

The emergence of the comparatively unmarked

Martin Krämer
Universitetet i Tromsø / CASTL^{Fr}
martin.kraemer@hum.uit.no

1 Introduction

(1) Glottal stop in Selayarese

- a. ku-ʔ-uraŋi ri-uraŋi ku-inuŋi ri-ʔ-inuŋi
'I accompany him' 'you hon. accompany him' 'I drink it' 'you hon. drink it'

- b. taʔ-ataʔ taʔ-entenj taʔ-inuŋ
'to be roofed' 'to be erected' 'to be drunk'

(Lombardi 2002, Mithun & Basri 1986)

(2) Glottal stop in German

- a. ['ʔe:kl] Ekel 'disgust' b. ['zaən] sahen 'see' (past, -2, pl.)
[ka'ʔotɪʃ] chaotisch 'chaotic' ['kaʊs] Chaos 'chaos'
[te'ʔata] Theater 'theatre' [tea'tra:lɪʃ] theatralisch 'showily'
[ʔi'ke:a] Ikea 'Ikea'

(3) Where glottal stop does not occur in German

- a. *ʔlam *ʔnam *ʃʔlo:m *tyʔə *tyʔ
*ʔRam *ʃʔa:l *ʃʔRo:m *tyʔə *tyʔ
b. * [na'ʔotɪʃ] ~ ['naʔʊs]

The absence of unpredictable glottal stops in German shows: Glottal epenthesis inserts an alien.

The problem:

OT analyses of insertion account for (2), but not for (3).

The RotB forces us to consider all kinds of inputs (the forms in 3)

(4) Typical OT analysis:

PhonoCONSTRAINT » FAITHFULNESS » *Lab/Dors » *Cor » *Lar

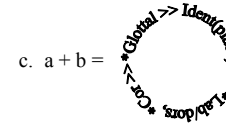
(5) The emergence of the non-contrastive in OT:

- a. *F » FAITH(F)
b. PHONO-CONSTRAINT » *F » FAITH(F)

(6) The (impossible) emergence of the non-contrastive with Lombardi (2002):

- a. Glottal stop is not contrastive, other places of articulation are:
*Glottal » FAITH(Place) » *Labial, *Dorsal » *Coronal

- b. Glottal stop is epenthetic C, so must be least marked:
FAITH(Place) » *Labial, *Dorsal » *Coronal » *Glottal



(7) Ranking (6a): Wrong epenthetic consonant

/ekl/	ONSET	*GLOTTAL	IDENT(PLACE)	*LAB/DORS	*COR
a. ekl	*!			*	
b. ʔekl		*!		*	
c. pekl				**!	
d. kekl				**!	
e. tekl				*	*

(8) Ranking (6a): Right result for lexical glottal stop

/peʔl/	ONSET	*GLOTTAL	IDENT(PLACE)	*LAB/DORS	*COR
a. peʔl		*!		*	
b. pekl			*	**!	
c. pepl			*	**!	
d. petl			*	*	*

(9) Ranking (6b): Right result for epenthetic consonant

/ekl/	ONSET	IDENT(PLACE)	*LAB/DORS	*COR	*GLOTTAL
a. ekl	*!		*		
b. ʔekl			*		*
c. pekl			**!		
d. kekl			**!		
e. tekl			*	*!	

(10) Ranking (6b): Wrong result for lexical glottal stop

/peʔl/	ONSET	IDENT(PLACE)	*LAB/DORS	*COR	*GLOTTAL
a. peʔl			*		*
b. pepl			**		
c. pekl			**!		
d. petl			*	*!	

^{Fr} CASTL = Center for Advanced Study in Theoretical Linguistics. <http://uit.no/castl>

The proposal

The emergence of glottal stop in German is a Comparative Markedness effect:
Laryngeal consonants are good enough for epenthesis, but not good enough for the lexicon: Old *LAR >> FAITH >> New *LAR

This leads us to a general account of structure preservation and a return to lexical economy.

2 Excluding glottal stop from the German lexicon by surface constraint interaction

2.1 Comparative markedness

(11) Old and New Markedness

- O^*PLACE Assign a violation mark for each consonantal place of articulation in the output that is present in the FFC.
- N^*PLACE Assign a violation mark for each consonantal place of articulation in the output that is *not* present in the FFC.

(12) Comparative markedness constraint satisfaction and violation

/p/ FFC: p	O^*PLACE	N^*PLACE
a. p	*	
b. k		*
c. \emptyset		

(13) Ranking old markedness above new markedness

/p/ FFC: p	O^*PLACE	MAXIO	N^*PLACE
a. p	*!		
b. k			*
c. \emptyset		*!	

(14) Coalescence in Sanskrit (McCarthy 2002)

/a+i/ → e:
/ca₁ + i₂ha → ce:_{1,2}ha 'and here'
/a+u/ → o:
/ca₁ + u₂ktam → co:_{1,2}ktam 'and said'

(15) Sanskrit

/e/	*DIPH	O^*MID	IDENT	N^*MID
a. e		*!		
b. i			*	
c. a			*	
/a ₁ + i ₂ /				
d. a ₁ i ₂	*!			
e. e: _{1,2}				*
f. i: _{1,2}			*!	

2.2 The comparative markedness of glottal stop

(16) The sad fate of underlying glottal stops

/ʃʀo:ʔ/	O^*LAR	MAXIO	IDENT(PLACE)	N^*LAR
a. ʃʀo:ʔ	*!*			
b. ʃʀo:t			**	
c. ʃʀo:		**		

(17) Glottal epenthesis

/ekl/	O^*LAR	ONSET	IDENT(PLACE)	N^*LAR
a. 'e:kl		*!		
b. 'ʔe:kl				*

(18) Who is the best epenthetic consonant?

/ekl/	ONSET	O^*LAR	IDENT(PLACE)	*LAB/DORS/COR	N^*LAR
a. 'e:kl	*!				
b. 'te:kl				*!	
c. 'pe:kl				*!	
d. 'ke:kl				*!	
e. 'ʔe:kl					*

(19) Coda neutralisation in Colloquial German: Another glottal stop

[Raʔn] Ratten 'rats'
[laʔm] Lappen 'cloth'
[haʔŋ] Hacken 'hoes'
[ha:ʔŋ] Haken 'hook'

(20) For codas, MAX-IO has to outrank IDENT(place).

/Ratn/	O^*LAR	DEBUCC	MAXIO	IDENT(PLACE)	*PLACE
a. Ratn		*!			***
b. Raʔn				*	**
c. Ran			*!		**

3 No alternative

3.1 Positional markedness or positional licensing

- (21) Positional markedness constraints on glottal stop - to be rejected
- *Glottal Complex onset
 - *Glottal unstressed onset
 - *Glottal coda

- (22) Positional licensing constraint: LIC /ʔ {#_, F(}_
- '[ʔ] is possible in word-initial and foot-initial position only.'

All descriptively adequate, but do not tell us anything about the grammar.

For varieties that have [ʔ] only word-initially we need more machinery.

3.2 Markedness and Faithfulness scales

- (23) Markedness (de Lacy 2002):
- *K; *K,P; *K,P,T; *K,P,T,ʔ

- (24) Faithfulness:
- IDENT(K); IDENT(K,P); IDENT(K,P,T); IDENT(K,P,T,ʔ)

Whatever the ranking, glottal stop can only be present if the other poa's are.
+ glottal stop may be the least faithful, but still the least marked.

Ranking for German:

IDENT(K); IDENT(K,P); IDENT(K,P,T) >> *K; *K,P; *K,P,T; *K,P,T,ʔ >> IDENT(K,P,T,ʔ)

(25) /ʃ/ mapped unfaithfully

/ʃʀo:ʃ/	IDENT(K,P,T)	*K,P,T	*K,P,T,ʔ	IDENT(K,P,T,ʔ)
a. ʃʀo:ʃ			**	
b. ʃtʀot		**	*!*	**
c. ʃʀo:				

(26) ∅ mapped to [ʔ]:

/ekl/	ONSET	IDENT (K,P,T)	*K,P	*K,P,T	*K,P,T,ʔ	IDENT (K,P,T,ʔ)
a. 'e:kl	*!		*	*		
b. 'te:kl			*	**	*!*	
c. 'pe:kl			**	**	*!*	
d. 'ke:kl			**	**	*!*	
e. 'ʔe:kl			*	*	**	

(27) /ʔ/ and ONSET

/ʔekl/	ONSET	IDENT (K,P,T)	*K,P	*K,P,T	*K,P,T,ʔ	IDENT (K,P,T,ʔ)
a. 'e:kl	*!		*	*		
b. 'te:kl			*	**	*!*	*
c. 'pe:kl			**	**	*!*	*
d. 'ke:kl			**	**	*!*	*
e. 'ʔe:kl			*	*	**	

Underlying glottal stop cannot be mapped to the surface unless an onset is needed.
Problem: [ka.ʔs] If /ka.ʔs/ is in the input we get the wrong result:

(28)

/ka.ʔs/	CONTIGUITY	IDENT (K,P,T)	ONSET	*K,P	*K,P,T	*K,P,T,ʔ	IDENT (K,P,T,ʔ)
a. ka.ʔs				*	*	**	
b. ka.tʰs				*	*!*	**	*!
c. ka.ʔs	*!		*	*	**	*	

/ʔ/ does not occur in onsets of unstressed syllables. Reranking of ONSET doesn't help: It cannot be ranked below *K,P,T,ʔ — /ʔ/ is unbeatable.

Same problem arises with glottal in stressed syllable coda: WSP or word minimality could cause glottal to be realised faithfully. /hyʔ/ -> *['hyʔ] > *['hy]

(29) /ka.ʔs/ in CM

/ka.ʔs/	o*LAR	IDENT (PLACE)	CONTIGUITY	ONSET	*LAB/DORS/COR	N*LAR
a. ká.ʔs	*!				**	
b. ká.tʰs		*!			***	
c. ká.ʔs			*	*	**	

Ranking of CONTIGUITY, ONSET, and IDENT(PLACE) wrt each other indeterminate: Whether input glottals in nonsense words are mapped to coronal or deleted has to be determined in further fieldwork.

4 Extension: Structure preservation and opacity

Another case of the emergence of the non-contrastive: Italian dorsal nasals only emerge in coda position in place assimilation to a following stop.

(30) *[ŋ]occo

/ŋɔkko/	FAITH(NAS)	CODACOND	* _O [ŋ]	FAITH(PLACE)	* _N [ŋ]
a. ŋɔkko			*!		
b. ɔkko				*	
c. gɔkko	*!			*	

The emergence of the dorsal nasal before a dorsal consonant is possible because of the low ranking of *_N[ŋ]. With this simple grammar we exclude the dorsal nasal everywhere except in the assimilation context.

(31)

/tʃimk ^w e/	FAITH(NAS)	CODACOND	* _O [ŋ]	FAITH(PLACE)	* _N [ŋ]
a. tʃimk ^w e		*!			
b. tʃink ^w e		*!		*	
c. tʃiŋk ^w e				*	*
d. tʃikk ^w e	*!				

(32) Schematic rankings

- a. Counterfeeding opacity: $oM \gg \text{Faith} \gg nM$
- b. DEE: $nM \gg \text{Faith} \gg oM$
- c. German glottal stop ranking: $oM \gg \text{Faith} \gg nM$
- d. Structure preservation: $nM \gg \text{Faith} \gg oM$
- e. Structure innovation: $oM \gg \text{Faith} \gg nM$

Comparison is misleading: Comparative Markedness constraints in (30a,b) trigger process; Comparative Markedness constraints in (30c,d,e) determine solution to satisfaction of another markedness constraint. Triggering constraints: ONSET in German, *DIPH in Sanskrit, CODACOND in Italian (not divided into _O and _N variants)

5 The consequences of CM for lexicon optimization

Lexicon Optimization filters out all predictable structure from the lexicon under the ranking $oM \gg nM$, resulting in the underlying segment inventory being leaner than the surface inventory.

From this perspective, counterfeeding opacity (or overapplication) arises from a ranking that serves lexical economy. Hence, opacity and non-structure preserving phonology are side effects of a struggle towards the same end: lexical economy.

Yet another puzzle: New word game in Turkish (Harrison & Kaun 2000, 2001): Predictable non-alternating structure was found to be underlyingly underspecified in vowel harmony systems.

(33) Turkish novel reduplications (Harrison & Kaun, 2001)

a. kibrit	kibrit-kabrit	*kibrit-kabrit	'match'
bütün	bütün-batın	*bütün-batın	'whole'
b. mali	mali-mulî	*mali-mulî	'Mali'
butik	butik-batik	*butik-batik	'boutique'

However, LO did not predict this at this time, because of the nature of the constraint set.

(34) With CM, LO does the job (given the right ranking, the right feature theory etc.)

	FAITH _O	_O *DORS	_O *COR	_N *DORS	_N *COR
a. /kibrit/, kibrit			**!		
b. /kibrV ^{hi} l/, kibrit			*		(*)

6 Conclusion

- ☛ The distribution of glottal stops in German poses a general puzzle due to the RotB: How do we solve the markedness paradox in a principled way: Too marked to be contrastive, but unmarked enough to be the default. Problem slipped through unnoticed in previous analyses.

- Comparative Markedness solves this riddle: Drawing a line between old and new.

- CM explains the emergence of the non-contrastive.

- CM brings OT's predictions on underlying representation back to pre-OT reasoning: Underspecification of predictable structure is predicted under $oM \gg nM$.

☛ Postscript

Kiparsky (1985): Non-structure preserving phonology applies *postlexically* only. An unstatable generalisation for a parallelist theory. Is this generalisation valid? No. (Harris 1987, 1990)

(35) Allophones of /e/ in Belfast English (own data)

a. [gɛ:]	'gay'	↳ Derived contrast
[gɛz]	'gaze'	
b. [gɛz]	'gay-s'	

Closed syllable diphthongization is non-structure preserving, but blocked before level 2 affixes, i.e., applies at stem level (in LP terms).

Hence: No need for further action.

References

- Alber, Birgit (2001). Regional variation and edges: Glottal stop epenthesis and dissimilation in standard and southern varieties of German. *Zeitschrift für Sprachwissenschaft* 20. 3-41.
- Archangeli, Diana (1988). Aspects of underspecification theory. *Phonology* 5:183-207.
- Beckman, Jill N., and Catherine O. Ringen (2004). Contrast and Redundancy in OT. In *WCCFL* 23. 101-114.
- Bermúdez-Otero, Ricardo (in press). *Stratal Optimality Theory*. Oxford: Oxford University Press.
- de Lacy, Paul (2002). *The Formal Expression of Markedness*. Ph. D. Dissertation, UMass, Amherst.
- Goad, Heather (1997). Coronals are not underspecified. *WCCFL* 15. 161-175.
- Gouskova, Maria (2003). *Deriving economy: Syncope in Optimality Theory*. Ph.D. Dissertation, University of Massachusetts, Amherst.
- Hall, T.A. (1997). *The phonology of coronals*. Amsterdam: Benjamins.
- Harris, John (1987). Non-Structure-Preserving Rules in Lexical Phonology. *Lingua* 72. 255-292.
- (1990). Derived phonological contrasts. In Susan Ramsaran (ed.) *Studies in the Pronunciation of English. A Commemorative Volume in Honour of A. C. Gimson*. London: Routledge. 87-105.
- Harrison, K. David & Abigail Kaun (2000). Pattern-Responsive Lexicon Optimization. *NELS* 30. 327-340.
- (2001). Patterns, pervasive patterns and feature specification. In T. Alan Hall (ed.) *Distinctive Feature Theory*. Berlin: Mouton de Gruyter. 211-236.
- Hume, Elizabeth and Georgios Tserdanelis (2002). *Labial Unmarkedness in Sri Lankan Portuguese Creole*. *Phonology* 19. 441-458.
- Inkelas, Sharon (1994). The Consequences of Optimization for Underspecification. In *NELS* 25. 287-302.
- Itô, Junko (1988). *Syllable Theory in Prosodic Phonology*. New York: Garland Publishing.
- Itô, Junko & Armin Mester (1998). *Markedness and Word Structure: OCP Effects in Japanese*. Ms. UC Santa Cruz.
- (2003). On the Sources of Opacity in OT: Coda Processes in German. In Caroline Féry & Ruben van de Vijver (eds.) *The Syllable in Optimality Theory*. Cambridge University Press. 271-303.
- Kiparsky, Paul (1982). From cyclic phonology to lexical phonology. In Harry van der Hulst and Norval Smith (eds.) *The Structure of Phonological Representations* Vol.1. Dordrecht: Foris. 131-175.
- (1985). Some consequences of Lexical Phonology. *Phonology Yearbook* 2. 85-138.
- (2000). Opacity and Cyclicity. *The Linguistic Review* 17. 351-365.
- Krämer, Martin (2003). Intervocalic s-voicing, geminates and the Richness of the Base in Veneto Italian. *Rivista di Grammatica Generativa* 28. 71-85.
- (to appear a). Optimal underlying representations. To appear in *NELS* 35.
- (to appear b). English shwa insertion before liquids and phonological opacity. To appear in *CLS* 41.
- Lombardi, Linda (2002). Coronal Epenthesis and Markedness. *Phonology* 19. 219-251.
- Lubowicz, Anja (2002). Derived Environment Effects in Optimality Theory. *Lingua* 112. 243-280.
- McCarthy, John J. (2002). *Comparative Markedness*. Ms. University of Massachusetts, Amherst.
- (2003). *Comparative Markedness*. *Theoretical Linguistics* 29. 1-51.
- (2004). Taking a Free Ride in Morphophonemic Learning. To appear in *Catalan Journal of Linguistics* 4 (Special issue on Phonology in Morphology, ed. by Maria Rosa Lloret and Jesús Jiménez).
- McCarthy, John & Alan Prince (1995). Faithfulness and Reduplicative Identity. *UMOP* 18. 249-384.
- Mithun, Marianne & Hasan Basri (1986). The phonology of Selayarese. *Oceanic Linguistics* 25. 210-254.
- Moreton, Elliot & Paul Smolensky (2002). Typological Consequences of Local Constraint conjunction. *WCCFL* 21. 306-319.
- Nevins, Andrew and Bert Vaux (2005). Underlying Representations that do not Minimize Grammatical "Violations". To appear in Sylvia Blaho, Patrik Bye and Martin Krämer (eds.) 'Freedom of Analysis?' Berlin: Mouton.
- Paradis, Carole & Jean Francoise Prunet (eds.) (1997). *Phonetics and Phonology, Volume 2: The special status of coronals*. San Diego: Academic Press.
- Pater, Joe (1999). Austronesian nasal substitution and other NC effects. In René Kager & Wim Zonneveld (eds.) *The Prosody-Morphology Interface*. Cambridge: Cambridge University Press. 310-343.
- Prince, Alan & Paul Smolensky (1993). *Optimality Theory: Constraint Interaction in Generative Grammar*. Ms., Rutgers University and University of Colorado.
- Rubach, Jerzy (1997). Extrasyllabic Consonants in Polish: Derivational Optimality Theory. In Iggy Roca (ed.) *Derivations and Constraints in Phonology*. Oxford: Oxford University Press. 551-581.
- Steriade, Donca (1995). Underspecification and Markedness. In John Goldsmith (ed.) *The Handbook of Phonological Theory*. Cambridge, Mass.: Blackwell Publishers. 114-174.
- Uffmann, Christian (to appear). Intrusive [r] and optimal epenthetic consonants. To appear in *Language Sciences*.
- Wiese, Richard (1996/2000). *The Phonology of German*. Oxford University Press.