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Reports

Experimental Games and Games of Life among the Ju/'hoan Bushmen

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Experimental games—the dictator game and the ultimatum game—were played out among the Ju/'hoan Bushmen of the Kalahari. Subsequently, the experimenter tracked what the players did with the money earned in the games to see how it was used in “games of everyday life.” Players were stingy and did not punish in experimental games and were generous and did punish in “games of life.” The fact that the conditions of anonymity of the games removed cultural institutions and emotions governing sharing and reciprocity led Ju/'hoansi to reassess risks and benefits and play more selfishly. The findings underline the importance of cultural institutions such as sharing, reciprocity, and social sanctions (costly punishment) to provide the structure for other-regarding behavior to be expressed and to be rendered beneficial for the participants.

In recent years, the field of experimental economics has taken *Homo economicus* to task. Economic games played out in different societies have shown that men and women are not entirely self-regarding and care not only for their own well-being but also about fairness and the welfare of others (Fehr and Gächter 2002; Fehr, Fischbacher, and Gächter 2000; Gintis et al. 2003, 2005; Henrich et al. 2004a, 2005, 2006). Humans appear to have a deeply rooted tendency toward “strong reciprocity,” that is, to cooperate and punish those who violate norms of cooperation even when it is implausible to expect that these costs will be recovered at a later date (Gintis et al. 2005; Turillo et al. 2002). In a large and impressive study of economic experiments in 15 small-scale societies, Henrich et al. (2004a, 2005) came to the following conclusions: (1) the classical model of self-interest fails in all of the 15 societies,¹ (2) there is substantial variability across social groups, (3) individual-level economic and demographic variables do not robustly explain game behavior, (4) economic organization and institutions that structure social interactions explain a substantial portion of the behavioral variation, and (5) ex-

perimental play often appears to reflect the common interactional patterns of everyday life.

Experimental games are intriguing in small-scale societies where economic exchanges are institutionalized on the basis of obligations to exchange partners and kin, not market rules, because the anonymity of the games can erase the faces of kinship and partnerships, thereby removing cultural institutions and emotional aspects of sharing and exchange from decision making. Two interesting questions arise: (1) how does decision making in experimental games that are “institution free” correspond to or diverge from that in daily life, where decisions are embedded in cultural institutions, and (2) what can the correspondence or lack of it tell us about human cooperation?

To answer these questions, I asked Ju/'hoansi of Nyae Nyae to play two experimental games, the dictator game and the ultimatum game, at a time when they were very hungry and the money mattered.² I then departed from the convention of experiments and discreetly followed what Ju/'hoansi did with the money earned in the games. This allowed for a controlled comparison between how people play institution-free experimental games and how they play institution-bound games of life.

Background

The Ju/'hoansi or !Kung Bushmen are well-known foragers of northeast Namibia and northwest Botswana whose former life has been documented by Biesele (1993), Lee (1979, 1993), Lee and DeVore, eds. (1976), Howell (2000), Marshall (1976), Shostak (1981), Wilmsen (1989), and many others. Until the 1960s, the Ju/'hoansi of the Nyae Nyae area were primarily foragers, with 20%–30% of their subsistence coming from hunting large and small game and the remainder from gathering over 100 species of wild plant foods. Food was widely shared according to rules of kinship and exchange partnerships. Meat distribution occurred in “waves,” with the hunter or owner of the arrow that killed the animal giving large portions to close kin and affines according to kinship obligations and subsequently redistributed in waves moving out from each recipient to his or her own kin (Lee 1993; Marshall

1. Economists have provided a number of challenges to this conclusion. The most important ones for this study are the effect of one-shot trials and the way in which games are presented (Binmore 2005; Hoffman et al. 1994; Schotter, Weigelt, and Wilson 1994). Had I done the experiments after I was familiar with these critiques, I would have tried to measure some of these effects.

2. I was involved in a much larger study at the time and conducted the experiments over 2 days because I was curious to see what they would yield, not because they were the centerpiece of my research. I followed protocol carefully and did my best to make sure the participants understood the study. However, despite many excellent suggestions by reviewers, I will avoid overanalyzing the data and overinterpreting some of the results. To answer questions such as why do offers decrease in the ultimatum game, I would have to go back, work with a larger sample of participants, and conduct other games.

1976; Wiessner 1996, 2002). Vegetable foods were shared in the family and with visitors to the hearth; usually only those with appropriate ties came by at mealtime. Even children 6–10 years old could take a plate of food and divide it equally among their peers with few squabbles. Access to alternate residences and the resources of others was secured through more formal gift exchange partnerships called *xaro* (Wiessner 1982). *Xaro* had two components. One was a delayed exchange of gifts that transmitted information that the relationship was alive and well; the other was an underlying mutual obligation to give access to resources and alternate residences in times of need.

Both sharing and *xaro*, the dominant economic institutions governing the distribution of mobile resources, were based on need and the ability to fill it. Who had what and did or did not give it to whom was constantly monitored by discussion and verbal sanctions. Tussles could escalate into conflicts that would result in one or more parties leaving the group. Of the 308 conversations analyzed (Wiessner 2005), only 22 (7%) included praise while 171 (56%) contained some norm enforcement through criticism. Of the latter, 49% had to do with economic matters such as sharing or kinship obligations and 51% had to do with troublemaking, inappropriate sexual behavior, big-shot behavior, land rights, or politics. Conversations indicate that Ju/'hoansi were aware that both cooperation and lack of it bore risks. On the one hand, cooperation and generosity were valued but measured because of free riding and because being too generous bred ill feeling. One person could not give generously to all, and thus the most capable and generous received criticism significantly more often than others owing to jealousy (Wiessner 2005). On the other hand, lack of cooperation and reclusive behavior were regarded as foolish and even pathological because such behavior took individuals and families out of groups who pooled risk, leaving them vulnerable.

In the Nyae Nyae area where the study was conducted, rapid change was initiated in 1959 when the South African government encouraged Ju/'hoansi to settle at Tsumkwe, where they established a center offering a store, a school, a clinic, permanent water, agricultural programs, crafts marketing, and wage labor. By 1973, as many as 900 Ju/'hoansi were settled at Tsumkwe. The settlement was plagued by social strife, violence, and drunkenness; tuberculosis took the lives of many. In the early 1980s, small groups of Ju/'hoansi began to move back to their traditional lands assisted by the anthropologists and film makers John Marshall and Claire Ritchie. By 1992, over 30 groups settled in small villages on their traditional lands established the Nyae Nyae farmer's cooperative; in 1997, the Nyae Nyae Conservancy was formed.

When this study was carried out in 2004, Nyae Nyae Ju/'hoansi were living in permanent settlements on their traditional lands and obtaining some 30% of the subsistence income from foraging and 70% from government rations, wages, the sale of crafts, and old age pensions. The low income from hunting and gathering is attributable to two factors: (1)

sedentism that caused rapid exhaustion of resources within reach of permanent settlements and (2) the large population of elephants that moved into the area as open water points were provided for wild game by the Namibian Government and World Wildlife Fund. Elephants compete with the Ju/'hoansi for roots, berries, nuts, garden produce, and water. At the time of the study, government rations were not being distributed, and gathering yielded 200–600 calories/hour in the three villages studied. Hunger prevailed, with caloric intakes ranging between 1,000 and 1,500/day (Wiessner 2004). *Xaro* ties had declined, but widespread sharing persisted, conforming closely to traditional patterns.

Methods for Experimental Games

Three villages were chosen for the study: Makuri, where Ju/'hoansi engaged in extensive foraging; !Obaha, where residents supplemented their subsistence with herding and gardening; and Xamsa, where there was heavy dependency on government rations and pensions. All but six of the residents of the three villages had less than 4 years of education, and the rest had less than 7 years. Most of the men, but none of the women, had engaged in wage labor at some time during the past 20 years. All men and women could manage cash and knew how much change to expect from a basic store purchase, even the ones who were completely illiterate.

Two games were played, the dictator game and the ultimatum game. In the dictator game, the proposer dictates the division of a sum of money designated for two people; the recipient has no recourse other than to take his or her allotted share. Both parties remain anonymous. For example, if the total stake is \$10, the proposer can decide to give \$1 or \$6 to the recipient as he or she chooses. Expectations grounded in assumptions about selfish behavior predict that the proposer should offer the smallest amount possible. The ultimatum game is similar to the dictator game except that the recipient is a responder. If the responder decides that an offer is too low, he or she can refuse the offer. In that case, neither party will get anything. The ultimatum game is designed to see at what point the responder will punish the proposer for unfair play at a cost to him/herself.

I decided to play experimental games with the Ju/'hoansi after discussions with Ernst Fehr of the University of Zurich. To protect myself from the many requests that arise when resources are available, I explained the project to the Ju/'hoansi by saying that there was a man in Switzerland who wanted to see how they played experimental games. I made it clear that it was his interest, that I did not care at all what their decisions were in the games, and that there would be no consequences for how they played. Because so many odd research projects have been carried out among the Ju/'hoansi, this did not seem strange to them at all, and they were all very keen to play. To this day they ask when is the Swiss man going to send more "money games."

People were told that they would play two games. The rules

Table 1. Mean offers made by Ju/'hoansi in the dictator and ultimatum games

Village	<i>n</i>	Dictator game		Ultimatum game		Refusals
		Offer	Fraction	Offer	Fraction	
Xamsa	29	3.0	0.20	2.5	0.17	2
Makuri	13	2.2	0.13	2.1	0.12	0
!Obaha	11	3.1	0.23	2.7	0.19	0
Total	53	2.8	0.20	2.4	0.16	2

Note: Offer = mean offer; fraction = fraction of stake size. In this case, the total stake was 9, not 10, because Ju/'hoansi decided that in a game of giving, something must be given (see text). Multiple regression analysis showed that the proposer's offers were not affected either positively or negatively by age and sex, although there was a marginally significant effect for Makuri village (see CA+ online supplement A). I am grateful to Adrian Bell for running these regression analyses.

of each games were explained and demonstrated twice by /Aice N!aici of Xamsa village, once to the group and again to individuals as they began the game. For the dictator game, the script was as follows: "The game is about giving. You will be given \$10 and asked to decide how you will divide the money between yourself and an anonymous partner. You will not know who the partner is and the partner will not know who you are. Nobody else will know how much you gave except me (Polly)." Everybody except five old people needed no further explanation, although most had a hard time understanding how something so simple could be a "game." A discussion ensued about how greedy one could be and if one could give nothing. I said that they could decide how much they would give or keep, but Ju/'hoansi felt that at least \$1 must be given or else it would not be a game about giving. I accepted their conclusion, so the minimum that could be given was \$1.³

For the ultimatum game, the script was as follows: "The game is about giving and accepting. You will be given \$10 and asked to decide how you will divide the money between yourself and an anonymous partner. The partner will be informed in private of how much he or she has been offered by an unknown person, and then he or she can either accept or refuse the offer if he or she feels the offer is too stingy. If he or she refuses, neither of you will get anything. You will not know who the partner is and the partner will not know who you are. Your decision will not be known to anybody but me (Polly)." The responder was told that "Somebody anonymous has \$10 and will decide how much to give to you. If you accept the offer, then you will keep the money offered and he or she will keep the rest. If you feel the offer is too stingy and reject it, then neither of you will get anything. You will not know who the partner is and the partner will

3. I agreed because if people did not feel this was a game involving giving, then I would not know what to make of the results.

not know who you are. Nobody else will know how much you gave except me (Polly)."

People gathered at my hearth and drank tea while subjects were called out one by one to play the game. Those present were promised not to talk about their decisions until all the games were over and not to tell people in the next villages (10–30 kilometers away) about the games until the project was complete. I carried out the project in 2 days before any news could spread. Ten Namibian \$1 coins were laid out in a rut on the tailgate of my truck in back of my hut. Ten dollars is the daily wage for a casual laborer and can buy a few days worth of tea and sugar or maize meal. Subjects were asked to divide the coins into two piles, one for themselves and one for an unknown other.

Thirty-two percent of subjects in the dictator game and 54% in the ultimatum game made decisions quickly; the remaining subjects deliberated, first dividing the coins in half and remarking that that division was equal, *khuian khoe*. A few asked me once more if it was *really* true that their identity would not be revealed; with confirmation, they slid more coins, one by one, over to their own sides. Occasionally the subject would hesitate and say, "Are you sure you are not deceiving me?" I assured them that I was not. After the dictator game, we held a short break and then proceeded with the ultimatum game.

Results

The results of the two games are given in tables 1 and 2. Regression analysis indicates that proposer's offers were not affected either positively or negatively by age, sex, or village (see CA+ online supplement A). The low offers of the Ju/'hoansi and low rates of punishment are matched only by the Hadza, Machiguenga, and Quicha in the study of 15 small-scale societies (Henrich et al. 2004a; Henrich and Smith 2004b; Patton 2004; Marlowe 2004). Interestingly, the offers in the ultimatum game were lower than in the dictator game, perhaps because people realized that they could indeed be greedy with no consequences, possibly following the well-known outcome that individuals decrease contributions with repeated rounds (Binmore 2005), or perhaps because they regarded the ultimatum game as a real game with "play" in

Table 2. Offers made by Ju/'hoan proposers in the dictator and ultimatum games

Amount (Namibian \$)	Dictator game		Ultimatum game	
	<i>n</i>	%	<i>n</i>	%
5	10	19	3	6
4	8	15	7	13
3	11	20	14	26
2	11	21	15	28
1	13	25	14	27
Total	53	100	53	100

it. Three village leaders who had made high offers of \$4–5 in the dictator game said that they expected to be rewarded for giving generously by being invited to play more games even though I had clearly explained that everybody would play two games only. When they saw that everybody was indeed chosen to play again, they were annoyed, and they lowered their offers in the ultimatum game. Only two people punished. I was hoping that somebody would offer more than \$5 to see if the offer would be rejected to punish the proposer for acting like a “big shot,” but nobody made a high offer (see Henrich et al. 2006 and Tracer 2003 for interesting discussions of rejections of very high offers).

When the games were over in Xamsa village, we sat around, ate, and talked.⁴ Most of the discussion was about rejection or punishment. Participants said that if somebody does not know to whom he or she was giving, then one should be really happy to get anything at all, even \$1 or \$2. One woman remarked that one would not want to give generously without knowing the recipient because of the risk of giving to somebody who had been stingy with you. I then asked participants if there were conditions when they would punish. They named two. One was if the proposer had to divide the money among two or more responders and gave different amounts to each. That would warrant punishment for unfairness. The other was if the anonymity condition was removed and people knew who was giving to whom. If the giver had any kinship or other obligations to them and made a low offer, then they would consider punishing at a cost to themselves, depending on the history of the relationship and how much money they would lose.

Games of Life

The following day at Xamsa (where I reside), games of life began, and I observed carefully but very discreetly, without asking any questions, so as not to disrupt the flow of events. Early in the morning, the money was burning a hole in people's pockets (ca. \$20/person), and eight Ju/'hoansi set off, bearing shopping lists and money from the entire village, for two towns that had stores: Tsumkwe, which is 50 kilometers from Xamsa, and G/am, which is approximately 60 kilometers away. These stores were stocked with a sparse array of food, soap, and tobacco. Because the money was won in games, it was seen as the legitimate property of the owner. As far as I could see, all of the cash went with the parties of shoppers with verbal wish lists from individual owners of the money. Money can be and is sometimes spent in other ways, for example, given to a kinsman, saved for a larger item such as clothing or a blanket, or kept by individuals who say they are going to visit kin and then travel alone to one of the towns and purchase meat, tobacco, or food for themselves. How money is spent on any single occasion is regarded as individual

4. I did not do any systematic debriefing but simply listened to what people said and observed how they prioritized.

choice, although if people are stingy on a regular basis and do not share, they are subject to harsh verbal criticism followed by ostracism if they do not reform their ways.

The G/am shoppers were lucky and got lifts on trucks right away; one party returned in the early afternoon and the other later that day. The three shoppers who went to Tsumkwe did not return for almost a week. The G/am shoppers returned with the orders for food, small amounts of tobacco, and four bars of soap that were delivered to individuals who requested them. The segment of the village whose shoppers returned first from G/am had recently had a serious quarrel with a second segment over a goat. Feelings were still very tense. They shared the tobacco, pooled the food purchased, and cooked it, even though some had contributed more than others. Sixteen people gathered around one hearth and shared generously and equally with spirits high. People from the second segment (six people) were expressly not invited to join them, although they sat in the shade some 50 m away. Among the many topics of conversation was the goat dispute, a discussion that was turned up loud enough for criticisms to reach the excluded segment. When shoppers from the second segment arrived, they too cooked and shared their food among themselves and distributed small portions of tobacco for individual pipes, excluding members of the first, even though close kin ties linked the two.

Such loud criticism within earshot of the offender is the first stage of Ju/'hoan social sanctions, or “punishment.” It may be accompanied or followed by exclusion from sharing that can escalate into more serious conflict. In this case, a brawl ensued the next day, and the excluded segment left to settle elsewhere. This was costly for the village because one of the women who departed was a sibling of the other village members who helped her sisters greatly with childcare; her husband was an occasional wage earner who brought valuable income to the village. There was anger and regret on the part of both parties. Such incidents are unusual; I have shown that Ju/'hoansi punish frequently through verbal criticism, but owing to cultural means, punishment is rarely costly for those who deliver it (Wiessner 2005).

The Tsumkwe shoppers did not return for a week because they could not get a lift home. Their kin knew very well what had happened. The first day they had purchased food. When they could not find a truck home in the days that followed, they exchanged the rest of the money or the food for alcohol at Bantu drinking joints on a one-night spree. Their last days were ones of hunger and dejection until they found a truck that would take them home. There was no criticism of them while they were absent or once they returned even though they had squandered the money of some of those who had remained in the village. The problem was said to be “the fault of the beer,” something that all village members had experienced. This use of money cannot be seen as “utility” but as “futility,” with high risks. Between 2001 and 2006, four prominent Ju/'hoansi in a population of some 1,800 were murdered in Tsumkwe while on such desperate drinking sprees.

Summary and Discussion

Unlike the findings for some societies (Henrich et al. 2004a; Paciotti and Hadley 2003), experimental games among the Ju/'hoansi did not reflect the common interactional patterns or cultural institutions of everyday life. Consistent with the findings of Henrich et al. (2005, Authors' Response), when local institutions do not get mapped onto the games, the games do not yield prosocial behavior. The fact that the anonymity assumption removed cultural institutions from the game led Ju/'hoansi to reassess risks and benefits and play in such a way that served their own self-interests. In the first round of games, many players first divided the coins into two groups of five, reflecting an equal distribution. Then they checked the rules of the game once again with me, confirmed that the game was indeed "new" and anonymous, and allotted more of the coveted coins for themselves. Although punishment is a regular part of Ju/'hoan life, few were willing to bear the costs of punishing if they did not know whom they were punishing and what changes in behavior punishment might yield. In all deliberations around the experimental games, conditional cooperation (Axelrod and Hamilton 1981) and reputation were of primary concern.

Games of life were played differently than experimental games. When cultural institutions with shared rules were reinstated, sharing and reciprocity could be expressed: people shared generously by sending shoppers to stores in the region and by jointly cooking the individually purchased portions of food and sharing them widely within their segment of the village. They also displayed leniency to fellow village members who intended to return with food but became stranded in Tsumkwe and squandered their money. Everybody had been in a similar position before, had done the same, and understood; punishing would not change the outcome. However, they also did not hesitate to use the occasion to punish by excluding in a segment of the village people who they felt had violated social norms during an earlier tussle over a goat. Exclusion from food sharing was accompanied by verbal criticism during the small feast, criticism that anybody in the vicinity could witness. The events that followed the exclusion, physical conflict and departure of one segment of the camp, were costly to both parties. Both the tendency for widespread sharing and for punishment via verbal criticism followed by more serious sanctions if the offender does not reform are consistent with other findings of other research on the Ju/'hoansi (Lee 1993; Lee and DeVore 1976; Marshall 1976; Shostak 1981; Wiessner 2005).

If results of experimental games and games of life differ so greatly, what can we learn from the experiments? First, the games indicate that Ju/'hoansi are highly self-regarding under two conditions. One is when participants act outside of the institutions that structure sharing and reciprocity, namely kinship, reciprocal altruism (*xaro*), and the risk of punishment for violating social norms (see also Henrich et al. 2005). The other is when there are no faces of loved ones or friends

present to make them want to give, an emotional factor that is often overlooked in experiments. There is little evidence from the Ju/'hoan results that it is a part of human psychology to be willing to engage in altruism or costly punishment in a social and cultural vacuum. When the faces and forces of culturally defined institutions are reintroduced, sharing and giving resume with warmth and generosity and punishment ignites with anger. Sometimes it brings costs, other times not.

The Ju/'hoansi are aware of the importance of generosity and social sanctions for the maintenance of the dynamics of their groups and networks that have assured their survival. Within these institutions, three forces of human psychology—self-regard or stinginess, other-regard or generosity, and fear of punishment—are played out on internal battlefields on a daily basis. The outcome is regulated in part by cultural institutions that make social exchange more predictable. The spice of life in Ju/'hoan society is comprised of discourse, myth (Bieseles 1993), song, and action that address the balance of these conflicting desires. It is anonymity that makes facile self-regard possible.

The experiment also underlines the importance of cultural institutions in providing the "rules of the game and accompanying norms" sufficient to reduce the transaction costs of social exchange (North 1990) so that human capacities other than self-regard can be played out and rendered beneficial. For the Bushmen, the name relationship restructures kin selection, *xaro* guides reciprocal altruism, and punishment is carried out within complex social conventions that greatly reduce its costs (Wiessner 2005). This is one more example supporting the coevolution of genes and culture: that the evolution of other-regarding psychological capacities would have been forbiddingly expensive in the absence of cultural institutions. As N!ai's uncle says jokingly in John Marshall's film *N!ai, the Story of a !Kung Woman*, "A Bushman is the stingiest being on earth, a bag with no opening." It is cultural institutions and context that entice the bag to open.

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