

# **A computationally-assisted approach to the research on the relative chronology of changes from Proto-Indo-European to Latin: towards an electronic etymological dictionary**

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Despite the fact that the research on the relative chronology of changes has been one of the main issues of Indo-European linguistics, the complete relative chronology of changes from Proto-Indo-European to Latin has never been fully established. Additionally, various studies on the subject concentrate usually only on sound changes leaving the interaction with morphological changes aside (cf. Parker 1986, de Vaan 2008: 7-9, Weiss 2020: 207-209). Moreover, various competing hypotheses exist alongside each other as far as the reconstruction of the proto-language is concerned and the exact order of changes.

The purpose of this paper is to show that the use of a more objective and explicit method, i.e. the computational replication of phonological and morphological changes (also called “historical derivation” or “reconstruction forward”, cf. Maniet 1985, Hartman 2003, Sims-Williams 2018, Weber 2020, Marr and Mortensen 2022) can be helpful in cross-checking the possible relative chronology of changes and possible proto-forms from Proto-Indo-European to Latin. The aim of such approach is the use of algorithm that reads the given input data (proto-forms), makes the appropriate changes based on the changes that are usually assumed to have taken place in the development of a particular language, and generates the output which is compared with the actually attested forms. The obvious purpose of this approach is to test the regularity of changes and their relative chronology. If the generated form is completely the same as the attested one, then the assumed relative chronology can be correct. This way, the compatibility of every single change can be checked with the hypothesis by its application to the lexicon of the language.

It will be shown that with the use of this computational tool (finite-state transducer replicating the changes) it is possible to explicitly compare the competing approaches both to the reconstruction of the Proto-Indo-European proto-forms and the relative chronology of changes within the on-line etymological database (the electronic etymological dictionary) which presents fully the stages of the development of all of the inherited words in the language in different possible scenarios – both including the different proto-forms and the different ways in which they could develop. The number both of the assumed proto-forms and the changes which occurred in the development is not infinite and can be easily tested within this algorithm thus pointing to the most probable proto-form and most probable cascade of changes which produced the attested Latin forms.

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