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Citation for published version:

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Peer reviewed version

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How good is the internal evidence for multiple-level phonological computation?

A view from Russian

Pavel Iosad
Universitetet i Tromsø/CASTL
pavel.iosad@uit.no

What's in a Word?
17. september 2010
Universitetet i Tromsø/CASTL

Talk outline
1. Context
2. Case studies from Russian
   - Backness switch
   - Palatalization
   - Obstruentization of /v/
3. The value of internal evidence...
4. ...and why it isn't enough
5. Conclusion

Historical context

- Generative phonology is said to basically start with Russian: Halle (1959)
- Plenty of classic generative accounts such as Lightner (1972)
- Also taken up within Lexical Phonology, figures in Kiparsky (1985)
- Most analyses very abstract, sometimes even more so than Chomsky & Halle (1968)

Example derivation (I kid you not)

šerstîstij 'furry'
  ↓ by Palatalization
šërstîstij
  ↓ by Iotacism
šırstîstij
  ↓ by Depalatalization
šırstîstij
  ↓ by Hi-switch
šırstîstij

But now we have OT

- ...right?
- Wrong!
- Significant body of work arguing that Russian (and more broadly Slavic) phonological data conclusively show that some sort of multiple-level serialism is unavoidable
  - Palatalization: [back] spreads C ← V
  - Velar mutation: dorsal [−back] → [coronal −ant +strident]
  - Iotacism: V[−high] → [i] / C[−back]−
  - Depalatalization: i [−back] → [−back]
  - Velar palatalization: k g x → [−back] / [−高的−round]
  - Hi-switch: [back] spreads C → V[i][−high −round]

What is at stake?

- The analysis of Russian
  - I am not aware of any work specifically refuting the serialism-based analysis of Russian
- The issue of intermediate levels
  - Where do the levels come from?
  - What is the distinction between a multi-level phonology and non-trivial components of a modular theory of grammar?
- The value of phonology-internal evidence
  - Can we say that purely phonological data can have a decisive say on the previous issue?
  - If yes, how overwhelming must the evidence be?

A typical example

- From Halle & Matushansky (2002)
- The following rules are all extrinsically ordered:
  1. Palatalization: [back] spreads C ← V
  2. Velar mutation: dorsal [−back] → [coronal −ant +strident]
  3. Iotacism: V[−high] → [i] / C[−back]−
  4. Depalatalization: i [−back] → [−back]
  5. Velar palatalization: k g x → [−back] / [−高的−round]
  6. Hi-switch: [back] spreads C → V[i][−high −round]

Goals of this talk

- The analysis of Russian
  - Discuss some specific alternatives to a serialism-based analysis
- The issue of intermediate levels
  - Argue that an analysis likely to be accepted as within the confines of "standard OT" is possible if one capitalizes on the feed-forward model
- The value of phonology-internal evidence
  - Discuss how the validity of the phonological analysis hinges on interface considerations which are rarely explored or even explicitly discussed
Assumptions I

- Minimalist feature theory (Morén 2003, 2007; Blaho 2008)
  - Only privative features
  - Contrastivist Hypothesis (Dresher 2009; Hall 2007): only contrastive features are active in the phonological computation
  - Substance-free I: phonetic representation of a feature not necessarily uniform either across or within a language
  - Substance-free II: assignment of phonological features based on phonological activity within the language at hand
- Consequences:
  - Surface underspecification
  - Non-trivial phonetic component

The basic facts

- Most consonants have a palatalized counterpart, e.g. [tʲ] [xʲ] [Hʲ] etc.
- Exceptions: [t s z'] (only non-palatalized), [ʃ] (only palatalized)
- Palatalized consonants have a pretty free distribution
  - But [k ɡ x] are impossible word-finally
  - And rare before non-front vowels, though not impossible and even created by the morphophonology (Timberlake 1978; Flier 1982)
- Conversely, [k ɡ x] are impossible (word-internally) before front vowels

The palatalizations I

- Mostly before front vowels:
  - C → C'
  - But the same affixes often trigger [k ɡ x] → [ʃ] s z'

  (1) a. (i) ['svet]: 'light' (n.)
      (ii) ['svʲit]: 'to illuminate'
    b. (i) ['muka]: 'torment' (n.)
      (ii) ['mufʲt]: 'to torment'
  - Another type where only the velars are affected:

    (2) a. (i) ['stol]: 'table'
        (ii) [steɾ'l]: 'table (loc. sg.)'
    b. (i) ['krʲuk]: 'hook'
        (ii) [krʲuk':] 'hooks'

The traditional approach

- Palatalization: triggered by [i]
  - [t i] → [t i]
- The other palatalization: triggered by [i] with later fronting following velars; ordering crucial
  - [t i] → [t i] → [t i]
- Across-the-board surface palatalization: word-level (Blumenfeld 2003) or some boundaries reproducing this effect (Plapp 1996); multiple levels crucial for counterfeeding of [i]-palatalization
- Transitive palatalization: often ignored or relegated to morphology despite the clear affinity to [i]-palatalization

The palatalizations II

- Yet another type where everything undergoes surface palatalization

  (3) a. (i) ['stol]: 'table'
      (ii) [steɾ'l]: 'table (loc. sg.)'
    b. (i) ['krʲuk]: 'hook'
      (ii) [krʲuk':] 'hooks'
- Transitive palatalization: [t d s z] → [ʃ] s z' s z'
  - No relation to the frontness of the following vowel
  - Same output as [i]-palatalization

Reanalysis

- Joint work with Bruce Morén-Duolljá
- Email for details of analysis or see http://www.hum.uit.no/s/ioeav/av.html
- Redux:
  - There is no [i]
  - There is very little actual C → V spreading of [back]
  - The various outcomes of palatalization are ascribed to a floating feature
  - Lexical indexation allows Russian to realize a fair bit of the factorial typology for this floating feature
Backness switch and [i] I

- There is no /i/ in Russian
  - Phonetically it is a sort of diphthong: textbook knowledge in Russia, also Padgett (2001)
  - Basically the target is [i]
  - Phonologically it is not necessary
- The relationship between frontness and palatalization properties is complex
- Some non-front vowels trigger palatalization:
  1. [pʲɪˈʃːʲanɨj]
     - Phonetic it is a sort of diphthong: textbook knowledge in Russia, also Padgett (2001)
  2. [pʲɪˈsok]
     - Phonologically it is not necessary
- Vice versa: slightly complicated
- All /e/’s do trigger palatalization (historical accident)

(4)

4a. [pʲɪˈʃːʲanɨj] ‘sandy’
4b. [pʲɪˈʃːʲanɨj] ‘sand’

Backness switch and [i] III

- Therefore [ʂʷ ʐʷ] should in fact be palatalized in the output of phonology (corroborated by vowel reduction)
- Serialism comes for free from the feed-forward model

The constraints

- **Max(V-pl[cor]), or MaxFlt** (Woll 2007): self-explanatory
- **DepFlk(V-pl[cor]): do not attach a V-pl[cor]**
- *C-pl[lab]/[cor]/[lab]: self-explanatory
- **Conjunction** of ”C-pl and DepFlk: ”do not attach V-pl[cor] to this type of consonant”
  - Can be undominated ⇒ no docking
  - Can be repaired by undoing the violation of DepFlk ⇒ no docking
  - Can be repaired by undoing the violation of *C-pl ⇒ deletion of C-pl and attachment of V-pl[cor] = postalveolars
  - Can be dominated ⇒ docking of V-pl[cor] leads to surface palatalization
- Ignoring additional complications which don’t change the picture...

Surface palatalization

- **Max(V-pl[cor]), Max(C-pl) ⇒ DepFlk(V-pl[cor])**
- Realize both the consonant’s underlying feature and the floating feature

No docking scenarios

- The feature may fail to surface at all ⇒ non-palatalizing suffixes, such as the /i/
- It may also force the epenthesis of some material to attach to
  - Attested as labial epenthesis: /p b m f v/ ⇒ pl b l f l vs
  - But the ranking is clearly contradictory: how can all these be attested in a single language
Lexical indexation I

- I suggest that the different palatalizing properties of Russian suffixes can be accommodated via lexical indexation (Pater 2009).
- So each class of suffixes has a corresponding ranking of the relevant constraints.
- Contrast this with the Stratal OT approach of Blumenfeld (2003):
  - SOT: velar palatalization happens at the stem level, surface palatalization happens at the stem level, differences accommodated via stratum-specific ranking.
  - Proposed approach: differences in the outcome of palatalization are due to arbitrary lexical indexes.
- Loss of generalization relative to SOT, even though the insight can still be expressed ("such-and-such indexes are associated with word-level suffixes.")

The notorious /v/

- Obstruent-like: undergoes word-final devoicing.
  5. a. [ɪˈvɐˈɡa] "from an enemy"  
  5. b. [ɪˈvʲordɪj] "hard"
- Sonorant-like: fails to trigger voicing assimilation.
  6. a. [vʲordɪj] "hard"  
  6. b. [vʲerʲ] "door"
- Also, and famously, postlexically.
  7. [et vɐˈɡa] "from an enemy"

Representational solution

- In a privative feature theory, what is the actual evidence of /v/ having the feature [voice]?
- Final devoicing (if it is in fact phonological)
- But can we model it without reference to the feature [voice]?
- Let’s assume /f/ is just [C-place[lab],C-manner[open]] (cf. Morén 2006 for Serbian)
- Then /v/ can be [C-place[lab],C-manner[open]] and still be distinct from /f/.
- Separate constraint to enforce final devoicing of /v/ by deletion of the manner feature.
- Loss of generality.
- But empirically adequate.
- And get around the voicing assimilation problem: if /v/ does not have [voice], we do not expect it anyway.

Phonology ignoring syntax

- I have hopefully shown that (Russian) phonological data supporting multiple-level derivations are not quite as compelling.
- In terms of OT, the analysis is quite orthodox.
- Yet it uses at least two devices which on general grounds could be questionable:
  - Local conjunction: questions of restrictiveness, learnability (also ability to express generalizations: Potts et al. 2010).
- Can we really make architectural claims like these without reference to syntactic work?
- You tell me!
References


References I


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