

Chapter 8

The Problem of Interdependent Cases¹

In Chapter 1 we mentioned that November 13, 1888 is sometimes regarded as birthday of Cross-Cultural Research, as it was on this day when Edward B. Tylor presented the results of an apparently first truly cross-cultural paper ("On a Method of Investigating the Development of Institutions, Applied to Laws of Marriage and Descent") at a meeting of the Anthropological Institute of Great Britain and Ireland [Tylor 1889]. However, this very day can well be regarded as the birthday of what some regarded as a "fatal curse" of cross-cultural research, Galton's problem.

The point is that a famous British meteorologist, biologist, psychologist and anthropologist, Sir Francis Galton (and, incidentally, Charles Darwin's cousin), who was presiding over the meeting made the following remark with respect to Tylor's presentation:

«It was extremely desirable for the sake of those who may wish to study the evidence for Dr. Tylor's conclusions, that full information should be given as to the degree in which the customs of the tribes and races which are compared together are independent. It might be, that some of the tribes had derived them from a common source, so that they were duplicate copies of the same original» [Galton, 1889. P. 272].

These two brief sentences already contained the description of what later became known just as Galton's problem, i.e. the problem of the influence produced on the results of cross-cultural research by sociocultural diffusion, the proliferation of certain sociocultural complexes and the functioning of historical networks.

Edward Tylor had envisioned anthropology to be comprised of ethnology and ethnography in equal parts. Today, it is ethnography that predominates and ethnology has a sort of refugee status in anthropology. Why is this? Strauss and Orans write that "...an extremely pessimistic appraisal of the possibility of verifying lawful relations between cultural traits...has doubtless profoundly shaped anthropological research" (1975:573), which is directly connected with Galton's problem. Tylor responded to Galton's query by stating that "the only way of meeting this objection is to make separate classification depend on well marked differences, and to do this all over the world" (1889:272). This is, however, an unfortunately vague remark as it is impossible to decide both what he meant by "well-marked differences" and how classification is to depend on these differences. But, this is, of course, the way that subsequent more specific solutions to Galton's problem have gone, that is by devising and using ad hoc, idiosyncratic classification schemes.

Before we discuss other solutions to Galton's query and offer our own, we need to discuss one more significant response recorded at the time of Tylor's talk. Professor

¹ This chapter incorporates some of materials which we have previously used in a paper published in *American Anthropologist* (Korotayev & de Munck, 2003).

Flower observed that any cross-cultural method "...depended entirely upon the units of comparison being of equivalent value..." (ibid.:271). This, somewhat neglected comment will form the basis of the second half of this text concerning the problem of creating comparable cultural units. The gist of our argument will be that one needs to consider Galton's problem anew for each research question because cultures themselves are more effectively regarded as "clusters of common concepts, emotions, and practices that arise when people interact regularly" (Brumann 1999:S1). Hence, there is no one-and-for-all effective solution for Galton's problem, but there is actually no "Galton problem" as it is commonly understood, but rather a "Galton asset" which can be used to trace and study historical and emergent cross-cultural networks.

In 1975, Strauss and Orans enumerated eight statistically-based remedies proposed to this problem, none of them, to our mind, satisfactory (see Strauss and Orans 1975 where they critique seven of these methods and then propose their own solution). All of these methods are based on statistical techniques that directly address the problem of whether or not the cultures in the cross-cultural sample are independent of one another. The two predominant criteria for assessing independence have been "propinquity" and "language." Thus, the more spatially distant and/or linguistically different the societies in the sample are from one another, the lower the probability that they are "replicas" of one another. Naroll and others have dealt with the problem of "propinquity" by proposing "systematic sift" solutions to Galton's problem (Naroll 1961, 1970, 1973; Naroll & D'Andrade 1963; Driver & Chaney 1970; Strauss & Orans 1975). The idea was that traits were more likely to be transmitted, that is "exogenously replicated," among societies that either spoke the same language or were near each other, therefore by selecting for your sample societies that were at a specific remove from each other one could eliminate or minimize the "Galton effect." These types of solutions involved systematically sampling societies on the basis of some sifting algorithm.

In 1975 Strauss and Orans wrote what may have been the last major "traditional" proposal for solving "Galton's problem." Galton's problems has been formulated as a purely statistical problem concerned with assuring the independence of the cultures being compared. As all manner of exchanges occur between cultures, particularly those that are near each other, the question that needs to be answered is how do we know that the similarities across cultures are not a result of diffusion or "exogenous replication" (Strauss & Orans 1975:581)? The solution Strauss and Orans proposed aimed to reduce or eliminate the effects of diffusion through a "cluster reduction method" that allows us to deduce what the cultures of our study were like in a "pristine state" at some time zero, prior to cultural contact (as they recognize, time zero is theoretical and not an empirical) (ibid.: 581). They describe the gist of their method as follows: ". . . take each trait combination and eliminate cases until the observed number of consecutive pairs matches that expected by chance. We hope thereby to get a reduced sample more representative of the pristine world than the original sample" (1975:582). They used the following hypothetical example to illustrate this technique: assume you are testing for the combination of two traits which take two values (present or absent) and that in the original pristine state these two traits were combined among four societies (A, B, C, D) as follows: $X Y, X \bar{Y}; \bar{X} Y, \bar{X} \bar{Y}$...

"Then the correlation between X and Y at t_0 is zero. Let societies A and D be the hits. Suppose that by endogenous replication [i.e., diffusion] A and D are each

replicated 48 times. At time t_1 , then we have XY (49 cases), $X \bar{Y}$ (1 case), $\bar{X} Y$ (1 case), and $\bar{X} \bar{Y}$ (49 cases). The phi coefficient of X and Y is now .96. Let us now apply the cluster-reduction method to these data. The 49 societies of type XY gave rise to 48 XY-XY pairs. The number of such pairs expected by chance is 23.5 (=49 x 48/100). Some of the XYs must be eliminated if observed and expected numbers of pairs are to match. It is easy to see that this can only be achieved if the proud cluster of 49 XYs is reduced to a singleton (and similarly for $\bar{X} \bar{Y}$)" (ibid.:582).

Hence, this methodology implies a solution that takes all the cultures that share the selected traits under study (*i.e.*, "hits"), calculate how many of those cultures by chance would be adjacent to each other or separated by one or by two cultures from each other; the number of proximate cultures above what one would expect by chance are then eliminated. The same procedure is performed for "misses."

This technique is of course difficult to apply in concrete cross-cultural studies. But what is more, we are not convinced that this technique can always reduce, even partially, the "Galton effect". The central ethnographic example they use to validate their method is the cross-cultural correlation between male genital mutilations and polygyny. They claimed that their technique showed that the functional relationship between the two variable actually existed and could not be accounted for as a result of some "Galton effect". However, as has been shown in Chapter 2 above, we are dealing in this case first of all with the results of functioning of Islamic and Christian historical communicative networks, *i.e.* just with the "Galton problem".

Incidentally, having described eight sophisticated solutions to Galton's problem (which virtually none of the practicing cross-cultural researchers actually ever uses) Strauss and Orans failed to mention one technique which is used by almost all cross-cultural researchers. Within their paradigm this technique should be called the "simple sifting method". They write that "no one stepped forward to deal with the [Galton] problem until the 1960s" (Strauss & Orans 1975:573). However, already in 1950 Beatrice Whiting had applied a very simple "Galton-solving" technique.² In her study on the relationship between the presence of authoritative political officials and witchcraft attribution she computed the correlation between these variables by using only one tribe from each cultural area (B. Whiting 1950). Three years later the same technique was applied by John Whiting and Gordon Child in their famous monograph (1953). At the moment most world-wide cross-cultural researchers apply this technique (though sometimes, perhaps, unknowingly) simply by using the Standard Cross-Cultural Sample (SCCS) in which Murdock and White (1969) tried to include only one culture from any cultural area.³

What is surprising is that this simple method seems to work in many cases. Why? To answer this question we need to recollect that in addition to Galton's response to Tylor's lecture in the Royal Anthropological Institute at least one more important observation was expressed (and recorded) during the discussion of this lecture. As mentioned before, Professor Flower observed that any cross-cultural method "...depended

²And we cannot guarantee that nobody had used this technique before Beatrice Whiting.

³Murdock and White themselves did not consider the Standard Cross-Cultural Sample to be "Galton-free". In fact they showed the severity of Galton's problem within the SCCS, using a test for diffusion in adjacent societies (Murdock and White 1969/1980:22–26).

entirely upon the units of comparison being of equivalent value..." (Tylor 1889/1961:27). This can be interpreted as similar to Galton's question but expressed slightly different – it is the other side of the same problem. Thus, Galton's problem cannot be appropriately treated without also considering the problem of "cultural units."

The notion of 'cultural unit' actually has two different meanings: one considers cultural units as the base, elemental units out of which culture is composed, the second is as units which can be reliably and validly compared. Many anthropologists doubt whether such entities exist at all (see *e.g.* Gatewood 1999; 2000). Furthermore, we do not see that the first meaning of cultural units is at all relevant to cross-cultural research. For example, in chemistry one can speak of molecular (or atomic) units without being concerned about the more fundamental particles of which they are composed. Analogously, one can discuss socio-cultural molecular units, such as post-marital residence practices, without being concerned about the elemental units that comprise this practice. However, the second meaning is directly relevant to cross-cultural research. In order to examine the problem of comparability we will use a descriptive rather than a formal approach.

In cross-cultural research, the problem of cultural units is not quite identical with the problem of units of comparison (though both problems are connected). An effective (to our mind) solution to the problem of comparison was proposed by John Whiting (*e.g.* 1964a, 1968) who suggested that the unit of comparison is **community** and not **culture**. The problem of delineating cultural units arises immediately when the researcher has to decide which communities to select for his or her study. As the very notion of cross-cultural research implies, the communities that are to be used for comparison have to belong to different 'cultures'. Clearly the inclusion of a number of communities that belong to the same 'culture' could result in producing spurious correlations confirming false hypotheses, or, alternatively, rejecting genuinely significant correlations. Actually, it is quite clear that at this point we have already confronted Galton's problem.

We will illustrate this problem with a fictional example. Let us hypothesize that the practice of male genital mutilation enhances masculinity, conversely, that its absence leads to the development of feminine traits. We will use the wearing of skirts by males as our indicator or measure of the relative strength of the feminine features in male personality. Imagine that to test the hypothesis we selected a sample of communities presented in Table 7.1:

T A B L E 7.1. Communities in Sample

4 Turkish communities	4 Highland Scottish	(18th century)
1 Estonian community	1 Libyan community	1 Tamil community
1 Russian community	1 Greek community	1 Sinhalese community

A statistical analysis of the data for this sample will most likely produce the following results (see Table 7.2):

T A B L E 7.2. *Male Genital Mutilations * Skirt-Wearing by Males (version 1)*

		Males Wearing Skirts	
		<i>absent</i>	<i>present</i>
Male Genital Mutilation	<i>absent</i>	3	6

<i>present</i>	5	0
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Note: $p = 0.03$ (by Fisher's exact test; one-tailed)

Thus, the test will most likely support the patently wrong hypothesis that we offered. One of the main reasons for this is that we included into the sample 8 communities from 2 national cultures, Turkey and Scotland. One of these (i.e., Scotland) is characterized simultaneously by the absence of circumcision practices and (for the 18th century) by kilts as typical male dress; the other is simultaneously characterized by Islam and, hence, the presence of circumcision rites for males and by the absence of any kilt/skirt-like male clothes.⁴

To avoid this sort of bias in our sample, we should just choose one community from each culture. We can consider all communities in which the majority of people speak the same language to belong to the same 'cultural unit;' that is to say, to the same 'culture' (e.g. C. R. Ember & M. Ember 1998, 2001). This implies a 'linguistic definition' of culture by which people speaking the same language over a contiguous region are members of the same culture and people speaking a different language belong to another culture.

Indeed, in most cases, the 'linguistic definition of cultural unit' will provide a solution to Galton's problem for as soon as we follow the advice embodied in the 'linguistic definition of culture' we arrive at the following sample (see Table 7.3):

T A B L E 7.3. *Communities in Sample*

1 Turkish communities	1 Highland Scottish	(18th century)
1 Estonian community	1 Libyan community	1 Tamil community
1 Russian community	1 Greek community	1 Sinhalese community

The statistical analysis of the data for this sample is most likely to produce the following results (see Table 7.4):

T A B L E 7.4. *Male Genital Mutilations * Skirt-Wearing by Males (version 2)*

		Males Wearing Skirts	
		<i>absent</i>	<i>present</i>
Male Genital Mutilation	<i>absent</i>	3	3
	<i>present</i>	2	0

Note: $p = 0.36$ (by Fisher's exact test; one-tailed)

By applying the 'linguistic solution' the problem, at least for this example, has been solved and our obviously false hypothesis is now rejected. But, will this solution solve all problems of choosing and delineating independent cultural units for comparative research?

⁴The "misses" are produced by the Sinhalese and Tamils, i.e., South Asian Buddhist and Hindu communities, where the circumcision is not practised, and sarongs and dhotis are typically worn by men. Needless to say that in none of the above-mentioned communities the wearing of kilts/sarongs/dhotis etc. is associated, in any way, with femininity.

The definition of culture we find most useful for cross-cultural research is the one recently proposed by Brumann who argues that "culture should be retained as a convenient term for designating the clusters of common concepts, emotions, and practices that arise when people interact regularly" (1999:S1). This definition has important consequences for cross-cultural research by (albeit unintentionally) clarifying "Galton's problem".

Communities that interact frequently over time eventually generate a cultural network consisting of "clusters of common concepts, emotions, and practices." Hence, what may, at first glance, appear to be number of different cultural cases could, in fact, turn out to be copies of just one case. This would lead to the problems specified above and result in the confirmation of false hypotheses or the rejection of right ones (i.e., that is, "Type I" and "Type II" errors). We frequently find such clusters of traits among communities using the same language or a mutually intelligible dialect. Consequently, we colloquially use the name of a language to signify a national-cultural identity. For example, we use such qualifiers as "Russian", "French", "Japanese", and "Turkish" to identify both a language and a culture. Obviously, this correspondence makes sense for everyday speech and is often justified as a commonsensical theory of language, culture and identity. But, we must question whether or not cultures cluster only at the level of language?

Obviously not. We frequently observe cultural clusters comprised of communities which use different dominant languages. By adopting the approach offered by Brumann, it seems perfectly reasonable to speak about Islamic or Indian cultures. With regard to cross-cultural research this implies that we should consider the possibility that the cultural units we want to select for our research can be formulated at different levels of abstraction and/or specificity. This implication leads to the reappearance of Galton's problem, but, now, from a very different and much more contingent perspective; a perspective that necessitates a hermeneutic as well as a statistical approach to determining what the appropriate cultural units should be. We describe what we mean in the hypothetical examples provided below.

For example, we seemed to have solved Galton's problem for testing the hypothesis that the absence of male genital mutilations leads to the development of feminine traits in male personality simply by applying the 'linguistic solution'.

Now let us test a hypothesis that the consumption of dates enhances sexual drives among religious specialists and the consumption of red wine inhibits that drive in religious specialists. We measure sexual drive by asking people about the frequency and variability of sexual intercourse after consuming dates or wine. We assume that the frequency and variability of sexual intercourse will go up after consuming dates and go down after consuming wine. Imagine that to test the hypothesis we selected a sample of communities described in Table 7.5:

T A B L E 7.5. Communities in Sample

1 Basque community	1 Portuguese community	1 (So.) French community
1 Italian community	1 Iraqi community	1 (So.) Kurdish community
1 Russian community	1 Estonian community	1 Javanese community
1 Ganda community	1 Greek community	
1 Maronite-Lebanese community		1 (South-West) Persian community

All the communities in this sample use different mutually unintelligible languages; hence, the "linguistic criterion" (or solution) is observed. However, the result of the test in this case looks as follows (Table 7.6):

T A B L E 7.6. Dates vs. Wine Consumption * Sexual Intercourse Index (among Religious Specialists)

	Sexual Intercourse Index		
	<i>Celibacy</i>	<i>Regular w/one partner</i>	<i>Regular w/more than one partner</i>
<i>Wine</i>	4	1	0
<i>No wine/no dates</i>	1	1	2
<i>Dates/no wine</i>	1	0	3

Note: Gamma = + 0.75, p = 0.004; Rho = + 0.6, p = 0.03

Hence, our false hypothesis appears to have found "empirical support", for the correlation is in the predicted direction and definitely significant. The reason seems quite clear, when we notice that four communities from our Table 60 belong to the Southern European cultural area (where we find overlapping diffusion zones of wine-production and Catholic Christianity) and three other communities belong to the Middle Eastern cultural area (where we find overlapping diffusion zones of date-production and Islam). In cases such as this the "simple sifting" technique is likely to solve the problem. The most wide-spread sifting technique is the Standard Cross-Cultural Sample (Murdock and White 1969/1980), which includes one community from one cultural area, thus reducing the number of the Mediterranean Catholic wine-consuming cultures in the sample to just one. Indeed, our test of the "wine-dates" hypothesis using the Standard Cross-Cultural Sample has produced Rho = + 0.037, p = 0.62; Gamma = + 0.1, p = 0.68 . Thus by using the Standard cross-cultural sample as our "simple sifting" technique we seem to have solved the problem.

However, we believe that this solution does not solve Galton's problem once and for all. In other words, we do not believe that the identification of cultural areas of a certain type as cultural units should be applied, in a mechanical fashion, to any and all types of cross-cultural research problems.

But, let us try to apply the "simple-sifting" solution through the use of the Standard Cross-Cultural Sample to the hypothesis with which we started this appendix – the one on the possible significant relationship between the polygyny and the male genital mutilations (and which was discussed in more detail in Chapter 2 above). Let us test this hypothesis using the most recent full electronic version of the *Ethnographic Atlas* (Murdock *et al.* 1999) and then the Standard Cross-Cultural Sample (Tables 7.7 and 7.8):

T A B L E 7.7. Male Genital Mutilation * Polygyny (for Ethnographic Atlas)

		Polygyny	
		<i>absent</i>	<i>present</i>
Male Genital Mutilation	<i>absent</i>	141	592
	<i>present</i>	15	253

Note: Phi = + 0.166; p < 0.05

T A B L E 7.8. Male Genital Mutilation * Polygyny (for the Standard Cross-Cultural Sample; version 1)

		Polygyny	
		<i>absent</i>	<i>Present</i>
Male Genital Mutilation	<i>absent</i>	30	100
	<i>present</i>	3	48

Note: Phi = + 0.200; $p < 0.05$

A rather surprising thing about this test is that it has produced almost the same growth of the correlation strength (34 points; $0.200 - 0.166 = 0.034$) as the application of Strauss - Orans cluster-reduction technique (26 points; $0.211 - 0.185 = 0.026$). However, on a closer inspection we found that this was not so surprising. The "cluster-reduction" method increased the Galton effect through eliminating the number of native American cultures (not affected by the "galtonizing" influence of the Old World male genital mutilation spreading historical networks) in the sample to a greater extent than the one of the Circummediterranean cultures fatally infected by the Galton effect. However, the use of the Standard Cross-Cultural Sample has produced a precisely similar effect. If we compare the respective samples, we shall find that in the *Ethnographic Atlas* we have 395 native American cultures and 65 "narrow" Circummediterranean region, whereas in the SCCS you would find 65 native American cultures and 16 "Circummediterranean" ones. Hence, the use of the SCCS leads to the reduction of the "Galton-free" native American cultures 6.1 times, whereas the "Galton-infected" Circummediterranean cluster is reduced 4.4 times. Hence, the application of both techniques devised to reduce the Galton effect actually increases it.

At the moment a number of the most influential cross-cultural researchers argue that the Galton problem is not serious at all. For example, Carol Ember and Melvin Ember maintain that Galton's Problem is not serious, "because we believe that random sampling of cases is the best way to prevent sampling bias. Also, the sample societies in most cross-cultural studies usually speak mutually unintelligible language, which means that the speech communities involved have been separated for at least 1,000 years. If two related languages began to diverge 1,000 or more years ago, many other aspects of the cultures will also have diverged. So, such cases could hardly be duplicates of each other" (1998:678).

As we have shown above they could. What is more, even the cultures coming from apparently different regional clusters could. However, it is difficult not to find some sense in the basic argument of the "anti-Galton" scholars (Otterbein 1972, 1976, 1989; M. Ember & Otterbein 1991; C. R. Ember & M. Ember 1998, 2001). Indeed, it is difficult to imagine how the diffusion *per se* could create a significant correlation for the traits which are not actually related.

Imagine that we have a couple of unrelated traits and a perfectly devised "pristine-world", "Galton-free" sample of 20 cultures. In this case the result of a statistical test would likely look as follows (see Table 7.9):

T A B L E 7.9. Trait A * Trait B (version 1)

		Trait A	
		<i>absent (-)</i>	<i>present (+)</i>
Trait B	<i>absent (-)</i>	5	5

	<i>present (+)</i>	5	5
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Note: $p = 1.0$

Now, imagine that a case having both traits present was exogenously replicated fifteen times, all of which were included into the sample. Thus, nearly half the cases are a result of the simultaneous diffusion of a couple of traits. But would such a huge diffusion effect produce a significant correlation? Let us see the statistical results below (see Table 7.10):

TABLE 7.10. Trait A * Trait B (version 2)

		Trait A	
		<i>absent (-)</i>	<i>present (+)</i>
Trait B	<i>absent (-)</i>	5	5
	<i>present (+)</i>	5	15

Note: $p = 0.17$

Hence, even such a huge Galton effect does not result in a significant correlation! But is it realistic to expect that nearly one-half of a cross-cultural sample would consist of cultures coming from a single historically connected cluster? Are cross-cultural researches so stupid as to make such an obvious and devastating mistake? The answer is no. But in that case, why should we even bother about Galton's problem?

Imagine we have a sample of the *Ethnographic Atlas* size. Imagine that we have not one diffusion zone, but two competing intersocietal networks, like the medieval Christian and Islamic ones. As was shown above (see Chapter 2), you would not just get a random diffusion of various combinations of traits but, instead, you will be confronted with a systematic increase in the opposite (++) - (--; or +- - -+) cells of respective tables. The situation which we found regarding the distribution of male genital mutilation and polygyny in the Circum-Mediterranean falls squarely within this pattern. In this example, we observed that a huge set of communities (i.e., all the Islamic communities) systematically reproduced a pattern opposite to the one of another equally huge set of communities (i.e., all the Christian ones) to serve as a sort of cultural boundary marker. As a result we have a systematic inflation of figures not just in one cell, but precisely in two diagonally opposite cells.

Now imagine that within such a context you would have both diffusion zones covering just 6% of the whole sample. The result would be as follows (see Table 7.11):

TABLE 7.11. Trait A * Trait B (version 3)

		Trait A	
		<i>absent (-)</i>	<i>present (+)</i>
Trait B	<i>absent (-)</i>	280	250
	<i>present (+)</i>	250	280

Note: $p = 0.037$

Note that the size of the general sample and of the supposed diffusion zones is virtually identical with the situation which we confronted while studying the correlation between the male genital mutilation and polygyny. Hence, with cross-cultural samples of *Ethnographic Atlas* size we could find a significant Galton effect, even when only about 6% of the sample is infected by it. But who now uses the *Ethnographic Atlas* as a sample for cross-cultural research? Almost no one. The question remains: should we really bother with Galton's problem? We still think we should. Most cross-cultural researchers would use the Standard Cross-Cultural Sample (SCCS). But is it really immune to the Galton effect?

There are 7 Christian and 23 Islamic cultures in the SCCS. Could they produce a Galton effect within the model specified above? Let us test this and compare the results with a sample that includes Muslim and Christian cultures (located on the diagonals), see Tables 7.12 and 7.13:

TABLE 7.12. Trait A * Trait B (version 4; for Standard Cross-Cultural Sample, omitting the Christian and Islamic cultures)

		Trait A	
		<i>absent (-)</i>	<i>present (+)</i>
Trait B	<i>absent (-)</i>	39	39
	<i>present (+)</i>	39	39

Note: $p = 1.0$

TABLE 7.13. Trait A * Trait B (version 5; for Standard Cross-Cultural Sample, including the Christian and Islamic cultures)

		Trait A	
		<i>absent (-)</i>	<i>present (+)</i>
Trait B	<i>absent (-)</i>	46	39
	<i>present (+)</i>	39	62

Note: $p = 0.025$

Thus, we can see that the two competing historical networks comprising only 16% of all the cases could still make a significant difference, even in the SCCS. If we leave just one representative of both Islamic and Christian historical networks in the original ethnographic sample comparing male genital mutilation with polygny, we believe the correlation will become insignificant: We test this hypothesis below (see Table 7.14):

T A B L E 7.14. Male Genital Mutilation * Polygyny (for Standard Cross-Cultural Sample, leaving one culture from the Christian and Islamic historical interaction networks)

		Polygyny	
		<i>absent</i>	<i>present</i>
Male Genital Mutilation	<i>absent</i>	26	99
	<i>present</i>	3	30

Note: Phi = + 0.12; p = 0.12 (0.093 by Fisher's Exact Test, one-tailed)

As we see, if we use religion as the criterion for delineating and selecting cultural units, the relationship drops to an insignificant level and we can finally reject our hypothesis.

It is quite clear that here we are dealing with a hypothesis of precisely that type that demands the use of the cultural units of the highest possible level (i.e. ones like the "Islamic civilization", or the "Christian world") as units of comparison in order to test it.

But does that mean that to solve Galton's problem we need to use such cultural units as "Islamic culture" or "the Christian world"? By so doing we would be virtually unable to conduct any cross-cultural research on complex societies. But is it really always necessary to use cultural units of such a high order of magnitude? The answer is 'No'.

For example, if we hypothesize that the number of supracommunal levels (that is, levels of political integration) is directly correlated with class structure, and if we use only a sample of societies from the Islamic world we will obtain the following statistical measures of significance:

	Value	Approx. Sig.
Gamma	.536	.001
Spearman Correlation	.550	.010

This is to be expected, if we assume that the above correlation of 0.01 is a consequence of the diffusion of class structure and of political integration in the Islamic world. But if we extended our sample to include a world-wide sample then we obtain the following results (we have still used the Standard Cross-Cultural Sample for this test):

	Value	Approx. Sig.
Gamma	.708	.000
Spearman Correlation	.615	.000

In other words, our hypothesis is significant regardless of whether we choose a sample from within a mega-cultural unit, such as the Islamic world, or from a larger and more culturally diverse sample. This suggests that we could include any number of cultures from the Islamic world without significantly distorting the final results.

However, we have still employed the Standard Cross-Cultural Sample for these tests. Therefore, we are using cultural areas rather than individual ethnic cultures as the standard (cultural) unit for cross-cultural comparison. But will the situation really change if we use "ethnic cultures" as the units for testing hypotheses cross-culturally?

Let us test the above hypothesis using a cluster of very closely connected historically and constantly interacting cultures. Normally, this condition would lead us to expect to encounter the

severest "Galton effect". We have taken the Equatorial Bantu (i.e. Amba, Babwa, Bafia, Bali, Bamileke, Bamum, Banen, Bashi, Bira, Bombesa, Bubi, Budja, Budu, Duala, Dzem, Ekonda, Fang, Fungom, Fut, Ha, Hunde, Kela, Koko, Kom, Kota, Kpe, Kumu, Kundu, Kutshu, Lalia, Lokele, Luba, Lulua, Mongo, Mpongwe, Ndaka, Ndob, Ndoko, Ngala, Ngombe, Ngumba, Nkundo, Nsaw, Nsungli, Plainsbir, Poto, Puku, Rega, Ruanda, Rumbi, Rundi, Sanga, Songe, Songola, Tetela, Tikar, Topoke, Widekum, and Yeke). The correlation between the two variables (i.e., political integration and class structure) for them is seen below:

	Value	Approx. Sig.
Spearman Correlation	0.72	< 0.00000000000000001

The correlation between the two variables in this closely knit cultural region is even higher than the one for the world-wide sample! Obviously, this cannot be explained by any particular Galton effect. Thus, even among the equatorial Bantu cultures we find the hypothesized correlation between political integration and class structure: the greater the political integration, the more stratification we find in that society.

Similar results were obtained by Strauss and Orans (1975:583) using a bit different method. They also show that it is possible to include societies from similar cultural areas and/or ethnic backgrounds without biasing the results in order to test, for example, hypotheses regarding the relationships between the type of descent and the type of residence (pp. 581–3) as well as between mode of marriage and animal husbandry type (p. 583).

Therefore, we conclude that to test hypotheses of certain types, one can include societies from similar cultural areas and/or ethnic backgrounds without biasing the results. In the case discussed above, Galton's effect is utterly irrelevant to the analysis. Thus, the concerns voiced by Murdock and White with regard to Galton's problem of selecting independent cultures for comparative research appears not to be relevant for some cross-cultural comparisons.

What, then, is the bottom line? We have offered a paradoxical argument; on the one hand, we are arguing that to test certain hypotheses it is appropriate to use linguistic clusters as baseline cultural units for cross-cultural comparison; on the other hand, our later examples illustrate the existence and biasing effects of cultural "mega-units" such as the Islamic or Christian worlds that incorporate clusters of communities speaking the same language into the same cultural complex; hence, to test such hypotheses we have no other choice but to use such huge cultural units as units of comparison. Importantly we have also shown that for testing certain hypotheses we can include as many "linguistic" cultures as we like from one "mega-area." We can even include communities from closely knit cultural areas without being afraid of any distortions by the "Galton effect".

In this appendix we have applied Brumann's definition of cultures as 'clusters of common concepts, emotions, and practices that arise when people interact regularly.' But do we not also observe such clusters **within** linguistically homogenous areas? On what grounds then do we decide not to consider such clusters as 'cultures'? All this leads to the supposition that for certain types of cross-cultural research questions one might include in the cultural sample communities which speak the same language but which belong to different cultural clusters.

Consider the problem of the relation between communal complexity and "supracommunal" political structures. Previous research suggests that for most of human history there have existed two very different paths for political evolution. Along one, increasing cultural complexity is accompanied by the development of supracommunal political organization that takes over the

running of community affairs and this, in turn, reduces the complexity of the local (i.e., communal) political organization. Along the other evolutionary path, an increase in cultural complexity is accompanied by an increase in infracommunal political structural complexity. This latter path appears to be particularly associated with highland environments whose rugged terrain creates natural obstacles for political centralization (Korotayev 1995). If we test this hypothesis using conventional samples based on linguistic or cultural area criteria, we would not include in our sample two communities speaking the same language or located in the same cultural area. By ignoring this critical environmental variable, we might well obtain the following sample for the 18th Century Circum-Mediterranean region: Germans, French, Albanians, Serbs, Moroccan Berbers, Georgians, Slovaks, Ukrainians, and Algerians. This sample satisfies the traditional criterion for distinguishing culturally groups by including only linguistically diverse groups in the sample. However, it would ignore the environmental variable and thus, the sample consists of only **lowland** communities from the respective ethnic groups. The test of the hypothesis using this sample would produce the following result:

	Value
Phi	...
N of Valid Cases	9

Warnings

No measures of association are computed for the crosstabulation of Community Complexity * Level of Effective Sovereignty. At least one variable in each 2-way table upon which measures of association are computed is a constant.

No statistics are computed because the values of both variables ("**Community Complexity**" and "**Level of Effective Sovereignty**") remain constant. However, when we add the highland (and linguistically similar if not identical) counterparts of the above lowland communities (German Swiss, French Swiss, North Highland Albanians, Montenegrans, Central Atlas Berbers, Swans, Highland Slovaks, Carpathian Ukrainians, Highland Algerians) to our sample, the situation changes dramatically:

T A B L E 7.15. *Community Complexity * Level of Effective Sovereignty*

Community complexity	Effective Sovereignty		Totals
	At the community level	Above the community	
Medium	1	10	11
High	7	0	7
Totals	8	10	18

NOTE: Phi = - 0.89; $p = 0.0003$ (by Fisher's Exact Test)

This table shows that the relationship between community complexity and level of effective sovereignty is in the expected direction if we add the highland counterparts to the lowlands cultures to our sample *as independent cultural units*.

The effect of including similar language and cultural areas into our sample was to increase variation in our sample. We see that "culture" is a complex concept, with cultural clusters varying on the basis of a wide variety of different dimensions: language,

ideology, environment, etc. Thus, culture really does deserve its name, and, as Brumann asserts, deserves to be retained as a concept. For some types of cross-cultural research it is in fact useful and necessary to take examples from within cultural and/or linguistically "bounded" areas.

We conclude our discussion of cultural units by declaring that it is simply not possible to know beforehand what criteria to use for selecting one's cultural units for cross-cultural research. The criteria will vary on a case by case (or rather hypothesis by hypothesis) basis. If we see culture as a "cluster of cognitions, emotions, and practices" then we have to determine what criteria are responsible for organizing the cluster. Under certain circumstances, we need to be aware that cultural clusters are not necessarily geographically contiguous or even proximate, but can be organized on the basis of global transcultural systems such as Christianity or Islam. In other circumstances, linguistic and cultural area boundaries serve as useful criteria for identifying cultural units. Still at other times, it is unnecessary to be concerned about linguistic or cultural areas, as differences are predominantly affected by environmental and/or extra-cultural factors.

In our study we addressed the issue of cultural units and came to the conclusion that Galton's problem takes a variety of forms, primarily because culture takes many forms. We have been much influenced by Brumann's definition of culture, which is a good substitute for older ideas of cultures as bounded and uniform wholes. Rather, we agree that cultures consist of various distributions of traits that are more or less shared. For cross-cultural researchers this means that initially attention should be paid to the kinds of traits that may be distributed among the cultures that one includes in one's sample as a consequence of one's research question.

Finally, a few practical suggestions regarding sampling techniques for world-wide cross-cultural comparisons. From what has been said above it must be clear that we believe that the answer to the question "What cultural units should be used as units of comparison?" will be different for different cross-cultural comparisons depending on what kind of hypothesis is being tested. What is more, we believe that in many cases the answer to this question could hardly be received *a priori*. Hence, our practical advice would be to start with as large a cross-cultural data sets as could be obtained (at present, this would really mean the *Ethnographic Atlas* data base whenever its data could be used to test the given hypothesis). After the initial tests it seems necessary to test for any network autocorrelation ("Galton") effects. This way we shall be able to obtain first the optimum sample to test the given set of hypotheses and second to achieve some progress in the study of the communication networks and historical diffusions affecting the distribution of the variables under consideration. In this case the "Galton problem" will appear not as a problem for cross-cultural comparison, but rather as an asset.

⁵From what we have said above, it must be overtly clear that we are strongly in favor of the treatment of the Galton problem as a network autocorrelation one (see *e.g.* Doe, Burton & White 1981, 1982, 1984; White, Burton & Doe 1981; Burton & White 1987:147, 1991).