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Prehistoric population contact and language change¹

Brigitte Pakendorf

Introduction

Molecular anthropology is the branch of biological anthropology that uses molecular genetic methods to study the origin, relationships, history, and migration patterns of human populations. The combination of such different fields as genetics (molecular anthropology) and linguistics may appear rather incongruous; however, joint investigations can elucidate some of the factors involved in prehistoric language contact, since molecular anthropology can provide insights into prehistoric events, which in turn can help inform historical linguistic analyses. This will be outlined below.

Language change is a ubiquitous process, although it is rarely noticed at an individual level, and we lack historical documentation over extensive periods of time for most areas of the world. Nevertheless, sound changes are attested in the histories of many language families (cf. Hock 1991: 34-166), as are changes at the lexical level; words become obsolete and are replaced by others for various reasons, for instance when they become associated with taboo meanings or are replaced by erstwhile metaphors (cf. Hock 1991: 293-307). Similarly, grammatical structures change over time; for example, in the process called grammaticalization (cf. Heine and Kuteva, this volume; Bybee, this volume), separate words in frequently used constructions become shorter and fuse into one word, changing their meaning over time as they do so and resulting in a new construction with a new meaning.

However, although languages change all the time for different internally conditioned reasons, language change can also be triggered or accelerated through contact. In this event, the knowledge that people have of a second language influences the way they use their primary language; this in turn leads to copies of words or structures from the second language entering and changing their primary language. Conversely, the patterns of a person's primary language can influence the patterns of a language learnt later in life, leading for example to foreign accents or to the diverse variants of former colonial languages.

Several factors might have an impact in situations of language contact. Was there extensive intermarriage between the two groups? Did the groups keep socially apart, reserving interactions for a tightly defined sphere, such as the market place? Did one group formerly speak a different language and shift to their current language? These are important questions in the field of language contact research, since it is assumed that distinct factors involved in different contact situations will affect the linguistic outcome of that contact. Since multilingualism has been widespread throughout the history of modern humans (cf. Nichols, this volume), language contact can be assumed to have played an important role in shaping the patterns of modern linguistic variation. Research into the factors that influence the outcome of language contact is therefore important to further our understanding of language evolution.

Difficulties arise in the assessment of situations of population and language contact when the contact took place in prehistoric times, so that little is known about the contact situation, and all we have to work with is the linguistic outcome of the contact.

Given that the vast majority of human languages were spoken in prehistoric contexts, without standard languages, nation states, orthographies, and therefore without any written documents available to illustrate the changes they have undergone, these difficulties beset a large proportion of possible contact situations. Careful analyses can tell us what kinds of change a language has undergone under contact influence, but without knowing anything about the actual contact situation, it is difficult, if not impossible, to come to definitive conclusions as to what conditioned the linguistic results of the contact. It is precisely in such cases that molecular anthropology can be of help, as will be outlined below.

Language change through contact influence

A brief note on terminology may be useful at the outset: since the word ‘borrowing’ is used in the literature with numerous distinct meanings (cf. Pakendorf 2007: 26-31), I prefer to avoid it; instead, I use the term ‘copying’ to cover all instances of transfer of items from one language to another.

In the past 20 years, research on language contact has burgeoned (for extensive introductions see Thomason 2001 and Winford 2003), triggered to a large extent by the seminal monograph by Thomason and Kaufman (1988). It has become clear that anything can be copied from one language to another, both actual forms of words or morphemes as well as structural patterns. Although words from the cultural lexicon (e.g. words for ‘computer’, ‘car’, or ‘television’) are copied most frequently, since they are introduced into a language at the same time as the object they denote is introduced into the society, basic lexical items (e.g. words for ‘sister’, ‘face’ or ‘to boil’) and morphemes can also be copied. Structural patterns can be copied as well, such as word order patterns or the usage patterns of case markers. Some of the most striking examples of structural copies that languages can introduce are known from the Indian village of Kupwar, where Kannada, Marathi and Urdu are spoken (Gumperz and Wilson 1971); from Northwest New Britain (Thurston 1987), where the Non-Austronesian language Anêm is spoken in contact with several Austronesian languages; and from Karkar Island off the coast of Papua New Guinea (Ross 1996), which is inhabited by speakers of the Austronesian language Takia and the Non-Austronesian language Waskia. In all of these cases, although the languages in contact have retained separate lexicons, the syntactic patterns have aligned to such a degree that ‘[i]t is possible to translate one sentence into the other by simple morph for morph substitution’ (Gumperz and Wilson 1971: 155).

The factors leading to the transfer of different kinds of copies are quite diverse, ranging from ‘cultural contact’ in which speakers of the recipient language do not necessarily know the model language (e.g. the copying of English words into Japanese, cf. Ross 2003: 193) to long-term bilingualism (for example, in the above-mentioned cases of Kupwar, Karkar Island, and New Britain, as well as in Arnhem Land (Heath 1978) and Amazonia (Aikhenvald 2002)) or to language shift (cf. Thomason and Kaufman 1988: 110-146; Ross 2003: 191-192). The impact of linguistically mixed households has not yet been systematically investigated; however, Ross (2003: 193) suggests that the regular introduction of spouses from one linguistic group to another might lead to both phonological and structural change in the language of the receiving group.

Thus, contact between populations speaking different languages is expected to lead to noticeable changes in the languages concerned. However, notwithstanding the large amounts of data amassed over recent years, as yet no consensus has been reached on what kinds of linguistic change result from which kind of contact, nor are the actual processes involved in contact-induced change clear. Various factors have been proposed as playing a role, such as the structural similarity/dissimilarity between the languages in contact (Johanson 2002: 306), the attitudes of speakers towards their own and the contact language as well as towards copies introduced from one to the other (cf. Gumperz and Wilson 1971; Heath 1978), or the sociopolitical status of the languages in contact (e.g. Johanson 2002: 289; Sakel 2007: 20-25); however, none of these is unanimously accepted.

It is difficult to study the factors involved in the different linguistic outcomes of language contact solely with linguistic methods, as the nature of the contact situation is often not known. For example, it is often unclear whether specific changes were introduced through long-term bilingualism, or instead through shift from one language to another. It is here that molecular anthropological investigations can be of use, as will be outlined below.

Molecular anthropology and its uses in language contact research

Two parts of the human genome are studied most widely in molecular anthropology, due to their very specific mode of inheritance: mitochondrial DNA (mtDNA) and the Y-chromosome. (For a more detailed overview of molecular anthropology for non-geneticists see Appendix 1 in Pakendorf 2007; for reviews of the use of mtDNA and the Y-chromosome in molecular anthropological studies see Pakendorf and Stoneking 2005, and Jobling and Tyler-Smith 2003, respectively; for an in-depth introduction to molecular anthropology see Jobling et al. 2004.)

MtDNA is a small circular molecule that exists in large copy numbers in special little organelles in the cell called mitochondria. Its special advantage in molecular anthropological studies lies in the fact that it is inherited solely in the maternal line – although both men and women carry mtDNA, the small number of molecules of the father's mtDNA that enter the egg get eliminated within days after fertilization. The Y-chromosome, on the other hand, is one of two sex chromosomes found in the human genome, with the X-chromosome being its counterpart; women carry two X-chromosomes, while men carry one X-chromosome and one Y-chromosome. From this it follows that the Y-chromosome is male-specific, being inherited solely in the paternal line, from fathers to sons. Thus, mtDNA analyses highlight female-specific evolutionary processes, while Y-chromosomal analyses furnish insights into male-specific events.

Molecular anthropological analyses can provide indications of prehistoric admixture events, sex-biased migration patterns, decreases or increases of population size, and settlement practices (matri- vs patrilocality). These results allow insights into prehistoric sociocultural practices that may have had an effect on language change in contact situations. Of particular importance with respect to the study of language contact is the detection of prehistoric language shift, in other words when a population has given up its language in favour of a different one. No agreement has yet been reached amongst linguists on what changes occur in languages that were the target of a shift, since such a

shift is frequently not historically documented. However, language shift can result in a mismatch between the genetic and linguistic affiliation of a group (that is, a group is genetically more similar to its geographic neighbours than to its linguistic relatives), which can be detected with genetic methods. Thus, linguistic investigations of languages which can be shown genetically to have been the target of a language shift can provide evidence for what linguistic changes, if any, such a shift produces.

A good example of the genetic detection of prehistoric language shift is the case of Azerbaijanian from the south Caucasus, which is closely related to Turkish. Analyses of mtDNA and Y-chromosomal variation in Azerbaijanis have demonstrated that this group is genetically more closely related to their geographic neighbours from the Caucasus than to their linguistic relatives (Nasidze and Stoneking 2001; Nasidze et al. 2003). From historical sources it is known that a Turkic-speaking group, the Seljuks, invaded what is now Azerbaijan in the 11th century, establishing their rule over the indigenous populations. The genetic results indicate that this immigrating Turkic-speaking group was numerically quite small, but that it managed to impose its language on the resident population without contributing much to the local genepool. Interestingly, linguistic traces of this pre-Turkic substrate can be found in the phonology and structure of Azerbaijanian (Stilo 1994: 88-91), thus confirming the idea of a prehistoric language shift.

The detection of sex-biased gene flow, such as the introduction of foreign spouses into a group, is facilitated through the comparison of the mtDNA and Y-chromosomal affiliation of a group. For example, research has shown that Polynesian mtDNAs (i.e. the maternal lineages) are of predominantly Asian origin (with 94% of mtDNA lineages being traced back to Asia), while their Y-chromosomes (i.e. the paternal lineages) have a major component (66%) of Melanesian origin, indicating that a large number of Melanesian men were incorporated into the pre-Polynesian societies before these societies migrated to Polynesia. This might be an indication that the ancient Austronesian groups were matrilocal, that is, husbands moved in with their wives' families (Kayser et al. 2006). The linguistic effects of such sex-biased gene flow have yet to be investigated.

Combining linguistic and genetic analyses to investigate prehistoric contact: a case study

I illustrate the application of combined molecular anthropological and linguistic investigations of a prehistoric contact event with a case study from Siberia which deals with the prehistoric contact undergone by the Sakha (Yakuts) (for details see Pakendorf 2007). The Sakha are Turkic-speaking cattle- and horse pastoralists who immigrated to the middle reaches of the Lena river in northeastern Siberia from a more southerly point of origin. This migration, assumed to have taken place in the 13th or 14th century CE (Gogolev 1993: 61, 88f), brought the ancestors of the Sakha into contact with Tungusic-speaking hunters and reindeer herders, mainly Evenks. Starting in the late 17th century, the Sakha expanded territorially under pressure of Russian colonization, and settled in large areas of northeastern Siberia, where they are nowadays the numerically and linguistically dominant indigenous group (Forsyth 1992: 63). During this expansion they further encroached upon the territory of other indigenous peoples, namely the Tungusic-

speaking Evenks and Èvens as well as Yukaghirs, who speak a language which might possibly be distantly related to the Uralic language family.

A number of ethnographers have mentioned the intermarriage of the Sakha people with indigenous north Siberian groups as well as the linguistic assimilation of the latter in the course of Sakha prehistory (e.g. Seroševskij [1896] 1993: 230f; Dolgix 1960: 461, 486; Tugolukov 1985: 220). This would imply that differences between the Sakha language and its Turkic relatives are due to the shift of these indigenous groups from their native languages to Sakha. However, combined molecular anthropological (Pakendorf et al. 2006) and linguistic investigations of the possible contact undergone by the Sakha lead to somewhat unexpected results.

The Y-chromosomal analyses provide convincing evidence that no admixture with Evenks took place in the paternal line. This implies that no shift of entire groups of Evenki-speakers (i.e. of both women and men) to the Sakha language and identity occurred, contrary to previous proposals. Based on mtDNA analyses, no conclusive evidence for admixture in the maternal line could be detected; however, some intermarriage of the immigrating Sakha with Evenk women cannot be excluded, either. These somewhat inconclusive results regarding potential admixture in the maternal line are due to the fact that the Sakha, Evenks and Èvens, as well as South Siberian Turkic groups all share certain mtDNA lineages. This indicates that these groups intermarried amongst each other, probably at a time when both the ancestors of the Sakha and the ancestors of the Evenks and Èvens were still settled in southern Siberia in the vicinity of Turkic groups. However, since it can be assumed that the ancestors of the Sakha who migrated to northeastern Siberia carried at least some of these shared lineages with them, later intermarriage with Evenk women carrying the same lineages would not be detectable with the methods used. Therefore, more finely-grained analyses of the entire mtDNA molecule are necessary to resolve the issue of whether the Sakha ancestors intermarried with the neighbouring Evenks or not.

Turning to the linguistic investigations, we find that interestingly, although the number of loanwords from Evenki is quite small, the Sakha language can be shown to have undergone structural changes under Evenki influence. For example, Sakha lost the genitive case, which in other Turkic languages marks the possessor in possessive noun phrases, since Evenki, like other Tungusic languages, does not mark the possessor. Furthermore, although the Turkic languages lost the separate case to mark coordinate subjects (called comitative case) and nowadays use the same marker to express instruments and coordinate subjects (very similar to English 'with'), in Sakha two separate case suffixes were retained. Although such a distinction is cross-linguistically widespread, and so might have been retained in Sakha for language-internal reasons, the similarity in form between the Evenki comitative case suffix and a variant of the Sakha suffix points towards Evenki influence. Other features of Sakha that are arguably due to contact influence from Evenki include: the development of a case suffix to mark indefinite direct objects in the imperative mood (that is, a different case suffix is used on 'horse' in sentences such as 'Catch me a horse!' from that used in a sentence like 'Catch me that horse!'); the development of a future imperative mood (i.e. there is a separate verb form in Sakha to express commands that are to be fulfilled at a later point in time rather than immediately); as well as certain pragmatic uses of the possessive suffixes.

It is notable that nearly all of these contact-induced changes are of a purely structural nature, without the copying of any forms. These kinds of changes are indicative of bilingualism in Evenki by the ancestors of the Sakha, since in order to copy structural patterns from one language to the other, speakers of Sakha had to be closely acquainted with both languages. There is thus an interesting mismatch between the genetic results (no evidence of language shift of entire groups of Evenks to Sakha, though possibly some intermarriage in the maternal line) and the linguistic data, which indicate more than just a casual knowledge of Evenki by the ancestors of the Sakha. From a modern-day perspective it is somewhat hard to imagine that the Sakha might at some time have been bilingual in Evenki, since nowadays they are the linguistically dominant group in northeastern Siberia. However, the Y-chromosomal analyses demonstrate that the ancestors of the Sakha underwent a severe reduction in their genetic diversity (a so-called founder event) in the paternal line during their history, which indicates that only a small group of Sakha migrated to the north. In the initial period after their migration to the Lena river this small group of immigrants would have been quite vulnerable in the new environment and harsher climate, and therefore dependent on the indigenous Evenki-speaking population (Pakendorf 2007: 320; cf. Güldemann 2006, on a similar dependency of immigrating pastoralist Khoe-speakers on their hunter-gatherer neighbours in southern Africa). During this period of dependency it is probable that they used their neighbours' language for intergroup communication (cf. Khanina, ms).

Conclusions

As has been demonstrated through this brief case study, the combination of in-depth molecular anthropological analyses and linguistic investigations can open up new insights into the factors at work in prehistoric population and language contact. This is a highly important area of investigation, since multilingualism has been the norm throughout human history (cf. Nichols, this volume), and therefore language contact will have been an important source of change in the evolution of human languages. However, there are several parameters that might play a role, and one case study alone is not enough to develop predictions for language contact phenomena in general. An important role in contact between human populations is played by social factors, such as the kind of interaction that takes place between groups speaking different languages, or the attitudes towards language-mixing. Therefore, it is highly desirable to add sociolinguistic investigations to the multidisciplinary approach to language contact studies, in order to obtain a comprehensive view of the parameters at work. Furthermore, since the social factors are expected to be different depending on differing environmental factors (for example, contact in the scarcely populated expanses of Siberia was probably very unlike that in densely populated areas of Africa), it is desirable to undertake multidisciplinary investigations of potential contact situations in various regions of the world. Only when data from several such studies have been gathered and analysed will we be able to make inductions about one of the great forces that have shaped human languages.

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