

CLIPP

Christiani Lehmanni inedita, publicanda, publicata

titulus

On the methodological bases of genetic language comparison

huius textus situs retis mundialis

http://www.uni-erfurt.de/sprachwissenschaft/personal/lehmann/CL_Publ/Method_genetic_comparison.pdf

dies manuscripti postremum modificati

25.05.2005

occasio orationis habitae

Colloquium on 'New methods in genetic language comparison', University of Erfurt, 9.-10.11.2001

volumen publicationem continens

Language Research (SNU) 41

annus publicationis

2005

paginae

379-404

On the Methodological Bases of Genetic Language Comparison

Christian Lehmann
(University of Erfurt, Germany)

Lehmann, Christian. (2005). On the methodological bases of genetic language comparison. *Language research* 41(2), 379-404.

The notion of arbitrariness plays a fundamental role in the identification of linguistic properties which can prove genetic relatedness. In the traditional comparative method, arbitrariness is only relied upon in individual linguistic signs. The paper attempts to generalize the concept of arbitrariness to other areas of the linguistic system, including constraints on subsystems and processes, in order to widen the basis for genetic comparison and lay the theoretical foundation for new methods of genetic comparison.

Key words: genetic relations, contact relations, regular correspondence, motivation, arbitrariness, grammaticalization, comparative method

1. Introductory Remarks

The purpose of my presentation is twofold:¹⁾ First, I will try to formulate what I perceive as common ground on which those who establish genetic relationships by means of the historical-comparative method move. Second, I would like to make my own methodological proposal within this framework. Therefore I will start, in sections 2 and 3, by reminding the reader of things that we know and that I consider uncontroversial, and gradually pass on to things that the reader may find controversial. In particular, I will propose, in sections 7–9, to extend the traditional notion of arbitrariness and to base arguments of genetic relationship on the arbitrariness of the single features considered and the ar-

1) Thanks are due to the participants of the colloquium on 'New methods in genetic-comparative linguistics' (University of Erfurt), in particular Willem Adelaar, Balthasar Bickel, Orin Gensler, Sergio Meira and Frans Plank, and also to the anonymous reviewers of this journal, for helpful comments.

bitrariness of their combination in a linguistic system.

2. The Historical-comparative Method

2.1. The Traditional Conception

Scientific methods for proving genetic relationships among languages have been developed in the nineteenth century, chiefly by Indo-Europeanists. The traditional historical-comparative method relies on the Neo-Grammarians' concept of regular sound correspondence (cf. Katičić 1970). This may be illustrated by such pairs as Latin *septem* = Greek *heptá* 'seven', Latin *sal* = Greek *hal* 'salt' etc. In all of such pairs, Greek has an /h/ where Latin has an /s/. This is so both in lexical and in grammatical morphemes. The method thus involves comparison of semantically similar morphemes across two languages. If the significantia of such morphemes are found to be similar, too, then we have a first heuristic clue for genetic comparison. This kind of similarity provides, at the same time, the theoretical basis for genetic affiliation within that model.

Within certain limits that have been discussed ever since Saussure 1916 and that will be taken up in section 6.1, the linguistic sign is arbitrary. In the present context, this means that the association of the significans and the significatum of a linguistic sign is an operation proper to each language. Consequently, elementary signs of two languages which have the same²⁾ or at least a highly similar significatum must be expected to differ randomly in their significans. If, for a given pair of languages, this turns out not to be the case on a large scale, i.e. morphemes which are semantically related³⁾ are generally found to be phonologically related, too, then this is a *prima facie* violation of the princi-

2) Let us assume, for the sake of simplicity, that it is possible for a significatum of a sign of one language to be identical to the significatum of a sign of another language.

3) Ideally, the meaning and grammatical category of the morphemes compared must be the same. Differences must be plausibilized as phenomena of some kind which are expectable in semantic change. While adherents of the method have acknowledged for a long time that more precision in this area would be desirable, little progress has been made here, and perhaps the nature of semantic change precludes the possibility of sharpening the notion of regular correspondence for the semantic side of the linguistic sign in the same way that is required for its expression side. As a matter of fact, the historical-comparative method has disclosed very good results despite this weakness.

ple of arbitrariness of the linguistic sign. If the comparative linguist is confronted with such evidence, his only possible conclusion is that the two languages must be historically related.⁴⁾

2.2. Regular Correspondence

Two points of precision are necessary here. First, arbitrariness of the linguistic sign is limited by universal principles which concern the constitution of the significans, the constitution of the significatum and the more or less iconic character of their association. Given that the morphemicon of a language comprises something on the order of 5,000 to 10,000 morphemes, and given the aforementioned limits within which they can vary at all, statistics predicts that a certain portion of semantically similar morphemes of any two languages will be phonologically similar, too. Laymen (and even some linguists) who compare languages and detect similar words in them often do not appreciate this point and postulate genetic relationships on unsound grounds (see, e.g., Ringe 1995 and Kessler 1999 on this).

Therefore, what is of relevance in the historical-comparative method is not mere phonological similarity of semantically similar morphemes, but instead regular correspondences between the significantia of semantically similar morphemes. This concept may be defined as follows:

A **regular correspondence** among the morphemes of two languages L_A and L_B holds iff:

First, given any two morphemes M_{A_i} and M_{A_j} of L_A , which correspond semantically with two morphemes M_{B_i} and M_{B_j} of L_B , and given that M_{A_i} and M_{A_j} share some phonological property P_{A_k} , and M_{B_i} has some phonological property P_{B_k} where M_{A_i} and M_{A_j} have P_{A_k} ; then M_{B_j} has P_{B_k} , too.

Second, this holds for any (lexical or grammatical) morpheme of either language (with individual P_k s, of course, differing). Morphemes that do not correspond in this way are subject to a counteracting principle which is itself of a systematic nature. That is, there are no

4) The argument goes back at least to Meillet 1925:2. In this argument, the danger of a *petitio principii* seen in Plank 1981:37f cannot arise because it is not assumed that a single correspondence is an "element of cognateness" between two languages.

exceptions (in the sense of ‘unaccounted-for exceptions’) to the regular correspondences (cf. Katičić 1970).

The second point of precision concerns the notion of similarity implied here. It is of particular importance (and it clashes sharply with the layman’s notion of similarity among cognate languages) that the principle of regular correspondence does not require any substantial similarity between cognate morphemes of two languages. They may, in fact, be as different as Latin *centum* and Sanskrit *śata* (both ‘hundred’), provided all the differences recur in the same fashion in the rest of the morphemicon.⁵⁾ What the notion of regular correspondence does exclude is that the members of the set of morphemes of L_A differ with respect to where, i.e. in which sounds, the similarities with the morphemes of L_B reside. For instance, OE *hafud* and Latin *caput* (both ‘head’) are phonologically similar; and so are OE *habban* and Latin *habere* (both ‘have’). However, the first pair partakes in a regular correspondence ‘OE /h/ = Latin /k/ (spelt <c>)', which also involves the pair OE *hȳd* = Latin *cutis* (both ‘hide, skin’) and many others. This regular correspondence does not cover the pair OE *habban* and Latin *habere*; and in fact, these words are not cognate. To repeat, a phonological similarity that is not based on a regular correspondence does not count in this methodology.

Being a violation of the principle of the arbitrariness of the linguistic sign, the sheer recurrent phonological similarity of morphemes of similar meaning as such points to a historical connection between the two languages. The criterion of regular correspondences goes beyond that. Given that it applies to all the morphemes of a language, it serves to distinguish a genetic relationship from a contact relationship, unless a language has borrowed its entire morphemicon from another one, in which case the relationship between the two languages is equivalent to a genetic one. In the writing of historical grammars of the languages concerned, the regular correspondences will show up as sound changes. For the last example given, this means that the historical grammar of Old English will feature a sound change that leads from /k/ to /h/ (and which, of course, Old English shares with the other Germanic languages).

5) Cf. Campbell 1986 (where the even more unlikely cognate pair Armenian *erku* = Engl. *two* is quoted) for some qualifications of this point.

2.3. Limitations of the Historical-comparative Method

Based as it is on the criterion of regular correspondences, the traditional historical-comparative method has proved unfailing in identifying existent genetic relationships. More precisely, what is genetically related by the standards of this method is genetically related by any scientific standards. However, it has limitations of various kinds. One of them is that it is very demanding, so that the net gain of its application is often not quite up to the effort. This has given rise to lexicostatistics and glottochronology, a point that will not occupy us further.

Another shortcoming is that the method loses its power in distant genetic relationships. Linguistic change is not only sound change. All the other kinds of linguistic change directly or indirectly diminish the portion of the morphemicon of a language which is cognate with a sister language or at any rate may be recognized as such; and insofar they undermine the very basis of the historical-comparative method. After 6,000 years, grammar and vocabulary of a language may be reshuffled to such an extent that almost no morphemes are left to compare with the sister languages. As a result, the time-depth of the historical-comparative method is relatively shallow. Linguists and laymen alike want to see linguistic diversity on the globe tamed in the form of a handful of linguistic stocks stemming from their respective proto-languages. The boldest among them want to reconstruct Proto-Human. However, if we consider the time-span separating us from Proto-Human, we must recognize that the 6,000 or so years that the historical-comparative method can span cover at the very best 10%, but probably far less – maybe only 1% – of the whole distance.

As a consequence, the historical-comparative method can never prove that two languages are genetically unrelated. Quite to the contrary, it is highly probable that many languages which, on the basis of the historical-comparative method, must as yet be treated as isolates, and many language families which must be treated as separate, do in fact stem from common ancestors. Japanese, Korean and the Tungusic languages provide a well-known case in point. The fact that the historical-comparative method cannot prove such a relationship does not render it any less probable. The most one can say is that if these languages are genetically related, they must have separated a longer time ago than can be spanned by the historical-comparative method.

Reactions to this situation have varied. Indo-Europeanists and other methodologically cautious comparativists (like Campbell & Kaufman, 1980) have preferred to abide by what their teachers told them can be claimed with responsibility. Some have reapplied the historical-comparative method to its own results, reconstructing, e.g., Proto-Nostratic on the basis of Proto-Indo-European, Proto-Uralic and Proto-Afro-Asiatic (Shevoroshkin & Markey (eds.), 1985; Bomhard & Kerns, 1994). However, this recursive application of the method faces a serious problem of deterioration of the results. Others, especially J. Greenberg (1987), have taken to “large-scale (or mass) comparison” in the hope that quantity can make up for quality – a hope that has not been shared by many. The last resort that has been tried is diachronic typology. Nichols (1992) has grouped language families in large areas on the basis of properties of grammar that she assumes to be diachronically stable. However, the properties structuring the linguistic system are subject to universal and typological principles. If two languages share such a property, this may be due to some historical relationship or may simply follow from such general principles. No criteria are yet known which could tell these two cases apart. Furthermore, even if such a relationship could be shown to be of a historical nature, there is still the possibility that it stems from borrowing instead of common genetic origin.⁶⁾

It must be concluded that the methodological situation of historical comparative linguistics has essentially remained unchanged. With the methods available, we arrive at some 250 language families (e.g. in Voegelin & Voegelin, 1977, one of the more conservative classifications) plus numerous isolates; and we cannot get beyond this, i.e. we cannot reduce this number considerably. New, more powerful criteria to prove genetic relationship are needed.

3. Kinds of Relationships Among Languages

Two principal kinds of relationships among historical objects such as languages may be distinguished: relations of contiguity and relations of similarity. Contiguity means that the objects have some kind of contact

6) Cf. Modini 1988 for an attempt at relating Japanese to the Ural-Altai family on grounds of typological similarity.

in their history. Similarity means that the objects share some features if compared, irrespectively of any historical contact. Relations of contiguity among languages are **historical relations**, relations of similarity among languages are **typological relations**.⁷⁾ Of course, contiguity may lead to some kind of similarity. Then the methodological problem arises of whether some similarity that emerges from comparison is just a typological similarity or is the consequence of some historical contiguity. Viewed from this angle, the relations of correspondence between two languages which go back to historical contact between them are a subset of all the similarities that they have, and the methodological problem is to identify this subset.

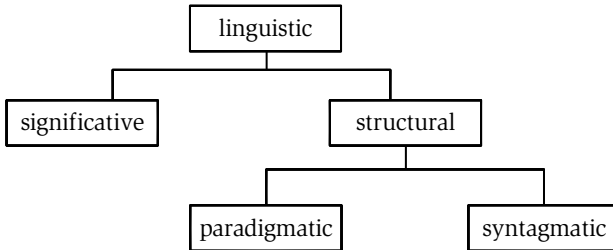
Historical relationships among languages are further subdivided into **genetic** and **contact relations**. If projected on the time axis, a genetic relation is one of divergence of an initially unitary language, while a contact relation is one of convergence of two initially separate languages. If one knows the history of the languages in question, the two relations are easy to tell apart. The methodological problem arises if the correspondences in question are observed at the earliest stages of the documented history, or even at prehistorical stages, of the languages in question, because the distinctive criterion – convergence vs. divergence – by definition antedates this point and is therefore not controllable.

4. Kinds of Relations in the Language System

Before we can approach the issue of the interpretation of similarities among languages, we need a theory of what such similarities can consist in. The first thing to be said here is that our branch of linguistics – historical-comparative linguistics – is concerned with language as a system, not with language as an activity. We therefore essentially take the standpoint of structural linguistics. From this point of view, the language system is a set of units that is structured by a set of relations among these units. The **units** are what L. Hjelmslev called signs and figurae. A sign consists of a significans and a significatum. Figurae include significata and significantia as well as their components.

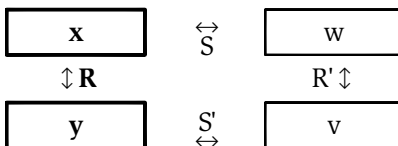
The **relations** may be arranged in the taxonomy of (1).

7) Plank 1981 opposes historical relationship to elementary/typological relationship.

(1) *Kinds of relations in the language system*

The relations apply to the units as follows: There is only one, unique, significative relation,⁸⁾ which is the relation between the significans and the significatum of a linguistic sign. All the other relations, i.e. relations between figurae and relations between signs, are structural relations. All structural relations between linguistic units obtain either in the system or in the text and are therefore either paradigmatic or syntagmatic. Taxonomic relations (e.g. hyponymy) are paradigmatic relations; meronomic relations (e.g. constituency) are syntagmatic relations.

Relations among linguistic units may be motivated or arbitrary. The issue of motivation arises as follows: There is a certain unit x which is to be put into relation R with unit y . For instance, x may be a significatum, R the significative relation, and what is sought is the y that should be the significans of x . If such choices are motivated, it means they are made on the basis of an **analogy**. The analogy presupposes the existence of two further units v and w which are related to each other and to x and y as shown in (2).

(2) *Motivation of xRy by analogy*

Since an analogy is the perception of a similarity, S and/or S' are relations of similarity or even identity. To resume the example: The sig-

8) This is the semantic relation in the sense of Morris 1938. It would be amenable to a sub-categorization in the sense of Peircian 'icon vs. index vs. symbol.'

nificans y to be paired (R) with significatum x may be chosen because y is identical (S') to significans v which signifies (R') w , and w , in turn, is similar (S) to x . This example is a formal description of metaphor (a significative relation). The schema may be applied to more complex cases like the sequential order of an adposition and its dependent NP (a structural relation). The governing relation between an adposition (x) and its dependent NP (y) may be represented by the adposition preceding (R) the NP on the basis of an analogy to the governing relation of a relational noun (w) to its dependent NP (v), which already is represented by the former preceding (R') the latter.

The relation R at stake is, thus, shaped on the analogy to another configuration R' which serves as its model. R' may enjoy this preference as a model for various reasons: it may follow a more general pattern or principle, or it may seem intrinsically appropriate. This generates chains of motivation which ultimately lead us outside the linguistic system into the area of universal external conditions for functioning languages.

Since motivation inside the language system presupposes an analogy, the motivation of a relation may get lost if the analogy gets lost, i.e. if either the configuration at stake or the model of the analogy changes. What started out as motivated may then become arbitrary.

5. Motivation vs. Arbitrariness

Every human language has the januslike status of being both an instance of the natural human language faculty and a system of conventions bound up with the historical situation of a speech community. To the extent that it is the former, it is like any other language. To the extent that it is the latter, it is unlike any other language that it does not share its history with. Properties that a language shares with all other languages are motivated by the nature of human language. Properties that it has developed historically are not so motivated and, insofar, arbitrary.

The individual language system is constructed both according to universal principles and by idiosyncratic historical choices. It is partly motivated, partly arbitrary. Given that the principles underlying motivated phenomena are, to a large extent, universal, **historical relationship of two languages can only be proved on the basis of shared arbitrary features**. The possibility of distinguishing between a historical and a ty-

polological relationship therefore presupposes an answer to the question: which properties of a language are motivated, which are arbitrary?

6. Distinguishing Historical Relationship from Typological Similarity

6.1. Arbitrariness in the Significant Relation

In our search for criteria by which we can tell historical relationship apart from typological similarity, the methodological problem is that the arbitrary features are not clearly separate from the motivated ones. Traditionally, it was believed that the significant relation in the individual sign was arbitrary, while structural relations were principled, and therefore the historical-comparative method relied exclusively on the former. In treatises on the historical-comparative method, it has been commonplace to insist on the restriction of the method to the significant relation, to the exclusion of grammatical structure. The dogma is reiterated in Aikhenvald & Dixon, 2001, p.3; see also Lehmann, 1984, section 6.

The significant relation provides a clearly delimitable area of the overall language system. However, the traditional assumption is wrong. It has been proved abundantly (Jakobson, 1966; Lehmann, 1974) that there is a high degree of motivation in the significant relation.

The traditional method of proving genetic relationship by regular correspondences is based on the correct intuition that relevant criteria must be sought in an area in which the character of the language as a historical individual and, consequently, arbitrariness prevails. However, the basis of the intuition must be extended and systematized. It is not the case that the significant relation is the only area of arbitrariness in language; and it is not totally arbitrary, either. The tension between motivation and arbitrariness pervades the whole linguistic system, including its structural relations. At all levels and in every area, including even the formation of individual linguistic signs,⁹⁾ there are both universal principles and language-specific discretion. Just as there is a complex interplay between motivation and arbitrariness in the formation of the in-

9) Cf. Jakobson 1966 on the extent of motivation in this area.

dividual sign, there is such an interplay in the formation of a sound system, including the phonotactics of a language, of the grammar and the lexicon.

6.2. Arbitrariness and Grammaticalization

Grammaticity of a paradigmatic or syntagmatic configuration of linguistic units, i.e. of a category or of a construction, is a matter of degree. This can be measured by the parameters of grammaticity as set out in (3) (cf. Lehmann, 1995).

(3) *Parameters of grammaticity*

axis of relation aspect of autonomy	paradigmatic	syntagmatic
cohesion	paradigmaticity	bondedness
variability	selectability	ordering freedom

The parameters allow an ordering of structural devices according to their grammaticity. They are equally applicable to structural devices which are in a paradigmatic relation within one functional domain, which may evolve into each other by grammaticalization, and to such devices which belong to diverse functional domains and may therefore cooccur in syntagmatic combination.

Let us consider the various techniques of nominal classification as an example (cf. Lehmann, 1982). At the pole of lowest grammaticity, we have such techniques as numeral classification. The technique as a whole is motivated cognitively by the concretization of the abstract concept of cardinality of a set and by the possibility of individuating counted items by categorizing them. It is motivated intralinguistically by giving numerals a syntactically independent status. The various classes into which numeral classifiers sort the counted objects are mostly motivated semantically.

More grammaticalized techniques of nominal classification include Bantu type noun classes and Indo-European type gender. The technique as a whole is motivated intralinguistically by the possibility of re-identifying referents by the nominal class of their designations and by signalling syntactic relations. The noun classes and genders themselves

are partly motivated semantically, partly arbitrary.

The most grammaticalized technique of nominal classification is declension class. Its intralinguistic motivation is weak and essentially boils down to a mutual adaptation of nouns of diverse morphological and phonological shapes with the various declension morphemes. The classes themselves are motivated only formally, if at all.

This example shows neatly how arbitrariness correlates with grammaticity. At the pole of weakest grammaticity, linguistic devices – categories and constructions – are formed and employed in a motivated way. The motives are ultimately grounded in cognition and communication and therefore universal to a large extent. Consequently, many languages have similar linguistic devices of weak grammaticity and employ them in a similar fashion. With respect to the example, this means that many languages have numeral classifiers, the category as a whole essentially always has the same function, and the classes defined by these classifiers coincide to a very large extent cross-linguistically.

At the pole of highest grammaticity, linguistic devices are formed and employed in idiosyncratic fashion. They are not motivated with respect to extralinguistic matter, but, if at all, intralinguistically as part of a complex structure. Therefore, these devices are highly language-specific. Although many languages do have declension classes, they do not have a clearly discernible function, and the classes themselves are arbitrary and totally language-specific. **The most grammatical structures of a language are, at the same time, the most arbitrary ones.**

Consequently, the criteria of grammaticity of (3) may serve as criteria of arbitrariness of linguistic structure as well. On this basis, we can say that proof of historical relationship of languages is made on the basis of shared arbitrary phenomena, and such phenomena may be found not only in arbitrary significative relations, but also in arbitrary structural relations (in the sense of (1)).

7. Distinguishing Genetic from Contact Relationship

7.1. Borrowability

As we have seen in section 3, genetic relationship is clearly distinct from contact relationship. Genetic relationship ideally takes the form of

a pedigree. Contact between languages has traditionally been considered as a sort of promiscuity which has to be factored out in reconstructing a pedigree. Therefore it is of the utmost importance in the historical-comparative method to distinguish a resemblance between words which are genetically cognate from a resemblance which is based on borrowing.

If one ignores the history which precedes the contact or unity of the languages in question, genetic affiliation and contact relationship are on a continuum. Trubetzkoy (1939) was the first to point out that Proto-Indo-European could well have been a linguistic area instead of a unitary proto-language. Beyond a certain point of interpenetration of the languages in question, it becomes impossible to tell the two situations apart. Nonetheless, in every given case the attempt must be made to apply the distinction. The methodological question, therefore, is: Are there types of similarities among languages which cannot arise through contact, but can only be inherited?

Contact studies have shown that there is almost no limit to what a language can borrow from another. Even phonemes can be borrowed, by borrowing a sufficient number of words that contain them. In principle, borrowing presupposes some kind of motivation (cf. Moravcsik 1978:103f). However, the motivation may be more or less intrinsic. A feature may be borrowed because it serves expressive needs in the recipient language, but it may also be borrowed because it – or the donor language as such – is prestigious. Arbitrary structural features escape intrinsic motivation for borrowing, as they serve no expressive needs. Unfortunately, they do not escape extrinsic motivation; i.e. if the donor language is more prestigious, then even arbitrary structural features may be borrowed just because they are chic.

There is, however, a continuum of borrowability. Obviously, individual lexical items are easiest to borrow, grammatical paradigms are most resistant. More precisely, grammatical **borrowing** is restricted by the following implicational regularities (see Moravcsik, 1978, section 2.1, and cf. Aikhenvald & Dixon 2001:17-19):

Borrowing

- Borrowing of grammatical items from a language presupposes borrowing of lexical items from that language.
- Borrowing of clitics presupposes borrowing of free forms.
- Borrowing of inflectional morphemes presupposes borrowing of der-

ivational morphemes.

These regularities help in excluding the possibility of borrowing of a structural feature of strong grammaticity if the language has not borrowed all the other kinds of properties mentioned from the donor language in question.

However, just the opposite implications hold for **interference** from a substrate or adstrate language into a target language (Thomason & Kaufman, 1988, ch. 3):

Interference

- Lexical interference from a substrate language into a target language presupposes grammatical interference from that substrate language.
- Grammatical interference presupposes phonological interference.

Here again, the continuum of grammaticity plays its role: The most grammatical features, which are, as we have seen, the most arbitrary structural features, are hardest to borrow (cf. Field 1998). At the same time, the most deeply entrenched structural features are the first to produce interference in the target language.¹⁰⁾ Consequently, while choosing highly grammatical features for historical comparison may guard one against confusing a contact relationship with a genetic relationship, it is no protection against confusing it with substrate influence.

7.2. Arbitrary Constraints

Linguistic phenomena have the status of variants. The union set of the properties of all the languages represents the range of variation possible in human language. Within a given language system, only a fraction of the overall variation is available. Each language system imposes various kinds of restrictions on the expressive devices that are available to the speaker at the two levels of double articulation:

- From among all the phonetic units available at the level of the second articulation, only a subset is admitted and elevated to phonemic

10) As Balthasar Bickel says (p.c.): highly grammaticalized structures have a low diffusion potential and a high inheritance potential.

status in the language.

- From among all the expressive devices (such as prefixation, internal modification, tone shift, apophony ...) available at the level of the first articulation, only a subset is integrated into the grammatical system.
- The use of those elements that have the status of units of the language system is subject to conditions which restrict their use to certain contexts and impose such alternations as allophony, allomorphy and neutralization.

Such restrictions that a language system imposes on units of the two levels of articulation and on their use will here be subsumed under the general concept of **constraints**.

For instance, the fact that the sound system contains only a few dozen sounds from among the hundreds that are possible and that do occur in other languages represents a constraint that this language imposes on its sound system. These constraints are, in turn, motivated by universal and typological principles. There are, for instance, principles that guide the formation of vowel systems and which make the five-vowel system, *ceteris paribus*, the optimal one (Maddieson 1984). The five-vowel system is a typical representative of the kind of linguistic property which is useful in typologizing languages, but of no use in proving genetic relationship (cf. Bès 1967).

While all existent vowel systems are, by definition, admitted by universal and typological principles, they do diverge from the five-vowel default to varying degrees. Some are very special. Kabardian, for instance, has only two phonemic vowels, /a/ and /ə/. This represents a constraint, or a combination of constraints, on permitted vowels which, although compatible with universal phonological principles, is at the margin of cross-linguistic variation.

Constraints which are less principled may also be found in consonant systems. Spanish and some dialects of Portuguese have two *r* sounds at the same point of articulation, viz. /r/ and /r̄/ – rare enough.¹¹⁾ Both

11) A contrast between the same two *rs* is found in Chibchan languages such as Teribe (Quesada 2000, ch. 2.1.2.5f), Bari and Damana and in the Chocoan languages (González & Rodríguez (eds.) 2000). (In all these cases, Spanish influence is possible.) Jaminjung (Northern Australia) (Schultze-Berndt 1999, ch. 2.1.1) and Guajiro (Arawak, Colombia) also have two *r* phonemes, viz. [r] and [r̄], thus, at distinct points of articulation. None of these languages has anything reminiscent of the above constraint.

impose a constraint in their phonotactics to the effect that these sounds contrast only in intervocalic position, while in all other contexts the opposition is neutralized, the result being /r/ in word-initial position and /r/ in all other contexts (i.e. in syllable-internal and final position).¹²⁾ No universal or typological principle or other motivation for such a constraint is known. We do not expect to see it operative in another language. A constraint of this kind will be called an **arbitrary constraint**. It excludes a universally possible variant from a linguistic system and creates a gap in it.¹³⁾

To be sure, not all gaps in linguistic systems are arbitrary in this sense. Yucatec Maya has three series of stops: plain, ejective and voiced (cf. (4)). The former two have labial, alveolar and velar members. The voiced stops form a rather incomplete series, as there is only /b/. The gap left by /d/ and /g/ is, however, well-motivated. These voiced stops are variants of injectives (implosives). According to an implicational universal, if a language has injective stops, then it has /b/, for good phonetic reasons (s. Greenberg 1970:127f). This means that an injective stop system which reduces to /b/ is entirely natural. The same must then, apparently, be said of a voiced stop system which may be injective. Consequently, while this constraint on the consonant system is, in fact, shared by other Mayan languages (s. Campbell 1973 for details), it cannot be used for arguing their genetic relationship.

(4) *Yucatec Maya stop system*

manner \ place	bilabial	alveolar	velar
plain	p	t	k
ejective	p'	t'	k'
voiced	b		

12) Some dialects of Portuguese neutralize the opposition in favor of /r/ in word-final position.

13) Another candidate for this kind of constraint may be found in Japanese. After an Old Japanese spontaneous sound change converted /p/ into /ϕ/ (> [h]), the language now has a prohibition of single (i.e. non-geminate) *p* both in native and in Sino-Japanese forms: only geminate *p*, or *p* following an *m*, are admitted (Itô & Mester 1995).

Naturally, the co-occurrence of two or more arbitrary constraints in a language system has added methodological value. Consider, for example, the group of language families that includes Uralic, Yukagir, Chukchi-Kamchatkan and Eskimo-Aleut. Fortescue 1998, ch. 3 argues as follows: All of the respective languages share two constraints on their consonant systems: There is a single set of plosives, which are voiceless, and there is a single set of non-sibilant fricatives, which are voiced. While the first of these constraints is neither arbitrary nor exactly rare among the languages of the world, the second certainly is. The combination of the two constraints is extremely rare among the languages of the world and not found in the languages surrounding the four families in question. It may therefore count as evidence for their genetic relatedness. A third arbitrary constraint common to the whole group is the absence of word-initial /r/. Michalove (2000) suggests that this constraint is shared by Proto-Altaiic and would, jointly with a couple of other features, argue for including Altaiic in the group of Uralo-Siberian.

I said above that most properties of a language system can, under certain conditions, be borrowed. We can now restrict this further. In general, only positive properties can be borrowed. An arbitrary constraint, however, is something negative, something that the language does not have. Speech communities that get into contact with Spanish or Portuguese commonly do not even notice that the language possesses the above constraint on the *rs*, let alone borrow it.

Heteroclises are, in general, promising candidates for arbitrary constraints at the morphological level. The affiliation of Hittite with the Indo-European family was first hypothesized on the basis of the word for water, nom.sg. *watar*, gen.sg. *weten-as*, where the two stem alternants feature what is known as *r/n* heteroclisis. Compare this with Ancient Greek nom.sg. *hudōr*, gen.sg. *hudat-os* < *hudnt-os* 'water' (where Greek added a *t* to the stem).

A similar example comes from the paradigm of personal pronouns in Penutian languages (cf. DeLancey 1987, section I). Wintu has:

1.pl.nom./acc. *nele-/nite*, gen. *nele:n*; 2.pl.nom./acc. *male-/mite*, gen. *male:n*.

Thus, the nominative shows alternation between a stem containing an *l* and a stem containing a *t*, while only the former appears in the genitive. Now in Klamath, a geographically close language whose affiliation with Penutian is at stake, these pronominal forms are:

1.pl.acc. *na:l's/na:ds*, gen. *na:l'm*, 2.pl.acc. *ma:l's/ma:ds*, gen. *ma:l'm*.

This correspondende in an arbitrary constraint on the pronominal paradigm is among the strongest arguments for considering Klamath a Penutian language.

In such cases, the particular phonemes that make for the heteroclis is are comprised by the traditional method of regular correspondences; to pay attention to them does not constitute a methodological innovation. However, the sheer heteroclis is itself, i.e. the particular structural pattern of alternation and its conditions, has a diagnostic value of its own. In this respect, Indo-European *r/n* heteroclis is not particularly exotic, since a stem alternation between a casus rectus and the casus obliqui is not infrequent in the languages of the world. The Penutian heteroclis, too, may be seen to oppose a casus rectus to a casus obliquus. Here, however, we have two alternate stems, both of which appear in the casus rectus, while only one of them appears in the casus obliquus, a pattern that will not easily recur in the languages of the world.

Arbitrary properties of a language are proper to this language as a historical object. By virtue of their nature, they lend themselves to proving historical relationships among languages. Some arbitrary properties are isolable, positive properties. They can be borrowed. Such properties include, importantly, single words. They can consequently not serve in an argument for genetic relatedness. Other arbitrary properties are of a systematic nature, such as members of a sound system. They are borrowable indirectly. Yet others are systematic, too, but of a negative nature. They exclude certain configurations from the range of possible variation without motivation. These cannot be borrowed directly, but at most by some kind of calque by which the borrowing community would imitate, in its language, a constraint observed in a more prestigious language.¹⁴ Because of such heavy limitations, arbitrary constraints can be used to demonstrate a genetic relationship. They are, insofar, on a par with regular correspondences. These can't be borrowed, either, unless the whole vocabulary is borrowed.

14) Haas (1969:112) claims that Nitinat and Makah lost the nasal stop series by contact with neighboring languages. This borrowing is a candidate for a counterexample until it can be interpreted as the introduction of a positive trait in the system.

8. Diachronic Stability of Criterial Properties

Motivation of an expression by what it conveys is a permanent strong motor of innovation in language. This statement is almost circular: the reason why we choose a new expression instead of one that had been used so far is because what we want to say in some way motivates this choice.

Paradoxically, the significative relation is most subject to motivation and therefore to innovation. Research in glottochronology has shown abundantly that signs are replaced at such a rate that the vocabulary of a stage of a language may disappear within 10,000 years. Therefore, diachronic stability of the items contained in the basic vocabulary used in glottochronology has become an issue in this approach. Dolgopolsky (1964) sets up an ordered list of the 15 most stable words. In general, however, it must be said that linguistic creativity is easiest in neology, which is another argument against attributing too much weight to lexical comparison.

Some structural properties are diachronically relatively stable. These include alignment of fundamental relations, morphological complexity and, in general, morphological rather than syntactic properties (cf. Nichols 1992:166f). These are properties with a rather high degree of grammaticity. Properties with a low degree of grammaticity, such as basic constituent order, are more manipulable and therefore more shiftable. At the level of strongest grammaticity, both the structural devices as such and the particular morphemes representing them are stabler than at levels of lesser grammaticity. It is as if grammaticalization slowed down at the end of the scale. Thus, we can happily ascertain the convergence of our requirements onto the same kind of structural properties: **The most grammatical properties are arbitrary and therefore usable in a proof of historical relationship, they are least susceptible to borrowing and diachronically most stable.**

9. Quantity and Quality of Commonalities

How many commonalities do we need in order to prove a genetic relationship? As observed in section 2.2, the Neo-Grammarian tradition of historical-comparative linguistics as codified in Katičić 1970 assumes that

deviations in the phonological shape of the significantia of the signs of two related languages can be accounted for, without a rest, by sound laws. That is to say, the complete vocabulary of a language, with the exception of evident borrowings, would be reducible to the common genetic root. In actual fact, however, there is always a percentage of words which do not comply. This percentage is considered negligible, given the overwhelming majority of items that conform to the rules. Obviously, there is an implicit notion of a proportion of the relevant population – in fact, a very high proportion – that must be shared among the languages in order to prove genetic relationship.

If we use shared structural features in proving genetic relationship, the argument cannot run this way because we cannot quantify grammatical structure. I will return below to the question of how many features should be considered. In the first place, three requirements must be imposed on structural features on which to base an argument for genetic relationship. The first may be repeated from section 6.2: Relevant features must be **strongly grammatical**. This excludes the possibility of basing a genetic argument on basic word order, on the presence of conjunctions or of auxiliaries. Second, the features in question must be **mutually independent** (cf. Aikhenvald & Dixon 2001:11). For an example, let us consider the following set of features:

Set 1 of structural features

- free word order,
- richly developed case system,
- underdeveloped verb valency,
- lack of adpositions,
- lack of alienability contrast in possessive constructions.

This set is characteristic of Indo-European languages of the archaic type and even more so of Proto-Indo-European as it must be reconstructed. The same set of properties may be found, among others, in Pama-Nyungan languages such as Walbiri and Gunwingguan languages such as Wardaman. We do not draw any historical conclusions from this. The reason is not so much that the time depth required for a historical relationship would be enormous, but rather that we know these properties to form a cluster that may be dubbed ‘dependent-marking syntax.’ The co-occurrence of these features in a language follows from our typo-

logical theory, and it is sufficiently natural for us to expect it to recur in languages spontaneously, without any historical connection. Needless to say, this is the main reason why historical-comparative linguists (e.g. Meillet 1924) have always said that typological criteria cannot be used in an argument for historical relationship.

Here is a set of features which, at the present stage of our ignorance, are mutually independent:

Set 2 of structural features

- possessive classes,¹⁵⁾
- split ergative verb morphology,
- no infinitive,
- possessive and ergative pronouns are one paradigm,
- incorporation.

The concurrence of these features characterizes the Mayan languages. Several of these properties may be found in other languages of Meso-America. If all of them were to be found in a Non-Mayan language, we would be prepared to consider it for genetic affiliation with the Mayan family.¹⁶⁾

The requirement that the features compared are mutually independent is the counterpart, in this method, to the requirement of the historical-comparative method that there be regular correspondences in the significantia of translation-equivalent roots, because there it is assumed that the association of significans and significatum in one sign is independent from this association in another sign. The idea to base an argument for historical affiliation on a set of mutually independent typological properties was first advocated in Trubetzkoy 1939.

The third requirement to be applied to a set of structural properties to be used in an argument for genetic affiliation is that they should be **relatively rare**. This is again in order to limit the danger of chance similarities. For instance, the Mayan languages are also characterized by numeral classifiers, the lack of case and the presence of prepositions. These, however, are features each of which they share with a major

15) Nouns fall into grammatical classes appearing in possessive construction.

16) Cf. Campbell et al. 1986 for a different, but comparable set of features that may define Meso-America as a linguistic area.

portion of the world's languages. Suppose we work with five mutually independent features each of which occurs in a third of the world's languages. Then the product of the five probabilities would be 0.004 of the languages of the world, which, assuming 7,000 languages, yields 28 languages which share these five features by chance. This is rather too many for an argument to the effect that any two languages sharing these five features must be historically related. If we work with five mutually independent properties each of which only occurs in a tenth of the languages, then it is probable that all of them co-occur in 0.00001 of the world's languages, i.e. not even in a single language. Then, if two languages are found to actually share them, this is a much more solid basis for an argument in favor of a historical relationship. At the same time, we can see that half a dozen of features that fulfill the above conditions is amply sufficient for this kind of argument.

A structural property of a language may be delimited in more or less specific terms. For instance, we may distinguish between a grammatical category taken as a parameter and the set of values that it may assume. Thus, two languages may share a grammatical category, for instance possessive classification or tense, and yet differ in the particular values they possess for these parameters: one language may oppose a future to a non-future, while the other opposes a past to a non-past. Thus, if it turns out that a certain structural criterion, e.g. the existence of possessive classes, is not sufficiently distinctive, one may strengthen it by requiring that two languages have the same set of possessive classes. In this way, the probability that two languages share a feature by chance diminishes. On the other hand, of course, the chance that two languages that are actually cognate have conserved the feature in question in identical shape over the millennia decreases. For instance, all the Bantu languages have a noun class system; but they differ widely in their particular noun classes.

In all of the above requirements, genetic comparison is opposed to typological comparison. Typological comparison strives for linguistic types. It therefore gives priority to such features which are productive in the language system rather than fossilized, features which cluster together rather than being independent, features that have a great classificatory potential instead of serving differentiation at lower levels of detail. Consequently, even if genetic comparison does make use of structural features, it is still methodologically distinct from typological comparison.¹⁷⁾

10. Conclusion

Which linguistic properties can be used to prove a genetic relationship and which not, follows from a linguistic theory which determines which properties are arbitrary and therefore historically contingent, and which are motivated. Some considerations relevant for such a theory have been mentioned in section 7.2. The Saussurean arbitrariness of the linguistic sign is insufficient as a methodological basis in the sense relevant here. There are areas in the linguistic system, outside the association of the individual significans with a significatum, which are just as arbitrary. Among them are highly grammatical structures and arbitrary constraints. Such properties of a linguistic system have to be enumerated by a linguistic theory. They should then be put to use in genetic comparison. The next step would be to explore some cases such as the possible affiliation of Korean and Japanese with Altaic and see how far one can get with highly grammatical structures and arbitrary constraints.

Bibliography

- Aikhenvald, Alexandra Y. & Dixon, R.M.W. eds. (2001). *Areal diffusion and genetic inheritance. Problems in comparative linguistics*. Oxford: Oxford University Press.
- Aikhenvald, Alexandra Y. (2001). "Introduction." Aikhenvald & Dixon (eds.) 2001 (pp.1-26).
- Bès, G.G. (1967). "Parenté génétique et parenté typologique." *La linguistique* 1, 139-.
- Bomhard, Allan R. & Kerns, John C. (1994). *The Nostratic macrofamily. A study in distant linguistic relationship*. Berlin & New York: Mouton de Gruyter (Trends in Linguistics, 74).
- Campbell, Lyle. (1973). "On glottalic consonants." *International Journal of American Linguistics* 39, 44-46.

17) Zvelebil (1990:118f) reports on a proposal of a historical link between Japanese and Tamil which is based on the following set of features: agglutinative morphology, adjective-noun order, adverb-verb order, three degrees of distance in demonstratives, perfective/imperfective aspect, converbs, absence of relative clauses. This set fulfills the above three criteria for typological comparison in an almost paradigm fashion and is, consequently, completely useless in proving a historical relationship.

- Campbell, Lyle. (1986). "Cautions about loan words and sound correspondences." Kastovsky, Dieter & Szwedek, Aleksander (eds.), *Linguistics across historical and geographical boundaries. Festschrift for Jacek Fisiak*. 2 vols. Berlin etc.: Mouton de Gruyter; 1:221-224.
- Campbell, Lyle & Kaufman, Terrence. (1980). "On Mesoamerican linguistics." *American Anthropologist* 82, 850-857.
- Campbell, Lyle & Kaufman, Terrence & Smith-Stark, Thomas C. (1986). "Meso-America as a linguistic area." *Language* 62, 530-560.
- DeLancey, Scott. (1987). Morphological Parallels between Klamath and Wintu. Redden, John (ed.), *Proceedings of the 1987 Hoka-Penutian Conference*. Carbondale, IL: Dept. of Linguistics, Southern Illinois University; 50-60. (<http://www.uoregon.edu/~delancey/papers/hpw87.html>)
- Field, Fredric W. (1998). Borrowing and borrowability. Los Angeles: University of Southern California (PhD diss.).
- Fortescue, Michael. (1998). *Language relations across Bering Strait. Reappraising the archaeological and linguistic evidence*. London & New York: Cassell.
- González de Pérez, María Stella & Rodríguez de Montes, María Luisa eds. (2000). *Lenguas indígenas de Colombia. Una visión descriptiva*. Bogotá: Instituto Caro y Cuervo.
- Greenberg, Joseph H. (1970). "Some generalizations concerning glottalic consonants, especially implosives." *International Journal of American Linguistics* 36, 123-145.
- Greenberg, Joseph H. (1987). *Language in the Americas*. Stanford: Stanford University.
- Haas, Mary R. (1969). "Internal reconstruction of the Nootka-Nitinat pronominal suffixes." *International Journal of American Linguistics* 35, 108-129.
- Itô, Junko & Mester, Armin (1995). "Japanese phonology." Goldsmith, John A. (ed.), *A handbook of phonological theory*. Oxford: Oxford University Press; 816-838.
- Jakobson, Roman. (1966). "Quest for the essence of language." *Diogenes* 51:21-37. (French: *Diogenes* 51, 1965:22-38)
- Katičić, Radoslav. (1970). *A contribution to the general theory of comparative linguistics*. The Hague & Paris: Mouton (Janua linguarum series minor, 83).

- Kessler, Brett L. (1999). Estimating the probability of historical connections between languages. Stanford: Stanford University (PhD diss.).
- Lehmann, Christian (1974). "Isomorphismus im sprachlichen Zeichen." Seiler, Hansjakob (ed.), *Linguistic workshop II. Arbeiten des Kölner Universalienprojekts 1973/4*. München: Fink (Structura, 8), 98-123.
- Lehmann, Christian. (1982). "Universal and typological aspects of agreement." Seiler, Hansjakob & Stachowiak, Franz Josef (eds.), *Apprehension. Das sprachliche Erfassen von Gegenständen. Teil II: Die Techniken und ihr Zusammenhang in den Einzelsprachen*. Tübingen: G. Narr (LUS, 1, II), 201-267.
- Lehmann, Christian. (1984). "Progress in general comparative linguistics. Review article of: Bernard Comrie, *Language universals and linguistic typology*. Oxford, 1981; Graham Mallinson & Barry J. Blake, *Language typology*. Amsterdam, 1981." *Studies in Language* 8, 259-286.
- Lehmann, Christian. (1995). "Synsemantika." Jacobs, Joachim et al. (eds.), *Syntax. Ein internationales Handbuch*. Berlin: W. de Gruyter (Handbcher der Sprach- und Kommunikationswissenschaft, 9/II); 1251-1266.
- Maddieson, Ian. (1984). *Patterns of sound*. Cambridge: Cambridge University Press (Cambridge Studies in Speech Science and Communication).
- Meillet, Antoine. (1924). "Introduction [a la classification des langues]." Meillet, Antoine & Cohen, Marcel, *Les langues du monde*. Paris: Centre National de la Recherche Scientifique & Champion; 1-18 (2. ed. 1952).
- Meillet, Antoine (1925). *La methode comparative en linguistique historique*. Oslo: H. Aschehoug; Paris: H. Champion (Institutet for sammenlignende kulturforskning. Serie A, Forelesninger; 2) (2. ed.: 1970).
- Michalove, Peter A. (2000). [Review of Fortescue 1998]. *International Journal of American Linguistics* 66, 271-274.
- Moravcsik, Edith A. (1978), "Language contact." Greenberg, Joseph H. (ed.), *Universals of human language. 4 vols*. Stanford, Calif.: Stanford University Press; 1, 93-122.
- Nichols, Johanna. (1992). *Linguistic diversity in space and time*. Chicago & London: University of Chicago Press.
- Plank, Frans. (1981). "Geschichtlich verwandt - elementar verwandt - typologisch verwandt." *Linguistische Berichte* 74, 35-44.

- Quesada, J. Diego. (2000). *A grammar of Teribe*. München & Newcastle: Lincom Europa (Lincom Studies in Native American Linguistics, 36).
- Ringe, Donald A. (1995). "'Nostratic' and the factor of chance." *Diachronica* 12, 54-74.
- Saussure, Ferdinand de (1916). *Cours de linguistique générale, publié par Charles Bally et Albert Séchehaye avec la collaboration de Albert Riedlinger*. Paris: Payot.
- Schultze-Berndt, Eva. (1999). Simple and complex verbs in Jaminjung. Nijmegen: Katholieke Universiteit (unpublished PhD diss.)
- Shevoroshkin, Vitalij V. & Markey, Thomas L. eds. (1985). *Typology, relationship and time. A collection of papers on language change and relationship by Soviet linguists*. Ann Arbor: Karoma.
- Trubetzkoy, Nikolaj S. (1939). "Gedanken über das Indogermanenproblem." *Acta Linguistica Hafniensia* 1, 81-89.
- Voegelin, Charles F. & Voegelin, Florence M. (1977). *Classification and index of the world's languages*. New York etc.: Elsevier (Foundations of Linguistics Series).
- Zvelebil, Kamil Veith. (1990). *Dravidian linguistics. An introduction*. Pondicherry: Pondicherry Institute of Linguistics and Culture.

Prof. Dr. Christian Lehmann
 Philosophische Fakultät
 Universität Erfurt
 Postf. 900221
 D-99105 Erfurt
 Germany
 E-mail: Christian.Lehmann@Uni-Erfurt.De

Received: Feb. 24, 2005

Revised version received: May 26, 2005

Accepted: Jun 3, 2005