Chapter 7

Cruel to Be Kind: Effects of Sanctions and Third-Party Enforcers on Generosity in Papua New Guinea

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Perhaps nowhere in the world is the norm of generosity more pronounced than in Melanesia. Whereas purchase, via either money or barter, tends to be the dominant mode of resource acquisition in much of the world, apart from self-generated production, the generosity norm manifested primarily through gift-giving operates to provide people in most Melanesian societies with many of their resource needs (Sillitoe 1998). In some cases, the generosity norm dictates obligatory exchanges necessitated by ceremonial occasions that are highly structured in form and value; in others, the exchanges are unsolicited and variable with respect to time, place, and value.[1] Regardless of form, Paul Sillitoe (1998) argues, the norms of generosity and gift-giving are so pervasive and intrinsic to the basic social, political, and economic structure of Melanesian society that individual acts of "gift-giving" should instead be referred to as "socio-political exchange."

The origin and maintenance of generosity norms, however, is problematic. In neoclassical economics, the central discipline concerned with understanding the basis of resource exchange, individuals are expected to be hyper-rational—to have knowledge of not only their own preferences ("utility functions") but those of all others with whom they interact (Young 1998). Moreover, given this knowledge, individuals are expected to exhibit exchange strategies that are utility-maximizing for themselves—that is, to use those strategies that maximize their personal payoffs (Kreps 1990). Indeed, the notion that people exhibit "self-regarding selfishness" (Tracer 2003) underlies the "Nash Equilibrium" in game theory—the fundamental concept that the optimal solution to any "game" (n-person exchange situation) is reached when all participants are playing a strategy such that no individual can further increase his or her payoff by changing it unilaterally (Camerer 2003). The notion that exchanges are n-person games in which each person selfishly attempts to maximize payoffs at the expense of others would seem, at face value, to preclude the idea that individuals would ever behave according to a norm of generosity—providing for others, either in solicited or unsolicited fashion, at a cost to themselves.

Apart from economics, the discipline of anthropology is also concerned with the establishment and maintenance of social norms, and for anthropology the existence of prosocial generosity norms is no less problematic. In place of the Nash Equilibrium, rigorous anthropological models of behavior are based on the concept of the evolutionarily stable strategy (ESS), a dominant strategy that cannot be supplanted by any invading alternative strategies given that others do not change their strategies (Maynard Smith 1982). The modeling of prosocial behaviors has

shown that cooperation (as well as altruism and generosity) can be sustained as an ESS where groups are strongly kin-based and thus individuals have a high coefficient of relatedness ("kin selection" models) (Hamilton 1964) or where repeated interactions are likely ("reciprocal altruism" models) (Axelrod and Hamilton 1981; Trivers 1971). An alternative model of cooperation as a form of signaling that, by virtue of its costliness, is honest and thus serves as an indicator of worth as a mate or partner in future interactions has also recently been shown to be potentially evolutionarily stable under certain conditions (Gintis, Smith, and Bowles 2001). Ernst Fehr and Simon Gächter (2002) maintain that none of these explanations can fully account for the pervasiveness of human beneficence since it is seen to occur in situations where individuals are unrelated, where individuals are unlikely to meet repeatedly, or where signaling or reputation effects are negligible. Although the former two situations clearly do occur, it is unclear under what conditions reputation effects might be negligible. Nonetheless, the evolution and maintenance of a generosity norm remains not fully explained according to many of the dominant models employed within anthropology.

Another possible explanation for the evolution and maintenance of generosity norms in human groups is that violators of the norm are sufficiently sanctioned or punished for noncompliance that it becomes more costly for individuals to violate the norm than to adhere to it (Henrich et al. 2006).[2] Costly punishment itself may evolve because of a combination of benefits conferred on enforcers by their willingness to engage in an honest and costly signal of their preference for fairness coupled with the reputational effects they accrue as an individual who will neither be cheated nor take a "sucker's payoff" without retribution. The hypothesis that generosity norms are maintained by sanctions and enforcers is consistent with the neoclassical economic and evolutionary propositions that individuals are self-interested utility-maximizers whose basic nature is to be noncooperative whenever possible (Kendal et al. 2006).[3] It also leads to the testable prediction that in cases where sanctions or enforcers are absent or the punishments imposed for norm violation are sufficiently small such that they do not offset the advantages of behaving noncooperatively, individuals will defect from the cooperative strategy.

To test the proposition that generosity is maintained by sanctions and punishments, we carried out a series of economic experiments in a remote region of Papua New Guinea, an area that, like other parts of Melanesia, has a pervasive and strong generosity norm. The series of experiments consisted of: (1) the dictator game (DG), an experiment that tests for individuals' propensities to be altruistic and in which individuals cannot be sanctioned for behaving selfishly; (2) a strategy method ultimatum game (UG), in which one member of a bargaining dyad may be punished by the other member of the dyad, albeit at a cost to the punisher, for behaving in the game in a manner reckoned as being unfair; and (3) a third-party punishment game (TPG), in which a third-party "enforcer" may punish (at a cost to him- or herself) a member of a dyad for dividing a sum between him- or herself and the other member of the dyad in a manner perceived by the enforcer to be unfair. According to the notion that individuals are basically selfish and the hypothesis that the generosity norm is maintained by sanctions and enforcers, we would expect individuals to behave more selfishly in the dictator game than in either of the two games in which punishment for noncooperation is possible. In addition, the hypothesis that adherence to a generosity norm is perpetuated by enforcing sanctions and punishments implies that there must exist a corollary norm dictating that individuals who are able to punish noncooperators should in fact do so. The propensity of people to punish those perceived as behaving selfishly is also examined in this study using the ultimatum and third-party punishment games. Finally, data from previous economic experiments carried out in Papua New Guinea (Tracer 2004) and elsewhere (Eckel and Grossman 1998; Ensminger 2004; Henrich et al. 2001) suggest that

demographic variables, such as gender, and measures of market integration, including wealth and income, may exert a direct influence on offer amounts. Consequently, the effects of a roster of proxy measures of market integration and personal and household wealth on offer amounts are investigated here as well.

ETHNOGRAPHIC BACKGROUND

The experiments reported here were conducted among the Au people of Papua New Guinea, a group among whom the first author has been working for twenty-five years. The name Au refers to the principal language spoken in the region by approximately 10,000 inhabitants of roughly fifty villages ranging in size from fewer than 100 to almost 500 individuals, with a mean village size of approximately 280 persons. The dictator and ultimatum games were carried out in Weis, a village of 300, and the third-party punishment game in Wulukum, a village of 350 people. The former village is quite remote, being roughly five hours by foot from Yangkok Mission Station, the nearest mission station (the site of the largest market as well as the central airstrip in the area), while the latter is only one and a half hours away and is more integrated into the social and economic life that revolves around the mission station. All individuals in these villages, as in most of contemporary Papua New Guinea, also speak Neo-Melanesian (Tok Pisin) the lingua franca of the country.

The area of study is located at 3 degrees 30 minutes south of the equator, roughly fifty kilometers inland from the northern coast of Papua New Guinea. It is hot, wet, and humid lowland tropical rain forest. Although there is one dirt track into the area from the midsized coastal town of Wewak, the overland route takes about eleven hours in a four-wheel-drive vehicle over terrain that is frequently blocked by fallen trees and brush or flooded and impassable. Transport to the area is therefore usually conducted by light plane, landing on a grass airstrip at the Yangkok Mission Station.

The Au are forager-horticulturalists subsisting primarily on starch extracted from semi-wild stands of sago palm, supplemented by tubers, fruits, leaves, and nuts collected from the rain forest or grown in small gardens prepared using slash-and-burn techniques. They also hunt wild game, the most common prey items being small marsupial mammals such as bandicoot and phalanger (cus-cus); large animals such as wild pigs are taken much less often. Husbandry of pigs and chickens is also practiced, but these are considered prestige items and are seldom consumed except on ceremonial occasions. The Au construct gardens specifically for the small-scale cash-cropping of coffee, cocoa, and, most recently, vanilla. Despite the availability of at least some income through cash-cropping and, to a lesser degree, employment by local missionaries and government agencies, the area occupied by the Au has long been known as one of the poorest in Papua New Guinea, with rampant and chronic undernutrition, high infant and toddler mortality, and an average life expectancy at birth of only forty-three years for males and one year less for females (Sturt 1972; Tracer et al. 1998).

Despite living in an environment characterized by a chronic scarcity of resources, Au society, like other Melanesian societies, revolves around an elaborate system of obligatory and non-obligatory exchange relationships. Moreover, within the context of these exchange relationships, a premium is placed on generosity. For example, when a woman is betrothed to a man in another village, for a period of time she initially continues to dwell primarily in her natal village but visits her prospective husband's village periodically for several days at a time to work with his female kin. This period is essentially a trial period during which much union dissolution takes place. However, after it is deemed that she is a good fit for her husband and works well with his female kin, a portion of the bride-price is paid, and a "sending ceremony" is held: the bride

formally leaves her natal village and is accompanied by a procession of villagers to the village of her husband. Along with the bride, her village sends gifts to the husband's village consisting, at minimum, of betel nut, sago starch, leaves traditionally used as plates, and coconuts. Although no specific amount of these items is specified, her natal village is supposed to be as generous as possible in its gift-giving; in addition to the aforementioned items, it is not altogether uncommon for the gifts to include store-bought commodities such as rice, canned meat, or fish. A parcel of gifts perceived to be less than adequate for the occasion might result in a dispute that if not resolved promptly could turn violent.

A successful pig kill is another occasion on which both obligatory and voluntary exchanges occur and generosity is valued. According to traditional Au values, a hunter is barred from consuming any part of his own pig kill and must instead distribute shares to his and his wife's kin. Other villagers may be given shares at the discretion of the hunter or may specifically ask to be given a share. As in the previous example, the hunter is expected to be generous in doling out pig meat, and individuals who perceive themselves as having been slighted by receiving smaller-than-expected shares or none at all might retaliate against the hunter with a verbal assault or physical violence. In the 1998 field season, an alleged violation of the meat-sharing norm resulted in severe physical violence against the wife of the offending party.[4] Following the physical violence, ostracism continued, and within the year the man and his wife had been forced to flee his village and take up residence in the wife's natal village.

Apart from exchanges in the formal contexts of rites of passage and hunts, the Au also emphasize generosity in day-to-day relationships. Individuals who need specific items often make requests of other villagers (and sometimes of people outside the village) for those items, and the individuals of whom requests are made are expected to oblige. In 1989 David Tracer's wife made a traditional taanik, or string bag, for a prominent elder in the village in which we lived. He was quite proud to possess a bag woven by an American woman and carried it virtually everywhere. When Tracer returned several years later, he noticed that the man no longer carried the bag. When he inquired what became of it, fully expecting to be told it had ripped, he instead was informed that a distant relative from another village had passed through, seen the bag, and asked for it. "What could I do?" continued the elder. "I was obligated to give it to him." Although low-value items such as betel nut and tobacco are by far the most common items requested, higher-value items such as meat, clothing, and metal tools—and string bags—are also sometimes requested. It is perhaps for this reason that the Au tend to be discreet about their possessions and not talk about them too much. Although the right to request and the obligation to give are ubiquitous norms recognized by the Au, they also recognize that the right to request must not be abused. Individuals who are viewed as making too many frivolous requests may be shunned or ostracized.

Unsolicited gift-giving is also an important part of Au village life. The giving of an unsolicited gift generates prestige for the giver and incurs a debt for the recipient. Although the debt is not explicit and is not required to be paid back in kind, by accepting the gift, the recipient implicitly acknowledges an alliance relationship with the giver and is expected to reciprocate in the future if asked for help. Help may be sought in such contexts as hunting or house-building, or in disputes. Thus, as noted by Marshall Sahlins (1972, 133), generosity may place such severe constraints on others that, as an Inuit proverb says, " 'Gifts make slaves.' " As such, among the Au, unsolicited gifts are sometimes rejected by potential recipients who may either perceive the ensuing debt as unmanageably large or fear forming an alliance with someone with undesirable qualities, such as a person seen as overly belligerent. An ultimatum game conducted by Tracer (2003) in the villages of Anguganak and Bogasip produced results that seemed to reflect both a valuation of the norm of generosity and fear of overly large unsolicited gifts: recipients rejected both very low offers (20 percent of the stake or less) and hyper-fair offers (greater than 50 percent of the stake) more than 50 percent of the time.

METHODS

The dictator and ultimatum games were carried out at Weis Village and the third-party punishment game at Wulukum Village. Scripts explaining the games were prepared in Neo-Melanesian by the first author and back-translated into English by Mr. Sakawi Meku of Anguganak Village. Some minor adjustments to the script were made during the back-translation process.

The first and third authors arrived at the villages one day prior to the scheduled game day in order to announce that a research project would be conducted the following day. It was explained that the project involved playing something that was akin to a game but was in fact research. It was further explained that participation in the research was completely voluntary and that participants would be compensated for their time with a show-up fee of 2 kina and the opportunity to earn an additional payoff. Individuals were also told that, if they chose to participate, they should be prepared to remain at the research site all day, as the project was fairly time-consuming. To avoid further discussion among participants and the possibility of collusion, no details of the games were given during the prior day's announcement.

The dictator and ultimatum games were conducted at Weis Village using thirty pairs of subjects on a single day over the course of approximately thirteen hours. The stake for each game was 10 kina, a midlevel single day's wage for unskilled labor.[5] The games were conducted in a secluded room that normally served as a birthing chamber, under one of the village houses. Prior to entering the room, each participant was interviewed to collect basic demographic data as well as information on wealth, income, and proxy measures of market integration. The variables collected were:

1. Birth year

2. Sex

3. Years of formal schooling

4. Marital status

5. Number of offspring

6. Religion

7. Frequency of attendance at religious services (per month)

8. Fluency in the national language ("none," "some," "fluent")

9. Individual annual income

10. Estimated total household wealth

11. Percentage of household diet derived from market goods

12. Annual income from wage labor, rentals, and trade

13. Frequency of wage labor in the past month

14. Number of trips to market in the past month

15. Frequency of purchasing goods for resale in the past month

16. Animal wealth possessed (in animal units and monetary value)

17. Land wealth possessed (in hectares and monetary value)

18. Hectares of land devoted to annual subsistence cropping

19. Hectares of land devoted to annual cash-cropping

However, the present analysis uses only a subset of these variables.

After individuals entered the room, they were given their show-up fee of 2 kina and the standardized script was used to explain each game to them. In addition, during the explanation ten 1-kina coins lined up on a cloth were manipulated and used to illustrate the options open to the proposer (player 1) and recipient (player 2) in each game. Following the explanation of each game, participants were given the chance to ask any questions they may have had about it. A testing period then commenced, during which individuals were presented with different scenarios of offer amounts and, for the ultimatum game, acceptance or rejection of those offers; they were asked to identify the amount that player 1 and player 2 would take home in each instance. Individuals who incorrectly answered test questions were given additional questions to answer. The number of test questions given varied from 5 to 12, with a mean number of 6.9 in the dictator game and 6.0 in the ultimatum game.

The dictator game was conducted first among all thirty pairs of participants, followed by the ultimatum game. Participants kept the same role in both games (that is, as either player 1 or player 2); however, they understood that they would be paired up with different people playing the opposite role in each of the two games. Payoffs to the participants were disbursed at the end of the thirteen-hour day of game play. Because the game day lasted longer than expected, exit interviews during which participants were asked why they had played the game as they did and whether they had any other comments about the game were administered only to a sample of twelve players.

The third-party punishment game was played at Wulukum Village during a single day lasting approximately ten hours. The game was played with an allotment of 10 kina to player 1 and player 2 and 5 kina to player 3 (the punisher). In contrast to the previous games, and owing to the complexity of the TPG, we conducted an initial explanation meeting with the participants as a group, using a prepared back-translated script. Members of the group were asked to neither comment on the game nor ask any questions during this group explanation. Following the group explanation, the game was conducted in a secluded structure that the village used as a small church. An interview was again conducted with each participant before he or she entered the structure, to collect basic demographic data as well as information on wealth, income, and proxy measures of market integration. As individuals entered the structure to play, they were paid a 2-kina show-up fee and the game was explained to them a second time. They were then given the opportunity to ask clarifying questions, followed by a period of testing. The average number of test questions administered was 10.1. In total, thirty player 1s, twenty-five player 2s, and thirty player 3s participated in the experiment. Five player 2s were thus given two offers at the end of the game. This is not at all problematic, since it is player 1s and player 3s who are active "decisionmakers" in the third-party punishment game. Player 2s are essentially "inert" participants who are merely awarded their endowments at the end of the game on the basis of the actions of the player 1s with whom they are paired.

RESULTS

Sex, Age, and Household Size

The sex distributions of the samples at Weis and Wulukum are shown in figure 7.1. The sample used for the dictator and ultimatum games at Weis (N = 60) was 95 percent male and 5 percent female. The Wulukum sample (N = 85) for the third-party punishment game was 74 percent male and 26 percent female. Although it was announced that both males and females could participate—and indeed a mix of male and female was encouraged—the males of both villages dominated the sample.

FIGURE 7.1   *Comparison of Gender Distribution of the Samples at Weis and Wulukum*
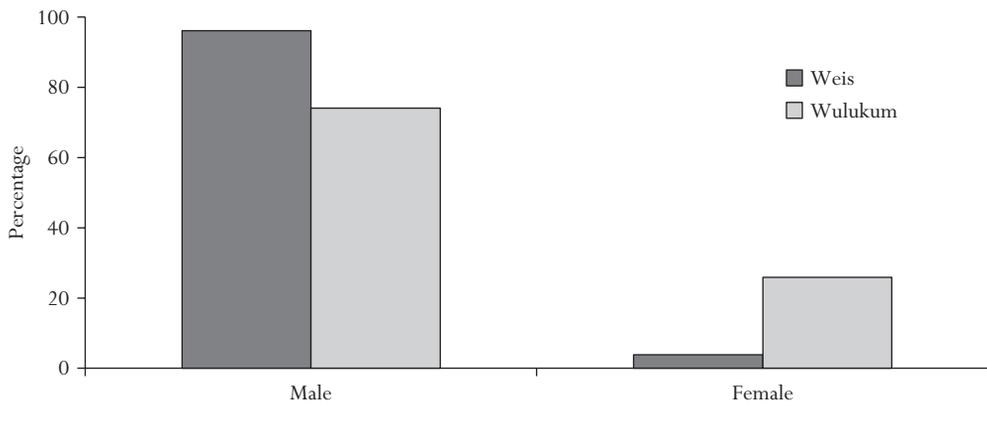
Age could be definitively assessed for only 28 percent of the sample (N = 17) at Weis and 71 percent of the sample (N = 60) at Wulukum. The mean age of the participants at Weis was 36.2 years, and at Wulukum it was 38.4 years. The difference between the villages was not significant (two-tailed *t*-test, $p = 0.51$). Age is omitted as a variable in all further analyses since its inclusion would significantly reduce sample sizes.

Figure 7.2 shows a comparison between the Weis and Wulukum samples of the distribution of household size. Household size at Weis ranged from 1 to 11 persons, with a mean of 5.4 persons. At Wulukum, household size ranged from 1 to 10 persons, with a mean of 5.6. The difference between the villages was not significant (two-tailed *t*-test, $p = 0.20$). The most common household structure in both villages consisted of the game player, a spouse, and their dependent offspring.

Educational Attainment, Religious Attendance, and Fluency in the National Language

Figure 7.3 compares the Weis and Wulukum samples in the distribution of educational attainment, in years. The focal points of zero and six years reflect the fact that in Papua New Guinea many parents choose not to send their children to school, but among those who do, primary schooling proceeds until grade six. Overall, the Wulukum sample is slightly better educated than the Weis sample, with an average of 3.7 versus 2.6 years of schooling. The difference, however, does not quite reach the level of statistical significance (two-tailed *t*-test, $p = 0.06$).
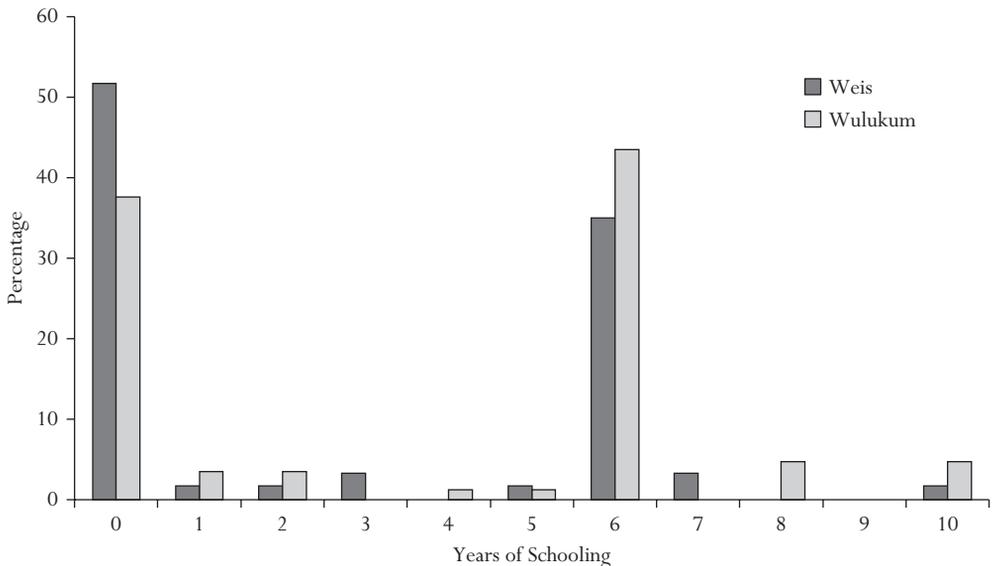
Figure 7.4 shows the frequency of attendance (times per month) at Christian church services at the two villages. Each village has several bush material churches located in several of its hamlets; however, Wulukum is an active center for the "Christian Revival" sect in Papua New Guinea and also has a large church made of sawn timber with a corrugated sheet metal roof. One can easily get the impression from being in the two villages that religious life is much more central at Wulukum than it is at Weis. Indeed, as shown in figure 7.4, the percentage of the sample who never attended church services was much higher at Weis than at Wulukum (83 percent versus 39 percent), and none of the sample at Weis attended services twice per week, whereas

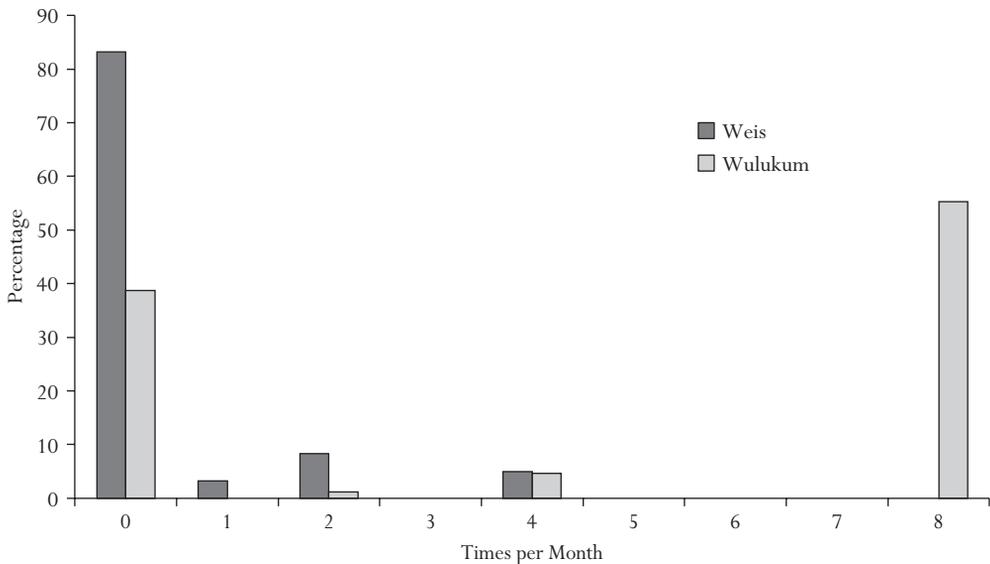FIGURE 7.2   *Comparison of Household Size of the Samples at Weis and Wulukum*
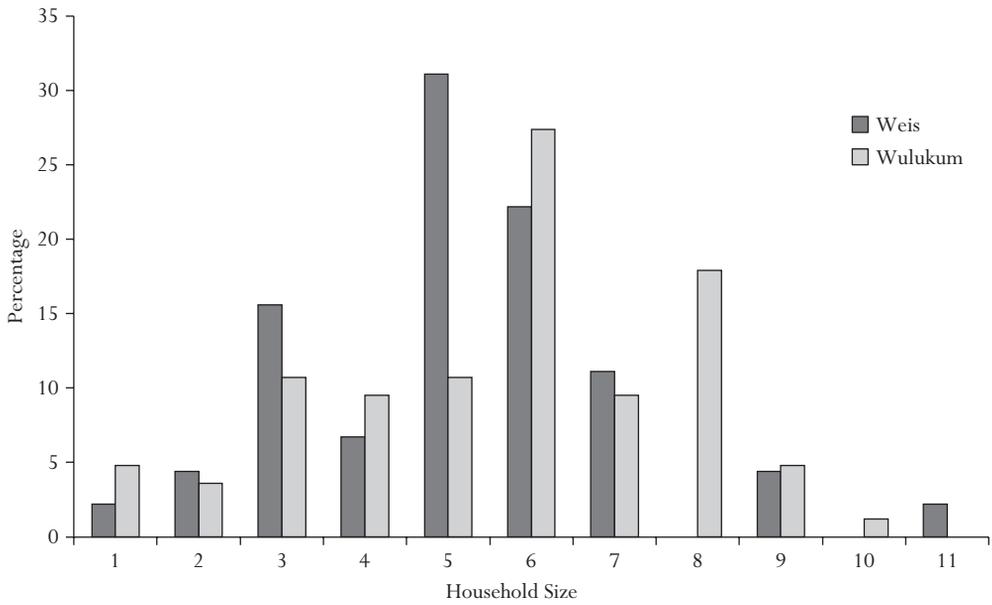
Source: Authors' compilation based on author data.

FIGURE 7.3   *Comparison of Educational Attainment of the Samples at Weis and Wulukum*

Source: Authors' compilation based on author data.

FIGURE 7.4   *Comparison of Frequency of Attendance at Christian Religious Services at Weis and Wulukum*

55 percent of the sample at Wulukum did. Overall, the mean monthly frequency of attendance at religious services was significantly different between the villages, with a frequency of 0.4 at Weis and 4.6 at Wulukum (two-tailed t-test, $p < 0.0001$).

Although the official national language of Papua New Guinea is English, most local (and sometimes national) discourse within the country is carried out in the lingua franca, Neo-Melanesian, and only a small proportion of the nationwide populace is fluent in English. As shown in figure 7.5, at Weis, 80.4 percent of the sample reported no proficiency in English, while 17.6 percent reported some. At Wulukum, 62.4 percent of the sample reported no knowledge of English, while the remaining 37.6 percent reported some. The greater proficiency in the national language at Wulukum compared to Weis is undoubtedly a product of the village's higher educational attainment, as most English is learned in community schools. In addition, the greater proximity of Wulukum to the mission station, with its predominantly English-speaking missionaries, may also contribute to the greater reported knowledge of at least some English in that village. It is worth noting, however, that in neither village can communication with villagers be accomplished solely in English.

Income, Wealth, and Indices of Market Integration

Individual annual income in the two villages, converted from Papua New Guinea kina to U.S. dollars, is shown in figure 7.6. For most Au people, income is derived from the sale of cocoa and, to a much lesser extent, home produce. Income in the total sample ranged from $0 to just over $1,200, with a mean of $41. A full 57.5 percent of the total sample reported no cash income whatsoever in the preceding year. Again, being closer to the mission station and airstrip,

FIGURE 7.5   *Comparison of Proficiency in the National Language (English) at Weis and Wulukum*
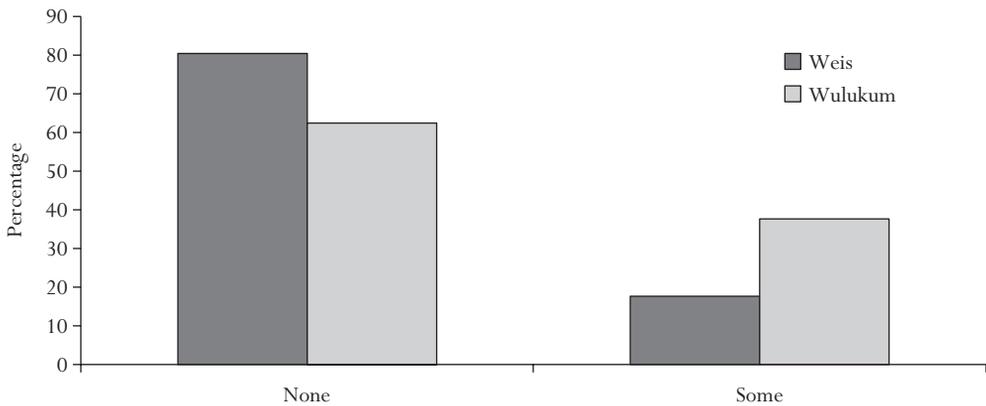
Source: Authors' compilation based on author data.

FIGURE 7.6   *Comparison of Annual Income of Individuals at Weis and Wulukum*
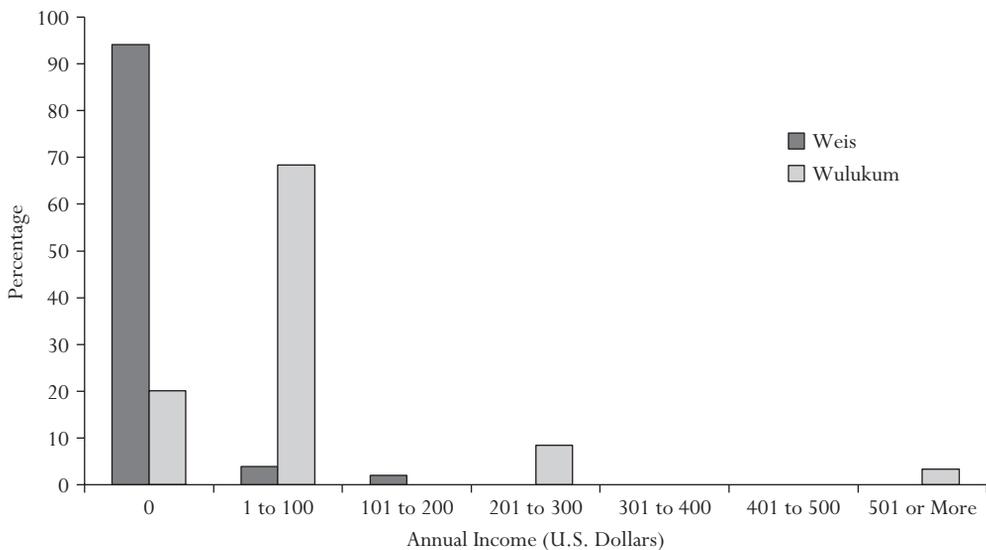
Source: Authors' compilation based on author data.

the people of Wulukum have a greater opportunity for commerce than those at Weis, and this is reflected in the extreme difference in average individual income between the villages. Mean reported income at Weis was $2.98, versus $80.25 at Wulukum (two-tailed t-test, $p = 0.001$).

Household wealth, mostly derived from animal holdings (predominantly pigs and chickens) and land wealth, is shown in figure 7.7. It ranged from $0 to $377 with a mean of $73.83. Household wealth did not differ significantly between the two villages. It is worth noting that

FIGURE 7.7   *Comparison of Wealth of Households at Weis and Wulukum*
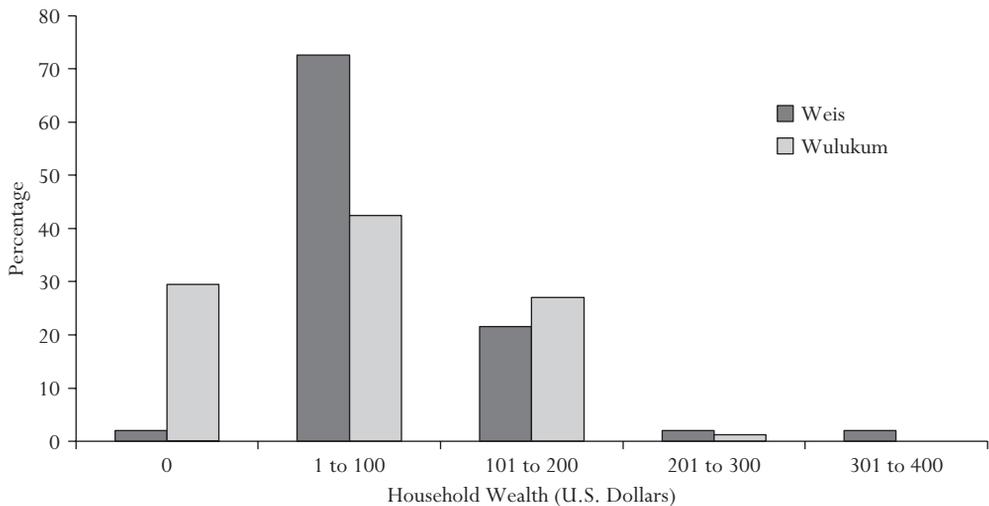
household wealth was estimated in part from the amount of land reported by participants to be currently under cultivation for either subsistence crops or cash crops. This method gives a very conservative figure for wealth, as virtually all households possess much more land than they have under cultivation at any one time. In addition, since land is never sold, its contribution to wealth is derived from the crops produced on it rather than from the land itself. Although chronic undernutrition is extremely prevalent in the area, it is caused entirely by the high-carbohydrate, low-protein composition of the diet, rather than by food restriction. Indeed, it is exceedingly rare to hear anyone in the area complain of hunger. Food is plentiful (especially the dietary staple, sago starch), and among the majority of people who subsist on a traditional rather than store-derived diet, household wealth per se does not contribute to differences in nutritional status.

Game Outcomes

Figure 7.8 shows the amounts offered by player 1s in the dictator and ultimatum games at Weis and in the third-party punishment game at Wulukum. Although it was predicted that the lack of a capacity to reject offers in the DG should lead to lower offers on average than in the UG, in fact the figure shows that the modal offer in both games was exactly 50 percent of the stake. The distribution of offers in the DG, however, is slightly skewed toward lower offers, such that the DG mean offer is 40 percent and the UG mean offer is 44 percent. This difference in mean offers is significant ($p < 0.01$).

The threat of punishment by a third party might be expected to coerce player 1s to be fair, if not overly generous, in their offers, especially if the threat is believed to be credible. As shown in figure 7.8, this was obviously not the case at Wulukum. In contrast to the previous two games, in which the modal offer was 50 percent, the modal offer in the third-party punishment game was 30 percent. Moreover, the distribution of offers in the game was such that the mean offer was 32.7 percent of the stake—lower again than in the previous two games.

FIGURE 7.8   *Offer Amounts in the Dictator, Ultimatum, and Third-Party Punishment Games*
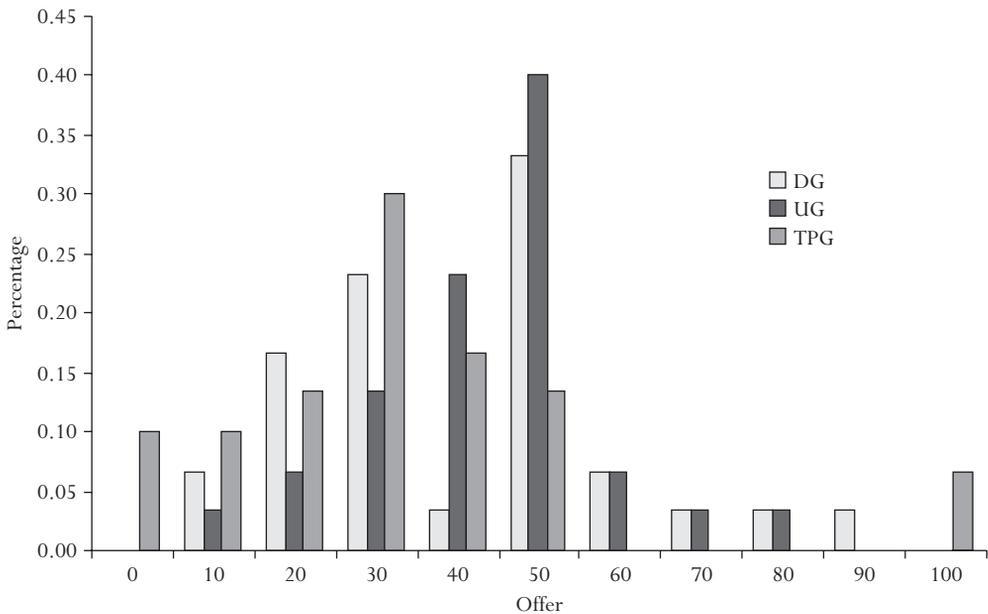
Figure 7.9 shows the frequency with which player 2s in the ultimatum game and player 3s in the third-party punishment game said that they would reject and punish, respectively, each specific offer. The distribution of rejections in the UG is not monotonic but instead is highest at 67 percent rejection of offers of 0 percent of the stake, and it falls gradually to 0 percent rejection of 50 percent of the stake. The frequency of rejection then begins to rise slowly among the "hyper-fair" offers, with a rejection of 3 percent of offers of 60 percent, rejection of 10 percent of offers of 70 and 80 percent, rejection of 17 percent of offers of 90 percent, and 33 percent rejection of offers of 100 percent of the stake. Using the distribution of rejections, a minimum acceptable offer (MinAO), the lowest amount below 50 percent of the stake acceptable to a player 2, and a maximum acceptable offer (MaxAO), the highest amount above 50 percent of the stake acceptable to a player 2, was computed for each player. The average MinAO for the total sample of recipients was 20 percent of the stake, and the average MaxAO was 93 percent of the stake. The dark line in figure 7.9 shows expected payoffs to player 1s given the amount of their offer and the likelihood that their offer will be accepted or rejected. It shows that the income-maximizing offer (IMO) in this sample is 20 percent of the stake—much less than the overly generous 50 percent that in fact occurs most frequently.

Given that player 2s in the ultimatum game tend to reject both low and hyper-fair offers, it is instructive to examine whether third-party enforcers punish proposers of both low and hyper-fair offers. Figure 7.9 shows that this is in fact not the case. For offers of 0 to 40 percent, player 3s are actually willing to punish at higher frequencies in the TPG than player 2s are to reject in the UG. For example, while offers of 0 percent in the UG are rejected 67 percent of the time, proposers of 0 percent in the TPG are punished 80 percent of the time. Even at offers

FIGURE 7.9   *Frequency of Rejection in the Ultimatum Game and Punishment in the Third-Party Punishment Game and Corresponding Expected Incomes, by Offer Percentage*
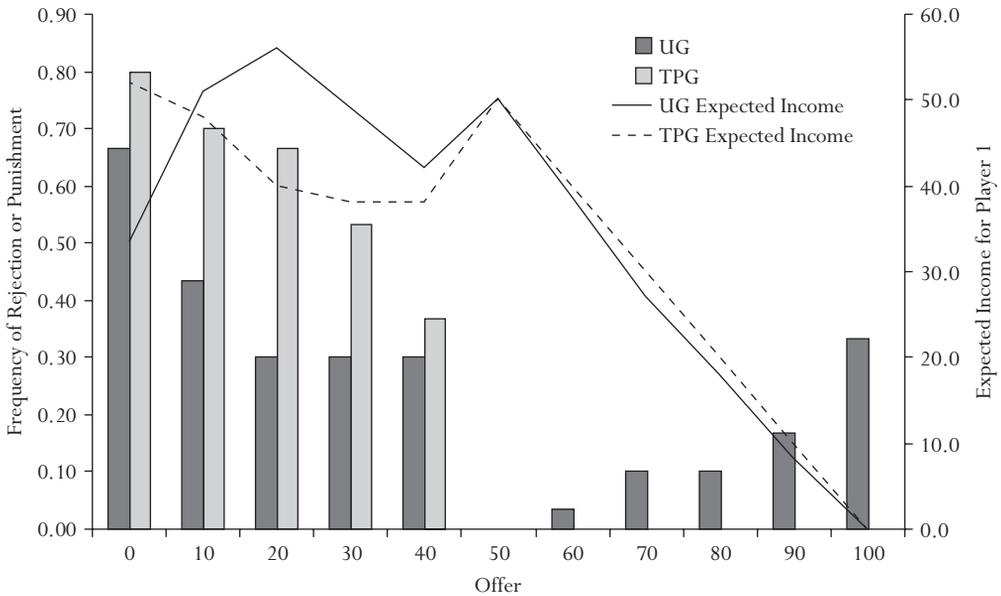
Source: Authors' compilation based on author data.

of 40 percent, player 3s are willing to punish 7 percent more frequently than player 2s in the UG reject such offers. As in the UG, punishment in the TPG falls to 0 percent for offers of 50 percent of the stake. Interestingly, however, and in contrast to the UG results, the frequency of punishment does not rise again thereafter but remains at 0 percent for all hyper-fair offers. The gray line in figure 7.9 shows expected payoffs to player 1s given the amount of their offer and the likelihood that player 3s will punish such offers. It shows that the income-maximizing offer is 0 percent of the stake, with offers of 50 percent yielding just slightly lower payoffs. The actual modal offer of 30 percent yields on average approximately 12 to 14 percent lower payoffs than either of the two IMOs.

Demographic and Market-Related Correlates of Offers

Tables 7.1 through 7.5 present the results of a series of multiple linear regression models examining predictors of offers in the three games as well as the minimum acceptable offer (that is, the minimum offer not rejected) in the ultimatum game and its analogue in the third-party punishment game, the lowest offer not punished. The predictor variables are gender, educational attainment, individual income, household wealth, household size, frequency of church attendance, and proficiency in the national language. Significant effects of predictor variables are seen primarily for UG offers (table 7.2) and MinAOs in the UG (table 7.3). Frequency of church attendance exerts a significant negative effect on UG offers, and proficiency in English exerts a positive effect. However, the adjusted r-squared for the final model, 16.7 percent, is relatively small. For the minimum acceptable offer in the ultimatum game, both higher educational attainment and

TABLE 7.1   *Linear Regressions of Au Dictator Game Offers*

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Gender dummy	−5.248					
	(16.679)					
Education	0.744	0.877				
	(4.780)	(4.647)				
Individual income (U.S. dollars)	−167.810	−164.622	−170.668			
	(198.596)	(193.578)	(186.249)			
Household wealth (U.S. dollars)	0.469	0.306	0.203	0.367		
	(4.525)	(4.387)	(4.246)	(4.226)		
Household size	−5.566	−5.331	−5.316	−5.534	−5.339	
	(5.810)	(5.624)	(5.486)	(5.460)	(4.865)	
Attendance at church services	−0.454	−1.010	−1.174	−0.973	−0.920	−0.959
	(4.979)	(4.543)	(4.351)	(4.329)	(4.187)	(4.425)
Proficiency in national language	4.957	5.504	6.079	6.459	6.507	5.491
	(9.736)	(9.350)	(8.624)	(8.581)	(8.368)	(8.937)
Constant	50.715***	50.022***	50.767***	50.186***	50.266***	40.222***
	(13.732)	(13.229)	(12.319)	(12.255)	(11.943)	(4.000)
Observations	30	30	30	30	30	30
Model significance	0.917	0.859	0.760	0.778	0.614	0.827
Adjusted R-squared	−0.221	−0.163	−0.107	−0.098	−0.049	−0.059

Source: Authors' calculations based on author data.
Note: Standard errors are in parentheses. All coefficients are rescaled (divided by standard deviation), except gender.
***Coefficient significant at < 0.01 level in two-tailed test
**Coefficient significant at < 0.05 level in two-tailed test
*Coefficient significant at < 0.10 level in two-tailed test

larger household size are significantly associated with lower acceptable offers. Again, however, the adjusted r-squared for the final model, 16.6 percent, is small.

Qualitative Perspectives

Statements made by the game participants in the twelve postgame interviews and in ad libitum remarks and questions during the game provide insights into the reasons why some individuals acted as they did during the game.

The strategic nature of several player 1s' decisionmaking process is illustrated by a question that recurred a number of times during the explanation of the ultimatum and third-party punishment games. These participants asked if they could make an initial offer and have an opportunity to add to it later should the other party decide to reject or punish. This question suggests that at least some player 1s were in fact making strategic decisions about striking a balance between maximizing their own payoffs and preventing rejection, or possibly simply about not offending the other player with whom they were paired.

Another theme emerged recurrently in the ultimatum game among player 2s who rejected high offers. These individuals consistently expressed an aversion to or fear of accepting high offers, though none could articulate exactly why: "It's not good for me to take too much from someone," some said, and, "Ten kina is too much to accept from someone." These sentiments are

TABLE 7.2   *Linear Regressions of Au Ultimatum Game Offers*

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Gender dummy	8.443					
	(10.369)					
Education	−0.908	−1.121				
	(2.972)	(2.934)				
Individual income (U.S. dollars)	69.079	63.950	71.678			
	(123.461)	(122.202)	(117.916)			
Household wealth (U.S. dollars)	0.575	0.838	0.970	0.901		
	(2.813)	(2.769)	(2.688)	(2.645)		
Household size	5.974	5.596	5.578	5.669	6.146*	
	(3.612)	(3.550)	(3.473)	(3.417)	(3.053)	
Attendance at church services	−5.564*	−4.670	−4.460	−4.545	−4.415	−5.681*
	(3.095)	(2.868)	(2.754)	(2.709)	(2.628)	(3.007)
Proficiency in national language	13.655**	12.775**	12.040**	11.880**	11.997**	10.959*
	(6.053)	(5.902)	(5.460)	(5.371)	(5.251)	(6.072)
Constant	27.457***	28.571***	27.619***	27.863***	28.058***	44.243***
	(8.536)	(8.351)	(7.799)	(7.671)	(7.494)	(2.718)
Observations	30	30	30	30	30	30
Model significance	0.200	0.156	0.094	0.055	0.025	0.084
Adjusted R-squared	0.143	0.158	0.194	0.219	0.250	0.106

Source: Authors' calculations based on author data.
Note: Standard errors are in parentheses. All coefficients are rescaled (divided by standard deviation), except gender.
***Coefficient significant at < 0.01 level in two-tailed test
**Coefficient significant at < 0.05 level in two-tailed test
*Coefficient significant at < 0.10 level in two-tailed test

very similar to those expressed in a previous UG study in the Au village of Anguganak and one neighboring Gnau village (Tracer 2004).

Several participants who said that they would not reject any offer in the ultimatum game or punish any offer in the third-party punishment game were asked why they were willing to accept low offers or even an offer of nothing at all. Several recurrent themes emerged in response. One involved ceding control of the situation for the sake of keeping the peace because the other player was perceived to have been placed in the role of decisionmaker: "He is the decisionmaker, so I'll take what I'm given," said one player 2. "I don't like disputes, so I'll let him do whatever he wants and I will have no hard feelings," said another. "That was his choice to make." And one player 2 admitted, "I am just agreeable, I don't like anger and fights." Several player 2s expressed concern for the plight of player 1: "It's all right, maybe he really needs it and has some work he has to do with it," one said, and yet another asserted, "It's not good, it's not a good split, but I don't care, he probably has a reason."

Perhaps the most interesting, if not amusing, occurrence happened with a UG player 1. After we finished explaining the game, testing him for comprehension, and being satisfied that he understood it, this player 1 proceeded to make the following offer: "I'd like to offer the second person four kina, keep four kina for myself, and give you two kina for setting up the deal between us. It's a little 'thank you' to you." After Tracer thanked him but explained that he could not take any money in the game, this player 1 offered player 2 50 percent of the stake.

TABLE 7.3   *Linear Regressions of Au Ultimatum Game Minimum Acceptable Offers*

Variable	(1)	(2)	(3)	(4)	(5)
Education	−10.092*	−10.353*	−7.901	−7.882*	−7.015
	(5.406)	(4.945)	(4.863)	(4.323)	(4.288)
Individual income (U.S. dollars)	−15.495				
	(109.859)				
Household wealth (U.S. dollars)	−6.208	−6.478			
	(4.640)	(4.117)			
Household size	−9.820**	−9.794	−8.682*	−8.673*	−10.204**
	(4.605)	(4.481)	(4.585)	(4.383)	(4.207)
Attendance at church services	1.009	1.032	−0.040	2.751	
	(4.186)	(4.073)	(4.161)	(3.935)	
Proficiency in national language	16.276	16.875	11.017		
	(12.227)	(11.167)	(10.910)		
Constant	62.637***	62.892***	49.954***	49.903***	56.642***
	(18.795)	(18.219)	(16.847)	(15.590)	(14.552)
Observations	30	30	30	30	30
Model significance	0.174	0.101	0.142	0.070	0.052
Adjusted R-squared	0.152	0.196	0.137	0.178	0.166

Source: Authors' calculations based on author data.
Note: Standard errors are in parentheses. All coefficients are rescaled (divided by standard deviation), except gender.
***Coefficient significant at < 0.01 level in two-tailed test
**Coefficient significant at < 0.05 level in two-tailed test
*Coefficient significant at < 0.10 level in two-tailed test

DISCUSSION AND CONCLUSIONS

Results from previous cross-cultural research (Henrich et al. 2001; Henrich et al. 2010) have suggested that degree of market integration and, to a lesser extent, wealth and income may exert a direct effect on fairness in several economic games. In the present study, neither household wealth nor personal income was correlated with offer amounts in the dictator, ultimatum, and third-party punishment games. It must be noted, however, that the degree of variability in market integration measures among participants residing in the same village was exceedingly low. By contrast, there was somewhat more variability among individuals in family size, commitment to church attendance, and knowledge of spoken English. Moreover, of these, church attendance and knowledge of at least some English may be better indicators (or at least more common indicators, given the remoteness of the area) of the diffusion of at least some "Western" norms and values into the area than income or wealth. Indeed, these variables were related to offer amounts in the ultimatum game, albeit in different directions—more frequent church attendance exerted an inverse effect and greater knowledge of English exerted a positive one. Animal wealth and land in cultivation were not related to offer amounts. In one of our previous studies (Tracer 2004), participants from the relatively wealthier and more market-integrated Anguganak Village tended to offer slightly more in the ultimatum game than their poorer, less market-integrated counterparts at Bogasip Village. The difference between mean offers, however, was not significant. Like that study, the present research suggests that some indices of

TABLE 7.4   *Linear Regressions of Au Third-Party Punishment Game Offers*

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Gender dummy	13.699					
	(16.816)					
Education	3.806	1.431				
	(6.542)	(5.814)				
Individual income (U.S. dollars)	−0.362	−0.320	−0.377			
	(2.594)	(2.574)	(2.513)			
Household wealth (U.S. dollars)	−1.763	−0.605	−1.157	−0.822		
	(8.744)	(8.565)	(8.102)	(7.633)		
Household size	−6.726	−7.350	−7.572	−7.537	−7.637	
	(6.201)	(6.108)	(5.922)	(5.800)	(5.616)	
Attendance at church services	2.008	2.390	2.404*	2.387*	2.361*	1.504
	(1.493)	(1.407)	(1.378)	(1.346)	(1.300)	(1.155)
Proficiency in national language	12.797	12.865	14.418	14.140	14.045	11.455
	(11.856)	(11.769)	(9.740)	(9.374)	(9.153)	(9.092)
Constant	33.333	36.330*	39.037**	38.312**	37.484**	22.129***
	(20.901)	(20.424)	(16.869)	(15.842)	(13.584)	(7.669)
Observations	30	30	30	30	30	30
Model significance	0.670	0.638	0.506	0.358	0.217	0.262
Adjusted R-squared	−0.077	−0.062	−0.020	0.020	0.057	0.027

Source: Authors' calculations based on author data.
Note: Standard errors are in parentheses. All coefficients are rescaled (divided by standard deviation), except gender.
***Coefficient significant at < 0.01 level in two-tailed test
**Coefficient significant at < 0.05 level in two-tailed test
*Coefficient significant at < 0.10 level in two-tailed test

market integration—or perhaps more accurately, of Western influence—are associated with higher offers, but overall the association is fairly weak.

The modal offer amount was 50 percent of the stake in both the dictator and ultimatum games conducted at Weis Village. When player 2s are unable to sanction by rejecting offers in the DG, the usual result has been lower offers than are seen in the UG (Camerer and Fehr 2004). In this study, although the modes were equal, offers in the DG were more left-skewed (that is, toward lower offers) than in the UG, so that the DG mean offer was approximately 4 percent less than the UG mean offer. This difference was statistically significant.

In the ultimatum game, the income-maximizing offer—the best strategy given prevailing rates of rejection—was computed to be 20 percent, that is, 30 percent lower than the actual modal offer. It is possible that the prevailing generosity norm evident in everyday life among the Au was also at play in Au game behavior. It is also possible that given the strong generosity norm and extremely close social fabric of Au villages, individuals were more averse to the risk of rejection than concerned about maximizing payoffs.

The threat of punishment by a third-party enforcer in the third-party punishment game might have been expected to result in greater generosity and a higher modal offer than in either of the previous two games. This was not, however, the case. The modal offer in the TPG was 30 percent compared to 50 percent in the other games. One possible explanation for this

TABLE 7.5   *Linear Regressions of Au Lowest Game Offers Not Punished in Third-Party Punishment Game*

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Gender dummy	1.654					
	(12.078)					
Education	3.282	2.602				
	(9.096)	(7.450)				
Individual income (U.S. dollars)	10.933	11.188	13.058			
	(10.578)	(10.178)	(8.490)			
Household wealth (U.S. dollars)	3.667	3.616	3.799	4.866		
	(4.801)	(4.679)	(4.560)	(4.633)		
Household size	−0.517	−0.711	−0.888	−0.750	−0.451	
	(4.107)	(3.768)	(3.662)	(3.763)	(3.760)	
Attendance at church services	−1.329	−1.207	−1.156	−1.375	−1.338	−0.971
	(1.374)	(1.024)	(0.994)	(1.011)	(1.013)	(0.964)
Proficiency in national language	−17.297	−16.295	−12.278	−5.623	−5.096	−3.360
	(17.239)	(15.258)	(9.830)	(9.074)	(9.079)	(8.786)
Constant	30.938*	31.776*	32.079*	33.806**	40.996**	36.371***
	(17.296)	(15.812)	(15.484)	(15.876)	(14.368)	(6.573)
Observations	30	30	30	30	30	30
Model significance	0.632	0.503	0.379	0.561	0.594	0.580
Adjusted R-squared	−0.066	−0.019	0.020	−0.035	−0.040	−0.032

Source: Authors' calculations based on author data.
Note: Standard errors are in parentheses. All coefficients are rescaled (divided by standard deviation), except gender.
***Coefficient significant at < 0.01 level in two-tailed test
**Coefficient significant at < 0.05 level in two-tailed test
*Coefficient significant at < 0.10 level in two-tailed test

result might be the recent experimental finding by Ernst Fehr and Bettina Rockenbach (2003) indicating that the threat of punishment (compared to a reliance on trust) actually has the effect of reducing cooperation. An alternative explanation is that the introduction of fining into the dictator game produces a "crowding-out" effect (Bohnet, Frey, and Huck 2001; Frey 1993), essentially reducing the intrinsic motivation of player 1s to be "fair" and shifting their attention to the concerns of an extrinsic fining authority. Expecting a fine to reduce their payoff by three-fifths, player 1s are induced to keep a larger amount of the stake for themselves. Finally, however, because the third-party punishment game was carried out at Wulukum and the other games at Weis, village effects on game play cannot be ruled out as the cause of lower offers in the TPG.

In our previous experimental work in Papua New Guinea (Tracer 2003, 2004), we reported a remarkable pattern of rejections in the ultimatum game that at the time had been seen nowhere else in the world. In that research, UG participants in two villages (N = 55 pairs) were seen to reject both low offers and, incredibly, hyper-fair offers just over one-third of the time. Low offers were seen as unfair, and hyper-fair offers seemed to provoke a fear response. Large unsolicited gifts, which individuals sometimes refuse to accept, provoke a similar response among individuals in everyday Au life, and we interpreted the game response as a translation of the familiar "every-day life" reaction to the new and unfamiliar circumstance of the economic game. The pattern of rejections seen in the previous UG study was replicated in the present one. Rejection is highest,

at 67 percent, for offers of 0 percent of the stake, and it falls to 0 percent for offers of 50 percent. It then rises again, albeit slowly, among hyper-fair offers, to a rejection rate of 3 percent of offers of 60 percent, 10 percent of offers of 70 percent and 80 percent, 17 percent of offers of 90 percent, and a remarkable 33 percent of offers of 100 percent of the stake. Moreover, our qualitative results confirm that the primary emotion involved in the rejection of high offers was fear—probably fear of indebtedness.

We tested to see whether the pattern of punishment in the third-party punishment game would follow the pattern of rejection in the ultimatum game. In particular, we were interested, first, in whether player 3s would punish player 1s who made low offers at frequencies similar to those of rejecters in the UG, and second, whether player 3s would punish those making hyper-fair offers. Our results indicate that player 3s were willing to punish low offers at frequencies that were higher on average than the rate of rejection among UG player 2s. Similar to the pattern observed in the UG, the rate of punishment fell to 0 percent for offers of 50 percent, but in contrast, it remained at that level thereafter—that is, player 3s punished violators of the generosity norm but did not punish individuals who were overly generous. Instead, it appears that generosity was always favored and that people left it to the discretion of those directly involved in the exchange whether they chose to accept or reject the offer and the level of indebtedness it might imply.

Overall, our results suggest that a strong generosity norm prevails among the Au, as in other Melanesian societies. The norm seems to persist even in the absence of sanctions for its violation (as in the dictator game), though the threat of sanctions (in the ultimatum game) does seem to raise the mean level of generosity modestly. Our work suggests, however, that rather than bolstering prosocial behavior, the introduction of third-party enforcers may actually sabotage it. Finally, like our previous work (Tracer 2003), this study again suggests the utility of experimental economic methods, especially when used in tandem with ethnography, for understanding the basis and persistence of human social norms.

NOTES

1. The term "exchange" is used here to apply both to bidirectional exchanges and to gift-giving, which may be unidirectional, at least in the short term.
2. Conversely, a generosity norm could also be sustained by providing sufficient rewards to its adherents so that the benefits of compliance outweigh its costs. This study examines and discusses only the effects of sanctions and punishments in the case of noncompliance. It would be relatively easy, however, to design a test of the complementary "rewards" hypothesis.
3. It does not matter for the purposes of this hypothesis whether individuals seek to maximize utility in an absolute fashion or relative to others in their social group, only that they are self-interested. In either case, the expectations hold that individuals will seek to defect from cooperation in the absence of norm enforcement and will adhere to the norm in the presence of sanctions and enforcers. However, see Tracer (2004) for a discussion of "absolute" or "self-regarding" maximization versus "relative" or "other-regarding" maximization.
4. It was contended that the new wife of the hunter had convinced him to give her family a larger stake of the kill at the expense of his own extended family.
5. However, given that very few of the participants engaged in wage labor of any kind, the 10-kina stake was highly valued.

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