Deriving the gap in velar coronalisation

Daniel Gleim (U Leipzig)
daniel.gleim@uni-leipzig.de

Stony Brook University · AMP 7 · 12th October 2019

Observation

(1) [t] ←✗— /k/

- Phonological or morpho-phonological processes, prototypically palatalisation, front velar stops to a coronal place of articulation.
- Fronting may affect additional features like [± strident] or [± continuant].
- If they become [+anterior], additional changes are obligatory: /k/ does not front to [t] or [t̪] (Kochetov 2011).

Surveys

Survey	Sample	Vel →COR	k→t
Bhat (1978)	95 languages	at least 20	0
Bateman (2007)	117 languages	23	0
Mielke (2008)	4560 processes	115	2
Kochetov (2011)	25 genera	at least 7*	0
Gleim et al. (2019)	548 featural affixes	14	0

*/k/→[c] 7 genera; */k/→[tʃ] 6 genera; */k/→[ts] 4 genera

Bhat 1978

- Survey of palatalisation processes.
- Synchronic processes and diachronic changes.
- No clear distinction between [c] and [kʲ].
- No instance of fronting a velar to an anterior, plain stop (/k/ to [t]/[t̪] with any laryngeal specification).

Bateman 2007

- Survey of palatalisation processes.
- Genetically and areally balanced.
- No case of fronting a velar to an anterior, plain stop.

P-Base (Mielke 2008)

- Database of phonological processes.
- Two potential counterexamples: Kiowa (Watkins 1980) and Orma/Oromo (Stroomer 1987).

Kochetov 2011

- Survey of palatalisation processes.
- Genetically and areally balanced.
- Compares genera, not single languages.
- No case of fronting a velar to an anterior, plain stop.

MAMPF-Database (Gleim et al. 2019)

- Database on featural affixation.
- No case of fronting a velar to an anterior, plain stop.

- Minimally different patterns abundantly attested.
- Velar stop that turns into plain [-anterior] coronal stops [c].
- Velar stops turn into [+anterior] sibilant stops [tˢ].

Potential counterexample: Kiowa

- Distribution: Kiowa (Watkins 1980) does not have coronal stops preceding *i/j* and no velar stops or *j* preceding *e*.
- Alternation: Two morphemes show synchronic alternations between [d] and [g] and are analysed by Watkins as being underlyingly /g/.
- The same alternations can be derived from an underlying form /dj/, if the rule of 'glide deletion' is split into two rules: one that deletes glides before non-low vowel, and one that deletes glides in complex onsets.

(2) *Derivation*

/dj-e/	/dj-ɔ/	
de	–	GD I
–	gjɔ	d→g
–	gɔ	GD II

Claim

- The absence of a process that turns /k/ to [t] poses a challenge for both ordered rules and conventional constraints.
- Every mechanism that derives the attested pattern of coronalisation also derives the unattested one, because [t] is featurally closer to /k/ than [s] or [tˢ] are.
- The adoption of containment (Prince & Smolensky 1993,2004) and the Cloning Hypothesis (Trommer 2011) gives the necessary tools to formalise a constraint that accounts for the generalisation.

Implications

Rules

- A rule for /k/→[ts] patterns (3) entails a simpler rule that derives /k/→[t] (4).

(3) [DOR]→ [COR, +ant, +str] / __X

(4) [DOR]→ [COR, +ant] / __X

- If excluded by stipulation, a *feeding* order of necessary rules still derives k→t (e.g. k→c→t).

Constraints

- *Markedness* constraints penalise marked output structures and cannot refer to processes. A plain anterior coronal stop belongs to the most unmarked segments and thus cannot be a bad output.
- *Faithfulness* constraints predict [t] to be a more optimal output for underlying /k/ than [tˢ] or [s], since except for the place features, *k* and *t* are featurally identical.

Solution

- Containment: The Generator Gen cannot delete material, just mark it as invisible for phonetic interpretation (Prince & Smolensky 1993,2004; Trommer 2011).
- Cloning Hypothesis: Constraints come in two editions, one that sees only visible material (standard surface markedness constraints) and one that sees the 'deleted', phonetically uninterpretable material too (Trommer 2011).
- Binary features: Features, most importantly [±cont] and [± str(ident)], are binary and phonology can refer to the negative value.
- The constraint in (5) is now possible: It is violated by a plain coronal stop that is underlyingly associated to a [DOR] feature – a /k/ that surfaces as [t].

(5) *Constraint against k→t*

*
•
[COR] [-cont] [DOR]
[+ant] [-str]

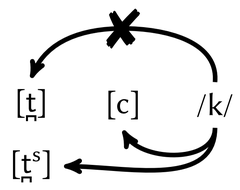
- If the generalisation is truly a universal and not just a strong tendency, the constraint in (5) must be a constraint on Gen.
- Full assimilation (/kt/ → [tː]) is not excluded by this constraint – here it is the mora that associates to the adjacent root node.

Repairs

The constraint shows itself not only in the typological distribution, but it also constrains repairs in several languages.

Acoma

(6) *Laminalisation of /k/ (cf. Miller 1965)*



- With laminalising affixes, /k/ is fronted to [t̪ˢ].

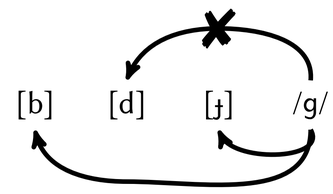
(7) /k'-[+lam]iʔipee/ → [t̪ˢ'iʔipee] 'his ear'

- Following sibilants strident stops are not allowed.
- If this prevents [t̪ˢ], /k/ fronts to [c].
- In the same context, /c/ fronts to [t̪].

(8) a. /ʃk-[+lam]áámúʃa/ → [ʃcáámúʃa] 'his beard'
b. /s'--isiu̯ʃcan-[+lam]a̯a̯jan/ → [s'isiuʃt̪a̯a̯ja] 'I am roping him'

Wakimbee

(9) *Place-assimilation of* /g/ *(cf. Kauczor 1920)*



- /g/ assimilates in place to an adjacent sonorant.
- If this nasal is an anterior coronal, it assimilates in coronality but does not become [+anterior], by changing into a palatal stop.

(10)

a. /am-gi/	→	[ambi]	'buck-Acc'
b. /hun-gi/	→	[huɲɟi]	'lineage-Acc'
c. /aren-tuɲ-gi/	→	[arenduɲɟi]	'horizon-Acc'
d. /kal-gi/	→	[kalɟi]	'bread-Acc'

Discussion

- In child language, k→t is a very frequent process (Vihman 1987; Inkelas & Rose 2007). This process might be context-free or conditioned by prominence, adjacent vowels or adjacent consonants.
- A phonetic or a historic approach for the absence of k→t is therefore difficult.