

Theories of the constraint set in OT

As we have seen, the strongest version of OT is one that claims that the set of constraints is universal — the same constraints are found in all languages.

The most important implications of this claim:

- There is a tight link between the **phonological analysis** developed for one language and the **cross-linguistic predictions** about phonological patterns

We have looked into this implication from a few specific perspectives:

- There is a relationship between the context-specific allophone in a complementary distribution pattern, and the missing sound class in an inventory-gap pattern
- Factorial typology: All possible rankings of a set of constraints are predicted to be possible language patterns somewhere in the world

But *what are the constraints* in this universal constraint set?

That's not a question we can answer up front. We need to analyze phonological patterns in many specific languages, and look for cross-linguistic patterns in possible phonological systems, in order to come up with the right theory of what the constraints are.

Fortunately, there are some principles that we can work with, which can help us develop a working model of what kinds of constraints are likely to be in the constraint set.

1. Faithfulness constraints

Reminder: A **faithfulness** constraint compares each output to its input, and assigns violations when there is some kind of difference between the two.

So far, we have proposed the following types of faithfulness constraints:

- NO_{DELETION} (called MAX_(IMIZE) in the OT literature; an older name was FILL)
- NO_{EPENTHESIS} (called DEP_(ENDENCY) in the OT literature; an older name was PARSE)
- IDENT[feature]

To generalize this approach: If there is any way that some language “deforms” input/UR structures in creating outputs/SRs, then there must be a faithfulness constraint against doing that. Otherwise, that type of “deformation” would be free, and every language would do it whenever that would allow other constraints to be satisfied. (Can you think of any other types of faithfulness constraints we would therefore need?)

2. Markedness constraints

Reminder: A **markedness** constraint looks at outputs only, and assigns violations on the basis of their phonological structure.

Some considerations we have used in stating formal definitions for markedness constraints:

- All constraints refer to the **representational elements** in our phonological grammar (just as rules used to do when we had a rule-based framework) — features, segments, syllables, syllable positions, word boundary, etc.
- Markedness constraints should be designed to take care of **one thing at a time**. If there is a complicated phenomenon, chances are good it is the result of the interaction among multiple constraints.

But there is still a big open question about a general theory of markedness constraints: Which of the markedness constraints that **could be** formally represented are **actually** part of the phonological grammar?

So far, we have proposed markedness constraints when they are **empirically motivated**. For example, good evidence for the existence of a markedness constraint would be:

- Phonological processes: Some language actively avoids a particular phonological structure (by deleting it or turning it into something else)
- Typology: There are languages that lack a particular phonological structure altogether
- Phonetics: A case can be made that a particular phonological structure is phonetically difficult (difficult to produce, or difficult to perceive)

But this still doesn't answer our deeper question. Namely, there are two main scenarios about what a theory of the universal set of markedness constraints might look like:

- Scenario #1: UG contains an **arbitrary list** of markedness constraints. All we can do is find out what constraints are on this list, based on empirical considerations as above.
- Scenario #2: There are actually **deeper principles** at play that determine what kinds of markedness constraints are allowed in the universal constraint set. Some possibilities:
 - (a) Only **phonetically motivated** markedness constraints are in the universal constraint set.
 - If this option is chosen, this requires an **independent theory** of “phonetic motivation” and how it affects the contents of the constraint set.
 - (b) **All logically possible** markedness constraints are in the universal constraint set, even the phonetically unmotivated or empirically disastrous ones.
 - If this option is chosen, there needs to be a secondary theory about what **restricts the factorial typology** of the undesirable constraints so that they never come to have a dangerously high rank in any language.

Scenario #2 is obviously more interesting than Scenario #1. But, there are pros and cons with both options (a) and (b). The best model may incorporate aspects of both of these approaches; there may be both phonetic (or phonological) restrictions on possible constraints, and a theory of how domains such as language acquisition and historical language change place external restrictions on factorial typology.