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Communications

The Friedman-Savage Utility Function in Cross-cultural Perspective

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A. Introduction

In their classic article on the utility of wealth, Friedman and Savage (1948) tried to devise a utility function to explain a variety of apparently conflicting phenomena. For instance, why do people who normally do not play gambling games such as calling heads-or-tails participate in lotteries? And why do people who gamble also buy insurance?

The purpose of this note is to show that the ideas underlying the Friedman-Savage utility function can permit us to make accurate predictions about which precapitalist societies do and which do not engage in gambling. The supporting data are macroeconomic, and the tests are carried out using a simple multivariate least-squares regression analysis.

B. The Utility-of-Wealth Function

The Friedman-Savage utility function has a rather strange shape, which is shown in figure 1 below. The utility function is the curve U–U'. A person normally has wealth W_n and experiences a utility U_n. He now faces two different gambling situations, in both of which his expected wealth after the bet (i.e., the sum of the probability of winning multiplied by his wealth position if he won plus the probability of losing multiplied by his wealth position if he lost) is the same as his normal wealth situation.

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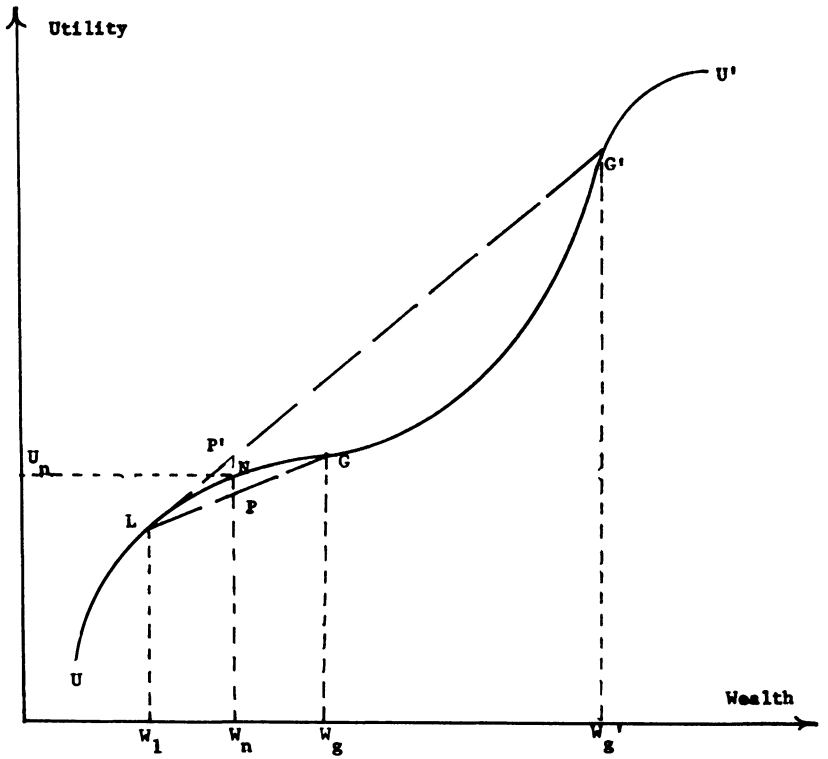

FIG. 1.—The Friedman-Savage utility function

Determining whether the person will take either of the bets simply involves calculating his expected utility after the bet, which in turn is determined as the sum of the probability of winning multiplied by the utility of his wealth position if he won plus the probability of his losing multiplied by the utility of his wealth position if he lost. In the first bet, the person will have wealth position L if he loses and wealth position G if he wins. The weighted utilities of these two wealth positions falls somewhere on the line L–G and, given the odds mentioned above, this is at point P (where the line indicating the expected wealth outcome intersects line L–G). Since point P has a utility less than U_n, the person will not take the bet. In the second bet, the person will have a wealth position L if he loses and a wealth position G' if he wins. The weighted utilities of these two wealth positions falls somewhere on the line L–G', and, given the odds mentioned above, this is at point P'. Since point P' has a utility more than U_n, the person will take the bet.

Friedman and Savage tried to interpret the derived utility curve in terms of the entire society, an interpretation which was subjected to attack by Markowitz (1952). Nevertheless, the basic shape of this curve has been accepted for more than a quarter of a century.

Empirical verification of this function has rested, as far as I have been able to determine, exclusively on microeconomic data. My macroeconomic approach extends a number of microeconomic propositions, and I focus my analytic attention particularly on the wiggle in the curve and the points left of point G'. I do not deal with situations in which the curve begins to show a marked diminishing marginal utility again to the right of point G'.

C. The Test Situation and Alternative Hypotheses

What kind of determinants can be used to predict the presence of gambling in a worldwide sample of 60 primitive and peasant societies? I draw several predictions from the Friedman-Savage utility function and then discuss a series of alternative hypotheses found in the anthropology literature.

Before the Friedman-Savage utility function can be used as a basis for prediction, we must inquire briefly into the authors' underlying justifications of the rising marginal utility of wealth. Most of their discussion is in terms of rationalizing the behavior of individuals who both gamble and take out insurance. However, such behavior is based on certain conditions in society. They suggest that the two convex segments correspond to "qualitatively different socioeconomic levels, and the concave segment to the transition between the two levels. On this interpretation, increases in income that raise the relative position of the consumer unit in its own class but do not shift the unit out of its class yield diminishing marginal utility, while increases that shift it into a new class, that give it a new social and economic status, yield increasing marginal utility" (pp. 298–99). The greater the possibility of achieving such qualitatively different statuses, the greater the possibility of the presence of gambling. We can predict, therefore, that there should be a positive correlation between socioeconomic inequality and the presence of gambling in the various societies in the sample, a hypothesis validated below.[1]

Another implication can also be drawn. Individuals in societies where members feel themselves close to the subsistence level of income should have a very high disutility of losing since (if they have average incomes) losing might bring them close to starvation; therefore, the presence of gambling should be inversely correlated with this condition. Unfortunately, the measurement of income level raises some difficult problems.

[1] A hidden assumption in this argument is that social-class mobility is difficult and that gambling is one of the few easy channels of mobility. It should be added that this argument does *not* rest on any assumption about the utility of any given amount of wealth being the same for the individual societies or the utility functions being similar. Rather, I am assuming only that the utility-of-wealth functions have the same general shape (two segments with diminishing marginal utility of wealth, separated by a segment with an increasing marginal utility of wealth.)

Sahlins (1972) presented convincing evidence that highly primitive hunting and gathering societies are nowhere near this subsistence point, as shown by the fact that members of most of these societies spend very little time searching for food. For instance, according to Lee (1968), the !Kung Bushmen of Botswana, who are among the most primitive peoples of the world, spend less than 20 percent of their work time looking for food. Boserup (1965) has presented more controversial evidence, showing that the most primitive agricultural groups who employ slash-and-burn agricultural techniques spend much less time farming than do farmers using much more "advanced" techniques. Since the food supply of these highly primitive societies can be increased by gathering natural products for a few more hours of the day, they should not feel close to the subsistence limit. Therefore, this subjective condition should not be correlated with the actual level of economic development, at least as conventionally measured by anthropologists such as Carneiro (1973) or Murdock and Provost (1973).

It does seem reasonable to suspect that the long-term feeling of closeness to subsistence occurs where the yearly food supply is quite uncertain. One such situation occurs in "hard" environments such as arctic, semi-arctic, or desert environments, where climatic shifts are considerable and the food quest is very difficult. Another such situation occurs in that type of subsistence production in which the maintenance of a critical minimum capital stock is quite uncertain at all times for the various individuals in the society. Of the five modes of food production (hunting, gathering, fishing, herding, and farming), it has been argued (e.g., by Collins 1965) that such uncertainty is greatest in animal husbandry, where the herder must keep the size of the herd above a critical minimum and growing as fast or faster than the food needs of the herding family. In nomadic herding societies, where the entire food supply comes from the herds and a herd is in many different places during the course of the year, the dangers that the size of the herd may be reduced below the critical minimum by disease, theft, stampede, climatic occurrences, or accidents seem sufficiently great that gambling losses may have a very high disutility. Therefore, from considerations underlying the Freidman-Savage discussion, we can predict that the presence of gambling should be inversely related to hardness of the environment and also to reliance on nomadic herding; positive evidence for these predictions is presented below.

In the anthropology literature, discussion about the determinants of gambling is much different and considerably less rigorous. Some of the studies are inductive correlation exercises (e.g., Roberts and Sutton-Smith 1966), while others attempt to trace the determinants of gambling to certain psychological variables such as values or attitudes induced by child-rearing practices. More interesting propositions come from

various ethnological studies in which authors are trying to explain the presence of gambling in the societies they are investigating.

One common hypothesis from this latter literature is that gambling is related to the level of economic development. More specifically, the higher the developmental level, the greater the individualism in the society and also the greater the breakdown of "strict tribal morality," two factors which might contribute to violations of injunctions against gambling. In addition, it is argued that economic development is related to the domestic use of money for commercial purposes and that such money serves to facilitate gambling. We can test not only this relationship between economic development and the presence of gambling but also particular aspects of the argument. For instance, we can test whether gambling is related to individualism by looking at proxies for individualism such as presence of nuclear (rather than extended) families and the absence of important lineage structures. We can also test whether the presence of money influences the presence of gambling.

Another kind of argument found in the anthropology literature rests on the possibility of cultural diffusion and comes in two versions. Version one is quite common: gambling arises from the cultural degeneracy which allegedly occurs upon extensive contact with the West. We can easily devise a measure for contact with the West; unfortunately, I expended much effort in coding various societies at periods in which such contact with the West was minimal, so that it is difficult to test this hypothesis satisfactorily with my data. Although, in fact, the calculated regression coefficient for the contact variable is not statistically significant, a certain verification is found by looking at particular cases. For instance, it is worth noting that at least three societies in my sample, namely the Truk Islanders of the Pacific, the Siane of New Guinea, and the Callinago Indians of the Caribbean, apparently did not aboriginally have gambling but adopted such practices after extensive Western contact.

A second version of the diffusion argument arises from an observation by the famous anthropologist Robert Lowie (1934, p. 169), who observed that gambling is especially prevalent among the Indians of North America (north, that is, of Central America). He did not specify whether gambling was a trait brought by the original settlers of North America thousands of years ago and maintained by the various groups which split off to form separate societies or gambling was diffused more recently. Nevertheless, I included a special location variable to take care of this contingency.

A final argument which friends of mine have suggested extends another intrasocietal argument to an intersocietal level: in some societies most members are "risk lovers" and therefore practice gambling in order to fulfill this personal and cultural need. Manifestations of "risk loving" are reliance on modes of subsistence in which there is a high daily variation in supply (e.g., hunting and fishing) or where the environment is "hard".

Thus the risk-loving hypothesis predicts that gambling will be positively correlated with the hardness of the environment, while the economic considerations discussed above predict exactly the opposite relation. It turns out that this risk-loving hypothesis provides very poor predictors of the presence of gambling.

D. The Sample

There are 60 primitive and peasant societies in the sample used for investigating the hypotheses discussed above, and they were drawn from all over the world. Murdock (1957) has divided the world up into 60 cultural areas, and 58 of these are represented in the sample. More than 85 percent of the 1,770 pairs of societies are more than 2,400 miles away from each other. Each society was coded for a particular year, usually in the second half of the nineteenth century, before much Western contact had occurred; however, this did not prove possible for some of the societies in the sample.

The data for coding the societies were drawn from more than 1,200 ethnographic sources; and this project represents a very small piece of a much larger comparative study of distribution in primitive and peasant societies (Pryor, forthcoming). My codings for the presence of gambling can be checked against the codings of Murdock and his associates for the presence of games of chance, and considerable agreement is obtained.[2] Difficulties in the coding of the independent variables was minimized in several different ways. First, only one coder (myself) made the various ratings, so that problems of intercoder reliability did not arise. Second, the data on the independent variables were collected for a purpose much different from this examination of gambling, a fortuitous circumstance which might minimize bias. Unfortunately, I did not have sufficient research funds to hire an independent coder so that independent ratings of the variables could be compared with mine.

A list of the societies in the sample, along with the codings of the different variables, can be found in the appendices. Further details may be obtained from the author.

E. The Calculations

The coding of the presence of gambling was carried out in two different ways. In one coding I set up three dummy variables, where 0 = gambling not reported; 1 = gambling reported but not an important economic

[2] The codings on games of chance come from the *Ethnographic Atlas*, 1972 card version, obtained from the Ethnographic Atlas project of the Department of Anthropology, University of Pittsburgh. Of the 43 societies for which their and my codings could be compared, we agree on the presence or absence of gambling in 37 (86 percent) of these. There was no systematic bias shown in the error pattern of the six societies where our codings differed.

activity; and 2 = gambling reported as important economic activity. "Importance" represented my subjective judgment on the relative value of the goods changing hands in such activities as a percentage of total societal income. Another type of gambling variable was also examined (where the dummy variable had only two values, denoting whether gambling was present or not), but the explanatory power of these regressions was somewhat less, and the experiments were abandoned. Several alternative measures of the level of economic development were also investigated and dropped because of lower explanatory power than the variable chosen.

The dependent variable plus the 10 proposed independent variables are presented in table 1 below, along with their correlations. It should be noted that there is a certain amount of multicollinearity among the explanatory variables, and therefore we must adopt special procedures. The most simple is to select subsamples of variables and determine which groups lead to significant regression coefficients and the highest coefficients of determination; and this procedure was followed. The risk-loving hypothesis and the contact-with-the-West hypothesis quickly fell by the wayside. The variables connected with individualism (i.e., presence of lineages and the type of family) also did not seem very important and were dropped. The hardness-of-environment variable and the nomadic-herding variables are sufficiently correlated to each other that only one must be used in the statistical analysis; the latter was chosen because there was less subjectivity in its coding and also because it yielded somewhat higher coefficients of determination, a fortunate congruence of events.

In the final rounds of testing, five independent variables remained. The major difficulty arose in deciding whether the economic-development variable or the social-inequality variable should be retained in the regression. If we calculate a regression with all five independent variables, the coefficient for the development variable is not statistically significant, while the coefficient for the inequality variable is. Further, the coefficient of determination for the regression if the development variable is dropped is somewhat higher than if the social-inequality variable is dropped. The final regression can be shown thus:

$$PG = -0.2811 + \underset{(.1514)}{1.3302}\, LNA + \underset{(.1256)}{0.4151}\, DCM$$

$$+ \underset{(.0746)}{0.2372}\, SI - \underset{(.1961)}{0.4299}\, NH \qquad R^2 = .6757, \quad n = 60$$

where PG = presence of gambling (0 = not present; 1 = present but unimportant or present and importance unascertainable; 2 = present and an important redistributive mode); LNA = location in North America

TABLE 1

CORRELATION MATRIX OF GAMBLING AND VARIOUS PROPOSED EXPLANATORY VARIABLES

	Dependent Variable	Independent Variables									
	1*D*	1	2	3	4	5	6	7	8	9	10
Dependent variable:											
1*D*. Presence of gambling	1.00	...	...	...	...	...	...	...	...	...	...
Independent variables:											
1. Location in North America	0.68	1.00	...	...	...	...	...	...	...	...	...
2. Social inequality	0.27	−0.11	1.00	...	...	...	...	...	...	...	...
3. Nomadic herding	−0.25	−0.16	0.11	1.00	...	...	...	...	...	...	...
4. Presence of domestic commercial money	0.35	1.01	0.38	0.13	1.00	...	...	...	...	...	...
5. Hardness of environment	−0.01	0.19	−0.05	0.68	−0.07	1.00	...	...	...	...	...
6. Level of economic development	0.24	−0.16	0.74	−0.04	0.57	−0.17	1.00	...	...	...	...
7. Hunting/fishing for 50% or more of total food supply	0.12	0.32	−0.24	−0.13	−0.17	0.16	−0.38	1.00	...	...	...
8. Type of family (nuclear or extended)	0.07	−0.07	0.05	−0.14	0.17	−0.01	0.12	−0.16	1.00	...	...
9. Contact with West	0.03	0.10	0.11	0.43	0.27	0.37	0.17	−0.13	−0.04	1.00	...
10. Presence of lineages	0.03	0.20	−0.23	0.18	−0.11	0.37	−0.34	0.21	0.06	0.15	1.00

(excluding Central America and the Caribbean islands) (1 = yes; 0 = no); *DCM* = presence of a domestic commercial money (1 = yes; 0 = no); *SI* = presence of socioeconomic inequality (a five-point scale: 1 = little or no socioeconomic inequality; 5 = considerable socioeconomic inequality); *NH* = society nomadic or seminomadic and more than half of its food supply coming from animal husbandry (1 = yes; 0 = no); R^2 = coefficient of determination; n = size of sample; and numbers in parentheses = standard errors.[3]

Several technical aspects of the regression deserve brief mention. First, this is the combination of four variables which has the highest coefficient of determination of any of the combinations which I tried. Second, the calculated regression coefficients are quite robust; when one of the variables is dropped from the calculations, there is not a great deal of change in the calculated slope coefficients of the other variables.

The most important feature of the regression for this discussion is that the calculated coefficient for the socioeconomic-inequality variable is statistically significant, thus confirming a deduction from the Friedman-Savage utility analysis. The calculated coefficient for the nomadic herding variable is also statistically significant (at the .05 level) and confirms another aspect of the Friedman-Savage discussion. The significance of the coefficient for the money variable confirms a commonsense economic proposition which rests on intuitive notions about the implications of liquidity. The only variable reflecting considerations discussed in the anthropology literature is the location variable, which shows, I believe, that the presence of gambling depends not only upon the presence of money or social inequality or the absence of nomadic herding but also upon some sort of diffusion phenomenon which remains to be explored.

In short, these results suggest that deductions from economic theory about gambling serve us well in examining economic systems much different from the industrialized, capitalist economies to which our theories refer. Further, we can derive from the strangely shaped Friedman-

[3] A problem in interpreting the statistical significance of the coefficients arises in the following manner: the presence of cultural diffusion of gambling among the 11 North American societies lowers the number of independent cases, and therefore our degrees of freedom are lowered. It is noteworthy, however, that the calculated coefficients of most of the variables in the regressions continue to have high *t*-scores, even when the variable representing the location factor is removed. For this reason, I do not believe that this problem of loss of degrees of freedom is serious. Additional statistical problems arise because the dependent variable is a dummy variable, which means that the estimators are unbiased but not efficient (Kmenta 1971, p. 427); and, further, because the error term is not normally distributed, the estimators of the constant coefficients are not normally distributed, and thus the classic tests of significance do not directly apply. However, since it was the size of the coefficient of determination which provided the key test for the choice of the combination of variables, rather than the *t*-test, I do not believe that investment in more sophisticated estimation techniques for the coefficients of the independent variables would have a very high payoff (especially since examination of the regression residuals did not suggest that the heteroscedasticity problem was very severe).

Savage utility function several propositions which receive impressive empirical validation from our sample of 60 primitive and peasant economies. Although the presence of gambling among societies in the sample cannot be explained by exclusive reliance on propositions derived from the Friedman-Savage analysis, they certainly help us explain an important part of the variance.

Appendix A

Societies in Sample

The listing below gives the societies in the sample, alternative names, locations, and dates to which the data apply.

1. *Alor:* Atimelang village, Alor, Lesser Sunda Islands, Indonesia; 1900 (before extensive contact with Chinese or Dutch).
2. *Amhara:* Gondar district, Ethiopia; 1900 (before extensive reforms and changes).
3. *Ao Naga:* Assam valley, India; 1885 (shortly before British conquest).
4. *Aweikóma:* Dalbergia, Santa Catarina, Brazil; 1913 (before "pacification").
5. *Azande* [Zande, Niam-Niam]: primarily in northeast Zaïre, but also Sudan and the Central African Republic; 1905 (before European administration).
6. *Aztec* [Tenochca]: central Mexico; 1519 (shortly before arrival of Cortes).
7. *Basseri* [Khamseh]: Fars, Iran; 1955 (shortly before Barth's fieldwork).
8. *Batak* [Toba-Batak]: Sumatra; 1880 (shortly before intensive missionary work).
9. *Bhil:* area around Rajpipla, Gujarat, India; 1935 (shortly before the fieldwork of Koppers).
10. *Bribri* [Talamanca]: Costa Rica; 1866 (before strong Western influence).
11. *Callinago* [Island Carib]: Dominica, Lesser Antilles; 1640 (at the time of early French visits).
12. *China* [Kwangtung province peasant]: Nanching village, Kwangtung province, China; 1930 (before modern road put in).
13. *Comanche:* Texas and Oklahoma, U.S.A.; 1850 (before "pacification").
14. *Copper Eskimo:* Coronation Gulf, Northwest Territories, Canada; 1910 (before extensive Western contact).
15. *Dogon* [Habe, Kado]: Sanga region, Mali; 1900 (before extensive Western contact).
16. *Fiji:* Vanua Levu, Fiji; 1820 (before extensive Western contact).
17. *Fon* [Dahomey]: Dahomey; 1860 (before end of slave trade and beginning of extensive Western influence).
18. *Ganda* [Baganda]: Uganda; 1855 (before extensive Western contact).
19. *Gheg:* Albania; 1912 (at year of independence from Turkey).
20. *Havasupai:* Arizona, U.S.A., 1890 (before extensive Western contact).
21. *Inca:* Peru, Bolivia, and Ecuador; 1532 (shortly before Spanish conquest).
22. *Iroquois:* New York, U.S.A.; 1700 (before extensive Western influence).
23. *Khalkha Mongol:* Mongolia; 1910 (before gaining independence).
24. *Koryak* [Reindeer Koryak, Chavchuven]: Kamchatka peninsula and adjacent areas; 1901 (at time of fieldwork of Jochelson).
25. *!Kung Bushmen:* Southwest Africa and Botswana; 1950 (shortly before fieldwork of the Marshall family).

26. *Kwakiutl* [Southern Kwakiutl]: Vancouver Island, British Columbia, Canada; 1860 (before extensive contact with the West).

27. *Lapp* [Mountain Lapp]: Käresuando parish, Sweden; 1950 (shortly before fieldwork of Whitaker and Pehrson).

28. *Lepcha* [Rong]: Sikkim; 1870 (before extensive Western contacts).

29. *Manóbo:* Agúsan valley, East Mindanáo, Philippines; 1905 (at time of fieldwork of Garvan).

30. *Maori:* north part of North Island, New Zealand; 1800 (before extensive white contact).

31. *Mundurucú:* Cabrúa village, Pará, Brazil; 1952 (at time of fieldwork of Murphy).

32. *Murngin* [Wulamba]: east Arnhem land, Northern Territory, Australia; 1926 (at time of fieldwork of Warner).

33. *Naskapi:* north Labrador peninsula, Canada; 1880 (shortly before fieldwork of Turner).

34. *Navajo:* Arizona and New Mexico, U.S.A.; 1860 (shortly before "pacification").

35. *Nuer:* Ā Ālī A-Nīl, Sudan; 1920 (before "pacification").

36. *Nyakyusa* [Banyakyusa, Wanyakyusa]: southern highlands, Tanzania; 1890 (shortly before missionary arrival).

37. *Omaha:* Nebraska, U.S.A.; 1850 (before extensive Western contact).

38. *Pomo* [Eastern Pomo]: Clear Lake, California, U.S.A.; 1847 (shortly before California gold rush).

39. *Rif* [Aith Waryaghar Rif]: Morocco; 1920 (before major changes).

40. *Rwala* [Rwala Bedouin]: Syria, Jordan, and north Arabia; 1905 (at beginning of fieldwork of Musil).

41. *Semang* [Orang-Utan, Sakai]: northwest Malaysia; 1924 (at time of first fieldwork by Schebesta).

42. *Serbia:* Sumadija region, Serbia, Yugoslavia; 1910 (before Serbian-Turkish war).

43. *Shavante* [Akwe-Shavante, Chavante, Xavante]: central plateau, east Mato Grosso, Brazil; 1950 (before extensive Western contact).

44. *Siane:* Goroka subdistrict, eastern highlands, New Guinea; 1944 (before Western contact).

45. *Siriónó:* eastern Bolivia; 1940 (at time of fieldwork by Holmberg).

46. *Suku* [BaSuku, Pindi]: Kwango district, Zaïre; 1915 (before extensive contact with West).

47. *Tanala* [Menabe Tanala]: Malagasy; 1890 (before extensive contact with the West).

48. *Thonga* [BaThonga]: Mozambique; 1870 (before beginning of fieldwork of Junod).

49. *Tikopia:* Santa Cruz Island, Solomon Islands; 1928 (at beginning of Firth's fieldwork).

50. *Tiv* [Munshi]: eastern central Nigeria; 1900 (before extensive Western contact).

51. *Toba* [Eastern Toba, Toba-Pilagá, Pitilagá, Takshik, Komlik]: Chaco and Formosa provinces, Argentina; 1860 (before lumber mills and military campaigns).

52. *Toda:* Nilgrili hills, Madras, India; 1901 (at time of Rivers's fieldwork).

53. *Trobriand:* Kiriwina district, Boyowa Island, Trobriand Islands; 1914 (at time of Malinowski's fieldwork).

54. *Truk:* Romonum Island, Truk Islands, Caroline Islands; 1895 (before extensive Western or Japanese contact).

Appendix B

TABLE B1

SAMPLE SOCIETIES AND CODED VARIABLES

SOCIETY	VARIABLES										
	1	2	3	4	5	6	7	8	9	10	11
Alor	1	0	0	1	38	0	0	0	2.0	1	0
Amhara	1	0	0	1	58	1	0	0	4.0	1	0
Ao Naga	1	0	0	1	33	1	0	0	2.2	1	0
Aweikóma	0	0	0	1	6	0	0	1	1.4	0	0
Azande	0	0	0	1	41	0	0	0	2.0	0	0
Aztec	2	0	0	1	56	1	0	0	4.5	1	1
Basseri	0	0	1	1	25.5	1	1	0	2.5	0	0
Batak	2	0	0	1	34	1	0	0	3.2	1	0
Bhil	0	0	0	1	47	1	1	0	2.5	1	0
Bribri	0	0	0	2	24	1	0	0	1.5	1	0
Callinago	0	0	0	1	27	0	0	1	1.8	0	0
China	2	0	0	1	60	1	0	0	3.3	1	0
Comanche	2	0	0	1	16	1	0	1	2.3	0	1
Copper Eskimo	1	1	0	1	9	0	0	1	1.4	0	1
Dogon	1	0	0	1	48	1	0	0	2.7	1	0
Fiji	0	0	0	1	45	0	0	0	2.3	1	0
Fon	1	0	0	2	51	1	1	0	4.8	1	0
Ganda	0	0	0	1	49	1	0	0	3.3	1	0
Gheg	1	0	0	2	50	1	0	0	2.0	1	0
Havasupai	2	0	0	1	14.0	0	0	0	1.3	0	1
Inca	1	0	0	1	52	0	0	0	4.7	0	0
Iroquois	2	0	0	1	28	0	0	0	1.8	1	1
Khalka Mongol	1	1	1	1	39	1	1	0	3.3	0	0
Koryak	0	1	1	1	12	0	1	0	2.2	0	0
!Kung Bushmen	0	0	0	1	4.0	0	0	0	1.2	0	0
Kwakiutl	2	0	0	1	29	1	0	1	2.5	1	1
Lapp	0	1	1	1	20.5	1	1	0	1.8	0	0
Lepcha	0	0	0	1	40	0	0	0	2.3	1	0
Manóbo	0	0	0	1	22	0	0	0	1.8	0	0
Maori	0	0	0	1	42	0	0	0	3.2	0	0
Mundurucú	0	0	0	1	11	0	1	0	1.3	1	0
Murngin	0	0	0	1	4.0	0	0	0	1.2	1	0
Naskapi	1	1	0	1	7	0	1	1	1.1	0	1
Navajo	2	1	0	2	23	0	1	0	2.0	1	1
Nuer	0	0	0	1	19	0	0	0	1.9	1	0
Nyakyusa	0	0	0	1	31	0	0	0	2.4	0	0
Omaha	2	0	0	1	17	0	1	0	2.3	1	1
Pomo	2	0	0	1	18	1	0	0	1.7	0	1
Rif	0	0	0	1	55	1	1	0	2.5	1	0
Rwala	0	1	1	1	37	1	1	0	2.4	1	0
Semang	0	0	0	1	2	0	0	0	1.2	0	0
Serbia	1	0	0	1	57	1	1	0	2.8	1	0
Shavante	0	0	0	1	8	0	0	0	1.0	1	0
Siane	0	0	0	1	10	1	0	0	1.5	1	0
Sirionó	0	0	0	1	1	0	0	1	1.3	0	0
Suku	1	0	0	1	44	1	0	0	2.0	1	0
Tanala	1	0	0	2	43	1	0	0	2.3	1	0
Thonga	0	0	0	2	35	0	0	0	2.4	1	0
Tikopia	0	0	0	1	30	0	0	0	2.5	1	0
Tiv	1	0	0	2	46	1	0	0	2.3	1	0
Toba	1	0	0	1	14.0	0	0	1	2.2	0	0
Toda	0	0	0	1	20.5	0	0	0	2.2	1	0
Trobriand	0	0	0	1	25.5	0	0	0	2.3	1	0
Truk	1	0	0	2	32	1	0	0	2.0	1	0
Tuareg	0	1	1	1	36	0	0	0	3.0	1	0
Turkey	1	0	0	1	59	1	1	0	2.8	0	0
Warao	0	0	0	2	14.0	0	0	0	2.0	1	0
Wolof	1	0	0	1	53	1	1	0	2.5	1	0
Yahgan	0	1	0	1	4.0	0	0	0	1.0	0	0
Yaqui	1	0	0	1	54	1	1	0	1.8	0	1

55. *Tuareg* [Ahaggar Tuareg]: Ahaggar area, Algeria; 1898 (before French military occupation).
56. *Turkey* [Turk]*:* Sakaltutan and Elbasi villages, central Anatolia; 1950 (at beginning of Stirling's fieldwork).
57. *Warao* [Warrau, Guaraunos]: Orinoco delta, Venezuela; 1920 (before introduction of Western agricultural techniques).
58. *Wolof* [Ouolof]*:* Senegal and Gambia; 1875 (before conquest by French).
59. *Yahgan* [Yamana]: Tierra del Fuego, Chile; 1850 (before missionaries).
60. *Yaqui:* Sonora, Mexico, and Arizona, U.S.A.; 1930.

Description of Data Series

1. Presence of gambling: 0 = none reported; 1 = some reported but either not important or importance unascertainable; 2 = gambling reported and an important redistributive mode.
2. Hardness of the environment: 1 = hard environment (e.g., arctic, semi-arctic, or desert); 0 = not hard environment.
3. Nomadic herding: 1 = animal husbandry accounts for more than 50 percent of food supply, and society is either nomadic or seminomadic; 0 = one or both of these conditions are not filled. (Further details on the coding of this variable may be found in Pryor, forthcoming).
4. Unit of observation: 1 = nuclear family (monogamous, polygynous, polyandrous) or small extended family; 2 = extended family. (Further details on this variable may be found in Pryor, forthcoming).
5. Rank order of level of economic development: 1 = rank of lowest level; 60 = rank of highest level. The decimal points indicate tie-scores. (Ranking follows an approach used by Carneiro 1973; further details may be found in Pryor, forthcoming).
6. Presence of a domestic money used for commercial purpose: 1 = yes; 0 = no. (Excluded from consideration were noncommercial moneys and moneys used exclusively in external trade).
7. Contact with the West: 0 = no contact, occasional contact, or light missionary activity; 1 = considerable contact, heavy missionary work, or considerable contact with Western government officials, colonists, visitors, or traders.
8. Hunting and/or fishing accounting for 50 percent or more of total food supply: 1 = yes; 0 = no.
9. Socioeconomic inequality, computed as an average of six five-point scales indicating inequality of total income, inequality of consumption, inequality of ownership of property, inequality of menial work carried out, inequality of total work carried out, and inequality in the holding of technological knowledge: 1 = least inequality; 5 = greatest inequality. (These scales were subjectively coded.)
10. Important presence of extensive lineages, defined in terms of group economic activities (lineages include patrilineal, matrilineal, duolineal, and ambilineal groups): 1 = yes; 0 = no.
11. Presence in North America (excluding Central American and Caribbean islands): 1 = yes; 0 = no.

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