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## Introduction, Project History, and Guide to the Volume

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This work represents the second volume emerging from a collaboration among about two dozen anthropologists and economists that began in 1997. Our goal in this volume is to shed light on the historical emergence of prosocial norms and their relationship to economic growth. By contrast with other primates, how is it that human societies manage to solve problems collectively and entice individuals to operate against their own narrow, short-term, economic self-interest and instead engage in behavior that benefits the group as a whole, or some significant subset? We argue that understanding the origins of such prosocial behavior, including the willingness to pay a price to punish those who violate such norms, is a necessary condition prior to the ability to live in large social groups with complex divisions of labor. Life in larger concentrations is in turn essential to economic growth and productivity, thus affording higher economic well-being.

To approach this question, we have integrated analytical and methodological approaches from experimental economics with the richness, context, and depth of anthropological field ethnography. Our team has administered the same economic experiments, according to controlled protocols, in highly diverse societies around the world that live with different levels of sociopolitical complexity and involvement in the market economy. We have sought to interpret our findings in light of how daily life operates in these diverse locales. The purpose is to understand how the behavioral differences that we observe in the economic experiments map across the substantial spectrum of the societies that we sampled. Ultimately, by tapping the extant global diversity, our efforts begin to illuminate the mechanisms behind the coevolution of social norms, economic growth, and the emergence of complex societies (see chapter 2).

Our sample includes hunter-gatherers, slash-and-burn horticulturalists, livestock herders, fisherfolk, cash-cropping farmers, and wage laborers in industrialized societies. We have also drawn from an impressive geographical distribution that spans Africa, South America, Papua New Guinea, Siberia, Oceania, and North America.

We employ economic experiments in this endeavor because they provide a scientifically rigorous method to get a handle on otherwise squishy socioeconomic phenomena, which can be challenging to measure and compare. This approach involves playing games for nontrivial sums of real money. In a sense, this is a real economic decision, albeit in an unfamiliar situation. The use of nontrivial sums of money in a stark, simple decision situation has practical, ethical, and scientific advantages that we discuss in greater detail in later chapters. In brief, this serves to increase participation (allowing us to obtain representative samples), focuses the participant's mind on the task, and suppresses the kind of "cheap talk" that one often gets with similar "what

would you do?" hypothetical scenarios. While one might be able to devise alternative methods of measuring fair-mindedness, cooperation, social norms, and the willingness to punish norm violators in widely varying contexts, to date we are not aware that any other method has the potential for such broad, controlled comparisons.

The core experiments that we employed in phase 2 of this project and report in this volume are the dictator game (DG), the strategy method ultimatum game (UG), and the third-party punishment game (TPG) (see chapter 3 for extended discussion of the games and protocols). The dictator game is the closest thing we have to a pure measure of fairness. As is the case in all of our experiments, two players from the same community interact anonymously in the dictator game. Both players know that the money, a sum equivalent to one day's local wage, has been allocated to the pair, but that it is player 1's job to decide how to allocate it. Both players receive the actual money that player 1 "dictates." In experiments done in Europe and the United States, a fifty-fifty split is generally considered a "fair" outcome. By contrast, a rational money maximizer will dictate zero for player 2.

Our second game, the ultimatum game, adds a complication to the dictator game. In this version, player 1 makes the allocation to player 2 as before, but now player 2 has the option of rejecting the offer, in which case neither party receives anything. As in all of our experiments, both players have full knowledge of the rules of the game before play. In the UG version that we run, referred to as the "strategy method," we ask player 2 to respond to all potential offers (before hearing the actual offer), but we make clear that they are bound by their response to the specific offer level that player 1 actually makes. The behavior of player 1 in this experiment has elements of fairness, but also of strategy. Player 1 may prefer to make a low offer, but may make a higher one, anticipating that a low offer might be rejected by player 2. Furthermore, the behavior of player 2 in this game captures the price that people are willing to pay to punish player 1 for what they perceive to be an unfair offer. This willingness to punish an anonymous partner, at a personal monetary cost, can also be interpreted as a benefit to the group, since it cannot affect the future interactions of this pair, but it can have an impact on player 1's behavior with others in the future. This choice can also be interpreted as prosocial behavior, because there are positive externalities for society when those who might be inclined to violate norms of fairness, as might happen when one reneges on a contract, change their behavior because they anticipate that others are prepared to undertake such punishment at personal cost. Since a rational money maximizer would never reject any positive offer, a money-maximizing player 1 will make very low (but positive) offers.

Our third core experiment adds yet another element. In the third-party punishment game, two people play the equivalent of a dictator game, but there is a third player who is also endowed with money equivalent to half the amount that the first two are dividing up and whose existence, but not identity, is known to all players. The third player has the option of using part of her or his stake to punish player 1 for having made what player 3 considers an unacceptable offer to player 2. In this game, unlike the UG, the player paying a price to do the punishing is not the injured party. This is evidence of powerful prosocial behavior aimed at ensuring that members of society abide by local norms. As in the UG, since a money-maximizing player 3 would never pay to punish, a money-maximizing player 1 will offer zero to player 2.

Among the diverse societies that we study, we see a great deal of evidence that people do not play these games as money maximizers. As we explore the highly diverse behaviors that emerge across our global sample, we begin to see patterns that shed light on the coevolution of social norms of fairness and punishment, together with the development of markets, world religions, and life in denser populations with more complex sociopolitical systems.

This chapter has two aims. First, we provide a brief and personalized history of the overall project. Second, we outline the organization and content of the volume, highlighting some of the key topics covered in each chapter.

## THE HISTORY OF THE PROJECT

Our story begins during the winter quarter of 1995 in Robert Boyd's graduate seminar in the Anthropology Department at UCLA. Boyd had just returned from a small conference that was part of the MacArthur Foundation's Preferences Network, an interdisciplinary group of researchers focused on understanding the nature and origins of human preferences, with the goal of improving our models of human decisionmaking (for details on this group, see Henrich et al. 2004, ch. 1). In the seminar, Boyd casually presented what he had learned at the conference about recent work in behavioral and experimental economics, and in particular he discussed the ultimatum game. Joe Henrich, a graduate student at the time who had been working on economic decisionmaking and cooperation among an indigenous population in the Peruvian Amazon called the Machiguenga (Matsigenka), was particularly intrigued because he had been studying models of the evolution of cooperation and also trying to figure out why he observed so little cooperation among the Machiguenga. After some reading in experimental economics, Henrich developed a protocol for the ultimatum game and ran it that summer with Machiguenga participants in the village of Camisea, along the Urubamba River. In the week leading up to his departure, Henrich told Boyd of his plans, and both had the intuition that Machiguenga would probably behave like other populations.

Henrich's preliminary results were surprising, as they sharply contrasted with prior results that had been robust across diverse industrialized countries. The Machiguenga made low offers and would not reject, while in previous cross-cultural work people had made much higher offers and would reject low offers. In describing the results to Boyd, Henrich worried that there might have been a problem with the protocol design or the implementation. Nevertheless, Boyd felt that this was worth pursuing, and on the advice of Colin Camerer, Henrich and Boyd requested and received funding for a U.S. control experiment to see if the anomalous results could be traced to the particular protocol. With a stake of \$160 selected to match the Machiguenga stakes, UCLA graduate student subjects split the money fifty-fifty in the ultimatum game, with a single exception. This result, in line with the work of others, gave Henrich confidence that the Machiguenga result might be robust and indicative of strong population-level differences. The next summer Henrich returned to the Machiguenga, along with Natalie Smith (now Natalie Henrich), and performed more experiments, including a common pool resources game. The ultimatum game data converged with the common pool resource game data: the Machiguenga of Camisea were behaving quite differently from prior populations (Henrich 2000; Henrich and Smith 2004).

Around this time Henrich was invited to the Society for Economic Anthropology in Guadalajara, Mexico, where he presented his nascent experimental work with the Machiguenga. The anthropologists' reaction was a mix of dismissal, disdain, and some interest. Immediately after his talk, Jean Ensminger approached Henrich, and an enduring collaboration was born, as Ensminger would later team with Henrich in spearheading phase 2.

The Machiguenga research became pilot work in Boyd and Henrich's effort to write a larger proposal for the Preferences Network at the MacArthur Foundation. The proposal was intentionally inductive, seeking to "see what's out there," but the proposal did lay out the social, ecological, and economic variables that might relate to game play, including social stratification, level of sociopolitical complexity, market integration, and sedentism, as well as the potential effects of property rights, context, mediums of exchange, and a variety of other methodological

issues. The proposal was funded, and Boyd began writing letters to researchers who had interesting field sites and might be interested in collaboration. The invitation was to run the ultimatum game in diverse human societies.

In January 1998, a group of anthropologists were assembled at UCLA, along with key members of the Preferences Network, including Samuel Bowles, Colin Camerer, Catherine Eckel, Ernst Fehr, and Herbert Gintis. Basic concepts in game theory were presented along with experimental techniques, and methodology was discussed at length. The focus shifted away from the more specific hypotheses to whether these kinds of experiments were at all feasible at most field sites. Was it logistically possible to run identical experiments in a diverse sampling of small-scale societies? Many at the meeting wanted to create a standardized protocol, but most efforts to stipulate a particular way of doing the experiments were met with practical concerns from at least one fieldworker. Consequently, we did not create a rigorous protocol, but provided only guidelines in order to give researchers the flexibility to adapt in the field. In hindsight, this was a mistake, but under the conditions of extreme uncertainty regarding feasibility, it was probably necessary to get the project off the ground.

Over the next two years, the experiments of phase 1 were completed, and we reconvened at UCLA to present and discuss our findings. Along the way, fieldworkers dropped out and new ones were drafted. In the end, the phase 1 research group was composed of the following fieldworkers (and research sites): Michael Alvard (Lamalera, Indonesia), Abigail Barr (Shona, Zimbabwe), Jean Ensminger (Orma, Kenya), Francisco Gil-White (Torguuds and Kazakhs, Mongolia), Michael Gurven (Tsimane', Bolivia; Ache, Paraguay), Joseph Henrich (Machiguenga, Peru; Mapuche, Chile), Natalie Henrich (Machiguenga, Peru), Kim Hill (Ache, Paraguay), Frank W. Marlowe (Hadza, Tanzania), Richard McElreath (Sangu, Tanzania), John Q. Patton (Achuar and Quichua, Ecuador), and David Tracer (Au and Gnau, Papua New Guinea). These findings were presented in our 2004 volume (Henrich et al. 2004), *Foundations of Human Sociality: Economic Experiments and Ethnographic Evidence from Fifteen Small-Scale Societies*, as well as in syntheses published in the *American Economic Review* (Henrich et al. 2001) and *Behavioral and Brain Sciences* (Henrich et al. 2005).

Phase 2 of the project began in 2002 when we (Ensminger and Henrich) teamed up to write a proposal for a second round of experimental work for the National Science Foundation. This proposal eventually was cofunded by the programs for economics, anthropology, and decision, risk, and management sciences. Phase 2 aimed to improve on the first phase, both methodologically and theoretically. We designed a package of three one-shot bargaining experiments, including an alternative (strategy method) version of the ultimatum game (allowing us to replicate our prior work), paired with both a dictator game and a third-party punishment game. Methodologically, our team had now established that economic games of this type could be done in small-scale societies, so it was time to push the bar of methodological rigor higher, by creating standardized protocols including pregame tests, scripts, postgame interviews, and procedures to specifically address the many criticisms and concerns we and others had regarding our first efforts (many of these are discussed in the commentaries in Henrich et al. 2005). In an effort to understand what our experiments actually measure, we also proposed to explore the effects of contextual manipulations, double-blind treatments, and social networks. Theoretically, in a manner consistent with a coevolutionary approach to motivations and social norms, findings from the first phase suggested that ultimatum game offers are related to market integration. But, while suggestive, we had only a subjective rank variable for market integration at the population level, and no systematic data across groups to control for variables such as income, wealth, and education. Thus, our efforts in the second phase focused on gathering variables to measure market integration, along with nineteen other variables to address alternative explanations for any patterns we might unearth (see chapter 3).<sup>1</sup> For the sites in phase 2, we retained four of the populations

from phase 1 (allowing us to check for replication) and added twelve new sites. In particular, we sought to add another Papua New Guinea site so that we could examine more deeply the unusual findings from phase 1, which diverged from our market integration hypothesis. Thus, if we replicated our findings for market integration, we would be doing so with a largely new sample of societies, including one additional New Guinea population that was specifically selected because it challenged our prior results.

The goal of this volume is to document and synthesize phase 2 of what has come to be called the Roots of Human Sociality Project. This work aims to complement our journal publications on phase 2 (Henrich, Ensminger, et al. 2010; Henrich et al. 2006; Marlowe et al. 2008) by providing a more expansive and detailed theoretical context and compilation of our efforts, communicated in a more widely accessible manner.

In 2001–2002, Ensminger piloted an early version of our protocol among the Orma in Kenya and in rural Missouri. This version included dictator games (chapters 5 and 18), double-blind dictator games (chapter 5), and strategy method ultimatum games (chapter 18, available at: <http://www.russellsage.org/Ensminger>). At a workshop in 2002 at the California Institute of Technology, we pulled the new phase 2 team together; in a marathon of intense discussion informed by the pilot experience, as well as the experiences of many team members who had participated in phase 1 and subsequently run additional experiments on their own, we hammered out a protocol involving three games: the dictator game, the strategy method ultimatum game, and the third-party punishment game. We selected these games because we thought that they would work across sites and would permit us to replicate and greatly expand our earlier work. This was an immensely difficult task and required considerable honing before the final protocols, scripts, and survey instruments for the collection of the social and economic demographic data could go back out to the group.

The phase 2 fieldwork occurred in 2003 and 2004, and we met at Caltech in 2004 to present and discuss our results. In the end, the researchers who arrived with data and chapters in hand are represented in this volume: Abigail Barr (Accra, Ghana), Clark Barrett (Shuar, Ecuador), Alex Bolyanatz (Sursurunga, Papua New Guinea), Juan-Camilo Cardenas (Sanquianga, Colombia), Jean Ensminger (Orma, Kenya; Missouri, United States), Mike Gurven (Tsimane', Bolivia), Laban Gwako (Gusii and Maragoli, Kenya), Joseph Henrich and Natalie Henrich (Yasawa Island, Fiji; Emory University undergraduates, United States), Carolyn Lesorogol (Samburu, Kenya), Frank W. Marlowe (Hadza, Tanzania), Richard McElreath (Isanga village, Tanzania), David Tracer (Au, Papua New Guinea), and John Ziker (Dolgan and Nganasan, Siberia). Andrew Harris was a research assistant to the project and compiled all the data sets into a single master file.

## A GUIDE TO THE VOLUME

This volume is broken into two parts. Part I consists of five chapters, which introduce the project and present an integrative discussion of the overall effort; part II presents the findings from each of the individual research sites. (Part I is available in print or as part of the eBook; Part II is available only digitally, either as part of the eBook or as a free download, which can be found at: <https://www.russellsage.org/publications/experimenting-social-norms>.)

### Part I: Theory, Method, and Comparative Analysis

Part I presents the theory, methods, and empirics from the aggregate analysis of all sites, focusing on explaining the mechanisms underlying the cross-population variation in social norms. Chapter 2 lays out our theoretical framework for thinking about social norms, individual decisions,

development, and cultural evolution. It draws from diverse literatures on social norms—including evolutionary and classical game theory, economic theory of institutions, economic history, neuro-economics, child development, cognitive science, and ethnography—to develop an understanding of what behavioral games measure and a set of predictions regarding what to expect in analyses of our bargaining experiments across diverse societies.

Chapter 3 presents our background and methodology and provides details on our experiments, protocols, field sites, and socioeconomic data collection. This chapter has been written not only to document how we proceeded but also to help guide future researchers by warning of logistical pitfalls associated with field experiments and the general lessons we have learned. It also includes remarks about running large-scale, cross-cultural projects that should have relevance to other collaborative projects, whether experimental or not.

Chapter 4 synthesizes the major empirical findings from our comparative analyses. These findings largely replicate and extend our prior efforts based on results from the ultimatum game by showing that fairness, as now measured in three behavioral experiments, varies substantially across societies in a manner positively associated with degrees of market integration. While controlling for seven economic and demographic variables, we also show that participation in a world religion (Christianity or Islam) is associated with higher offers. From our measures of willingness to punish unfairness in two different experiments, our analyses show a strong positive relationship with community size, such that people from larger communities are more willing to punish unfairness even in these one-shot anonymous experiments.

Field experiments were extremely rare prior to our first volume, and most particularly among small-scale, remote populations. As a consequence, some readers of our original set of experiments wondered if there could be unknown effects resulting from the experimenter-subject interaction that explained some of the differences between our results and those typical of Western experiments done largely with university populations. In our final chapter in part I, we set out to test whether there was an “experimenter effect.” In chapter 5, Carolyn Lesorogol and Jean Ensminger report on the paired double-blind and standard dictator game protocols run in three of our study sites: Orma, Samburu, and rural Missouri. In the double-blind protocol game, administrators are prevented from knowing what participants do in the experiment and subjects know that their behavior is anonymous, even to the experimenters. What we learned is that compared to our standard single-blind treatment, in which the experimenter knows the player’s decision, double-blind treatments matter little among the Orma and Samburu in Kenya, where people were just as generous when they knew that no one, not even the researcher, would know how they had played. Among nonstudent adults in rural Missouri, the double-blind treatment mattered less than is typically the case among American undergraduates (Cherry, Frykblom, and Shogren 2002), but it affected their behavior significantly more than it did among the two African populations. These results encourage us by suggesting that the experimenter effect may be absent in the developing world when the experimenter and subject are of different ethnicities, which is the case in all but one of our case studies (the Gusii, chapter 12, available at: <http://www.russellsage.org/Ensminger>).

## Part II: Society Case Studies

The chapters in part II of the volume are written by the fieldworkers and focus on within-site variation. Each author presents and interprets the data from his or her own field site, based on their own experience, ethnographic knowledge, and other sources of data. Presentations across chapters are standardized: each chapter provides ethnographic background on the population and details on any methodological variations on those presented in chapter 3 or protocol

anomalies. The presentation of results is also standardized to a large degree; that standardization was built into the project protocol, as the same six demographic control variables (age, sex, education, individual income, household wealth, and household size) were collected at almost all sites. Each author presents histograms of these basic demographic data, presents some of the same plots of the game data, and provides within-site regression analyses, including the control variables. Beyond that, researchers were encouraged to include any additional analyses or plots they felt were appropriate and to interpret their findings as they saw fit.

In the following summary of each of the chapters, we have attempted to highlight aspects of the findings from a given site that correspond to or contrast with overall data trends in the cross-cultural comparisons. We have only occasionally referenced the demographic variation internal to specific societies, as these are often too complex to capture out of context. However, we have also highlighted some interesting ethnographic explanations by the authors for the variations off the trend, and these may lead others to propose and scientifically test new propositions in future research.

The chapters progress from least to most market-oriented, as measured by the percentage of calories purchased in the market versus those procured from hunting, gathering, fishing, cultivation, animal husbandry, or other home production. This organization of the chapters roughly tracks the change in subsistence from more nomadic foraging to shifting cultivation, horticulture, pastoralism, cash crop production, and wage work.

The first three chapters discuss three societies with virtually no market integration: the Hadza (Marlowe, chapter 6), the Au (Tracer, Mueller, and Morse, chapter 7), and the Tsimane' (Gurven, chapter 8). All three chapters are available at <http://www.russellsage.org/Ensminger>. They are also the only three societies in part II of the book that were part of phase 1 of the project. Despite using a different protocol and script, one involving the strategy method, this work largely replicates the same unusual findings seen in phase 1, with some qualifications among the Tsimane'.<sup>2</sup>

In chapter 6, Frank Marlowe returns to the Hadza of northern Tanzania, where he conducted phase 1 experiments (Marlowe 2004). The Hadza are our only nearly pure hunting-and-gathering population and our only society with no conversion to a world religion; they also have virtually no market integration. Consistent with the overall trend that we find in our cross-cultural data, the Hadza, at the lowest end of our market integration spectrum, make the lowest-average offers in the DG (26 percent) and the UG (26 percent). Contrary to what we might expect of people who make low offers, however, the Hadza have a relatively high rejection rate given their low offers, though it is still the case that a proposer’s income-maximizing offer is 10 percent, the lowest positive offer. Such low offers and relatively high rejection rates parallel the Hadza findings from phase 1.

The addition of the third-party punishment game (TPG) in phase 2 provides us with the most intriguing results for the Hadza, as they are not inclined to engage in third-party punishment. Thus, while the Hadza will avenge a personal slight to themselves (as is the case with a low offer in the UG), they appear much less willing to pay a price to punish an injury to a third party (as in the TPG). Marlowe comments that this corresponds with the general failure of the Hadza to sustain collective action efforts. He notes that the Hadza agree among themselves to make a concerted effort to keep their agro-pastoralist neighbors out of their area, but the same individuals then turn around and undercut such initiatives by begging and trading with these same neighbors, thus eroding Hadza solidarity. Notably, there is a tendency for those living in larger Hadza camps to punish more in the TPG. This pattern replicates the overall trend that we see across societies. As settlement size increases, we see a greater tendency toward third-party punishment. This is the basis for our coevolutionary argument that the institution of third-party punishment was a

necessary development before people were able to sustain life in larger communities. Over the four camps studied, the average camp size among the Hadza who played these games is forty-three—less than half the size of the next-smallest in our cross-cultural sample—so low TPG punishment in this society is consistent with our overall thesis.

While the Hadza are full-time foragers, the Au of Papua New Guinea have a highly diversified forager-horticulturalist subsistence that also includes some pig and chicken husbandry and small-scale cash-cropping. As detailed by David Tracer, Ivo Mueller, and Jennifer Morse in chapter 7, the Au have minimal wage employment, and they are one of the poorest groups in Papua New Guinea. Unlike the Hadza, the Au have been converted to Christianity. The average village size among game subjects was 309.

Tracer also participated in phase 1 of the project, and the Au produced some of the most interesting behavior in the original UG experiments: many Au made hyper-fair offers in the UG (above 50 percent), and those offers were often rejected. Although those results ran counter to our overall hypothesis regarding market integration, they have a well-known foundation in Melanesian ethnography. Tracer explains that norms of generosity and gift-giving are pervasive and intrinsic to the sociopolitical structure of Melanesian society. As he puts it, “The giving of an unsolicited gift generates prestige for the giver and incurs a debt for the recipient.” One interpretation of the rejection of high offers is that people were bringing their internalized social norms into the context of the game and behaving as they would have behaved outside the laboratory. When confronted with a large gift, they chose not to take on the obligatory debt of reciprocity that they assumed to be associated with it. Such norms are characteristic of Melanesia in general, and to test the robustness of this unusual behavior we purposely sought out another Melanesian sample (the Sursurunga) to add to our phase 2 project (see Bolyanatz, chapter 11, this volume, available at: <http://www.russellsage.org/Ensminger>).

Working in three Au villages, phase 2 produced results that replicated Tracer’s phase 1 results: the mean offer of the DG is 41 percent, the mean in the UG is 44 percent, and the Au display high punishment in the UG. Like the Hadza, the Au are also inclined to punish in the UG. Unlike the Hadza, however, the Au also punish high offers in the UG, and their hyper-fair punishment rates increase as the offers approach 100 percent, yielding a distribution with a U-shaped curve on which no punishment is at fifty-fifty.

Our third case study with exceptionally low market integration comes from the Amazon. Michael Gurven also returned to his phase 1 population, the Tsimane’ of Bolivia. The Tsimane’ are forager-horticulturalists who usually live in small, dispersed villages. Across the two villages studied this time, the average village size of participants in these games was 314, and Tsimane’ report Christianity as their religion. They live off their horticulture, fishing, hunting, and gathering. Like the Hadza, the Tsimane’ make low offers in both the DG (26 percent) and the UG (27 percent). But unlike the Hadza, they fail to punish in either the UG or the TPG. Only one out of thirty-three players reject an offer of 10 percent in the UG, and 36 percent do not even reject an offer of zero. The Tsimane’ UG offers for the phase 2 study reported here are lower than the Tsimane’ offers from previous experiments conducted by Gurven in three villages, but consistent with those from two other villages. Gurven has written about the tendency for offers among the Tsimane’ to vary by village, but he has had difficulty pinning down the variables that may be related to the differences (Gurven 2004; Gurven, Zanolini, and Schniter 2008). The results reported in this chapter (low offers and low punishment) are extremely consistent with those reported for the Machiguenga (Henrich 2000), who share many ethnographic similarities with Tsimane’ villagers (Johnson 2003).

Our next three case studies are all new sites and come from horticultural societies with a low level of market integration (20 to 25 percent): the Yasawans of Fiji (Henrich and Henrich,

chapter 9), the Shuar of Ecuador (Barrett and Haley, chapter 10), and the Sursurunga of New Ireland, Papua New Guinea (Bolyanatz, chapter 11). Chapters 9, 10, and 11 are all available at <http://www.russellsage.org/Ensminger>. Among these three societies we find high levels of conversion to Christianity, except among the Shuar: roughly 17 percent of that sample do not identify as Christians.

In the northwestern corner of the Fijian archipelago, Yasawa Islanders are quite a relatively isolated population who subsist on root-crop horticulture, littoral gathering, and fishing; access to wage labor is quite rare, but trade in basic commodities is common. In chapter 9, Joseph Henrich and Natalie Henrich provide a particularly detailed description of the importance of cooperative labor activities in the two study communities, which average 110 members. All residents identify with one of several Christian churches. Yasawan mean offers in the DG and the UG are 35 and 39 percent, respectively. The Yasawa show little willingness to punish low offers in the UG, including offers of zero. Like a number of our other societies, however, they do exhibit a weak to moderate U-shaped curve in UG punishment, such that their tendency to punish hyper-fair offers over 50 percent increases as the offers approach 100 percent. People’s willingness to punish in the TPG is also relatively mild.

In an effort to test even more plausible variables that might explain intracultural variation, Henrich and Henrich add a number of measures not found in the other case studies. To capture individual social status within the village they use a measure of network centrality and add it to the same six demographic variables used in all sites. They have also computed the average degree of relatedness to other members of the local population and within the particular game session. None of these additional variables, however, explain intrasocietal variation among this population.

In addition to running the games on Yasawa Island, the Henrichs also played the full set of games (DG, UG, and TPG) among Emory University undergraduates; these results are also reported in chapter 9. This was done in order to create a baseline for comparison between the project protocol of phase 2 games and the many university samples that exist in the literature, as well as the adult population sampled in rural Missouri (Ensminger and Cook, chapter 18, available at: <http://www.russellsage.org/Ensminger>). The Emory undergraduate offers in the DG and the UG are consistent with what others have observed among university populations, but are considerably lower than what we observe among the adult population of rural Missouri, as well as among other nonstudent adult populations in developed societies (see Ensminger and Cook, chapter 18).

The Shuar (Barrett and Haley, chapter 10, available at: <http://www.russellsage.org/Ensminger>) of the Ecuadorian Amazon, whose economy is based primarily upon horticulture and hunting, represent our second moderately low-market-integration society. Culturally, they are closely related to the Achuar in Ecuador, who were studied in phase 1 (Patton 2004). Their society is currently in a state of considerable flux as roads and markets are encroaching and animal and fishing resources are being depleted. Across two villages, the mean village size is a moderately high 498, and 76 percent of the population identify themselves as Christian, while the remainder do not identify with a world religion. At the time of Clark Barrett and Kevin Haley’s study, people were not realizing much income in the form of market exchange, and they were nutritionally stressed. Like the Tsimane’, the Shuar have historically lived in small, family-based villages, but maintain indigenous institutions of communal work parties and norms of cooperation. In this regard, the Shuar resemble the Tsimane’ more than Yasawans, for whom the more pervasive ethos is communal and cooperation.

Shuar mean offers in the DG (35 percent) and UG (37 percent) are similar to those of the Yasawa (35 and 40 percent, respectively), as is their mean minimal acceptable offer in the UG

(7 percent in both cases). Just like the Yasawa, 30 percent of the Shuar are unwilling to punish offers of zero in the UG. However, the Shuar diverge considerably from most of the other societies discussed up to this point (with the exception of the Au) when it comes to their punishment behavior in the TPG. Although the Shuar engage in limited punishment in the UG, they are quite active in third-party punishment. About 40 percent will pay to punish offers as high as 40 percent. Among the six low- to moderate-market-integration societies discussed up to this point, only the Au are more aggressive in third-party punishment. Shuar offers also are a bit less than those of the Achuar, who offered 43 percent in phase 1.

The Sursurunga (Bolyanatz, chapter 11, available at: <http://www.russellsage.org/Ensminger>) were added to our project in phase 2 in an effort to further explore the unusual findings from Tracer's phase 1 work among the Au and Gnau, where the results ran counter to the main body of our findings: the society had low market integration, but high offers in the UG. Tracer's (2004) explanation for this was rooted in the ethnography of Melanesia, where societies are well known for excessive gift-giving, as well as a reluctance to take on such indebtedness, which Tracer speculated might account for both their willingness to make and reject offers over half of the stake. We wished to explore this explanation for game behavior by including a third Melanesian society.

The Sursurunga of New Ireland, Papua New Guinea, are swidden horticulturalists who occasionally fish, gather shellfish, and plant cash crops. Purchased rice is a regular part of their diet. The road through this area has deteriorated since the 1990s, and this population's involvement in the market economy has actually declined in recent years as economic hardship (less wage work and cash-cropping) has forced them back to more subsistence production. Across three villages, the average village size is low, at 187 people.

Relative to the Au, the Sursurunga are from a geographically distant part of Papua New Guinea, but like the Au, they display the same Melanesian predilection toward extensive gift-giving, and indeed, Alexander Bolyanatz's findings substantially extend Tracer's earlier work, as did the work of Tracer's team in phase 2 of the project reported here (chapter 7, available at: <http://www.russellsage.org/Ensminger>). Sursurunga mean offers in the DG exactly match those among the Au, with a mean of 41 percent. Their UG mean offer of 51 percent is even higher than that of the Au (44 percent). Like the Au, they both make and reject many hyper-fair offers in the UG. The main difference between the two is that the Sursurunga do more punishment across the board in the UG, rejecting even offers of half the stake 28 percent of the time. Like Tracer, Bolyanatz interprets the behavior of the Sursurunga in terms of their ethos of balanced reciprocity and equality. Delving more deeply into this possibly pan-Melanesia pattern, Bolyanatz argues on the basis of ethnographic evidence that this "giving with a purpose" is more rational self-interest than altruism in the context of this society, in which there is a strong tendency to wish to avoid receiving too much. Aggressive gift-giving is perceived as a premeditated effort to publicly humiliate a rival, enemy, or detractor; "giving is an unfriendly, even somewhat hostile act because it is an attempt to exert control over the behavior of another." These observations help explain the behavior of both the Au and the Sursurunga, who are our two main outlier populations with respect to the overall tendency for offers to increase with market integration.

Our next two case studies are from Kenya, and both are cash-cropping farmers who are far more economically integrated than the previously discussed populations. Nevertheless, the Gusii and Maragoli, studied by Edwins Gwako (chapter 12, available at: <http://www.russellsage.org/Ensminger>), do not score as highly on our market integration variable as one might expect (28 and 43 percent, respectively), primarily because they are rural, agrarian societies that still live off their own produce. However, their mean education (most have completed high school) is dramatically higher than that of the societies we have previously discussed, as are other signs

of their connection to the global market. For example, many absent family members engage in long-distance wage labor in large cities. Both populations also live in large settlements that average close to four thousand, and both are devout Christians. Gwako collected data from three communities in each population.

Although these two ethnic groups are distinct today, they do share a common ethnic ancestry; however, the particular populations who participated in the experiments faced dramatically different economic circumstances. A major difference between the two societies is that the Maragoli have extremely high population density, and at the time of the experiments a severe drought was adding to that stressor. In contrast, the Gusii studied here have large farms and are significantly wealthier, and the experiments were conducted in a normal year.

The most striking result from this pair of studies is the exceptionally high level of prosocial punishment that we find among both groups in both the UG and the TPG. These are the highest measures of punishment reported in any of our societies. Both societies have highly effective organizations for collective action, and Gwako posits that these organizations function because both societies have developed social norms to contend with free riders, and that is what is captured in the exceptionally high punishment behavior in the games. Both societies are also conservative Christian, with high levels of religious participation, and this could also be a factor in their punishment behavior. These societies live in the largest communities that we sampled, which is consistent with our theory of the coevolution of prosocial punishment and the ability to sustain cohabitation in large groups.

Moving up the market integration spectrum, the next two studies come from former and current pastoralists: the Dolgan and Nganasan of Siberia (Ziker, chapter 13, available at: <http://www.russellsage.org/Ensminger>) and the Samburu of Kenya (Lesorogol, chapter 14, available at: <http://www.russellsage.org/Ensminger>). These groups are relatively highly integrated into the market economy: at 63 and 69 percent, respectively, and their levels of market integration are similar to those of the Orma pastoralists (72 percent), who participated in only the DG (see Lesorogol and Ensminger, chapter 5).

The Dolgan and Nganasan (Ziker, chapter 13, available at: <http://www.russellsage.org/Ensminger>) are historically distinct ethnic groups in northern Siberia, but most have lived together in modern permanent villages since the 1960s and 1970s, as did this study population. While the Dolgan were historically reindeer pastoralists who also hunted, fished, trapped, and engaged in mercantile trading, they settled into work collectives in the Soviet era. The Nganasan were historically known for wild reindeer hunting and used small herds of domestic reindeer for decoys. Another distinction between the two groups is that the Dolgan accepted Russian Orthodoxy in the nineteenth century (96 percent so identify), while the Nganasan continued to have active shamans into the 1970s (and only 12 percent of the players identify as Christians). Today both the Dolgan and the Nganasan receive state support and continue to hunt wild reindeer, to fish, and to trap. They consume reindeer or fish at almost every meal. The village from which all players were drawn has 612 residents.

The mean DG (37 percent) and UG (43 percent) offers of the Dolgan and Nganasan place them just slightly below the predicted expectation for our full sample of fifteen societies based on market integration alone. In the demographic regressions for this population, income is strongly correlated with DG offers, but this does not hold for the UG. John Ziker makes the important point that it is unclear to what extent this is strictly an income effect, as opposed to a proxy for intrasocietal variation in market integration and familiarity with modern institutions. Most of those with high incomes are teachers and civil servants, who have the most interaction with outside bureaucracies and institutions. Particularly successful (high-income) hunters and fisherman also tend to be involved in more market and trade relations. The regression analyses

also show large positive effects for attendance at religious service on DG offers, though not on UG offers. The rejection behavior for the Dolgan and Nganasan in the UG falls roughly in the middle of our cross-cultural sample, which is also consistent with their mid-ranking status by market integration. The TPG was not conducted among this population.

Our next-highest market integration study also focused on a pastoralist community, the Samburu of Kenya (Lesorogol, chapter 14, available at: <http://www.russellsage.org/Ensminger>). Unlike the Dolgan and Nganasan, the Samburu are still active herders of cattle, sheep, goats, and increasing numbers of camels. Their economy has seen many changes in recent years, however, including increasing economic diversification (including some cultivation) and labor migration for wage employment. Many petty trading activities provide income, especially for women, while men try to pursue livestock marketing if they can muster the capital. Land tenure has also changed, as this area became a group ranch in the 1970s. Sixty-six percent of the Samburu identify as Christian, while the remainder practice their indigenous religion. Samburu mean offers in the DG (40 percent) are extremely similar to the mean DG offers (42 percent) of the pastoral Orma of Kenya (see Lesorogol and Ensminger, chapter 5), as are their levels of market integration (69 versus 72 percent, respectively).

Carolyn Lesorogol's Samburu study was one of only two of our studies (the other was Gwako's study of the Maragoli, chapter 12, available at: <http://www.russellsage.org/Ensminger>) in which the mean DG offers (40 percent) came in higher than the mean UG (35 percent). As per protocol, the same players were player 1 in both the DG and the UG in a long one-day session of play. In both cases the authors speculate that those who had been particularly generous in the DG may have decided to bring down their average offers by giving less in the UG. Lesorogol notes that all six of those who made hyper-fair offers in the DG reduced their offers in the UG, with an average decline of 32 percent. Nevertheless, it is worth noting that higher DG offers, compared to UG offers, have been reported using a different protocol, where this explanation does not hold (Henrich and Henrich 2007, ch. 8).

Perhaps the most interesting finding among the Samburu is their relatively low punishment in the UG and their high punishment in the TPG. Lesorogol provides a plausible ethnographic explanation for this behavior. She explains that third-party punishment is common among the Samburu. The council of elders routinely adjudicates cases and imposes fines. The notion of a third party sitting in judgment over an exchange between two independent parties is highly familiar to the Samburu. For this reason, players may have comfortably taken on the role of the third party in the TPG and exacted fines against player 1 for perceived unfairness toward player 2. Like almost all of the other societies with high TPG punishment, the Samburu also live in moderately large communities (survey population: 2,000).

Our next study site, the town of Isanga in southwestern Tanzania, shares roughly the same high level of market integration (70 percent) as the pastoral groups, but shows slightly lower fair-mindedness in the DG (36 percent) and UG (38 percent). This is a mixed-ethnic population in which the largest ethnic group (the Nyakusa) makes up about 50 percent of the otherwise highly ethnically diverse population. The population is semi-urban (1,500 individuals) and located one mile from the regional capital of Mbeya. The majority are Christian, and the rest Muslim. Commerce, wage labor, service industries, farming, animal husbandry, and petty trading create great economic diversity in this peri-urban landscape.

As Richard McElreath points out at the beginning of chapter 15 (available at: <http://www.russellsage.org/Ensminger>), the fact that we find significant and predictable variation in prosocial behavior across human societies and communities does not necessarily mean that we should expect the same variables to predict variation within societies (Henrich et al. 2012). Even though they arise from individual-level decisions and psychologies, social norms and institutions are

fundamentally group-level phenomena. Indeed, the evidence linking individual-level economic and demographic variables is weak or contradictory as we move across our sites. This applies to both phases 1 and 2. The question remains whether we fail to find robust predictive relationships at the individual-site level because they are not there, because our site-level sample sizes are too small (thirty in most regressions), or because there is too little variation in our key independent variables. In this study, McElreath is able to draw on a mixed-ethnic population with more variation in the key control variables than we typically find at other sites. He also applies rigorous statistical tests to the data and bootstraps the standard errors to better control for outlier effects. His conclusion is that there is still no meaningful and consistent variation at the site level even under these conditions. This result is consistent with the general thesis of the project, which is that the institutional complexity that undergirds the development of a market economy and affords the possibility of peaceful cohabitation in larger communities is a characteristic shared broadly by members of a given community regardless of their individual demographics. This yields predictions of greater variation in prosocial behavior between societies than within societies.

Moving further up the scale of market integration, Juan-Camilo Cardenas (chapter 15, available at: <http://www.russellsage.org/Ensminger>) conducted experiments among the Afro-descendants occupying the Sanquianga region of the Pacific shores of Colombia. The Sanquianga (mean village size: 1,931) make their living logging and harvesting fish, shrimp, crabs, and mollusks for sale from the mangroves and coasts inside Sanquianga National Park. This population is highly involved in the market and purchases 82 percent of their daily food. Eighty-four percent of the population identifies as Christian.

The Sanquianga play exceptionally fair-mindedly in both the DG (47 percent mean) and the UG (48 percent mean). Cardenas interprets these findings by referring to the ethnography of this society, which exhibits constant sharing, especially among the neediest. When a family has bad luck in a daily fishing catch, neighbors invariably share their food. Indeed, it is the poorest in this community who are the most generous in the DG and the UG.

In addition to these exceptionally fair offers, the Sanquianga stand out for their UG rejection responses. Six of our societies demonstrate marked U-shaped curves in rejection behavior in the UG (the Au, the Yasawa, coworkers in Accra, the Sursurunga, and the Samburu)—that is, they punish unequal offers, both high and low. In Sanquianga and Accra (Barr, chapter 17, available at: <http://www.russellsage.org/Ensminger>), the tails of these rejection data are particularly steep: there is a high tendency to reject offers of both 0 and 100 percent, with declining rejection rates in both directions as they approach fifty-fifty from the extremes. Based on the data from the post-play questions, Cardenas discusses in detail the participants' own explanations for this behavior, which makes it quite clear that they understand what they are doing. Such U-shaped rejection curves have also been observed by other researchers in Russia and China (Bahry and Wilson 2006; Hennig-Schmidt, Li, and Yang 2008).

Cardenas also compares his DG results to a modified double-blind experiment in which the players play in private and submit their offers in a sealed envelope (see also Lesorogol and Ensminger, chapter 5). He finds evidence of what looks like a small experimenter effect: DG offers shift downward from a strong mode of 50 percent to a strong mode of 40 percent. Hyper-fair offers also disappear. These results are similar to those from rural Missouri in which the nationality of the experimenter was also the same as that of the players. When the experimenters are complete outsiders to the community, as was the case for the Samburu and the Orma (Chapter 5), there is no statistically significant impact on DG offers in the double-blind treatment.

Our last two case studies are from fully market-integrated societies: urban wage-earners in Accra, Ghana (chapter 17, available at: <http://www.russellsage.org/Ensminger>), and

rural wage-earners in Missouri (chapter 18, available at: <http://www.russellsage.org/Ensminger>). Both societies produce extremely high DG (42 and 47 percent, respectively) and UG offers (44 and 48 percent, respectively) and exhibit a high willingness to punish unfair offers, all of which is consistent with the prosocial behavior we expect of highly market-oriented societies.

Abigail Barr ran the experimental protocol with manufacturing employees of several enterprises that ranged in number from seventeen to eighty-nine employees. Ninety-six percent of these wage workers identify with a world religion, either Christianity or Islam. In this study, the small-scale “community” is composed of coworkers rather than villagers. Most are production workers, with a few apprentices and office personnel. Like most urbanites anywhere in the world, they are exposed to newspapers, radio, television, and a broad range of ethnic diversity.

The most striking finding from these data is the steeply sloped U-shaped rejection pattern from the UG, which parallels the same steep and symmetrical pattern among the Sanquianga (chapter 16, available at: <http://www.russellsage.org/Ensminger>). As Barr notes, this “suggests that the Ghanaian employees are averse to inequality even when that inequality is in their own favor.” Barr does not find the same punishment pattern with respect to hyper-fair offers among the TPG players, but neither do any of our other sites that exhibit this pattern in the UG.

Barr’s analysis adds a new dimension by examining the differences in behavior between those who were born in an urban environment and those born in rural Ghana who had immigrated to their current urban location. This test was designed to examine whether the resocialization of norms that occurs in the urban context is sufficient to override the original socialization from rural origins. Although the evidence points in that direction—the urban-born do make higher offers in all three games—the results are not completely conclusive statistically, except in the UG.

Barr also finds evidence in the regression analyses of an income effect. In all games, individuals with higher incomes make higher offers. Barr suggests two possible interpretations of this finding: either richer players are more generous because they know that they are better off, or the stakes mean less to them because of their higher income, so the cost of acting on their other-regarding preferences is lower for them. The only other society in which we find statistically compelling evidence of income effects for both DG and UG is the Tsimane’ (chapter 8, available at: <http://www.russellsage.org/Ensminger>). Income is significant in the DG for Siberia (chapter 13, available at: <http://www.russellsage.org/Ensminger>), but not in the UG. Income is not significant in any of the other populations we have examined. Given that the Amazonian Tsimane’ and the population of Accra have virtually nothing else in common, we are not inclined to make much of this result. As a predictor for the overall game data set, income is not robustly a large and significant predictor across games and model specifications.

Finally, in chapter 18 (available at: <http://www.russellsage.org/Ensminger>), Jean Ensminger and Kathleen Cook present findings from the early pilot project for the phase 2 work, conducted in the heartland of America. Rural Missouri was chosen for the U.S. comparison sample because it was possible to find a small community (population: 1,813) where people lived in a face-to-face social environment that fell in the community size range of our other communities in less market-oriented environs. Because this site was the pilot for phase 2, some changes were made to the choice of games and protocols, based on the experiences at this site. As a consequence, there are no TPG results from this site, and although the strategy method UG was conducted, responses to offers above 50 percent were not elicited.

Chapter 18 presents the findings from four economic experiments: the dictator, strategy method ultimatum, public goods, and trust games. Across all four experiments, the populations demonstrated quite high levels of prosociality in offers, rejections, and reciprocation of trust. As the United States represents the most extreme end of our market integration spectrum, and

this Bible Belt population is virtually universally involved in a world religion, these findings of exceptionally high prosociality fall in line with the general tendencies demonstrated by the data across our entire project. Although the particularly high prosocial behavior observed in the games at this site contrasts somewhat with the results from many studies of undergraduates in university laboratories (including those in our own benchmark; see chapter 9, available at: <http://www.russellsage.org/Ensminger>), it is quite consistent with many studies of more representative adult populations from field studies in many areas of the highly developed world (Bellemare, Kröger, and van Soest 2008; Henrich, Heine, and Norenzayan 2010).

In closing this chapter, we would like to offer our sincerest gratitude to the individuals, families, and communities that opened their lives to us. In small appreciation, we will donate the royalties from this volume to Human Rights Watch. Most of us see imminent or conclusive signs that not only the livelihoods but also the rights of the indigenous societies we study are being seriously undermined. We support the efforts of Human Rights Watch and other organizations that are attempting to help indigenous populations in these struggles. We would also like to thank the MacArthur Foundation’s Preference Network, which funded and supported our earlier work when it was highly “experimental,” and Stuart Plattner, whose tireless work at the National Science Foundation helped make phase 2 a reality. The Russell Sage Foundation provided generous support for the Missouri pilot experiments.

## NOTES

1. We also included a trust game that was performed in only a subset of our societies. This was combined with social network data and has been published separately (Barr, Ensminger, and Johnson 2010).
2. The Orma (Lesorogol and Ensminger, chapter 5) were also part of phase 1.

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