

Week 12: Optimality Theory**Reading:** Archangeli chapter

Optimality theory does not necessarily change our representational devices or levels in phonology. Serious reexamination of rules, still within generative phonology framework.

Kisseberth (1970): shows Yawlemani has a conspiracy of rules, resulting in permissible syllables for the language.

Historically in Phonology, we wrote rules of the form:

$$A \rightarrow B / C _ D$$

But as a theory of **Structural Descriptions** (CAD) and operations of **Structural Change** (A→B), it missed an object of study: **the character of the output** (CBD)

OT characterizes the output as a result of a struggle between **markedness and faithfulness** constraints.

Syllable structure:

most unmarked: CV (Hawaiian, also allows slightly marked V)
 more marked: CVC (Yawelmani. also allows unmarked CV)
 much more marked: (C)(C)(C)V(C)(C) (English)

Yawelmani

CV(X) syllables explain all the possible sequences found in words, and disallows all the impossibilities (note: words have no appendix).

Rather than rules that accidentally conspire to give the right output, use the constraints directly in phonology.

In Yawelmani: ONSET, PEAK, *COMPLEX always true on the surface, but NOCODA sometimes not

OT Mechanics and Representations

Grammar defines a relation between input and output, pairs of underlying and surface forms: (input_i, output_i)

GEN(Input_k) → {Out₁, Out₂, ...} (part of UG) Gen creates infinite possible outputs for a given input form.

H-EVAL(Out_j, 1 < j < ∞) → Out_{real} H-eval picks out the best as the real output.

The burden of explanation in phonological theory then lies in H-EVAL, which determines the "best"; the workings of H-eval are shown in a "tableau"

Formalism: The "tableau"



- C_1 , C_2 , C_3 are constraints; here C_1 outranks C_2 outranks C_3 , and the higher ranked constraint is always written to the left.
- When a possible output violates a constraint, an * appears in the cell below that constraint, in the row of the candidate output.
- The "!" indicates a fatal violation; the candidate output loses because of that violation.
- The  points to the winning output, the one with fewer or lower ranked violations.
- No number of violations of a lower ranked constraint is as bad as a violation of a higher ranked constraint. Think alphabetical order. Azure comes before Babar.
- Shading indicates that a cell no longer contributes to the evaluation; that candidate has already won or lost.

Tableau 1: Optimality Evaluation Schema

Candidate Outputs	C_1	C_2	C_3
output ₁	*!		
 output ₂		*	***

Principles of OT (McCarthy and Prince 1993a: p. 4, and fn 3)

- (1) a. Violability Constraints are violable; but violation is minimal.
- b. Ranking Constraints are ranked on a language-particular basis; the notion of minimal violation is defined in terms of this ranking (lexico-graphically).
- c. Inclusiveness The constraint hierarchy evaluates a set of candidate analyses that are admitted by very general considerations of structural well-formedness.
- d. Parallelism Best satisfaction of the constraint hierarchy is computed over the whole hierarchy and the whole candidate set. There is no serial derivation.

References (Archive address: <http://roa.rutgers.edu/>)

- Kisseberth, C. 1970. "On the Functional Unity of Phonological Rules", *Linguistic Inquiry* 1: 291-306.
- McCarthy, J. and A. Prince. (1993a). *Generalized Alignment*. Technical Report #7 of the Rutgers Center for Cognitive Science, Rutgers, NJ.
- _____. (1993b). *Prosodic Morphology*. Tech. Rep. #3 of the Rutgers Center for Cognitive Science, Rutgers, NJ.
- Prince, A. and P. Smolensky. (1993). *Optimality Theory*. Tech. Rep. #2 of the Rutgers Center for Cognitive Science, Rutgers, NJ.