Revealing Footprints of Ancient Sources in Recent Eurasian and American Folk Music Cultures Using PCA of the Culture-Dependent Moment Vectors of Shared Melody Types.

Journal: Music and Science 7. 2024
Juhász, Zoltán PhD HUN-REN Centre for Energy Research

Presumably there were certain ancestral musical languages in ancient times, and imprints of these ancestral musical languages are still present in the folk music cultures up to the present days.

The aim of the article is to find these ancestral musical languages by mathematical analysis of a folk song database containing 55 000 tunes arising from 59 musical cultures. The tunes were described by multidimensional vector representation of their melody contour and the tonal system, and the analysis was based on the study of the corresponding multidimensional point system.

First of all, the author determined the universal melody types, as those of are shared by more musical cultures in parallel. For this purpose, he elaborated the self-learning algorithm called "Self Organizing Cloud (SOC)". In the next step, the rates of the local variants of the resulting 847 universal melody types were determined in the 59 cultures.

Using Principal Component Analysis, seven ancestral musical languages were identified, whose footprints are detectable in recent musical cultures by correlated propagations of their universal melody types.

Three of the seven musical languages point to geographical units from where the musical culture can be followed step by step.
The three geographical units are:
1. Eurasian steppe and Carpathian Basin;
2. Middle East and Asia Minor; and
3. Western Europe.

The author also mentions in the article that he calculated the proportion of the seven ancestral musical languages in the total melody content of a given folk musical culture, using the Linear combination algorithm. The proportions of ancestral musical language 1 (Eurasian steppe and Carpathian Basin) are represented in the map of cultures studied in the Figure below.

The ancestral musical imprints can be detected in Hungarian folk music. Applying the Linear combination algorithm for the Hungarian folk music, just the three ancestral languages mentioned above proved to be deterministic.Three of the 10 Hungarian folk song styles can be connected to the three ancestral musical languages mentioned above:

1. The “High range descending pentatonic” style comes from ancestral language 1 (Eurasian steppe and the Carpathian Basin),
2. The “Psalmodic” style comes from ancestral language 2 (Middle East and Asia Minor).
3. The “Novel ascending” style originates from ancestral language 3 (Western Europe).

The motivation of this approach arises from the results of correlation analysis detecting simultaneous geographical propagations of certain groups of universal melody types and genetic characteristics (mitochondrial haplogroups) (Juhász & al. 2019). These correlations identified associations of melody types being very similar to the hypothetical musical parent languages shown here, and the corresponding genetic associations could be well interpreted by known prehistoric processes that can be traced back at least to the Bronze Age. At the same time, the results presented here show that an independent, pure musical analysis of folk music cultures that have only been documented in the last two centuries also can reveal these ancient musical parent languages. This result suggests the conclusion that living oral musical traditions preserve ancient roots of music that are much earlier than our written sources.

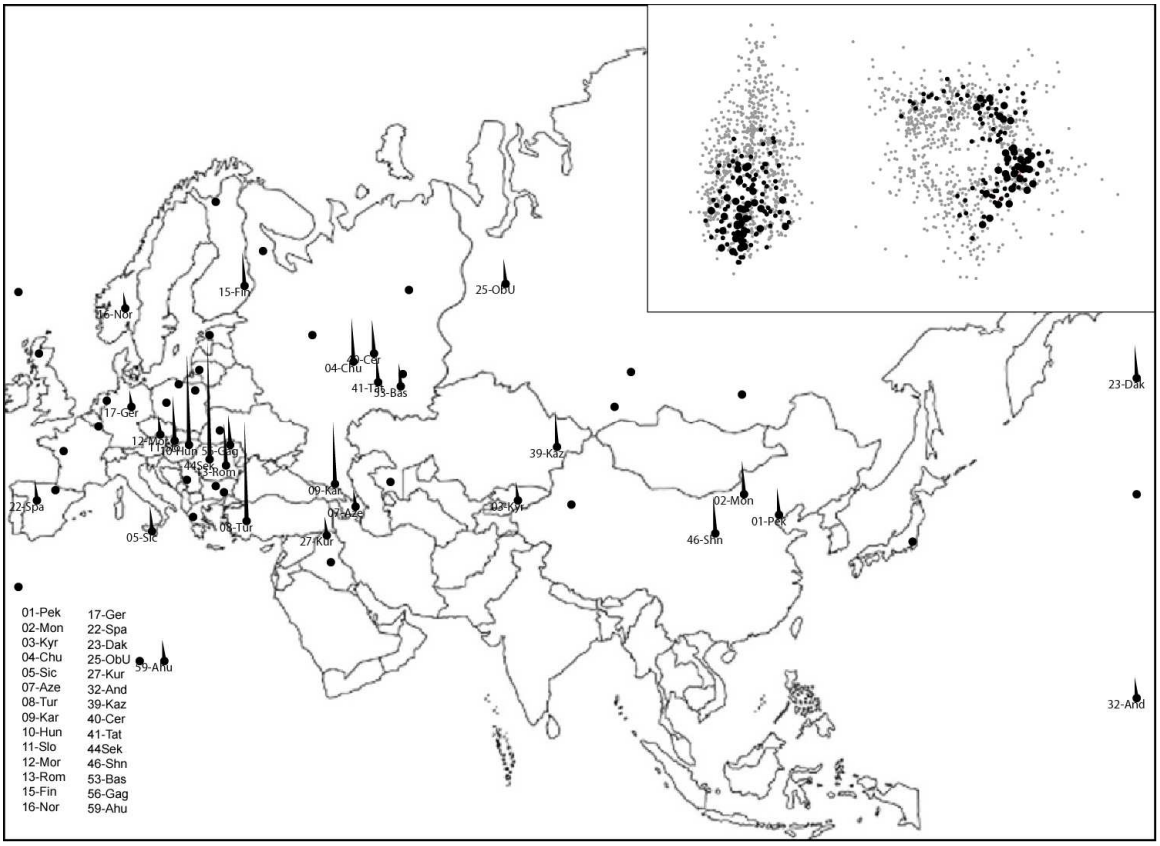

Figure: Geographical map of the linear combination weights of the ancestral musical language 1 (Eurasian steppe and Carpathian Basin) in the 59 cultures studied. Column heights are proportional to the moments of ancestral language 1 in the corresponding cultures.
SOC maps of the contour and degree distribution vectors are shown in the right upper part.
Black dots in the musical maps: the most important UMTs in the reconstructed UMT-distribution of ancestral musical culture 1.

References:

Juhász, Z. (2024). Revealing Footprints of Ancient Sources in Recent Eurasian and American Folk Music Cultures Using PCA of the Culture-Dependent Moment Vectors of Shared Melody Types. Music & Science, 7. https://doi.org/10.1177/20592043241228982

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Online resource: https://doi.org/10.1177/20592043241228982