Phonology with "goals": Optimality Theory

1. Introduction: Why goal-based phonology?

We have found that pursuing a rule-based approach to syllable structure has raised questions:

- Syllabification rules seem to (re)apply continuously throughout the phonological derivation; other kinds of rules don't seem to do this.
- When there are conditions on syllabification rules, such as restrictions on possible coda clusters, these aren't rules themselves; they are more like **goals** that a syllable has to meet.
- Many languages have phonological "conspiracies"—separate, formally unrelated rules that seem to be trying to achieve the same result. This looks like an effect of **goals** again.

In fact, when we look at syllabification options and rules that modify syllable structure (such as epenthesis, deletion, and [±syll]-changing rules), there is something that does seem to be fairly consistent across languages, and that is the **goals** or targets that rules are trying to achieve.

A recent trend in phonology has been to develop a phonological model that directly **refers to goals** instead of arriving at them indirectly via phonological rules, or mixing rules together with goals. We will pursue a **goal-based model of phonology** for the rest of the semester.

On the one hand, we will keep many aspects of the model that we have developed intact, especially our understanding of phonological **representations**. For example:

- Phonological processes operate on features
- Syllable structure is an important part of the phonology of languages

However, we will make use of these ideas while using **goals** rather than using rules to model phonological processes and phenomena, such as syllabification or segmental alternations.

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2. Formalizing goal-based phonology

The most popular goal-based approach to phonology is called **Optimality Theory (OT)**, and it has been in development since the early 1990s. Here are the basic ideas behind OT.

Basic concepts behind OT

- Goals are universal: they are present in all languages. (OT formalizes goals as **constraints**.)
- However, no language perfectly satisfies all goals. This would be impossible, because many of the goals **conflict** with each other.
- Individual languages respond differently to the conflicting demands because each language sets up its own system of priorities, satisfying the high-priority goals at the expense of the lower-priority goals. (OT formalizes this notion of prioritization as **constraint ranking**.)
- We can determine the priorities of a given language by looking to see what it does when it has to choose between competing goals. (OT formalizes this as an explicit **competition** between a winning output — the actual surface form — and various informative losing competitors.)

We will learn more about the OT framework in upcoming classes.

[Excerpt from Prince & Smolensky (1993), *Optimality Theory: Constraint interaction in generative grammar*. Published 2004, Blackwell.]

1.2 Optimality

The standard phonological rule aims to encode grammatical generalizations in this format:

(1) $A \rightarrow B / C\text{—}D$

The rule scans potential inputs for structures CAD and performs the change on them that is explicitly spelled out in the rule: the unit denoted by A takes on property B. For this format to be worth pursuing, there must be an interesting theory which defines the class of possible predicates CAD (Structural Descriptions) and another theory which defines the class of possible operations $A \rightarrow B$ (Structural Changes). If these theories are loose and uninformative, as indeed they have proved to be in reality, we must entertain one of two conclusions:

(i) phonology itself simply doesn't have much content, is mostly 'periphery' rather than 'core', is just a technique for data-compression, with aspirations to depth subverted by the inevitable idiosyncrasies of history and lexicon; or

(ii) the locus of explanatory action is elsewhere.

We suspect the latter.