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

A view from Russian

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What's in a Word?
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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)

šerstIstɨj ‘furry’

- by Palatalization
šërstɨtʃ

- by Iotacism
šystɨtʃ

- by Depalatalization
širstɨtʃ

- by Hi-switch
šɨrstɨtʃ

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] → [ɨ] / C[−back]−
  - Depalatalization: iastes C → [+back]
  - Velar palatalization: k g x → [+back] / _V[−high −round]
  - Hi-switch: [±back] spreads C → V[−high −round]

Goals of this talk

- 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?

What is at stake?

- The analysis of Russian
- The issue of intermediate levels
- The value of phonology-internal evidence
The traditional approach

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

Overview and assumptions

- 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 palatalizations I

- Mostly before front vowels:
  - C → C ɨ
  - But the same affixes often trigger [k y ɨ] → ([k y ɨ] ɨ)

The basic facts

- Most consonants have a palatalized counterpart, e.g. [t tɨ] [x ɨ] [h ɨ] etc.
- Exceptions: [ts ɨ] [z ɨ] (only non-palatalized), [ɨ] ([z ɨ] only palatalized)
- Palatalized consonants have a pretty free distribution
  - But [k y ɨ] 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 g x ɨ] are impossible (word-internally) before front vowels

The palatalizations II

- Yet another type where everything undergoes surface palatalization

Case studies

- Palatalization and backness switch

Reanalysis

- Joint work with Bruce Moren-Duolljá
- Email for details of analysis or see http://www.hum.uit.no/s/home/cv.html
- Redux:
  - There is no [ɨ]
  - There is very little actual C → V spreading of [əback]
  - The various outcomes of palatalization are ascribed to a floating feature
  - Lexical indexation allows Russian to realize a kind of serialism, but with principled restrictions
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 [ɨ]
  - Phonologically it is not necessary
- The relationship between frontness and palatalization properties is complex
- Some non-front vowels trigger palatalization:
  (4) a. [pʲɪˈʃːʲanɨj] 'sand'
  b. [pʲɪˈʃːʲanɨj] 'sandy'
- Vice versa: slightly complicated
- All /e/’s do trigger palatalization (historical accident)

Backness switch and [i] III

- Therefore [sʲ ʐʲ] 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

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

Place-changing palatalization

- Unified name for velar and transitive palatalization: same output, would be good to have a unified representation
- \( \text{Max(V-pl[cor]), DepLink(V-pl[cor])} \Rightarrow \text{Max(C-pl)} \)

Representational assumptions

- Based on a holistic approach to Russian phonology
  - V-place[coronal]: Palatalization in consonants with a C-place (à la Clements)
  - The only place feature for the postalveolars
  - On its own: /i/
- Floating V-place[coronal] (unattached to a Root node) must attach to something to surface
- Factorial typology for floating feature

Surface palatalization

- \( \text{Max(V-pl[cor]), Max(C-pl) } \Rightarrow \text{DepLink(V-pl[cor])} \)
- Realize both the consonant’s underlying feature and the floating feature

No docking scenarios

- The feature may fail to surface at all \( \Rightarrow \) non-palatalizing suffixes, such as the /i/
- It may also force the epenthesis of some material to attach to
- Attested as labial epenthesis: \( / p b m f v / \Rightarrow \text{p b b’ m’ f’ v’} \)
- 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. [ˈpva] 'lion (gen. sg.)'
  - b. [ˈlef] 'lion'
- Sonorant-like: fails to trigger voicing assimilation
  - (6) a. [vˈvوردɨj] 'hard'
  - b. [vˈvёрʲ] 'door'
- Also, and famously, postlexically
  - (7) [et vɾeˈga] '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]] (cf. Moreń 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 gets 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)
  - Lexical indexation: indirect reference? Cf. recent work by Scheer
- Can we really make architectural claims like these without reference to syntactic work?
- You tell me!

Lexical indexation II

- Better empirical adequacy
  - Unified expression of place-changing palatalization
  - Correctly expresses the lack of a principled relationship between vowel frontness and palatalizing properties (other than diachronically)
  - Correctly expresses the types of palatalizing processes possible in Russian
- Give me empirical adequacy over loss of generalization any day

The classic analysis

- Underlyingly, the [v] is /w/
  - Becomes an obstruent by a later rule
  - Crucially, obstruentization must precede voicing assimilation since they stand in a counterfeeding relation
- But voicing assimilation must be postlexical, since it applies across word boundaries
  - (8) [ɾɛˈdəmə] 'from the house'
- Postlexical ordering is an issue…

How good is phonological evidence?

- It is not my purpose here to argue for this specific analysis
- But it does seem that many of the facts previously argued to absolutely require serial derivation in phonology could in principle be reanalyzed
- What would the compelling evidence look like?
  - Demonstrably phonological
  - Crucially ordered processes
  - Operating categorically on contrastive symbols
  - Not amenable to a representational analysis (e.g. preservation of subsegmental elements as opposed to spreading-and-deletion)
- Place to look for: languages with really long derivations: Sanskrit? Sámi?
- I don’t know

Summary

- Analysis of a number of phenomena in Russian which have traditionally been argued to support multiple-level derivations
- Claim: analysis more empirically adequate in terms of the phonological phenomena
- Loss of generality in terms of stating the conditioning, but arguably preferable over an elegant but insufficient analysis
- I am not really arguing for fully parallel OT
- Just showing that a number of reasonable assumptions about phonological computation can help us run with this ball much further than assumed in some of the literature
Can phonological data alone be used to resolve the number-of-levels debate?
I am not so sure
Other evidence:
Coherent theory of diachrony (Bermúdez-Otero 2007)
A Theory of Everything? (Vaux 2008)
?????
Maybe purely phonological evidence is enough after all?
Future work

References I

References II
Gribanova, Vera. 2009. Phono
tological evidence for a distinction between Russian prepositions and prefixes. In Gerhild Zybato

References III

References IV

References V