

## What can we learn from implementing Optimality Theory?

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Lauri Karttunen (2006) argued more than a decade ago for “the insufficiency of paper-and-pencil linguistics”. He showed that even a leading phonologist could make a mistake when developing a complicated analysis, namely, by omitting relevant candidates from an OT tableau. Karttunen therefore suggested that the best recipe to avoid such a problem is to implement the grammar computationally, such as by using a finite-state realization thereof.

Already before Karttunen’s paper, and also since then, numerous software tools have been developed to support the linguists working with Optimality Theory and Harmonic Grammar. In fact, many of us are not as well-versed in programming as Karttunen is, not to mention the restrictions posed by finite-state technology on Optimality Theory. Consequently, those OT tools are very useful to phonologists who would like to check their analyses for possible mistakes, but would not be able to do so without them.

Now the problem is that OT allows a very broad spectrum of “objects”: not only (underlying and surface) linguistic representations, but also Gen and the constraints come in all shapes and sizes. While they are postulated to be universal across languages, they immensely differ per linguist and per article. Many OT tools simply expect the user to enter a tableau manually; so the software immediately work with the violation levels (number of stars) in the cells, without caring for either the representations (the leftmost column) or the constraints (the uppermost row). These tools, in turn, can only implement grammars that contain not simply a finite number of candidates, but a “reasonable” number of them. Unless the linguists are able to generate the tableau automatically, they have to create it themselves by hand, which would be too laborious, were the tableau realistically complex.

The toolkit developed by the present author comes with predefined sets of forms, candidates, Gen and constraints. Some of them are motivated by contemporary phonology, and others by the simplicity of the formalism. Moreover, the toolkit also permits the combination of constraints, such as their addition, multiplication or logical combinations. In short, the toolkit invites the linguist to build up the modules of their analysis in a novel, creative way.

In my talk, I shall present the conceptual framework behind this toolkit, and demonstrate how colleagues can use it. I argue that a novel perspective on OT’s well-known building blocks not only makes it possible for the phonologists to double-check their analyses, but it is also provides a new conceptual understanding. I compare the situation to the famous Gestalt picture that can be perceived either as a young lady looking backwards, or as an old woman looking downwards. Similarly, the building blocks of an OT grammar can also be perceived it two ways: either as linguistic concepts, or as mathematical objects. In turn, this second perception may benefit the linguist’s creativity.

### Reference

Karttunen, Lauri 2006. The insufficiency of paper-and-pencil linguistics: the case of Finnish prosody. *Intelligent linguistic architectures: Variations on themes by Ronald M. Kaplan*. 287–300.