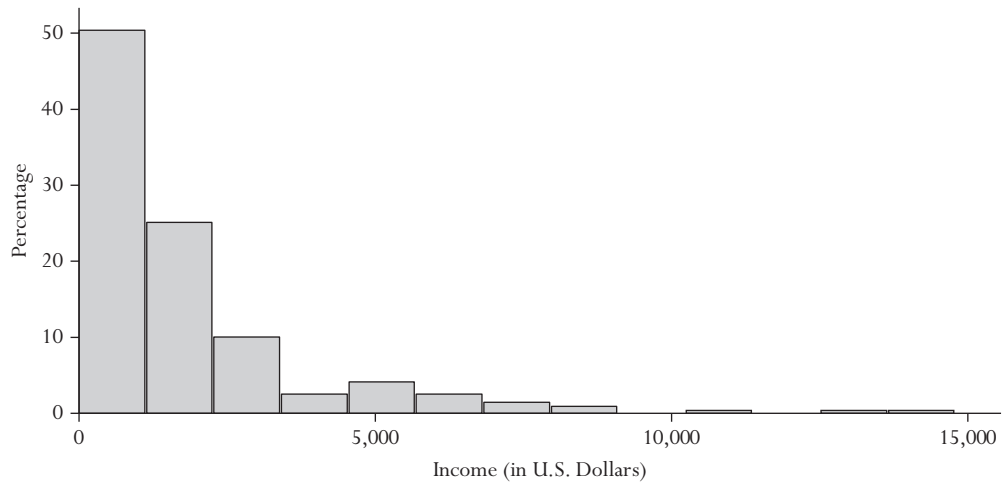
Based on these data, direct observation, and other sources (Restrepo 1996a, 1996b; del Valle 1996), we could describe the economic and social systems of the people of Sanquianga as highly dependent on extractive natural resources subject to the common-pool resource dilemma. Only a minor fraction of the households in our sample were dependent on private wealth such as land

FIGURE 16.3 *Distribution of Wealth in Productive Assets Valued at Local Prices in the Sanquianga Sample*



Source: Author's compilation based on author data.

FIGURE 16.4 *Distribution of Income from Wage Labor, Trading, Profits, and Remittances in the Sample of Sanquianga*



Source: Author's compilation based on author data.

TABLE 16.4 *Sanquianga Sample Size, by Experiment*

Experiment	Number of Sessions	Number of People
Dictator game	30 pairs (UG)	
Strategy method ultimatum game	30 pairs (DG)	60 ^a
Third-party punishment game	32 trios	96
Sealed-Envelope dictator game ^a	15 pairs	30
Total	107	186

Source: Author's compilation based on author data.

^aRecall that for the DG and UG, the same group of people played both games, although matching was anonymous and random. Choices for the first game (DG) were not known to player 2s until the second game (UG) was finished.

or livestock. Human capital as expressed in educational achievement does not seem to explain either individual- or household-level income or wealth.

Market integration in terms of frequency of visits to local markets and number of market transactions was rather high among our participants, who mostly were engaged in the purchase of goods for immediate consumption. However, the fraction of income that they generated through market transactions was rather small, despite frequently selling their catch from fishing or gathering piangua clams and, on rare occasions, obtaining wages for their labor.

AN EXPERIMENTAL APPROACH TO THE SOCIAL PREFERENCES OF THE SANQUIANGA PEOPLE

As in the rest of the studies reported in this volume, we replicated the experimental design described in chapter 3.² Here we provide some specific details about the setting for the experiments that may be of value to the reader.

For a listing of the economic games that we conducted in Sanquianga, as well as the number of sessions and players for each game, see table 16.4.

All experiments were conducted in Spanish by the main researcher (Cardenas), who also served as the monitor and interviewer for all sessions. Students and field assistants helped to collect the additional information on the individual and household survey data forms. All sessions were run from August 19 to August 23, 2002. Other activities—fieldwork, recruitment, follow-up, the gathering of field data and secondary sources—took up almost the entire month of August.

Based on an estimated population of about 1,500 people in Amarales and about 2,300 in Bazán, the 72 people recruited in the former and the 114 people in the latter represented roughly 5 percent of the population in these settlements. The two sites are within a few miles of each other by boat and have very similar conditions in terms of access to the resources the residents extract. Both sites are within the national park boundaries, and the two communities share a common history in terms of the origins of their people, traditions, and demographic characteristics. However, Bazán has a significantly higher level of poverty, as measured in terms of income and wealth and also as confirmed by the sampled household wealth.

Logistics: Our Field Lab

In both Amarales and Bazán, we chose the local school as the main site for conducting the experiments. We recruited participants during the days before the sessions in the following manner.

PHOTO 16.2 *Researcher with a Dictator Game Participant*

Source: Author's photograph.

Note: Researcher with a dictator game participant sitting in the second story of a municipal building in Bazán where fishermen lay their nets.

Through local contacts (local leaders, schoolteachers, municipal officials), the word was spread that a set of economic exercises were to be conducted in the local school on a specific number of days and at certain times and that any adult from the village could participate. We also made it clear that no two people from the same household could be in the same session, yet we sought to have better coverage of the entire village by encouraging people from the same household to sign up for the exercises.³ The small size and high population density of the two settlements guaranteed that once the word was spread, it was quite unlikely that the sample could have a specific bias in favor of these contacts.

All participants were recruited in batches of about twenty people and were assigned to specific periods of the day (morning or afternoon). For each of the groups, the same protocol was followed and can be roughly summarized as follows: once the number of required people arrived (twenty people for ten pairs of DG and UG games), the door of the schoolroom was closed. Then the researcher welcomed everyone and read the instructions for the games. Once examples were presented, the roles (player 1 or 2) were assigned randomly. The actual experiments were conducted in a separate place (see photo 16.2) where, one at a time, each participant made a decision.

While each of the players made their game decisions with the researcher, the rest of the group waited in the original schoolroom or outside. The players who had already played the game were moved nearby to a third location, usually next to another schoolroom. Both groups—those

PHOTO 16.3 *Sanquianga Participants Waiting for Their Turn in the Games and a Monitor Filling Out Survey Forms with a Participant*



Source: Author's photographs.

waiting and those who had finished playing—were supervised by a monitor or assistant who did not allow people to engage in conversations regarding the game. The assistants used this time to fill out the individual and household surveys, as shown in photo 16.3. We provided refreshments for the people in these groups while they waited during the sessions.

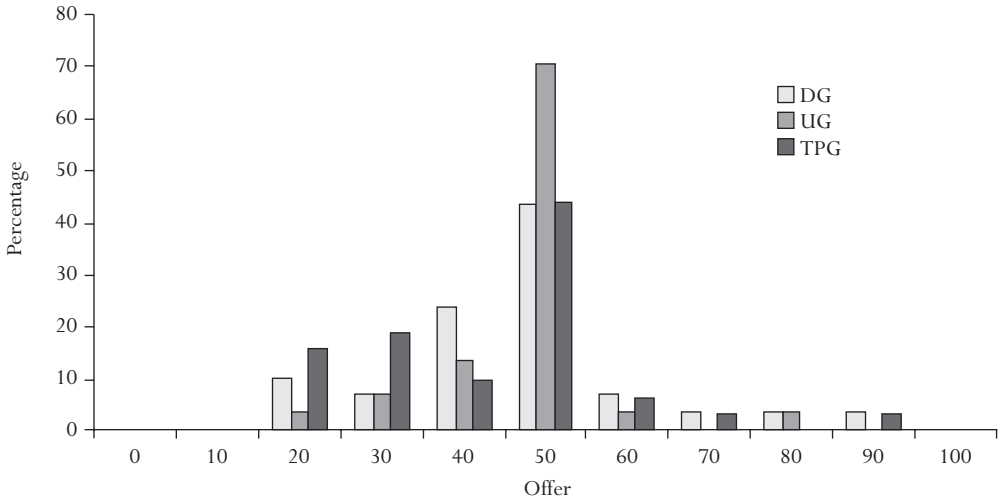
It was difficult, however, to keep the groups from discussing the decisions and strategies involved in the game, especially those in the group that had just played the games. Nevertheless, the data do not seem to support major differences between the early sessions and later sessions within a site, thus making it unlikely that there were carry-on effects.

After all the participants had played the games, they were informed about their payoffs, paid, and asked to sign receipts and finish filling out the survey forms. When these tasks were completed, we moved on to the next group of participants.

ANALYSIS: EXPLAINING BEHAVIOR IN SOCIAL PREFERENCES EXPERIMENTS

The dictator game (DG), strategy method ultimatum game (UG), and third-party punishment game (TPG) experiments provide very valuable information about people's preferences for fairness, altruism, reciprocity, and social punishment, which have emerged as key features in the literature on individuals and their economic rationality regarding others (Bowles 1998; Camerer and Fehr 2004). Given their simplicity and the standardization of the protocols, these games allow us to replicate tests across sites, cultures, social groups, and individuals, enabling us to make comparisons across sites and discover factors that may explain the observed behavior

FIGURE 16.5 *Frequency of Offers by Player 1s in the Dictator Game, the Strategy Method Ultimatum Game, and the Third-Party Punishment Game*



Source: Author's calculations based on author data.

within and across sites. Such is the case with the Sanquianga people, who have very low levels of schooling and whose social relations based on fairness and reciprocity are usually observed in daily interactions with their environment and with each other.

This section describes the main outcomes of the core experiments and statistically explores how the participants' demographic and socioeconomic characteristics may in fact explain variations in their experimental behavior. The section starts with the main distributions of the decisions made by player 1s in the three core games and continues with the strategic data (schedules) on player 2s in the UG and player 3s in the TPG.

Player 1 Offers (Core Games): Driven by Strong Fairness Norms

In our sample, the same thirty people were player 1 in both the DG and UG, and another thirty people were player 2 in both games, although the pairing was not fixed from one game to the other. Recall that player 2 does not know the decisions of player 1 in the DG at the time he or she has to decide on a schedule of rejections for the UG. In the TPG game, we had thirty-two trios. All offers are summarized in figure 16.5. The offers could only be made in units of ten, since we endowed player 1s with 10,000 Colombian pesos (COP\$10,000) in bills of \$1,000.

The median and distribution of offers are highly consistent with previous work with these experiments in which fair offers of 50 percent of the initial stake were most frequently made by player 1s. For all three games, the modal offer was half of the initial stake. Reported offers in the experimental literature using the DG with both students and nonstudents are below the 50 percent average (Cardenas and Carpenter 2008).⁴ In our UG the modal offer of half the stake was made by 70 percent of the participants, which is consistent with the literature that reports increased fair offers under the conditions of the UG.

These data bring up a few points regarding fairness behavior by player 1s that are worth discussing. Notice in figure 16.5 that the frequency of low offers decreased from the DG to the UG. Also, the 50 percent offers increased from 43 to 70 percent. The possibility of a very costly punishment created by a rejection in the UG induced, on average, more fair offers from player 1s compared to their offers in the DG. However, it is interesting to note that 57 percent of our player 1s maintained their exact offers from the DG to the UG and that 27 percent increased their offers. In fact, eight out of the thirty player 1s increased their offers from the DG to the UG, and five of them—two of whom had originally offered 90 percent and 70 percent of the stake in the DG—decreased their offers. There is a strong statistical pairwise correlation between the offers (pairwise correlation = 0.5700, p -value = 0.0010), and we fail to reject the hypothesis that the two distributions are statistically different. A Wilcoxon matched-pairs signed rank test for the thirty pairs of observations yields a z value of -0.709 with a $\text{Prob} > |z| = 0.4780$, and a simple t -test also supports the idea that the two distributions are equal, with a minuscule difference in mean offers of Col\$0.06 (about 0.7 percent of the initial stake), a t -test = -0.2842 , and a $p > |t| = 0.7783$.

Therefore, the ultimatum game rule structure increases the chance of fifty-fifty splits. In this community, it seems that there are already strong preferences for fairness and equal splits even under the less strategic dictator game. Later we discuss the behavior of player 2s in the UG to help explain these behaviors in player 1s. As we will observe, the likelihood of rejection by player 2s in the UG is rather low compared to similar experimental evidence and further confirms the proposition of very strong hyper-fair norms among these social groups. This is highly consistent with the fair offers in both the DG and UG.

The offers for the third-party punishment game deserve additional comments. As we can see in figure 16.5, the fifty-fifty offers in the TPG were less frequent than in the UG; offers of 20 percent and 30 percent of the initial stake were more frequent in the TPG. On average, the offers in the TPG were similar to those in the DG and slightly smaller than those in the UG.⁵ The differences are not statistically significant, but this could be because of the limited sample size of thirty and thirty-two observations, respectively.

Player 2 Strategies of Rejection and Punishment: Driven by Hyper-Fairness, Aversion to Inequality for Some, and Conformism for Others

The data on player 2s for the UG and on player 3s for the TPG enrich our understanding of the Sanquianga people and their strong social preferences. Recall that in both games we used the strategy method: player 2s' strategy of rejection (UG) or punishment (TPG) would be elicited before they knew player 1s' offers but when they did know that player 1s had already made their decisions. Since the design and sequence of decisions was common knowledge for all players, we assumed that this strategic environment might affect the behavior of player 1s.

We have the benchmark of the canonical game-theoretical model prediction. UG player 1 should send the minimum nonzero offer assuming that player 2 would be better off. Since player 3 in the TPG derives no positive material gain from punishing and player 2 cannot affect player 1's well-being, player 3 should offer zero. However, once player 1s assume that the preferences of player 2s in the UG or TPG include a component of fairness, care for others, or equality, player 1s should rethink their strategies, even for the case of the *Homo economicus*, who would maximize their earnings by offering fractions that guarantee an acceptance in the UG or that reduce the probability of punishment in the TPG.

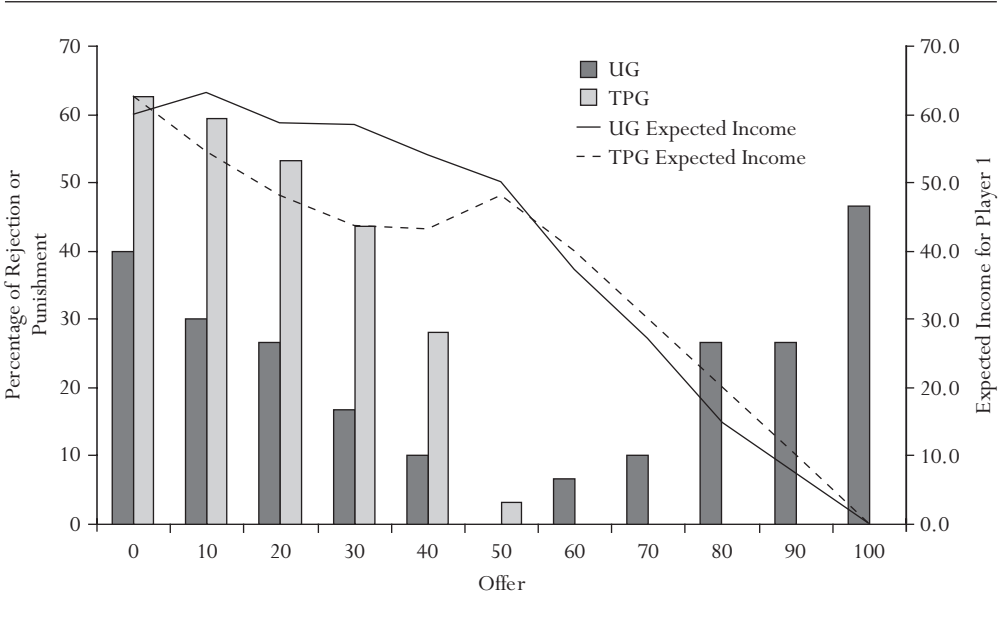
Table 16.5 and figure 16.6 show the frequencies of rejection and punishment for the UG and the TPG. The first and most interesting result is the U-curve for rejections in the UG. We find

TABLE 16.5 *Frequency of Rejection in the Ultimatum Game and Punishment in the Third-Party Punishment Game and Expected Income for Both Games*

Offer	UG Count	TPG Count	UG Rate of Rejection	TPG Rate of Punishment	UG Expected Income	TPG Expected Income
0	12	20	40%	62.50%	60.0%	62.5%
10	9	19	30.00	59.38	63.0	54.4
20	8	17	26.67	53.13	58.7	48.1
30	5	14	16.67	43.75	58.3	43.8
40	3	9	10.00	28.13	54.0	43.1
50	0	1	0.00	3.13	50.0	48.1
60	2	0	6.67	0.00	37.3	40.0
70	3	0	10.00	0.00	27.0	30.0
80	8	0	26.67	0.00	14.7	20.0
90	8	0	26.67	0.00	7.3	10.0
100	14	0	46.67	0.00	0.0	0.0

Source: Author's compilation based on author data.

FIGURE 16.6 *Frequency of Rejection in the Ultimatum Game and Punishment in the Third-Party Punishment Game and Expected Income for Both Games*



Source: Author's compilation based on author data.

that very unfair offers were much more likely to be rejected, even if they were unfair to player 1 and favorable to player 2. The zero rejection rate for the fifty-fifty split confirms the preference for highly fair distributions.

However, a more detailed look at the individual data reveals a more complicated story about the behavior of player 2s in the UG. Looking at the individual schedules elicited from these thirty people, roughly half (fourteen) of them accepted all possible offers from 0 percent to 100 percent, and the remaining half (sixteen) responded by rejecting unfair offers based on the U-curve shown in figure 16.6. Table 16.6 shows the individual accept/reject schedules, with each row being one player 2. The data are sorted by the percentage of rejections, where ones are accepted offers and zeros are rejected offers. The first column shows the amounts these players actually received based on the offers made by player 1s and their rejection. The last column shows the percentage of offers accepted for that particular player 2.

Notice the symmetry in the responses in table 16.6 for those with rejections (zeros), including four cases where player 2s would accept any offer except when player 1 offered the entire 100 percent of the stake. Toward the bottom of the table we have more hyper-fair individuals who would accept only very equal offers.

These data offer a puzzle regarding social preferences. Most people seem to value high fairness and altruism, and their behavior does not seem to show highly self-oriented choices with respect to material payoffs. However, we observe this behavior in two types of individuals: those who greatly value fairness and are willing to forgo income when the distribution is unequal, and those who are conformist with any distribution. Notice that the latter could be of the first type as well: if they are certain that no unequal offers will be made, then they know that a fair distribution does not need to be enforced (rejection). A look at the qualitative data in the next section may enrich the analysis of these experimental data.

What Did Player 2s in the Ultimatum Game Say About Their Rejection or Acceptance Strategy?

We now explore some of the arguments that may explain player 2s' responses to the survey at the end of the experiment. The following are answers to the question "How would you have felt if you received an offer of zero from player 1?" that were given by those player 2s in the upper half of table 16.6, that is, those who accepted any possible offer by player 1:

- "Well, it would be the will of the other person; it was him who would share from his heart."
- "I'd feel fine, because each person has her own way of thinking."
- "I'd feel bad, but I could not do anything."⁶
- "I'd feel fine because this is what their heart and conscience told them to do."
- "Fine, relaxed, because I cannot force their mind."
- "Fine, I'd accept what their conscience would tell them."
- "Relaxed, the other person could take all the money, The One up there [God] told him to."
- "Fine, because it was the decision of the other person."
- "Two things, I'd be an unfair person [not accepting], or maybe the other person needed the cash, that's why I accepted all."
- "Fine, anyway, the other person took something home."

TABLE 16.6 Schedules of Acceptances by Thirty Player 2s in the Ultimatum Game

	Player 2: Accept 0	Player 2: Accept 10	Player 2: Accept 20	Player 2: Accept 30	Player 2: Accept 40	Player 2: Accept 50	Player 2: Accept 60	Player 2: Accept 70	Player 2: Accept 80	Player 2: Accept 90	Player 2: Accept 100	Sum Accepted
5,000	1	1	1	1	1	1	1	1	1	1	1	100%
4,000	1	1	1	1	1	1	1	1	1	1	1	100%
2,000	1	1	1	1	1	1	1	1	1	1	1	100%
5,000	1	1	1	1	1	1	1	1	1	1	1	100%
3,000	1	1	1	1	1	1	1	1	1	1	1	100%
5,000	1	1	1	1	1	1	1	1	1	1	1	100%
5,000	1	1	1	1	1	1	1	1	1	1	1	100%
5,000	1	1	1	1	1	1	1	1	1	1	1	100%
5,000	1	1	1	1	1	1	1	1	1	1	1	100%
5,000	1	1	1	1	1	1	1	1	1	1	1	100%
5,000	1	1	1	1	1	1	1	1	1	1	1	100%
5,000	1	1	1	1	1	1	1	1	1	1	1	100%
5,000	1	1	1	1	1	1	1	1	1	1	1	100%
5,000	1	1	1	1	1	1	1	1	1	1	1	100%
5,000	1	1	1	1	1	1	1	1	1	1	1	100%
5,000	1	1	1	1	1	1	1	1	1	1	1	100%
6,000	1	1	1	1	1	1	1	1	1	1	1	100%
5,000	1	1	1	1	1	1	1	1	1	1	1	100%
5,000	0	1	1	1	1	1	1	1	1	1	0	91%
5,000	0	1	1	1	1	1	1	1	1	1	0	91%
5,000	0	1	1	1	1	1	1	1	1	1	0	82%
8,000	0	0	1	1	1	1	1	1	1	1	1	82%
5,000	0	0	0	1	1	1	1	1	1	1	1	73%
4,000	0	1	1	1	1	1	1	1	0	0	0	64%
5,000	0	0	0	1	1	1	1	1	0	0	0	45%
3,000	0	0	0	1	1	1	1	1	0	0	0	45%
5,000	0	0	0	0	1	1	1	1	0	0	0	36%
0	0	0	0	0	0	1	1	1	0	0	0	27%
5,000	0	0	0	0	1	1	0	0	0	0	0	18%
0	0	0	0	0	0	0	1	0	0	0	0	18%
5,000	0	0	0	0	0	1	0	0	0	0	0	9%
Accepted	60%	70%	73%	83%	90%	100%	93%	90%	73%	73%	53%	73%
Rejected	40%	30%	27%	17%	10%	0%	7%	10%	27%	27%	47%	47%

Source: Author's compilation based on author data.

Player 2: Sum Accepted

Player 2: Offer Received

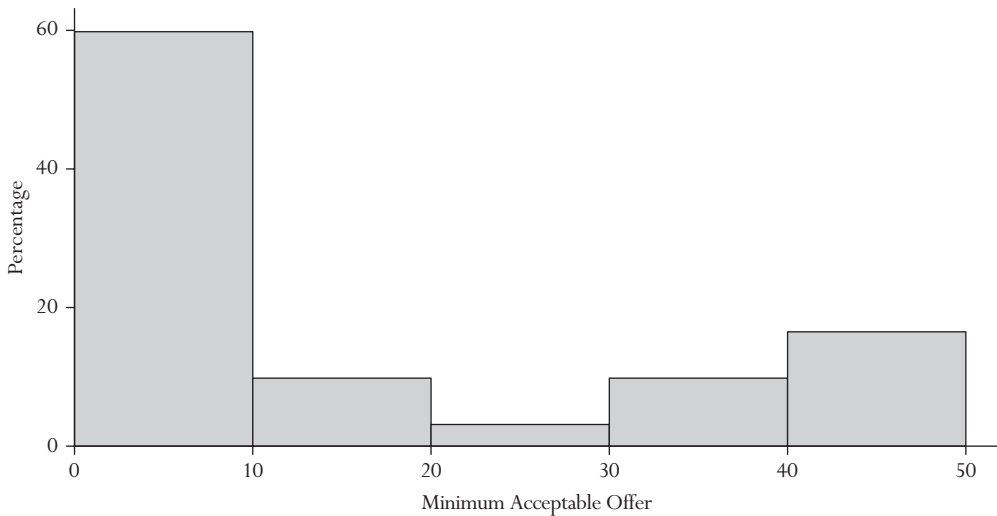
- “I wouldn’t feel anything, because it was a present.”
- “I decided to accept whatever the other person sent me.”

And these are the answers by the same group of players (in the upper section of table 16.6 accepting all possible offers) to the next question in the questionnaire: “How would you have felt if you had received an offer of 10 from player 1?”

- “Fine.”
- “Fine, their hearts told them to send all the money to me.”
- “Fine too, because it was their decision.”
- “Fine, I’d be thankful.”
- “Happy, but why wouldn’t they take any money?”
- “Fine.”
- “Fine, because it was voluntary.”
- “The other person gave me all, therefore I wouldn’t feel bad.”
- “Bad, because it is better to share.”
- “It’s not right, I cannot use all the money.”
- “I’d feel uncomfortable.”
- “I will feel bad because I know that it’s the decision of the other person, but it would not be fair that he does not get any money.”

Although the latter player 2s show some remorse for getting 100 percent offers, they still accepted all offers in their decision schedule. If we look at the responses given by those in the bottom of table 16.6 with the hyper-fair responses, their reactions to receiving a 100 percent offer from player 1 support the argument that there is a discomfort with unfair outcomes:

- “I’d feel bad, because the other person would not keep anything.”
- “Bad, because the money belongs to the other person, and how come they would give it up all?”
- “Bad, because we have to share.”
- “I won’t accept!”
- “I’ll feel bad, but otherwise happy.”
- “Good for me but bad for the other.”
- “I don’t think the conscience of the other would do that.”
- “Bad too.”
- “Bad because none of us win.”
- “Bad, because I think the other must share half and half.”
- “Bad, because the other person did not take any money, it’s much better to share.”
- “Fine and relaxed.”
- “Fine because it’s a choice of the other person.”

FIGURE 16.7 *Frequency of Minimum Acceptable Offers for Player 2s in the Ultimatum Game*

Source: Author's compilation based on author data.

Except for the last two, most player 2s expressed a negative sentiment about taking all the money and a strong preference for fair outcomes. The players choosing schedules with both very low and very high offers were rejected.

The strategy method in the UG can provide another valuable measure: the minimum acceptable offer (MinAO) of player 2s, which is calculated based on the smallest percentage that they would accept in the ultimatum game. We have two particular situations regarding this measure for the Sanquianga people. First, 60 percent of our sample had an MinAO of 0 percent, which yields a bimodal distribution as shown in the histogram in figure 16.7. Second, the hyper-fair rejections would not be reflected in the way the MinAO index is constructed, and therefore it does not incorporate these additional components in the preferences. As we will see later when explaining the variation of experimental behavior in the multivariate analysis, we obtained non-significant results for the models explaining the MinAO variation.

It is worth noting that these combinations of behavior (fair and altruistic offers by player 1s to player 2s, whose responses are half conformist and half hyper-fair) resulted in a high number of accepted transactions (only two of the thirty offers were rejected). The distributions of offers in the DG and the UG are not very different in terms of fairness and altruism. Player 2s seem to elicit, with their rejection schedules, preferences similar to such fair behavior. We therefore would have more reason to argue that generosity in the UG is based on the well-being of others and an aversion to inequality than on fear of negative reciprocity (Fehr and Schmidt 1999).⁷

Willingness to Punish Unfair Offers in the Third-Party Punishment Game

We also conducted the third-party punishment game, using the strategy method for player 3s, who had to reveal their schedules of punish/not punish for every possible decision by player 1s. The data are shown in table 16.6 and figure 16.6. When player 1s offered nothing, 62.5 percent

of player 3s were willing to punish. Thereafter, the rate of punishment decreased in a concave, smooth rate down to 28 percent of player 3s being willing to punish a 40 percent offer from player 1.⁸ Offers of 50 percent and higher were not punished by player 3s.

This behavior is consistent with the argument that humans are willing to undertake costly actions in order to maintain social norms that are beneficial to the group (Fehr and Fischbacher 2004; Fehr and Gächter 2002). We have already observed from the DG and UG data that fairness and equality are strong social norms that are not only demonstrated by player 1s but also expected by player 2s. These are norms that player 3s would be attempting to sustain through the costly behavior of having to pay 20 percent (\$2,000) of their initial stake (COP\$5,000) to decrease the payoffs of player 1s (by COP\$3,000). In fact, the data for the Sanquianga people are quite similar to the concave schedule reported by Ernst Fehr and Urs Fischbacher (2004) for the same experiment, although in their study the fraction of people willing to punish unfair offers remained at 60 percent for offers up to 40 percent from player 1s. In our study, when offers were for 40 percent, only 30 percent of player 3s were willing to punish.

The individual data on the punishment schedules and the offers by players can provide some additional insights. Only four (COP\$2,000, \$3,000, \$4,000, and \$3,000) of the thirty-two offers were in fact punished by player 3s. However, recall that there were more offers in the TPG that were less generous than in the DG and UG. There were at least five cases in which a player 1 offered 30 percent or less, and these happened to be matched with player 3s who were not interested in punishing any of these offers.

Explaining Experimental Behavior from Demographic Characteristics

The next step in the analysis is to further explore the observed variation in the key choice variables in our sample by exploring the data collected about the behavioral, social, and economic conditions of these individuals. We have found aggregate patterns that are consistent with similar literature and experiments and the role of norms such as fairness, reciprocity, and altruism across the three core games. However, players varied in their individual preferences for altruism, reciprocity, and social sanctioning.

Since we gathered demographic and socioeconomic information about the participants and their households, we can explore how much of their individual and household characteristics could explain the variation across their individual decisions within the experiments.

The dependent variables we aim to explain are the offers by player 1s for the three core games and the minimum acceptable offers for the ultimatum game, since it is being calculated for all sites in the project. The regression results are included in tables 16.7 through 16.10.

The statistical procedure for all subsamples was similar to the protocol for the entire project. The explanatory (independent) variables chosen for the regressions were age, gender, education, individual income, household wealth, and household size. To explore the robustness of some of these variables and explain variation in the dependent variables, we report different models. We compare coefficients of variables in different units by dividing each value by the standard deviation of the subsample.

Dictator Game Offers According to the different models we estimated, we are able to explain about 40 percent of the variation in offers using the thirty players' personal and household characteristics (see table 16.7). Overall the models' significances allow us to draw some conclusions about the changes caused by these characteristics in the independent variables because

TABLE 16.7 *Dictator Game Offers Explained by Demographic Variables*

Variables (Divided by Standard Deviation)	(1)	(2)	(3)	(4)
Age	1.47 (3.43)			
Female dummy ^a	4.69 (6.73)	4.19 (6.51)		
Education	9.36 (3.82)**	8.27 (2.80)***	8.21 (2.76)***	8.23 (2.69)***
Individual income (U.S. dollars)	1.05 (2.96)	0.97 (2.91)	-0.19 (2.25)	
Household wealth (U.S. dollars)	-5.17 (2.54)*	-5.28 (2.48)**	-5.33 (2.45)**	-5.34 (2.39)**
Household size	11.04 (2.84)***	10.89 (2.77)***	10.56 (2.69)***	10.56 (2.64)***
Constant	5.47 (18.48)	11.43 (11.90)	16.46 (8.88)*	16.24 (8.34)*
Observations	30	30	30	30
Model significance (<i>p</i> -value)	0.009	0.004	0.002	0.001
Adjusted R-squared	0.37	0.39	0.40	0.43

Source: Author's calculations based on author data.

Note: Standard errors are in parentheses.

* Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent

^aNot divided by the standard deviation.

they existed prior to the experiment. Based on the regression results, and given that we have transformed the variables, the estimation results show that years of education and household size had a significant and positive effect on the amount offered by player 1s, while the effect of household wealth was negative. Given that individual income was not found to be correlated with household wealth, we suggest that income has no effect by itself. In terms of the relative weight in explanatory power, household size and education seem to be similar in having a higher effect than wealth.

Ultimatum Game Offers With the first model (see table 16.8), we can explain about 50 percent of the variation and have a significant model. Once again, gender does not seem to have explanatory power. Education, household size, and wealth have the same effects on offers. This result is expected given that these are the same thirty people and the dictator game and ultimatum game offers were highly correlated for the sample. Only age, now showing a positive significant coefficient, and income, with a negative significant effect, add to the explanatory power of the estimator.

Minimum Acceptable Offer Responses The results here are rather weak when compared to the estimations of the dictator and ultimatum games (see table 16.9). The only model with a statistically significant explanatory power, model 5, shows age and wealth as significant and positive in both cases, explaining a very small fraction of variation in the MinAO responses. The adjusted R-squared is only 14 percent. Most of the statistical problem lies in the data for the dependent variable. We know that about 60 percent of our participants were basically indifferent to any offer, that is, their MinAO was zero. Therefore, the results reported here should be interpreted with caution.

TABLE 16.8 *Strategy Method Ultimatum Game Offers Explained by Demographic Variables*

Variables (Divided by Standard Deviation)	(1)	(2)
Age	5.23 (1.99)**	4.96 (1.94)**
Female dummy ^a	3.08 (3.90)	
Education	8.71 (2.21)***	8.46 (2.17)***
Individual income (U.S. dollars)	-1.52 (1.72)	-2.36 (1.33)*
Household wealth (U.S. dollars)	-4.93 (1.47)***	-4.98 (1.46)***
Household size	4.48 (1.64)**	4.21 (1.60)**
Constant	15.24 (10.70)	19.92 (8.85)**
Observations	30	30
Model significance (<i>p</i> -value)	0.001	0.000
Adjusted R-squared	0.49	0.50

Source: Author's calculations based on author data.

Note: Standard errors are in parentheses

* Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent

^aNot divided by the standard deviation.

TABLE 16.9 *Minimum Acceptable Offers by Player 2s in the Strategy Method Ultimatum Game*

Variables (Divided by Standard Deviation)	(1) mao	(2) mao	(3) mao	(4) mao	(5) mao
Age	8.12 (3.61)**	8.23 (3.53)**	7.16 (3.47)**	7.62 (3.45)**	6.89 (3.18)**
Female dummy ^a	2.57 -7.69				
Education	4.69 -3.72	4.62 -3.65			
Individual income (U.S. dollars)	5.79 -4.01	5.15 -3.47	3.34 -3.19		
Household wealth (U.S. dollars)	6.27 (3.26)*	6.29 (3.20)*	6.05 (3.23)*	5.98 (3.23)*	5.81 (3.18)*
Household size	-0.84 -3.49	-0.78 -3.42	-1.6 -3.4	-2.02 -3.38	
Constant	-27.22 -18.42	-25.02 -16.89	-9.95 -12.13	-5.58 -11.4	-9.06 -9.67
Observations	30	30	30	30	30
Model significance (<i>p</i> -value)	0.193	0.12	0.124	0.1	0.049
Adjusted R-squared	0.11	0.14	0.12	0.12	0.14

Source: Author's calculations based on author data.

Note: Standard errors are in parentheses.

* Significant at 10 percent; ** significant at 5 percent

^aNot divided by the standard deviation.

TABLE 16.10 *Third-Party Punishment Game Offers Explained by Demographic Variable*

Variables (Divided by Standard Deviation)	(1)	(2)	(3)	(4)	(5)	(6)
Age	1.65 (2.82)					
Female dummy ^a	8.37 (6.27)	7.55 (5.96)				
Education	-3.86 (2.75)	-5.05 (2.54)*	-4.61 (2.55)*	-4.69 (2.62)*	-5.39 (2.66)*	-4.61 (2.55)*
Individual income (U.S. dollars)	-3.95 (3.03)	-4.58 (2.95)	-6.41 (2.60)**	-5.39 (2.59)**	-5.64 (2.66)**	-6.41 (2.60)**
Household wealth (U.S. dollars)	5.91 (3.01)*	5.24 (2.85)*	4.53 -2.83			4.53 -2.83
Household size	1.68 (2.87)	1.71 (2.82)	2.41 -2.79	4.32 -2.59		2.41 -2.79
Constant	33.25 (12.48)**	41.11 (9.38)***	44.21 (9.16)***	41.8 (9.28)***	54.83 (5.15)***	44.21 (9.16)***
Observations	31	32	32	32	32	32
Adjusted R-squared	0.24	0.26	0.24	0.2	0.15	0.24
Prob > F	0.043	0.023	0.02	0.025	0.034	0.02

Source: Author's calculations based on author data.

Note: Standard errors are in parentheses.

* Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent

^aNot divided by the standard deviation.

Third-Party Punishment Game Offers Although the overall significance of the models estimated for these thirty-two observations is slightly stronger here than in the previous case, the results need to be interpreted with caution (table 16.10). The estimation suggests that some of the coefficients and signs that were statistically significant in the DG and UG data now have effects that are similar in some cases and not in others. Education seems to reduce the amount being offered. Income now shows a negative and significant relationship, while wealth is positive.

The positive sign for wealth could be interpreted in two ways. First, wealthier people were more generous, contradictory to the DG and UG data, owing to the lesser value of their forgone cash as a percentage of their average income. Second, wealthier people expected to be punished more often by third parties, although in this case player 1s knew that player 3s could not identify at any point who was in fact being punished.⁹ At this point, it is difficult to reject either interpretation. Nevertheless, the motivation for wealthier player 1s to make higher offers because they expect to be more strongly punished remains a plausible explanation.

Household size is no longer a powerful explanatory variable of the variation in offers. Nevertheless, the different models were, at best, able to explain about one-fourth of the variation in offers. It is worth noting that other variables for tenure—measures of the percentage of time the individual had lived in the village or of engagement in cooperative activities in the village—did not help to statistically explain the variation in experimental offers.

In general, wealth, age, household size, and education seem to be factors that statistically explain the behavior in the estimated models. These factors offer some grounds for arguments about individuals' possible motivations for their prosocial behavior in these experiments. These arguments are discussed in the next section.

TABLE 16.11 Frequency of Offers by Player 1s in the Sealed-Envelope Dictator Game

Offer (U.S. dollars)	Frequency	Percentage
\$0	0	0%
\$1,000	0	0
\$2,000	1	7
\$3,000	4	27
\$4,000	8	53
\$5,000	2	13
\$6,000 or more	0	0
Total	15	100

Source: Author’s calculations based on author data.

A Variation of the Dictator Game: Using Sealed Envelopes and a Drop Box

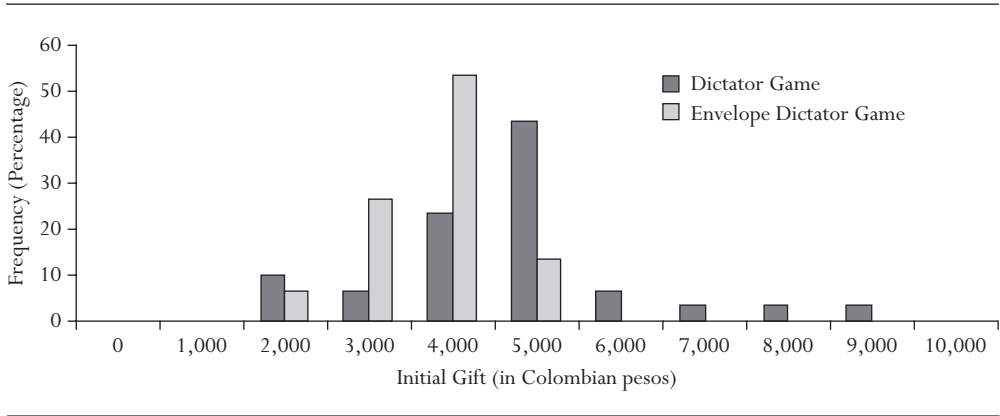
Concerned about experimenter effects in our prosociality experiments, we expanded our sample by recruiting fifteen new pairs in one of the two villages, Bazán, to play the dictator game in the same exact manner as before. They were recruited in the same way as in the earlier round of the DG, player 1 and 2 roles were once again randomly assigned, and communication among the participants during the experiment was forbidden. There was one difference, however, in this variation on the DG: player 1 made his or her decision in private, not in front of the experimenter but in a different room, where player 1 could have the privacy to keep the money he or she wanted, leave the money offered in a sealed envelope, and deposit the envelope in a drop box in that room with no one present. Once all fifteen offers were made, the experimenter randomly handed out the fifteen envelopes to the fifteen player 2s.

Table 16.11 shows the distribution of offers by the fifteen player 1s. If we compare the distribution of offers to those observed in the initial DG sample (See figure 16.8), we can notice a similar pattern: offers were more concentrated around the 40 percent offer, and there were no hyper-generous offers of more than 50 percent of the stake. Two nonparametric tests for comparing these distributions suggest that the offers are statistically different (Kolmogorov-Smirnov test, $p = 0.013$; Wilcoxon rank sum (Mann-Whitney), $p = 0.0102$).

These results suggest at least two conclusions that are not mutually exclusive. First, there is room to suspect an experimenter effect that shifts the distribution slightly to the right, including the possibility of extremely generous offers being driven in part by participants trying to impress the experimenter. I should not exclude, however, the possibility of learning in the Bazán village, given its small size and the usual excitement that these games produce in the village. This variation of the DG was conducted after we had conducted the core games, and therefore the villagers may have been communicating with each other, although speculating on the direction of the effect could be risky.

The second conclusion is that despite these possible shifts in the distribution of offers, this design and data confirm that generosity is a strong motivator in the same population where the other games were conducted and as discussed in the analysis here. Only one offer was for 20 percent of the stake; the remaining fourteen offers were 30 percent and higher, with a mean offer of \$3,700 (37 percent of the stake), compared to the 47 percent found in the larger sample for the initial DG. The analysis explains why such levels of prosociality might be based in both the historical and current contextual situations of the people of Sanquianga.

FIGURE 16.8 *Distribution of Offers in the Initial Dictator Game and in the Sealed-Envelope Dictator Game*



Source: Author's compilation based on author data.

THE ROOTS OF SOCIAL BEHAVIOR AND PREFERENCES IN SANQUIANGA

Using the demographic, socioeconomic, and experimental data gathered in the field and from secondary sources, this section discusses the foundations for the social preferences and prosocial behavior observed in the experiments among the Sanquianga people.

Strong and Symmetric Aversion to Inequality

There are strong preferences among the Sanquianga people for altruistic and fair outcomes. There is also a strong social acceptance of symmetric fairness and a strong aversion to unequal outcomes regardless of the direction, even at a cost in efficiency. The data, in fact, do not replicate the typical asymmetric pattern in rejection schedules in the ultimatum game, in which players were willing to reject offers that were unfair to them but would accept most offers that were generous to them. The Sanquianga data present a very symmetric rate of rejections and acceptances. For about half of the people tested, any division of the money was acceptable, and for the other half, only very equal divisions were acceptable. This has been labeled a “hyper-fair” set of preferences.

Thus, inequality aversion is much stronger here than would be proposed by Ernst Fehr and Klaus Schmidt (1999), who assume a smaller disutility from advantageous inequality than from disadvantageous inequality. Our data suggest that the weights observed are quite symmetric, yet they also vary from very conformist to very (symmetrically) averse to inequality across individuals.

Respondents' answers to questions about receiving very unfair or very generous offers suggest that inequity aversion may play only a partial role and that pure altruism was a much stronger preference among them than is usually observed. The fact that the offers in the dictator game were already generous and fair, compared to those in the ultimatum game, suggests that pure altruistic preferences played a significant role in Sanquianga decisions.

Such highly altruistic preferences by the player 2s who accepted any offer and by the player 1s who offered very fair offers are quite consistent with observed behavior in the field. When

Sanquianga households, for instance, had a “bad catch day” while fishing, they received transfers from neighbors who did better, knowing that such transfers could go in the opposite direction in the future.¹⁰ Participants reported during the follow-up conversations food was frequently transferred in cases of illness or need.

Interestingly, a recent experiment among the Gypsy population of Vallecas, Madrid (Brañas-Garza, Cobo-Reyes, and Domínguez 2006), using a replication of the strategy method ultimatum game with the same protocols as the present study, generated results that are compatible with the arguments here. The mode for the rejection by player 2s was zero. However, 97 percent of player 1s offered 50 percent of their stake. The argument remains that if the social norm among this particular group is for everyone to share any surplus they might have, they might as well accept any offer and avoid the risks of a rejection that would destroy any output to be divided. The Gypsies themselves, however, more frequently justified their lack of rejection of most offers as based on the deservedness of the other (“Si él lo necesita”). If player 1 needs the cash, he will keep it and that is fine with player 2. Donna Bahry and Rick Wilson (2006) also report a very high portion of 50 percent offers from player 1s for a set of experiments with different rural and urban individuals in two ex-Soviet republics.

Fair offers in the ultimatum game therefore could be interpreted as altruistic decisions by player 1s rather than decisions based on a strong fear of reciprocal rejection by player 2s. Although a small fraction of the offers moved toward the fifty-fifty split afterward, recall that seventeen out of thirty player 1s offered the same amount in both the DG and the UG, and that eleven of these offered the fifty-fifty split.

Therefore, if such a strong social norm exists, it is rational to have observed hyper-fair rejection rates where about half of player 2s accepted any offer. These players were trying to reduce the risks of a rejection that would produce no payoffs at all for anyone. In other words, not only was there a strong preference for the well-being of the others present in the experiments, but there was also a strong preference for the highest possible sum of the payoffs rather than equity between the payoffs. Combined with a common understanding that fair outcomes were the norm, it would be logical to observe the two types of behaviors in the respondents (conformists and hyper-fairness enforcers).

However, the strategic behavior of player 3s in the TPG presents another puzzle in the debate over hyper-fair versus conformist preferences among this social group. If we argue that hyper-fair or conformist preferences are generally held by this population, why would player 3s have punished only offers that were unfair to player 2s and not also those that were excessively unfair to player 1s? On the contrary, a conformist player 3 who accepts that player 1 keeps all of the stake should not punish any offer by player 1. The fact that the social interaction has no monetary effect on player 3 could be part of the argument. The responses given by player 2s in the UG and reported in previous sections suggest that hyper-fair individuals in Sanquianga had a strong feeling against receiving too much and leaving player 1s with nothing, a feeling that player 3s in the TPG would not have perceived personally. In the TPG the punish decision by player 3 only affects the earnings of player 1, by decreasing them, without altering the earnings of player 2.

Poverty, Wealth, and Prosocial Behavior

Many of the arguments about sharing excess goods are related to caring for an equal distribution of resources and opportunities, especially for those in greater need. This raises the issue of the role of private wealth and income in sharing networks and small-scale societies. Our results suggest that wealthier households or individuals with higher (cash) income are less likely to share in the DG and UG.¹¹ These findings would be consistent with the rationale that poorer people

are more familiar with sharing, or with others similar to them being in need, and therefore found in the experiment another situation in which others would need part of the newly available resources (in this case an amount of cash arriving from outside, and in particular from the experimenter).

We have argued that poverty or lack of private wealth (assets) might be associated with more altruistic preferences, owing to respondents' personal history of participating in exchanges based on altruism or solidarity. When there is less wealth among one's neighbors, one may be more likely to engage in sharing activities with other poor individuals. Since the experimental design was such that the sessions were conducted with people from the same settlement who were familiar with one another, then the immediate context could explain the likelihood that they would be more prosocial, at least when it came to sharing, as in the DG and UG. In previous experiments in rural villages in Colombia (Cardenas 2003), we found that individual wealth and the social distance created by it among eight villagers reduced the level of cooperation in the group participating in a common-pool experiment. Assuming that those with fewer private productive assets were more familiar with, or more likely to engage in, interactions based on prosocial norms such as fairness, trust, and reciprocity, we were able to devise and sustain a more effective cooperative agreement in the experiment.

Other experimental work on related preferences observed in public goods and common-pool resources would also suggest that individuals who have fewer private opportunities and are more dependent on reciprocal relationships are willing to act in more prosocial ways. Edward Buckley and Rachel Croson (2006) report on a series of experiments showing that, consistent with their analysis of charitable giving, less-wealthy people are willing to contribute an equal or greater percentage of their income than are the well-off. In other experiments run in the field (Cardenas et al. 2002), under asymmetric payoff structures in which a fraction of users of a common-pool resource have poorer private opportunities (or exit options), those users were more willing to engage in cooperative behavior than those with less income dependence on the common pool and better private options.

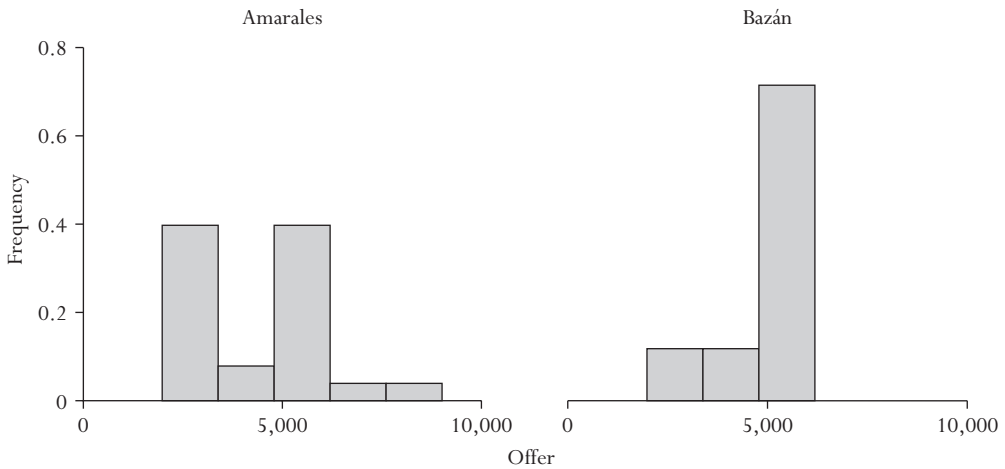
Further, the level of group poverty may have an effect on the reinforcement of social sharing norms. A small test across sites within our sample may raise evidence in this direction, although there are statistical limitations from the sample size. As mentioned earlier, we had to recruit participants from two neighboring settlements in this location, Bazán and Amarales, in order to complete our sample. There were differences in the average distribution of income and wealth, Bazán being a village with a higher fraction of much poorer people than was the case in Amarales. *T*-tests for the two indices wealth and income confirm a statistical difference between the two settlements.

Since the only experiment we ran in both sites was the third-party punishment game, we can only compare offers across sites for this sample. The small sample size restricts the power of the statistical test, but we do observe a higher frequency of fifty-fifty offers in Bazán, as shown in figure 16.9. Although there is no statistical difference in the distribution of TPG offers by players in Amarales and offers by those in Bazán, fifty-fifty offers were clearly made more often in the latter.

DISCUSSION: BACK TO HISTORY

Over the last three centuries, the history of human occupation of the mangrove forest on the Pacific Coast of Colombia has shown a set of patterns that include a permanent interaction with and high dependence on the ecosystem—and therefore on resolving the common-pool dilemma by devising institutions that align the interests of the individual and the group. For such institu-

FIGURE 16.9 *Distribution of Third-Party Punishment Game Offers by Player 1s in Amarales and Bazán*



Source: Author's compilation based on author data.

tions to work—at least in these regions where external enforcement by the state is relatively rare—social groups must comprise individuals who have more prosocial preferences in terms of fairness, altruism, reciprocity, and cooperation (Ostrom 1998).

The history of these settlements has also shown that informal social networks and acts of solidarity are essential to survival and may be a response to the state's capacity to provide public goods and infrastructure to this region compared with other rural regions in the country. Restrepo (1996b) highlights the importance of relations of solidarity among the black slaves and among the indigenous population on the Pacific Coast during the slavery eras in mining. Before slavery was abolished, some slaves were able to buy their own freedom by working on the weekends, when, for cultural and religious reasons, the *encomienda* and mining enterprises did not operate. Early settlements of free slaves and *cimarrones* (slaves that had escaped), called *palenques*, emerged at a time when extractive economic activity—from the mining of gold to the extraction of *caucho* and *tagua*, logging, and the exploitation of other valuable resources, depending on the period—operated in the absence of a state and endogenous systems of rules. The concept of “*minga*” (“*minga*” refers to a communal institution where individuals in a village contribute with labor to a task that produces a public good) was also present in these coastal communities and in the upper Andean lands, where indigenous cultures had used it for millennia for collective action. However, *minga* has now been displaced by the idea of “*cambio de mano*,” or hand-exchange, in which an individual “contributes” with personal unpaid labor to producing something for someone else who will later reciprocate by giving the former an equivalent unit of unpaid labor (Restrepo 1996a). Therefore, the behavior in the experiments reported here was of no surprise to the observers and to the participants in informal interviews.

Fifty years before this study, another anthropologist, Thomas Price (1955), reported on the strength of the social preferences of the Afro-descendent people of this region. This passage, cited by Restrepo (1996b, 180), eloquently describes what the experiments in this study capture about the behavior of the Sanquianga people:

Relatives, compadres and friends are accustomed to give each other whatever food which they have on hand over and above the immediate requirements of the family, especially to those who are known to be [in] need. Any individual can relate the names of many person[s] to whom at one time or another he has given food; some of these have eventually reciprocated, while the others may be called on when the need arises. As an instance of the way in which it works, the case may be cited of man who, though his neighbors declared that he had once been in a comfortable situation, had been without work for [some time]. Though he [had] no money [and] his prospect of [a] job [was] rather dim, both he and his wife seemed well fed. He was very much given to [taking] long walks, at the end of which he would inevitably return home with several large plantains, ucca, and the like, announcing that by chance he had encountered a friend who, after inquiring about his family [and] determining in the typically indirect way that the informant was in need, [had] given him these gifts. In conversation, it [became] clear that the one who had given him the food had in the past been in the same situation, and had benefited from similar gifts of food. (Price 1955, 20)

More than five decades have passed since Price described the prosocial behavior of the people of Sanquianga. Similar assessments were later made by another anthropologist, Nicole Pujol (1970), regarding the prosocial behavior of black communities on the Pacific Coast of Colombia. Her work was a biological and physiological anthropological study of blacks in the region, but in her notes she highlighted their higher levels of morality, hospitality, and abnegation compared to whites.

Not much has changed in the activities that support the livelihoods of the Sanquianga people and the social norms that support the reciprocal exchange of gifts among them. The experimental design we used in this project allowed us to explore the motivations for such behavior and ponder the reasons why fairness remains a strong motivator for action today, given the persistent levels of poverty still suffered in this region.

This chapter has definitely been a collective effort. My first thanks go to Lilliana Mosquera, who was the main research assistant in the field for these experiments. Ana Maria Roldán and Pablo Ramos also provided major assistance in the field, and Natalia Candelo processed the data. My colleagues Diana Maya and Maria Claudia Lopez played a major role in the field and in the experimental design and its adaptation to the context. Ximena Zorrilla and Carmen Candelo have always been very helpful with their enthusiasm and devotion in the field and toward the communities in Sanquianga. The people of Bazán and Amarales in Sanquianga deserve my gratitude as well, as does Eduardo Restrepo, a true scholar on the Pacific Coast social systems. Jean Ensminger, Abigail Barr, and Joe Henrich provided valuable inputs that made this a better chapter. An international fellowship from the Santa Fe Institute also provided ideal conditions for research.

NOTES

1. While the unemployment rate for the rest of the country is 11 percent, unemployment is at 14 percent for the Afro-Colombians living in various regions and mainly on the Pacific Coast. Primary schooling coverage is similar to the rest of the country. Secondary schooling reaches 62 percent of the population, while in the rest of the nation it reaches 75 percent. College-level education coverage is only 14 percent for this group, compared to 26 percent for the rest of the nation. The uninsured population encompasses 51 percent of the Afro-Colombians,

- while the rate is 35 percent elsewhere. Only 46 percent of the Afro-Colombian population has access to sewage systems, while such access has reached 81 percent in the rest of the nation. Further, 72.85 percent of the Afro-Colombian population are at high risk for malaria; in the rest of the country, less than one-third of the population is susceptible (Departamento Nacional de Planeación 2004).
2. The Spanish version of the protocols, instructions, and forms is available from the author.
 3. In fact, such recruitment rules were easily enforced by the same pool of potential participants willing to participate if they saw two people from the same household in one session.
 4. Juan-Camilo Cardenas and Jeffrey Carpenter (2008) surveyed papers from several studies in different countries around the world that had used the dictator game and thus should be more comparable to our study than those whose samples were college students in Western industrialized societies. For the Colombian student subject pools, the average offer was around 25 percent and ranged from 20 to 30 percent. For nonstudents, the average offer was 40 percent.
 5. Pairwise comparisons are not feasible since the participant samples in the DG and the TPG were different. For the hypothesis that the UG offers were higher than for the TPG, we obtain a t -test ($t = 1.3306, p > t = 0.0942$), with an average difference in offers of COP\$0.387, which is about 4 percent of the initial endowment.
 6. This player knew that he could reject any offer he wished, but had decided to accept any offer.
 7. We do not argue here that reciprocity is not playing a role in the experiments or in the daily social exchange of this society. On the contrary, reciprocity plays a major role for this group. Further, we argue later that ex post incentives outside of the field lab but within the subjects' group may also play a key role, as discussed in Cardenas (2004).
 8. There was one player 3 who had chosen to punish a 50 percent offer and not to punish the rest of the superior offers. These decisions were double-checked with participants during the game.
 9. In Cardenas (2004), I report a series of trust game experiments in which college students were recruited across four campuses and the only available information they had about the other player was the player's university affiliation, which mapped accurately the player's predicted socioeconomic status. Offers by player 1s were smaller when they came from higher-socioeconomic-status private universities, and especially when they were offers made to students in public universities with middle- and low-income populations.
 10. Eduardo Restrepo (1996b, 116) describes how the Sanquianga do not take the catch from a fishing day to the local market but rather keep it for the household and often share it with relatives, friends, and neighbors who may not have immediate access to fishing resources: "Los peces que se destinan para el autoconsumo, se utilizan tanto para el consumo doméstico como también pueden distribuir a los parientes o amigos cercanos que no tienen en ese momento acceso a ellos, o sea, que circulan por las redes de reciprocidad anotadas para el caso de la cacería o de la recolección."
 11. Notice that while wealth has a negative effect on offers in the DG and UG, education has a positive effect. Since education and wealth are not correlated for this group, one could reject the argument that wealthier people behave closer to the Homo economicus prediction because they better understand the incentives and rules of the game.

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