Differences between Otherwise Similar Communities Reveal Cultural Linkages with Higher Government Levels

Herbert Barry III
University of Pittsburgh

ABSTRACT

A world sample of 186 diverse communities was divided into 93 pairs with adjacent serial numbers. Members of the same pair have similar attributes. Differences between the pair members minimize cultural variations and might identify linkage of higher government levels with other cultural variables. Higher government levels are linked with residence fixity, writing and records, social stratification, a large building in the community, dowry instead of bride-price, more food obtained from agriculture and intercommunity trade, formal schooling for older children prior to adolescence, and more frequent external and internal warfare. Contrary to correlations using scores of the total sample, higher government levels have weak or reversed linkages with unilineal kinship, food obtained from animal husbandry, and requiring children to be obe-dient. Contrary to long term increase in social stratification and other measures of cultural complexity, the stratification score was usually lower in the pair member that was described in a later year.

INTRODUCTION

All human societies probably originated from a single small community in Africa, approximately 200,000 years ago (Tishkoff *et al.* 2009). Each subsequent community therefore shares a common origin. Likewise, all human beings are cousins, descended from the initial members of *Homo sapiens*. An important difference is how recently communities and individuals became differentiated from

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each other. A world sample of 186 societies (Murdock and White 1969) identifies for each society the date it was described and a focal community for each society that contained multiple communities. Communities with adjacent serial numbers are relatively similar in geographical location and other characteristics. Most of them had relatively recent common origins, less than 2,000 years earlier. They are more similar to each other than to most of the 184 other societies.

Many societies have evolved from small, independent communities to large, hierarchical nations. Some nations and empires have split into smaller political units that occupied smaller territories. The number of government levels is one of ten measures of cultural complexity, defined by Murdock and Provost (1973). The measures of cultural complexity are highly correlated with each other in the world sample of 186 communities.

Correlation coefficients are used to determine whether variations in number of government levels above the community, from zero to three or more, are associated with variations in measures of cultural complexity, and in other variables. When the correlations are applied to the scores of the total sample of 186 societies, a high correlation of government levels above the community with another cultural variable is not necessarily attributable to a functional linkage. The correlation might be caused by a functional linkage of both variables with a third variable instead of with each other.

An example is that more government levels above the community are correlated with more food obtained from animal husbandry. Both variables are functionally linked with technological developments, which make possible government above the community and animal husbandry. When the societies are divided into pairs that are similar in technological development, the pair member with more government levels above the community usually obtains less food from animal husbandry but more food from an alternative source, agriculture. The differences between the pair members provide evidence that government levels above the community are functionally linked with agriculture but not with animal husbandry.

METHODS

A world sample of 186 communities was selected and described by Murdock and White (1969). Each community is an independent

society or a focal community of a society that contains multiple communities. Each sample member is in a different culture cluster (Murdock 1967) and is geographically separated with a different language from the other 185 communities. A purpose was to include all cultural variations that have been described adequately. The desire for maximal diversity of the societies influenced selection of the sample members. Information on cultural customs of each community in the sample was reported in subsequent articles in the journal *Ethnology* and reproduced in a book edited by Barry and Schlegel (1980).

The 186 societies were divided into 93 pairs with adjacent serial numbers. The first pair contains numbers 1–2. The last pair contains numbers 185–186. For each variable, the difference between the pair members was calculated by the score of the first pair member minus the score of the second pair member. The difference therefore is plus, zero, or minus. For ordinal scales with more than two levels, the plus and minus differences include numerical measures of magnitude.

The similarities of the pair members in most other cultural variables minimize the effects of these variables, such as geographic location and type of subsistence economy. A linkage of government levels with another cultural variable is indicated if the differences between pair members reveal a consistent relationship between government levels and the other cultural variable.

For correlations between government levels above the community and another cultural variable, differences between pair members are omitted if the score for either member is unavailable and also if either of the two variables has the same score for both pair members and thereby a zero difference. When the numerical differences between pair members are –1 and +1, these numbers are adjacent because there is no zero score. Similarly, the years 1 B.C. and 1 A.D. are adjacent. There is no year zero.

Correlations between government levels above the community and another cultural variable are applied to three different measures. They are differences between pair members (DP), paired scores (PS), and total scores (TS) that include the omitted pairs. The correlations using the difference between pair members (DP) are limited to the pairs whose members have a different score on both variables. Because of the criteria for including pairs, their members

are not a random sample of the total number of communities. The paired scores (PS) contain the same communities as the differences between pair members (DP). The number of cases for paired scores is twice the number of cases for differences between pair members. The cases for total scores exclude only communities with insufficient information for a score on either variable tested in the correlation coefficient.

A collection of statistical programs was used (SPSS 1994). The relationship between two variables was measured by the Pearsonian correlation coefficient, also called the product-moment correlation. The maximum possible correlation is 1.00, if high scores of one variable correspond perfectly with high scores of the other variable, or –1.00, if high scores of one variable correspond perfectly with low scores of the other variable. The minimum possible correlation is zero if the positive and negative relationships between the two variables are equal in frequency and magnitude.

Alternative groupings of communities were tested. Parings began with serial numbers 2 and 3, ending with numbers 184 and 185. Because numbers 1 and 186 are omitted, there are 92 instead of 93 pairs. Threesomes instead of pairs were grouped, beginning with numbers 1–3, ending with numbers 184–186. Murdock and White (1969: 15) stated that the serial number of the community placed it between the two others to which it was geographically most contiguous and culturally most similar. In each of the 62 threesomes, the sum of the scores of the first and last member was subtracted from twice the score of the middle member.

MEASURES OF CULTURAL COMPLEXITY

Murdock and Provost (1973) coded ten measures of cultural complexity on an ordinal scale of five numbers, 0–4. For each variable, the scores are available on each of the 186 communities. One of the ten measures of cultural complexity is an ordinal scale of five government levels, reported by Murdock and Provost (*Ibid.*). The scale is defined as follows.

0. Political authority is dispersed among households or other small component units. This score contains 11 communities.

1. Autonomous local communities. This score contains 71 communities.

2. One higher government level, such as a petty state with a paramount chief. This score contains 47 communities.

3. Two higher government levels, such as a small state divided into administrative districts. This score contains 28 communities.

4. Three or more government levels above the community, such as a large state organized into provinces which are subdivided into districts. This score contains 29 communities.

A modified measure, government levels above the community, contains 82 instead of 71 independent communities with a zero score. The 11 communities with dispersed political authority are added to the 71 autonomous communities. The three levels of higher government therefore create a scale of 0 to 3 instead of 0 to 4. Table 1 shows correlations of government levels above the community with nine measures of cultural complexity. The measure of government levels below or above the community is omitted because of its replacement with the new measure of government levels above the community.

Table 1

Nine measures of cultural complexity are associated with government levels above the community in the world sample of diverse communities. Three correlations, followed by the number of cases for each correlation, are applied to differences between pair members (DP), paired scores (PS), and total scores (TS).

Measure	Correlations			Number of Cases		
	DP	PS	TS	DP	PS	TS
Residence fixity	.81	.76	.41	24	48	186
Writing and records	.78	.64	.58	37	74	186
Stratification	.77	.71	.73	45	90	186
Agriculture	.68	.53	.51	60	120	186
Population density	.66	.50	.57	40	80	186
Technology	.64	.64	.58	37	74	186
Land transport	.56	.56	.43	26	52	186
Money	.56	.51	.52	36	72	186
Urbanization	.43	.38	.48	43	86	186

The three correlations in Table 1 are applied to different measures. Correlation (DP) is for the difference between the pair members. The score of the second member is subtracted from the score of the first member. The pair is omitted from the correlation if both

members have the same score on either of the two variables. Correlation (PS) is for the paired scores, limited to the same pairs as in correlation (DP). Correlation (TS) is for the total scores of the 186 individual communities. Table 1 also shows the numbers of cases for the three correlations. In correlation (DP), each pair is a case. In correlation (PS), the number of cases is the number of individual communities in the same pairs. The number is twice the number of pairs in correlation (DP). In correlation (TS), the number of cases is the total scores of the 186 communities.

The correlations shown in Table 1 are all positive. Each difference from zero is statistically significant. Communities with higher government levels usually have a high score on the nine measures of cultural complexity. The magnitudes of the correlations differ greatly among the measures of cultural complexity and to a lesser degree among the three correlations.

The correlation for differences between pair members (DP) is highest for three measures of cultural complexity: residence fixity, writing and records, and stratification. Attributes of these measures of cultural complexity might account for their linkage with government levels above the community. A fixed residence increases the opportunity to develop higher government levels, whether by conquest or consent, and communities with sedentary residence also are easier for the highest government level to control. Written records facilitate development of higher government levels, and higher government levels increase the need for written records. Hierarchical stratification of the community members encourages development of hierarchical stratification in the higher government levels, and a stratified higher government level is easily applied to the communities.

The correlation applied to differences between pair members (DP) is lowest for urbanization, defined as population of the community. The urbanization score ranges from 0, fewer than 100 persons, to 4, more than 1,000 persons. In communities with higher government levels, the score is the average population of the multiple communities. Urbanization and government levels both are probably more strongly associated with a third variable, such as technological development, instead of with each other. Higher government levels can constitute hierarchical aggregations of communities with either large or small populations. A small village

instead of a large city was usually the selected community in modern industrialized nations. In the sample of 186 communities, the selected village is a component of the nations Russia, Turkey, Ireland, Korea, Japan, and China.

Linkage of government levels with each of the nine measures of cultural complexity may be inferred because the difference from zero is statistically significant for all nine correlations that are applied to the difference between pair members (DP). The correlation applied to the difference between pair members (DP) is higher than the correlation applied to paired scores (PS) for seven of the nine measures of cultural complexity. For the two exceptions, with Technology and Land Transport, the difference from zero is the same for both applications of the correlation (DP and PS).

Three measures of cultural complexity, writing and records, agriculture, and population density, have much higher correlations with government levels above the community for the difference between pair members (DP) than for the paired scores (PS) applied to the same communities. Writing and records may be expected to encourage development and maintenance of higher government levels. The agricultural activities of planting, tending, and harvesting crops require labor and planning. These behaviors are consistent with higher government levels. A crowded population is more likely to develop higher government levels and is probably easier for the highest government level to control.

The pairs of communities are portions of the total sample, selected for differences between the pair members in government levels and also in the designated measure of cultural complexity. The pairs of communities therefore are not randomly chosen portions of the total sample of 186 communities. In Table 1, the correlation of government levels with residence fixity is much higher for the correlation applied to paired scores (PS) than for the correlation applied to the total scores (TS). The correlation therefore is increased when the scores are limited to pairs in which the members differ in both variables. The correlation of government levels with land transport is also higher for the correlation applied to paired scores (PS) than for the correlation applied to the total scores (TS).

Each society was selected to differ from all 185 others in this world sample. Consequently, many members of the same pair have different scores on higher government levels and on the nine measures of cultural complexity. Among the 93 pairs of societies, the number of pairs with a different score for the pair members on both variables ranges from 60 of the 93 pairs for agriculture to 24 of the 93 pairs for residence fixity. Higher numbers indicate more frequent differences between the pair members or more rapid cultural change of the designated measures of cultural complexity. For government levels above the community, 58 of the 93 pairs have a different score.

GOVERNMENT LEVELS LINKED WITH OTHER VARIABLES

Differences between members of the same pair of communities have been applied to correlations of government levels above the community with several cultural variables that are not measures of cultural complexity. The correlations are shown in Table 2. The numbers of cases in correlations applied to the total scores (TS) show that for some variables the scores are not available on all 186 communities.

Table 2

Higher correlations for differences between pair members (DP) than for paired scores (PS) indicate strong direct linkage of the designated measures with government levels above the community. Total scores (TS) are for all communities with a score on the designated measure. The three correlations are followed by the number of cases for each correlation.

Measure	Correlations			Number of Cases		
	DP	PS	TS	DP	PS	TS
Large building	.67	.54	.40	29	58	186
Dowry at marriage	.52	.37	.21	32	64	186
Source of food						
Agriculture	.56	.42	.45	38	76	186
Trade	.39	.31	.29	34	68	183
Schooling						
Older girls	.53	.42	.39	45	90	178
Older boys	.45	.37	.46	43	86	178
Frequency of Warfare						
External	.36	.27	.27	32	64	154
Internal	.30	.23	.26	32	64	152

Murdock and Wilson (1972) coded absence or presence and type of a large building in the community. The types of large building are a residence, public building, ceremonial edifice, military installation, and industrial edifice. Government levels above the community are correlated with presence of a large building in the community. The correlation applied to differences between pair members (DP) is higher than the correlations applied to paired scores (PS) and total scores (TS). Most of the communities with higher government levels are not the capital city. Higher government therefore appears to be linked with presence of a large building in the component communities.

Murdock (1967) reported several categories of presence or type of gifts connected with marriage. Schlegel and Eloul (1987, 1988) modified the measure to distinguish between direct and indirect dowry. The following ordinal scale of six levels ranges from the minimum score of 1, bride-price, gifts from the husband's family to the wife's family, to 6, dowry, gifts from the wife's family to the husband's family. Indirect dowry means that relatives of the bride contribute gifts to the marrying couple.

1. Bride-price.
2. Bride-service.
3. Token bride-price.
4. Gift exchange, woman exchange, or none.
5. Indirect dowry.
6. Direct dowry.

Government levels above the community have the highest correlation with dowry instead of bride-price for the correlation applied to differences between pair members (DP). Gifts from the bride's family are adaptive adjustments to a surplus of marriageable women. The surplus may occur because some men leave the community to join a higher government for political or military service. The custom of bride-price is a rational adjustment to a surplus of marriageable men. The surplus is more probable in politically independent communities, especially if polygynous marriage decreases the availability of marriageable women. The majority of the 186 communities have polygynous marriage.

The relative amounts of food obtained from six sources were reported by Murdock and Morrow (1970). Table 2 shows the correlations of government levels with two food sources, agriculture and intercommunity trade. The correlation applied to differences between pair members (DP) is higher than the other two correlations (PS and TS). A linkage is indicated between both food sources and higher government levels. The pair member that obtains more food from either intercommunity trade or agriculture is more likely to develop and maintain higher government above the community.

Barry, Josephson, Lauer, and Marshall (1977) coded degree of formal schooling, using an ordinal scale with six categories.

1. Informal training only, with minimal guidance.
2. Apprenticeship (guidance) is atypical or occasional.
3. Apprenticeship is typical and frequent but informal training is more prevalent.
4. Apprenticeship is predominant.
5. Formal schooling is atypical or occasional.
6. Formal schooling is typical and frequent.

This measure was rated separately in the early and later stages of childhood, prior to adolescence. Table 2 shows that the correlations applied to differences between pair members (DP) are higher than the correlations applied to paired scores (PS). Government levels above the community probably help to develop more systematic education of older children. Industrialized nations develop prolonged schooling of the children because the nation and its communities benefit from a well educated population.

In the total sample of communities, average formal schooling scores are higher for boys than girls. A contrary difference is that the correlations of government levels above the community with formal schooling, applied to differences between pair members (DP), are higher for girls than for boys. The differences between pair members compensate for the prevalence of more formal schooling for boys than girls.

Ember and Ember (1992) coded two measures of frequency of warfare, internal and external, between 15 years before and 10 years after the date of the ethnographic description. The ordinal scale of 16 levels ranges from absent to constant. Linkage of fre-

quent warfare with higher government levels is indicated by higher positive correlations applied to differences between pair members (DP) than to paired scores (PS) and total scores (TS). Correlation (DP) of .36 for external warfare is reliably different from zero, defined as a probability less than 5 % that the difference from zero could be attributable to random variation. Correlation (DP) of .30 for internal warfare is slightly less than a reliable difference from zero according to the same criterion.

The correlations for differences between pair members (DP) in Tables 1 and 2 were tested with the alternative groupings, pairs beginning with serial numbers 2 and 3, and threesomes. These further tests generally verify the associations found between government levels and the other variables. A few variables with statistically significant correlations for pairs that begin with 1 and 2 and end with 185 and 186 were omitted from Table 2 because the difference from zero was not statistically significant with an alternative grouping.

WEAK OR REVERSED LINKAGES OF HIGHER GOVERNMENT WITH OTHER CULTURAL VARIABLES

Correlations of government levels above the community with some other cultural variables, applied to the total scores (TS), are not all attributable to a functional linkage of the two variables. The very diverse communities in the total sample cause many correlations to be attributable to linkages of both variables with a third variable. The members of the same pair, with adjacent serial numbers, have similar scores on most of the variables. If correlations applied to the difference between pair members (DP) are close to zero or in the opposite direction, they reveal a weak or reversed linkage between the variables whose correlations are applied to the total scores (TS).

The correlations between higher government levels and other cultural variables listed in Table 3 are reliably different from zero when applied to the total scores (TS). The correlations are close to zero or in the opposite direction when applied to the differences between pair members (DP).

Table 3

Lower or opposite correlations for difference between pair members (DP) than for paired scores (PS) indicate weak or reversed linkage of the designated measures with government levels above the community. Total scores (TS) include all communities with a score on the designated measure. The three correlations are followed by the number of cases for each correlation.

Measure	Correlations			Number of Cases		
	DP	PS	TS	DP	PS	TS
Bilateral kinship	.39	.31	–.19	17	34	186
Source of food						
Animal husbandry	–.38	–.04	.29	38	76	186
Fishing	.22	–.04	–.16	31	62	184
Training for older boys						
Obedience	–.05	.17	.30	35	70	162
Permissiveness	–.09	–.13	–.25	39	78	168

Bilateral kinship is a simple form of kinship, signifying equivalent or optional kinship with the father's and mother's relatives. A more complex form of kinship is unilineal, affiliation limited to the father's relartives (patrilineal), mother's relatives (matrilineal), or differential affiliations with both paternal and maternal relatives (double). Table 3 shows that higher government levels are negatively correlated with bilateral kinship measured by the total scores (TS). The complex unilineal form of kinship therefore is more prevalent in communities with the complex political system of higher government levels. The correlation between the complex political system and the simple form of kinship is positive when applied to the differences between pair members (DP). The member with higher government levels usually has bilateral kinship. The higher government weakens the power of extended families that support unilineal kinship in the community. Accordingly, bilateral kinship characterizes most of the industrialized nations with three or more government levels above the community.

Higher government levels have a positive correlation with food obtained from animal husbandry and a negative correlation with food obtained from fishing, when applied to the total scores (TS). The politically complex higher government levels therefore are correlated positively with the complex food source of animal husbandry

and negatively with the simple food source of fishing. The directions of the correlations are reversed when measured by differences between the pair members (DP). The pair member with a higher government level usually obtains less food from animal husbandry and more food from fishing. The higher government probably encourages agriculture instead of animal husbandry and improves the technology for fishing.

An ordinal scale of 11 categories on requirement for obedience by older, preadolescent boys was reported by Barry, Josephson, Lauer, and Marshall (1976). An ordinal scale of 11 categories on permissiveness toward older, preadolescent boys was reported by Barry, Josephson, Lauer, and Marshall (1977). Higher government levels have positive correlations with obedience training and negative correlations with permissiveness when measured by the total scores (TS). The correlations are close to zero when measured by differences between pair members (DP). The linkage therefore appears to be weak between higher government levels and these two measures of child training. A different variable may account for the large differences from zero for the correlations measured by the total sample (TS). Social stratification is a possible linkage with higher government levels and the child training variables. Stratification has a high positive correlation with higher government levels, a high positive correlation with obedience training, and a high negative correlation with permissiveness.

DIFFERENCES IN YEAR OF DESCRIPTION

The information on each community includes the year that it was described. The diverse sample of communities includes a wide range of years. The earliest is 1750 B.C. for the Babylonians. The latest is 1965 A.D. for the Yanomamo. The ancient Babylonians have the highest score of 4 on nine of the measures of complexity. The exception is the next to highest score on land transport. The recently described Yanomamo have the lowest score of zero on government levels and on social stratification.

The sample of 186 communities does not include the initial small group of humans approximately 200,000 years ago. Higher government levels began long before the ancient Babylonians. Some of the 82 politically independent communities were formerly components of higher government levels. Among the 93 pairs of communities with adjacent serial numbers, most members

of the same pair were described more than a thousand years after they had become differentiated from the same prior community, but within a hundred years of each other. White (1989) identifies the date described and other information on each of the 186 communities. Table 4 compares the date of description for members of 22 pairs. The table excludes pairs whose date of description differed by fewer than 25 years and therefore contained the births of individuals in the same generation.

Table 4

The earlier community is on the left and the paired later community is on the right. Both are followed by the year described and the scores for social stratification (SS) and higher government (HG). The difference between the earlier and later scores (E – L) are also shown.

Earlier Community	Year	SS	HG	Later Community	Year	SS	HG	E – L SS	E – L HG
1 Nama Hottentot	1860	1	1	2 Kung Bushmen	1950	0	0	1	1
5 Mbundu	1890	3	2	6 Suku	1920	2	3	1	–1
7 Bemba	1897	2	3	8 Nyakyusa	1934	0	2	2	1
12 Ganda	1825	3	3	11 Kikuyu	1905	1	0	2	3
14 Nkundu Mongo	1930	2	1	13 Mbuti	1955	0	0	2	1
18 Fon	1890	3	3	17 Ibo	1935	1	1	2	2
19 Ashanti	1895	2	3	20 Mende	1945	3	1	–1	2
29 Fur	1880	2	3	30 Otoro	1930	1	0	1	3
39 Kenuzi Nubians	1900	1	0	40 Teda	1930	2	0	–1	0
41 Tuareg	1900	2	2	42 Riffians	1925	1	2	1	0
70 Lakher	1930	3	1	69 Garo	1955	1	2	2	–1
81 Tanala	1925	3	1	82 Negri Sembilan	1958	2	2	1	–1
104 Maori	1800	2	1	103 Ajie	1845	0	1	2	0
110 Yapese	1910	3	1	109 Trukese	1947	0	0	3	1
111 Palauans	1873	2	2	112 Ifugao	1910	1	0	1	2
123 Aleut	1778	3	1	124 Copper Eskimo	1915	0	0	3	1
141 Hidatsa	1836	0	0	142 Pawnee	1867	2	1	–2	–1
144 Huron	1634	1	2	143 Omaha	1854	0	1	1	1
161 Callinago	1650	1	0	162 Warrau	1935	0	0	1	0
168 Cayapa	1908	0	0	167 Cubeo	1939	1	0	–1	0
177 Tupinamba	1550	1	1	178 Botocudo	1884	0	0	1	1
183 Abipon	1750	3	0	184 Mapuche	1950	1	1	2	–1

Government levels above the community, and most of the measures of cultural complexity, did not differ consistently between the pair member described earlier and later. An exception is social stratification. The scores are the following.

0. Egalitarian without classes, castes, hereditary slavery, or important wealth distinctions.

1. No class distinctions but hereditary slavery and/or important wealth distinctions.

2. Two social classes without castes and without hereditary slavery.

3. Two social classes plus hereditary slavery and/or caste divisions.

4. Complex stratification into three or more classes or castes, with or without slavery.

Table 4 shows for each paired community a stratification score less than 4 in the year described and the scores for stratification and higher government levels. The score is lower for 18 pair members that were described in the later year and for only four pair members that were described in the earlier year. According to the sign test (Siegel 1956: 250), the probability is 0.4% that the same or greater preponderance can occur by chance, either in the same or in the opposite direction. The four exceptions are the pairs with serial numbers 19–20, 39–40, 141–142, and 167–168.

The year in which the pair members were described differs by less than a century in 18 of the 22 pairs. Only four of the 44 communities were described prior to 1800. The preponderance of lower stratification scores for the pair member described in the later year might be attributable to a general increase in equality of status and opportunity during the 19th and 20th centuries. Differentiation of the pair members from the same prior community usually occurred more than a thousand years earlier. The preponderance of lower stratification scores for the pair member described in the later year therefore is probably not attributable to a longer interval of differentiation from the prior same society.

Bradley, Moore, Burton, and White (1990) reported that the reason for decreased social stratification may be depopulation and acculturation instead of greater equality of status and opportunity.

In Table 4, very few of the later pair members were more depopulated or acculturated than the earlier pair members.

Higher government levels are positively correlated with stratification, but higher government levels are less consistently lower in the pair member that was described later. In Table 4, the later pair member had less higher government levels in 12 pairs, the same higher government level in five pairs, and more higher government levels in five pairs.

The highest stratification score of 4 has the disadvantage of including absence in addition to presence of hereditary slavery. Stratification scores of 0 and 1 are without hereditary slavery. Stratification scores of 2 and 3 are with hereditary slavery. Table 5 lists 12 pairs of communities in which one member has the highest stratification score of 4. Communities are omitted if both pair members have the highest stratification score or if the difference in year described is less than 25.

Table 5

The earlier community is on the left and the paired later community is on the right. Both are followed by the year described and the scores for social stratification (SS) and higher government (HG). The difference between the earlier and later SS and HG (E – L) are also shown. One member of each pair has the highest score of 4 on social stratification.

Earlier Community	Year	SS	HG	Later Community	Year	SS	HG	E – L SS	E – L HG
22 Bambara	1902	3	1	21 Wolof	1950	4	2	–1	–1
26 Hausa	1900	4	3	25 Fulani	1950	0	1	4	2
31 Shilluk	1910	4	1	32 Mao	1939	0	0	4	1
38 Bogo	1855	3	1	37 Amhara	1953	4	3	–1	–2
45 Babylonians	–1750	4	3	46 Rwala Bedouin	1913	1	1	3	2
48 Gheg Albanians	1910	1	2	47 Turks	1950	4	3	–3	–1
53 Yurak	1890	1	0	54 Russians	1955	4	3	–3	–3
73 Vietnamese	1930	4	3	74 Rhade	1962	1	0	3	3
115 Manchu	1915	1	1	116 Koreans	1947	4	3	–3	–2
118 Ainu	1880	0	0	117 Japanese	1950	4	3	–4	–3
153 Aztec	1520	4	2	154 Popoluca	1940	0	1	4	1
171 Inca	1530	4	3	172 Aymara	1940	1	1	3	2

The community with the highest stratification score was described earlier in six pairs. In three of these six pairs, the earlier community, Babylonians, Aztec, and Inca, was the capital of an ancient civilization. Hereditary slavery was probably prominent in these ancient communities. The community with the highest stratification score was described later in six pairs. In four of these six pairs, the later community, Turks, Russians, Koreans, and Japanese, is a village in an industrialized nation. Each of these nations has abolished hereditary slavery.

The pairs of communities listed in Tables 4 and 5 omit pairs in which the stratification score is the same for both pair members. Four of the 22 pairs listed in Table 4 have the same score on government levels above the community for both pair members. Table 6 lists eight pairs of communities in which the members have different scores on government levels. They were omitted from Tables 4 and 5 because the pair members have the same score on social stratification.

Table 6

The members of the eight listed pairs of communities have the same score for social stratification. The earlier community is on the left and the paired later community is on the right. Both are followed by the year described and the scores for social stratification (SS) and higher government (HG). The difference between the earlier and later HG (E – L) is also shown.

Earlier Community	Year	SS	HG	Later Community	Year	SS	HG	E – L HG
44 Hebrews	–621	4	2	43 Egyptians	1950	4	3	–1
49 Romans	110	4	3	50 Basques	1940	4	2	1
56 Armenians	1843	4	3	55 Abkhaz	1890	4	1	2
61 Toda	1900	0	1	62 Santal	1940	0	2	–1
65 Kazak	1885	3	2	66 Khalka	1920	3	3	–1
102 Fijians	1840	1	2	101 Pentecost	1953	1	0	2
105 Marquesans	1800	2	1	106 Samoans	1828	2	2	–1
166 Mundurucu	1850	0	0	165 Saramacca	1928	0	2	–2

The later member has a lower score on government levels in only three of the eight pairs of communities listed in Table 6. This

difference between the earlier and later pair members is contrary to the preponderance of lower scores on social stratification in the later pair members, listed in Table 4 when the highest stratification score is excluded.

DISCUSSION

Correlations between two selected variables have often been measured and reported in the sample of 186 communities. An innovation of the present paper is to divide the 186 communities into 93 pairs of relatively similar communities. The correlation coefficients are applied to the pairs in which the members have a different score on both variables that are selected. The differences between the pair members (DP) resemble the technique of matched pairs, which can be applied to individual people in addition to communities. An example is to compare homozygous twins who have been reared in separate families. Differences between the twins are attributable to environmental instead of genetic influences. Similarities between the twins are attributable to their identical genetic attributes.

When the members of the same pair of communities differ in higher government levels, a consistent difference in another cultural variable probably indicates a functional linkage between the two variables. Higher government levels show evidence for linkage with nine measures of cultural complexity in Table 1, and with several other cultural variables in Table 2.

The pair members are communities with adjacent serial numbers, selected to be similar in most attributes. The differences between the pair members in higher government levels and in the other selected variable are thereby expected to be smaller and less consistent. The reduction in size and consistency of differences normally causes correlations to be closer to zero. Contrary to this general trend, most of the correlations in Tables 1 and 2 differ more from zero for the differences between pair members (DP) than for paired scores (PS). The paired scores constitute the most appropriate comparison because they are applied to the scores of the same communities that are included in the differences between pair members.

The usual correlations between two selected variables, applied to the total scores (TS), have the disadvantage that both variables

may be functionally linked with a third variable instead of with each other. The similarity of the pair members in most respects minimizes or reverses the effect of a third variable when correlations are applied to the differences between pair members (DP). Accordingly, Table 3 identifies correlations of higher government levels with several cultural variables, applied to the total scores (TS), which are minimized or reversed when applied to differences between pair members (DP).

Reduction in the number of independent cases is a disadvantage of correlations applied to differences between pair members (DP). The total sample of 186 communities is reduced to 93 pairs. The number of pairs is reduced further because the pair members need to have a different score on both selected variables. The pair does not contribute to the correlations if either member has the same score on either of the two selected variables. The number of pair members with the same score can be minimized if an ordinal scale contains many categories. Frequency of warfare, in Table 2, and training for older boys, in Table 3, are ordinal scales with more than ten categories.

The correlations applied to differences between pair members (DP) indicate linkages of higher government levels with other cultural variables, but they do not determine whether higher government levels caused the linked variable or whether the linked variable caused higher government levels. Both causal directions may contribute to the linkage. For example, agriculture is a favorable condition for aggregation of communities with the same higher government, and also helps to perpetuate the higher government.

Members of the same pair of communities differ substantially. The sample of 186 communities was selected to maximize the independence of each community from all of the 185 others. A possibly desirable modification of correlations applied to differences between pair members (DP) might be selection of pairs that have small differences in the year they were described and that share the same linguistic family. This selection would minimize the duration of differentiation of the pair members from their common antecedent community. The consecutive serial numbers were selected on the basis of general cultural similarity instead of time interval since their common antecedent community.

An alternative technique for minimizing differences between pair members is the use of 412 culture clusters in a world sample of more than a thousand societies, specified by Murdock (1967). The members of each cluster are similar in every known respect and became separated from the same society less than 1,000 years earlier (Murdock 1967*:* 412). Barry (1969) selected 12 pairs of societies that are members of the same cluster. The pair member with a higher score in training of children to be compliant instead of assertive also usually had a higher score in food obtained from agriculture or animal husbandry than from fishing, hunting, or gathering, a higher score in indulgent behavior toward infants, and a lower score in frequency of drunkenness.

Correlations of higher government levels with other cultural customs, applied to differences between cluster members, would not be feasible because most members of the same cluster do not differ in higher government levels and in the other cultural variables included in Tables 1–3. Scores on many more cultural variables are available on the sample of 186 communities than on multiple members of the same culture clusters.

When correlation coefficients are applied to total scores (TS), partial correlations can adjust the effect of one or more other variables on the correlations. Partial correlations were applied to portions of the sample of 186 communities by Barry (2005, 2007) and by Barry and Yoder (2002). A limitation is that the additional variables need to be identified and measured. The information consists of the scores of individual communities. Pairs of communities with adjacent serial numbers provide more generalized control for effects of other variables because it is not necessary to recognize or measure them. When the members of the same pair of communities resemble each other in most respects, correlations applied to differences between the pair members (DP) have important advantages over partial correlations applied to the total scores (TS).

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