

One phonology or many? Issues in stratal faithfulness theory*

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"One phonology or many?"—why the question in the first place? Isn't it obvious that there is only one phonology per language? No, it is not self-evident. Consider palatalization of coronal plosives and fricatives before [i] in Japanese:

| | |
|---------------|------------------|
| (1) /mat/ | 'to wait' |
| mat ana i | PRESENT NEGATIVE |
| matʃi mas u | POLITE PRESENT |
| matʃi maʃi ta | POLITE PAST |

Static-distributional counterpart—e.g., verb roots:

| | | | | |
|----------|-----------|-------|---------|--------|
| (2) de | das | tas | te | tor |
| 'go out' | 'put out' | 'add' | 'shine' | 'take' |

No roots like *[ti...] or *[di...].

But in loanwords and other lexically peripheral items:

| | | |
|------------|----------|---------------------|
| (3) paatii | *paatʃii | 'party' |
| diŋgo | *dʒiŋgo | (name of car model) |

At the same time:

| | | |
|------------|----------|-----------|
| (4) *tiimu | tʃiimu | 'team' |
| *diremma | dʒiremma | 'dilemma' |

Co-phonologies? Does this mean there are two phonologies in Japanese, with different rankings: one for the native words, and another for the foreign words?

| | | | |
|---|----------------------|--|---------------------|
| (5) Phonology- <i>native</i> : PAL » IDENT | Effect: /ti/ → [tʃi] | Phonology- <i>foreign</i> : IDENT » PAL | Effect: /ti/ → [ti] |
|---|----------------------|--|---------------------|

But how much can the such co-phonologies differ? How do they interact? etc. Instead of co-phonologies:

Stratal faithfulness theory ("SFT")— a single phonology (i.e., *one* constraint ranking) with multiple stratal faithfulness constraints:

| |
|--|
| (6) Phonology: IDENT- <i>foreign</i> » PAL » IDENT- <i>native</i> |
|--|

Better yet: a specific/general distinction.

| | |
|---|----------------|
| (7) IDENT- <i>foreign</i> » PAL » IDENT | |
| special case— | general case— |
| special FAITH: | general FAITH: |
| no palatalization | palatalization |

* Expanded handout of presentation at Meikai OT workshop, August 30, 2001. References have been kept to a minimum since a bibliography could not be included due to space limitations.

Similar to positional faithfulness:

| | | |
|--|----------------|-------|
| (8) FAITH-prominent (-initial, -onset, ...) | » MARKEDNESS » | FAITH |
|--|----------------|-------|

For FAITH, substitute MAX, DEP, IDENT, etc.

A non-viable alternative—stratal markedness: Rather than SFT, why not have stratal markedness theory ("SMT")?

| |
|-----------------------------------|
| (9) PAL-native » IDENT » PAL e |
|-----------------------------------|

Problems:

- SMT seems to resurrect the language-particular processes of rule-based phonology, where "palatalization" is earmarked to apply only to [+native] forms:

(10) t → tʃ / __ i
[+native]

Abolishment of language-particular processes/markedness constraints is an important achievement of OT.

- What is the general case?

(11) SFT:

SMT:

| | | | |
|--|---|--|--|
| IDENT-foreign » PAL » IDENT special case– foreign special FAITH | IDENT general case– native general FAITH | PAL-native » IDENT » PAL special case: native -special markedness | PAL general case: foreign -general markedness |
|--|---|--|--|

(12) SFT has the line-up:

"foreign / native"
↓ ↓
"special / general"

SMT reverses this line-up:

"native / foreign"
↓ ↓
"special / general"

But palatalization before [i] as the **special** case is odd because it is the **unmarked** situation, universally and in each individual language. There is a universal markedness constraint demanding it, and no markedness constraint against palatalization before [i]. Stratal Markedness Theory seems to turn this state of affairs on its head.

Cf. the general ban on positing multiple instantiations of markedness constraints: There is no "NoCoda-BR"/"NoCoda-IO" distinction corresponding to the familiar "Ident-BR"/"Ident-IO" distinction.

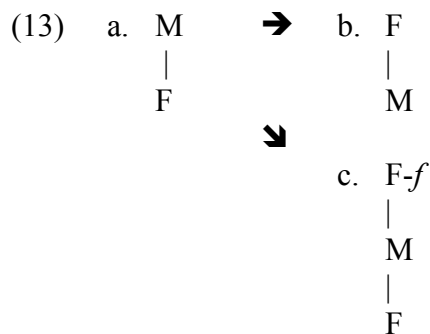
Why not?

- Backcopying argument: templatic constraints (e.g.: RED=σ) are ruled out in standard OT (instead: TETU). They would constitute one type of 'markedness constraints' imposed on a subset of forms (e.g., reduplicated forms).

- Formally: constraint diversification only with two-argument constraints.

SFT, learnability, acquisition, and default "M»F" ranking

Stratification is one way of maintaining a version of the low (default, dominated) position of F even in the face of counterevidence—whenever it is possible to confine the counterevidence within a stratum *f* whose inhabitants have other things in common. Instead of immediately collapsing in the face of anti-M data and moving from (a) to (b), stratification means trying out option (c).



Remark 1: The M » F ranking default (Smolensky 1995) holds quite generally, irrespective of the existence of alternations. For a different approach, see Fukazawa, Kitahara, and Ota 2001 (Meikai handout): "[...] we subscribe to the view that lexical items are grouped with the most marked sublexicon of the language unless alternation evidence indicates otherwise."

Remark 2: Members of a stratum **must have several characteristics in common**, not just identical behavior with respect to a single constraint (this should follow from the economy considerations concerning the overall grammar). This forestalls the possibility of pseudo-strata (such as *VoiObs-observing *pick* vs. *VoiObs-violating *pig* in English).

SFT and harmonic completeness

- (14) $[t] > [k] > [p]$ "α>β" = "structure α is less marked than structure β"
 $*P \gg *K \gg *T$ "C₁»C₂" = "constraint C₁ is ranked higher than constraint C₂"

Harmonic completeness: If $\alpha \in \beta$ and $\beta \in S$, then $\alpha \in S$. Let S be a system of linguistic structures and α, β elements that are markedness-wise comparable, with α more harmonic than β . Then, if S contains β , it must also contain α (see Prince & Smolensky 1993).

- (15)
- | | | | | | | | | |
|--------------|----|----|--------------|----|--------------|----|---------|-------|
| | *P | » | *K | » | <i>F(PL)</i> | » | *T | [t] |
| | *P | » | <i>F(PL)</i> | » | *K | » | *T | [k,t] |
| <i>F(PL)</i> | » | *P | » | *K | » | *T | [p,k,t] | |
- "*F(PL)*" = "Faithfulness to consonantal place of articulation"

- | | |
|---|---|
| (16) Universal: Impossible inventories | Language-particular: impossible strata (SFT) |
|---|---|

Reason: Ranking within markedness constraint families fixed in universal grammar.

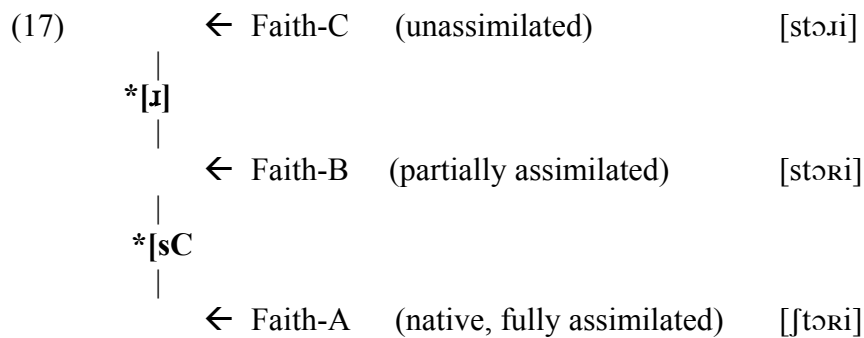
Reason: Ranking of all markedness constraints fixed for the individual grammar.

SFT vs. SMT again

What happens when more than one markedness constraint is involved? Does the theory predict what is impossible as a nativization? SFT does, but SMT does not (at least, not without further ado).

German has uvular [ʀ], ruling out retroflex [ɻ], and has word/syllable-initial [ʃC], ruling out [st] in this position. The prohibition against [ɻ] is "stronger": Nativization of [sC] implies nativization of [ɻ].

In SFT, the correct typology of possible strata for nativizations of loans from English is straightforwardly expressed by the hierarchy:



(18) SFT—implication follows directly from markedness ranking:

| a. | b. | c. | d. |
|---|--|---|---|
| * [ɻ] * [sC] Id(pl) | * [ɻ] Id(pl)- <i>f</i> * [sC] Id(pl) | Id(pl)- <i>ff</i> * [ɻ] * [sC] Id(pl) | Id(pl)- <i>ff</i> * [ɻ] Id(pl)- <i>f</i> * [sC] Id-(pl) |
| /stɔɪ/ → [tɔʀɪ] | /stɔɪ/- <i>f</i> → [stɔʀɪ] | /stɔɪ/- <i>ff</i> → [stɔɪ] | /stɔɪ/- <i>ff</i> → [stɔɪ] /stɔɪ/- <i>f</i> → [stɔʀɪ] |
| [sC-]:No [ɻ]:No | [sC-]:OK [ɻ]:No | [sC-]:OK [ɻ]:OK | |
| native German | partially nativized | "Genglish" " | combination of (b) and (c); actual German |

"f" = "(semi)-foreign", *"ff"* = "(very) foreign"

(19) SMT—implication does not follow directly from the markedness ranking:

| a. | b. | c. | d. | e. |
|----------------------------------|---|---|--|--|
| | *[sC demoted | *[ɹ] demoted | both demoted | both demoted |
| *[ɹ] *[sC Id(pl) | *[ɹ] *[sC-nat Id(pl) *[sC | *[ɹ]-nat *[sC Id(pl) *[ɹ] | *[ɹ]-nat *[sC-nat Id(pl) *[ɹ] *[sC | *[ɹ]-nat *[sC-nat Id(pl) *[sC *[ɹ] |
| /stɔ.ɹi/→ [[tɔ.ɹi] | /stɔ.ɹi/→ [stɔ.ɹi] | /stɔ.ɹi/→ [[tɔ.ɹi] | /stɔ.ɹi/→ [stɔ.ɹi] | /stɔ.ɹi/→ [stɔ.ɹi] |
| [sC-]:No [ɹ]:No | [sC-]:OK [ɹ]:No | [sC-]:No [ɹ]:OK | [sC-]:OK [ɹ]:OK | [sC-]:OK [ɹ]:OK |
| native German | partially nativized | impossible nativization ! | "Genglish " | "Genglish " |

"nat" = "native"

In order to rule out the unwanted (c), SMT needs to assume some kind of stratal consistency principle governing the stratal replication of different markedness constraints, which would merge (c) with (d). This would also rule out the superfluous (e) by merging it with (d)

Rejoinder: SFT needs similar assumptions regarding the stratal replicates of different faithfulness constraints.

The lure of underspecification

(20) The vision: "The more nativized, the less specified."

The problem: Misses the important implications, cannot distinguish possible and impossible nativizations in the correct way. Since specification/underspecification is a segmentally local affair, nothing ensure that property p underspecified in position I entails that property q must also be underspecified in position II. The fact that [st] nativization implies [r] nativization is again does not follow directly from the markedness ranking, as it should, and needs extra stipulation.

Number vs. importance of violations

(21) Isn't it just the number of faithfulness violations (with respect to the foreign source) that matters? "With n breaches of Faith, you're out." (n=1, 2, 3, ...)

The problem: It's not how many constraints are violated, but **which ones** (see Ito and Mester 2001 for a detailed example).

Restrictiveness

(22) SFT: "Only faithfulness can be stratal replicated".

•Criticism I: "Is this restriction restrictive enough? Isn't it still too powerful?"

Answer: "Restrictive" is hardly ever restrictive enough—what is hard is to come up with specific proposals. Probably SFT too loose in some respects and too restrictive in others, but it's a start, and it makes use of basic ideas and principles of OT.

•Criticism II: "Limiting stratal replication to faithfulness doesn't amount to much." (E.g.. Pater 2000, 262: "Since most phonological phenomena likely result from, and can be blocked by, rankings between structural and faithfulness constraints, the empirical consequences of this restriction are very subtle [...].")

Answer: True—as long as faithfulness is as fine-grained as markedness, with Ident[+F] and Ident[-F] for every property F, etc. (cf. also theories with Max[Feature] and Dep[Feature] constraints).

But—a version of OT that fully replicates the system of markedness constraints in a shadow world of faithfulness constraints is redundant and problematic, a fall-back to the world of rules with structural descriptions ("markedness") and associated structural changes ("faithfulness"):

| | | | |
|------|---|-----------------------|----------------------|
| (23) | $A \rightarrow B / C _ D$, i.e. C A D | <i>translated as:</i> | Markedness: *CAD |
| | ↓ | | » |
| | B | | Faithfulness: *(A→B) |

Overly rich faithfulness amounts to a continuation of process phonology with other means. Instead of replicating this "rule-package" as a "constraint package" *CAD » *(A→B), markedness and faithfulness are liberated from each other in OT.

•How?

(24) By keeping faithfulness general and symmetric.

In a theory with general and symmetric faithfulness constraints confronting highly diversified markedness constraints, one faithfulness constraint impinges on many markedness constraints (not just on "its M"). Here limiting stratal replication to faithfulness constraints is a genuine restriction since it excludes many types of strata as impossible.

This is easy to falsify by means of analyses informed by an understanding of the basic phonology of the language in question and going beyond two or three constraints.