Писменото наследство
и информационните технологии

El'Manuscript–2014

Материали от V международна научна конференция
Варна, 15–20 септември 2014 г.

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Bayesian Estimation of Closeness of Languages and Wedding Customs of the Slavs

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Bayesian estimation, Slavic languages, wedding customs, phylogenies, comparative methods

In this article, we describe a case study of phylogenies of the Slavic languages and wedding customs of the Slavs. The aim of this comparative study was to reveal the correlation between languages as the main trait of humanity and one of the best preserved customs, wedding rites.

> *I used to think a wedding was a simple affair.*
> *Boy and girl meet, they fall in love,*
> *he buys a ring, she buys a dress,*
> *they say I do. I was wrong.*
> *That's getting married. A wedding*
> *is an entirely different proposition.*

Steve Martin as George Banks in *Father of the Bride*

The history of the Slavs has made their cultures very closed and interconnected, which can be found in different layers, including languages. In our comparative study, we have concentrated on Slavic wedding traditions and languages.

Wedding traditions, as well as birth and funeral rites, are known to have a long history in every society. They are usually followed faithfully and as a result are well preserved in people culture. As all cultural traits, wedding customs may undergo transformations (e.g., due to borrowings) but they are still very stable and serve a good reflection of a people's cultural identity.

Another phenomenon that may help to understand the interconnections between societies and cultures are languages. For example, see (Pagel M., 2005; Holden C.J., 2005; Nurbakova D., 2013). Both lexical characteristics and cultural traits can be used in order to reveal deep relationships between societies. This means that closely related cultures are more likely to share their traditions or to have similar rites and languages than are more distantly related ones.

In this paper, we build language and cultural phylogenetic trees using Bayesian estimation. We proceed from the assumption that cultural traits such as wedding customs and languages, are vertically inherited, i.e., are passed down from ancestral to descendent cultures. Our expectation was that the cultural phylogenetic tree would have almost the same topology of the phylogenetic tree of languages.

We used a subset of the Dyen *et al*. (Dyen I., 1992) database of Swadesh's word-list corresponding to nine Slavic languages: Czech, Slovak, Ukrainian, Byelorussian, Polish, Russian, Bulgarian, Macedonian and Serbo-Croatian. The dataset consists of word pairs

identified as cognate or non-cognate according to their relationships. An example of lexical data is given in Table 1.

Table 1 – An example of lexical data

Gloss	*Czech*	*Russian*	*Ukrainian*	*Bulgarian*	*Slovak*
all	vse	vse	uves'	bsicko	vsetko
animal	zvire	zver	tvarina	zivotno	zver
ashes	popel	pepel	popil	pepel	popol

We then transformed each meaning to a binary character coding cognate forms as "1" and non-cognate word forms as "0".

We collected data that represents wedding customs and rites in the same nine cultures. The 48 traits on which we were able to find information are the following:

1. Wedding ceremony steps: matchmaking and marriage proposal (*svatovstvo* or *svatanye* in Russian), presentation of a marriageable girl and/or wealth of groom's family (*smotriny* in Russian, *aglyady* or *umoviny* in Byelorussian, *umovini* in Ukrainian), engagement (*pomolvka* or *rukobitye* in Russian), hen party (*devishnik* in Russian) and stag party (*malchishnik* in Russian), "wedding train" (*svadebniy poezd* in Russian—the groom's escort on the way to bride's house), ransom for the bride (*vykup nevesty* in Russian), church wedding ceremony, betrothal and crowning (*venchanie* in Russian), reception and "bride examination" at groom's family
2. Wedding season: winter, spring or autumn
3. Duration of the wedding: from a couple of days up to a week
4. Favorable wedding day
5. Dowry
6. Special ritual bread (*karavay* in Russian)
7. Use of liquids in rites: wine, vodka or water
8. Covering of the bride's and newlywed's head: wedding veil, (floral) crown, special dense veil (*pokryvalo* in Russian), cap or kerchief
9. Special bride jewels: necklace
10. "Transmission" of the bride's place: transmission of veil or crown
11. Bride's preparation: ritual bath, bride's and bridesmaids weeping, untwisting/cut of bride's braid
12. Main animators of the ceremony: the couple itself or their representatives, the best man (*druzhka* in Russian)
13. After-crowning activities: tour of a cemetery or monuments, coming back to their houses separately or going to the reception together
14. Welcoming ceremony for the newlyweds: getting out the "wedding train" and stepping on the fur/coverlet, entering the home passing on the special linen, sprinkling newlyweds with grains or sweets, entering the home holding hands

15. Artefacts: wedding tree, wedding towel (*rushnik* in Russian), wedding banner
16. Smashing dishes for happiness
17. After-wedding traditions: pouring water and washing guests' hands

Cultures in which the rite is followed were classified as "1" and in which there is no such a rite were classified as "0".

We then apply Bayesian methods to the sequences of data in order to calculate the tree. In application to phylogeny, Bayesian methods estimate a posterior probability that a node is similar to trees in the sample (Pagel M, 2005; Holden C.J., 2005). In other words, given the analyzed data (cognates or cultural features), the hypothesis will be similar to the following: "Ukrainian and Byelorussian are a group separated from Czech and Slovak", i.e. the group of Ukrainian and Byelorussian has a more recent common ancestor than any of them has with Czech or Slovak.

Using software called MrBayes (Huelsenbeck J.) we have obtained two different phylogenetic trees. The tree built on the basis of linguistic data is shown in Figure 1. The cultural phylogenetic tree is shown in Figure 2.
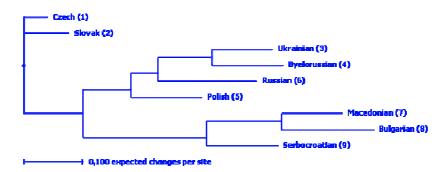

Figure 1 – Bayesian phylogenetic tree of the Slavic languages.

As can be seen from the figures above, the topology of two trees is similar. Thus, the Czech and Slovak pair is clearly distinguished. Another cluster is made of southern languages: Bulgarian, Macedonian and Serbo-Croatian. However, it must be mentioned that in terms of languages Macedonians and Bulgarians seem to be much more similar than their wedding customs. As for western Slavs and Poland, we can see the Ukrainian, Byelorussian and Polish diaspora, with Russian joining them. This fact may originate from the time of the Polish-Lithuanian Commonwealth when Ukrainian and Byelorussian culture suffered from strong Polish influence.
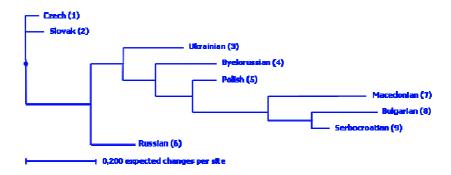
Figure 2 – Bayesian phylogenetic tree of the Slavic wedding customs

It is interesting to note that there are some wedding traditions that are common in all Slavic cultures. Thus, in almost all the cultures, the stages of the wedding ceremony are the same and bride's family usually pays dowry. Moreover, all Slavs have ritual bread that is the symbol of sun, wealth and happiness. Another common tradition for Slavic brides is to wear a crown as the symbol of purity, virginity, and beauty. Weddings are mainly celebrated or "played" (as it is said in Russian) in autumn after harvest is done. (Note that many of the Slavic wedding traditions originate as profane rites and date from the pre-Christian time.) Although the Slavs were Christianized, the customs have been preserved and re-associated with the new religion. Thus, a crown had been used in most of pagan rites of the Slavs but after Christianization was associated with the church wedding crown. Another tradition, according to which newlywed man holds his wife in hands while entering home, is thought to have been used to trick brownies but was then transformed to be the symbol of the wife's new life in her new house.

Our results accord with our expectations to some extent and point out the great relatedness of the Slavic cultures and the correlation between languages and archaic traditions kept by societies. However, these trees can only suggest the probable links between people, and more data on these cultures may reveal more relationships and trace back in time more links that seem to be lost.

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