Partial exceptionality in Logical Phonology

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1 Introduction

- Logical Phonology adopts decomposing feature change into independent rules of subtraction and unification

  (1) Devoicing-before-stops process

  a. [−son] ∖ {+voi} /___[−son; −voi; −cont]

  b. [−son] ⊔ {−voi} /___[−son; −voi; −cont]

- Formulation in (1) is a bit conspiratorial given that context of the first rule is the same as the context of the second rule. Suppose we change that—and take the context of the unification rule to be a superset of the subtraction rule.

  (2) a. [−son] ∖ {+voi} /___[−son; −voi; −cont]

  b. [−son] ⊔ {−voi} /___[−son; −voi]

- Or suppose we enlarge the natural class of targets

  (3) a. [−son] ∖ {+voi} /___[−son; −voi; −cont]

  b. [] ⊔ {−voi} /___[−son; −voi; −cont]

- If there are no underspecified segments in the UR, (1), (2), and (3) are equivalent: (2) only applies non-vacuously when fed by (1)

- However, if there are underspecified segments in the UR, (1) and (2) form a grammar with an exceptionless proceess and an exceptional process leading to the same structural change.

  (4) Change (a) is obligatory; change (b) is exceptional

  a. [−son; +voice] → [−son; −voice] /___[−son; −voice; −cont]

  b. [−son; +voice] → [−son; −voice] /___[−son; −voice; +cont]

- Let's call this partial exceptionality: the alternation is the same, but its obligatoriness depends on the context. I want to chat about whether that's a useful formal property.

2 Polish surface (velar) palatalization

2.1 The pattern

- The discussion is largely based on Rubach (2019) and Zdziebko (2023)
- High front vowel /i/ triggers palatalization of /k,g/

(5) a. 'seal': [foka] (NOM.SG) ~ [fokʲi] (GEN.SG) *[foki]

b. 'leg': [noga] (NOM.SG) ~ [nogʲi] (GEN.SG) *[nogi]

- A phonotactic fact: [ki, gi] is impossible—only [kʲ, gʲi] are allowed (Rubach 2019).
- There are two sources for [kʲ, gʲi]. First one is cases like GEN.SG above which arise as [ɨ] after other segments like [x], even ([kɨ,gɨ] are illicit sequences; Rubach 2019). These are amenable to an analysis where [ɨ] fronts to [i] after velar stops (giving rise to the phonotactic generalization).

(6) Masculine singular /-ɨ/

	/k/~[kʲ]		/g/~[gʲ]		/x/~[x]	
	wielka	*wielki*	*uboga*	*ubogi*	*cicha*	*cichy*
UR:	/vʲelk-a/	/wielk-ɨ/	/ubog-a/	/ubog-ɨ/	/t͡ʃix-a/	/t͡ʃix-ɨ/
SR:	[vʲelka]	[vʲelkʲi]	[uboga]	[ubogʲi]	[t͡ʃixa]	[t͡ʃixɨ]
		*[vʲelki]		*[ubogi]		*[t͡ʃixɨ]
Gloss:	great-F.SG	great-M.SG	poor-F.SG	poor-M.SG	quiet-F.SG	quiet-M.SG

- There are also cases where [i] surfaces after other segments, like [x]. These involve an underlying [i]—so surface palatalization after [i] is a more general process.

(7) a. Agent affix /-ista/

	/k/~/kʲ/		/g/~/gʲ/		/x/~/xʲ/	
	SOK	*SOKista*	*czołg*	*czołgista*	*szachom*	*szachista*
UR:	/sok/	/sok-ista/	/tsowg/	/tsowg-ista/	/šax-om/	/šax-ista/
SR:	[sok]	[sokʲista]	[tsowg]	[tsowgʲista]	[šaxom]	[šaxʲista]
Gloss:	rail.guard	rail.guard-AGENT	tank	tank-AGENT	chess-DAT	chess-AGENT

b. Secondary imperfective affix /-iva/ (only showing /k/ and /x/)

	/k/~/kʲ/		/x/~/xʲ/	
	poszukać	*poszukiwać*	*przesłuchać*	*przesłuchiwać*
UR:	/poʃuk-at͡ʃʲ/	/poʃuk-iv-at͡ʃʲ/	/pʃeswux-at͡ʃʲ/	/pʃeswux-iv-at͡ʃʲ/
SR:	[poʃukat͡ʃʲ]	[poʃukʲivat͡ʃʲ]	[pʃeswuxat͡ʃʲ]	[pʃeswuxʲivat͡ʃʲ]
Gloss:	look.for-INF	look.for-IPFV-INF	interrogate-INF	interrogate-IPFV-INF

(8) Productive surface palatalization on phrasal level

a.	*krok Ireny* 'Irene's step' [kʲi]	*[ki]
b.	*duch Ireny* 'Irene's spirit' [xʲi]	*[xi]
c.	*sklep Ireny* 'Irene's grave' [pʲi]	*[pi]
d.	*brat Ireny* 'Irene's brother' [pʲi]	*[ti]

- A generalization, then: [i] triggers palatalization of obstruents
- A very similar alternation can be triggered by the mid front vowel [ɛ]

(9) Surface velar palatalization triggered by /ɛ/

a. Instrumental singular affix /-ɛm/

	/k/~[kʲ]		/g/~[gʲ]	
	roku	*rokiem*	*rogu*	*rogiem*
UR:	/rok-u/	/rok-ɛm/	/rog-u/	/rog-ɛm/
SR:	[roku]	[rokʲɛm]	[rogu]	[rogʲɛm]
		*[rokɛm]		*[rogɛm]
Gloss:	year-GEN.SG	year-INST.SG	horn-GEN.SG	horn-INST.SG

b. Neuter nominative singular affix /-ɛ/

	/k/~[kʲ]		/g/~[gʲ]	
	wysoko	*wysokie*	*długo*	*długie*
UR:	/vɨsok-o/	/vɨsok-ɛ/	/dwugo/	/dwug-ɛ/
SR:	[vɨsoko]	[vɨsokʲɛ]	[dwugo]	[dwugʲɛ]
		*[vɨsokɛ]		*[dwugɛ]
Gloss:	high-ADV	high-N.SG	long-ADV	long-N.SG

- But: there is no phonotactic ban on sequences [kɛ, gɛ]

(10) Both variants are allowed morpheme-internally

Surface [kɛ,gɛ]		Surface [kʲɛ,gʲɛ]	
kefir	*gest*	*kiedy*	*giermek*
[kɛfʲir]	[gɛst]	[kʲɛdɨ]	[gʲɛrmɛk]
'yogurt'	'gesture'	'when'	'squire'

- Zdziebko (2023): "Why do velar plosives undergo palatalization in environments in which coronal and labial segments remain unaffected?"
- Is it possible to unify the two processes? Do we need to?

2.2 Approaching an analysis

- The pattern can be generated by two rules where the unification rule has a larger set of triggers.

  (11) a. [−son] ∖ {+back} / ___[+syll, −back, +high]

  b. [−son] ⊔ {−back} / ___[+syll, −back]

- 'Judicious underspecification': the necessary assumption is that there are velar stops that are underspecified for ±back in the URs. No other segments that are underspecified for ±back should be in the URs
- Is this analytically better / feasible? Is there a plausible procedure that leads to this?
- Typological point of Rubach (2019), fn. 9: "Rubach (2000a, 2003 and 2017), who postulated these constraints, argues that it would be empirically incorrect to postulate one general PAL constraint. For example, Ukrainian has Palatalization before [i] but not before [ɛ] and [j] (Bilodid 1969)." I am unsure of the force of this argument outside of a factorial typology discussion (which I take Rubach to engage in here).
- This is an issue of rule individuation as an analyst / as a LAD. Take a case of devoicing before a voiceless obstruent.

  (12) a. [−son, +voi] ∖ {+voi} / ___[−son, −voi]

  b. [−son] ⊔ {−voi} / ___[−son, −voi]

- Well, why not this?

  (13) a. [−son, +voi] ∖ {+voi} / ___[ⓟ]

  b. [−son, +voi] ∖ {+voi} / ___[ⓣ]

  c. [−son, +voi] ∖ {+voi} / ___[ⓚ]

  d. ...

- Presumably, rules that make the same change to the same class of target should be collapsed, if possible. Well, why not this?

  (14) a. [ⓑ] ∖ {+voi} / ___[−son, −voi]

  b. [ⓓ] ∖ {+voi} / ___[−son, −voi]

  c. [ⓖ] ∖ {+voi} / ___[−son, −voi]

- Presumably, rules that make the same change to in the same class of context should be collapsed, if possible. Well, why not this?

(15) a. [ⓑ] ∖ {+voi} / ___[ⓟ]
b. [ⓓ] ∖ {+voi} / ___[ⓟ]
c. [ⓖ] ∖ {+voi} / ___[ⓟ]
d. [ⓑ] ∖ {+voi} / ___[ⓣ]
e. [ⓓ] ∖ {+voi} / ___[ⓣ]
f. [ⓖ] ∖ {+voi} / ___[ⓣ]
g. [ⓑ] ∖ {+voi} / ___[ⓚ]
h. [ⓓ] ∖ {+voi} / ___[ⓚ]
i. [ⓖ] ∖ {+voi} / ___[ⓚ]

- Presumably, rules that make the same change should be collapsed, if possible.
- Analytical underdetermination: [ɛ]-triggered surface velar palatalization has exceptions. Two paths to take: underspecify some of the [k,g] or underspecify some of the [ɛ]. If the first path is taken, then there is a unification rule that adds {−back}. If rules that make the same change should be collapsed, the analysis is reached.

(16) a. [−son] ⊔ {−back} / ___[+syll, −back, +high] (for [i]-triggered)
b. [−son] ⊔ {−back} / ___[+syll, −back, −high] (for [ɛ]-triggered)

- So: it's somewhat reachable but needs principled way to resolve analytical choices that are (up to a certain point) equivalent

References

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