Selective Faithfulness and Voicing Assimilation*

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1. Introduction: Headed Syllable Constituents and Selective Faithfulness Theory

(1) *Overview of Selective Faithfulness Theory*

(a) Representation:
(i) Every syllable constituent has a (rigidly defined) head
(*Headed Syllable Constituents Hypothesis* (=: HeSC))

(b) Constraints:
(i) Faithfulness to heads (e.g., 'onset head')
(ii) No faithfulness to anything else

(c) Other Assumptions
(i) Autosegmentalism, full specification, equipollent voicing feature
(ii) Positional faithfulness to onset heads to predict the direction of assimilation (Beckman 1998 and Lombardi 1999)
(iii) Voicing faithfulness is split into faithfulness to each feature value (*Split Faithfulness Hypothesis*)
(iv) Autosegmentally defined markedness constraints which are used to drive assimilation and neutralization

(d) Results:
(i) Predicts *no* monomorphemic tautosyllabic voicing disagreement (*Absolute Assimilation*[1])
(ii) Accounts for known range of voicing assimilation and neutralization patterns
(iii) Avoids the Majority Rules problem

(2) *Structure of the rest of this talk*
Section Two: Headed Syllable Constituents hypothesis
Section Three: Core Constraints and Implementation
Section Four: Predictions: Typology and (NO) Majority Rules

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[1] I thank Paul de Lacy for the suggestion of this terminology

2. Headed Syllable Constituents (HeSC)

(3) *Constituent Heads*

(a) Each syllable constituent has a head
(Related to ideas in Charm and Government Phonology, Dependency Phonology, Span Theory).

(b) The head is the only locus of voicing faithfulness.

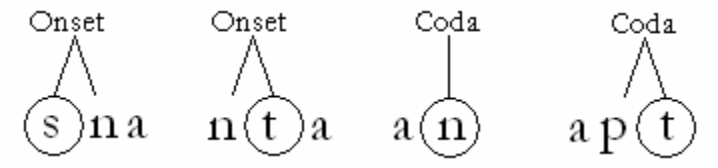
(c) The head position is rigidly determined.

(4) *Definition of Head Position*[2]

(a) Head(Onset) → the leftmost obstruent in the onset, else the leftmost segment

(b) Head(Coda) → the rightmost obstruent in the coda, else the rightmost segment

(5) *Illustrations of head definitions*



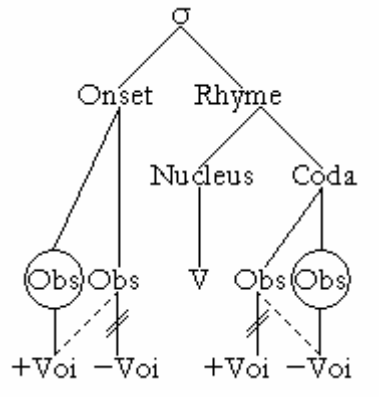
(6) *Faithfulness only to the head*

If there is *only one* member to whom the (monomorphemic tautosyllabic) cluster is faithful, given a markedness pressure to reduce the number of specifications (e.g., *SPECIFY(voice)), the cluster will necessarily agree.

(7) *Absolute Assimilation*

No language has surface within-constituent obstruent voicing disagreement:
i.e. ☠[bta], ☠[zta] (Greenberg 1978, Kehrein & Golston 2004)

(8) *Illustration* (heads are circled)



• Informally, this diagram shows the significance of heads:
In Selective Faithfulness Theory, there is no faithfulness (to voice) in non-heads, so, given the markedness pressure to minimize voicing specifications, non-heads obligatorily take on the voicing value of the head of their constituent[3] (see below for a constraint-based argument).
[NB: Heads are bolded in tableaux, not circled]

[2] The nucleus has a head, but discussion of this is not relevant here.

[3] Barring, of course, other markedness pressures, like voicing neutralization. In this case, a markedness constraint (*VOIOBS, or the like) would outrank faithfulness to the head and both the head and the non-head(s) would devoice. See Section Four for discussion within Selective Faithfulness Theory.

2.1 Definition of Onset Head: Evidence from Czech.

(9) *Why define heads as the 'leftmost obstruent' for onsets?*
Czech has obstruent-obstruent clusters where the leftmost member controls assimilation; evidence: underlying voicing distinction in tautosyllabic clusters.

(10) *The Czech obstruent* [r̝]
Czech [r̝], a strident rhotic trill (see Ketner 2005), is underlyingly voiced. [r̝] and [r̝̥] are in complementary distribution; [r̝̥] occurs only in assimilation contexts and word-finally (Czech has coda voicing neutralization). [See Appendix One for more detail.]

(11) *"progressive" tautosyllabic voicing*

(a) /tr̝i/	→	[.tr̝̥i.]	'three'
(b) /str̝eda/	→	[.str̝̥eda.]	'Wednesday'

- Here the leftmost obstruent is the head, so [r̝] devoices.
  IDENT-HEAD(ONSET) triumphs.

(12) *Onset head as the 'leftmost obstruent' explains both:*
(a) progressive tautosyllabic voicing assimilation *and*
(b) regressive heterosyllabic voicing assimilation

(13) H*eterosyllabic regressive voicing assimilation*

(a) /arab/+/ski/	→	[.arap.ski.]	'arabic'
(b) /mor̝/+/ski/	→	[.mor̝̥.ski.]	'oceanic'
(c) /pr̝es/+/r̝adou/	→	[.pr̝̥ez.r̝a.dou.]	'across (a/the) line'

- IDENT-HEAD(ONSET) triumphs.

(14) *Alternative 1: Why not say that [r̝] has weak faithfulness to [voice] or (ignoring Richness of the Base!!) say that it has no underlying [voice] specification?*
[+voice] *does* spread from [r̝] in regressive voicing.

(15) *Alternative 2: Lombardi (1999): The released obstruent is the 'head'*
(a) Incorrectly predicts /tr̝i/ → *[.dr̝i.]

2.2 Definition of Coda head: Evidence from Yiddish.

(16) *Why define heads as the 'rightmost obstruent' for codas?*
= Yiddish verbal paradigm: not stem-faithful

(a) /lib/+/-Ø/	→	[.lib.] 'I love' (love + 1.SG)
(b) /lib/+/-st/	→	[.lip-st.] 'you love' (love + 2.SG.FAM)
(c) /lib/+/-t/	→	[.lip-t.] 'he loves' (love + 3.SG)

- Here the rightmost obstruent is the head, so [b] devoices.
  IDENT-HEAD triumphs over stem faithfulness.

3. Core Constraints of Selective Faithfulness (for Voicing) and Implementation

(17) *Split Faithfulness Hypothesis*
There are languages which *independently* regressively spread either [−VOICE] (Ya:thê, Mekkan Arabic) or [+VOICE] (Ukrainian) (Butska 1998, Wetzels & Mascaró 2001). Faithfulness to voice must be split to each value to account for these patterns. [See Appendix Two for discussion and rankings for these two languages.]

(18) *Selective Faithfulness for voicing*
- (a) There is only voicing faithfulness to the underlying specification of heads.
- (b) There is stringent positional faithfulness (Beckman 1998 and Lombardi 1999)
- (c) There is split faithfulness.

(19) *Core Faithfulness Constraints for voicing assimilation*

(a) IDENT-HEAD([+VOICE]) (=: IH[+V])
"Heads are [+VOICE] if their input correspondents are"
> For all segments x, x' s.t. x ∈ Input, x' ∈ Output, and x' is syllabified in a head position, if x' is the output correspondent of x and x is [+VOICE], then x' is [+VOICE].

(b) IDENT-HEAD([−VOICE]) (=: IH[−V])
"Heads are [−VOICE] if their input correspondents are"
> For all segments x, x' s.t. x ∈ Input, x' ∈ Output, and x' is syllabified in a head position, if x' is the output correspondent of x and x is [−VOICE], then x' is [−VOICE].

(c) IDENT-HEAD(ONSET) ([+VOICE]) (=: IHO[+V])
"Onset heads are [+VOICE] if their input correspondents are"
> For all segments x, x' s.t. x ∈ Input, x' ∈ Output, and x' is syllabified as the head of an onset, if x' is the output correspondent of x and x is [+VOICE], then x' is [+VOICE].

(d) IDENT-HEAD(ONSET) ([−VOICE]) (=: IHO[−V]))
"Onset heads are [−VOICE] if their input correspondents are"
> For all segments x, x' s.t. x ∈ Input, x' ∈ Output, and x' is syllabified as the head of an onset, if x' is the output correspondent of x and x is [−VOICE] then x' is [−VOICE].

(20) *Core Markedness Constraints for voicing assimilation*

(a) *LINK[+VOICE] autosegment (=: *LINK[+V])
> Assess one violation for each obstruent in head position linked to a [+VOICE] autosegment.

(b) *SPECIFY[VOICE] (=: *SPEC[V])
> Assess one violation for each [VOICE] autosegment.

3.1 Absolute Assimilation

(21) *Selective Faithfulness predicts Absolute Assimilation*
Because there is no faithfulness to non-heads, pressure to reduce the number of voicing specifications causes *Absolute Assimilation*.

(22) *Absolute Assimilation of underlying voicing disagreement in /pda/*

/pda/	*SPEC[V]	IHO−	IH−	*LINK[+V]
1. ☞ [.**p**ta.]	1			
2. ~[.**b**da.]	$e_{1\sim1}$	$\mathbf{W}_{0\sim1}$	$\mathbf{W}_{0\sim1}$	$\mathbf{W}_{0\sim1}$
3. ~[.**p**da.]	$\mathbf{W}_{1\sim2}$	$e_{0\sim0}$	$e_{0\sim0}$	$e_{0\sim0}$

● The tableau in (22) shows that underlying /pda/ will *always* assimilate to [.**p**ta.], as both of the other candidates are harmonically bounded by candidate 1.

(23) *Absolute Assimilation of underlying voicing disagreement in /bta/*

/bta/	*SPEC[V]	IHO+	IH+	*LINK[+V]
1. ☞ [.**b**da.]	1			1
2. ~[.**p**ta.]	$e_{1\sim1}$	$\mathbf{W}_{0\sim1}$	$\mathbf{W}_{0\sim1}$	$\mathbf{L}_{0\sim1}$
3. ~[.**b**ta.]	$\mathbf{W}_{1\sim2}$	$e_{0\sim0}$	$e_{0\sim0}$	$e_{1\sim1}$

● The tableau in (23) shows that underlying /bta/ will *always* assimilate to *either* [.**b**da.], (when IHO+ >> *LINK[+V] or IH+ >> *LINK[+V]) or to [.**p**ta.], (when *LINK[+V] >> IHO+, IH+)

3.2 Tautosyllabic Voicing Disagreement

(24) *Obstruent-Sonorant Clusters*
Many languages preserve input voicing disagreement in obstruent-sonorant clusters; e.g. /sno/ → [sno] and /tre/ → [tre]

(25) *Only Markedness*
Selective Faithfulness theory predicts tautosyllabic obstruent-sonorant voicing disagreement *with no additional faithfulness constraints*

(26) *Obstruent-Nasal Clusters can disagree in voicing*

/sno/	*n̥	*SPEC[V]	*LINK[+V]	IHO−	IH+	IH−
1. ☞ [.**s**no.]		2	1			
2. ~[.**s**n̥o.]	$\mathbf{W}_{0\sim1}$	$\mathbf{L}_{2\sim1}$	$\mathbf{L}_{1\sim0}$	$e_{0\sim0}$	$e_{0\sim0}$	$e_{0\sim0}$

(The markedness constraint against voiceless nasals prevents absolute assimilation)

(27) *Obstruent-Liquid (or –Glide) Clusters can disagree in voicing*

/tre/	*r̥	*SPEC[V]	*LINK[+V]	IHO−	IH+	IH−
1. ☞ [.t**r**e.]		2	1			
2. ~[.t**r̥**e.]	$\mathbf{W}_{0\sim1}$	$\mathbf{L}_{2\sim1}$	$\mathbf{L}_{1\sim0}$	$e_{0\sim0}$	$e_{0\sim0}$	$e_{0\sim0}$

(The markedness constraint against voiceless nasals prevents absolute assimilation)

3.3 Summary: Typological predictions of heads

(28) *Absolute Assimilation*

Selective Faithfulness theory predicts all clusters should agree in voicing, with only one exception:

(i) Additional markedness constraints

e.g. not to devoice sonorants

/sno/ → [.**s**no.] and /tre/ → [.**t**re.]

(29) *Absolute Assimilation*

All within-constituent voice assimilation should be to the leftmost obstruent in onsets, and to the rightmost obstruent in codas, with only two exceptions:

(i) Additional markedness constraints (candidate 2 in the tableau in (23))

e.g. /ba/ → [.**p**a.], /bta/ → [.**p**ta.]

or /ab/ → [.a**p**.], /apd/ → [.ap**t**.]

(ii) Stem/root-faithfulness:

e.g. Czech [s-√domem] → [zdomem], *[stomem]

or English /√kæt-z/ → [kæts], *[kædz]

4. Predictions of Selective Faithfulness Theory and (No) Majority Rules

4.1 The Voicing Assimilation and Neutralization Typology

(30) *The typology predicted by Selective Faithfulness Theory has 11 cells*

(Dark grey shading indicates that type of language is not predicted; unshaded boxes are the predicted languages, and include examples of languages which exhibit that pattern.)

	Neutralization Pattern		
Assimilation Pattern	Complete	Coda	None
Regressive [+VOICE]			Ukrainian
Regressive [−VOICE]		Ya:thê' (?)	Ya:thê, Mekkan Arabic, Yorkshire English
Regressive [+/−VOICE]		Polish, Dutch, Czech, Slovak	Yiddish
Progressive [+VOICE]			
Progressive [−VOICE]			
Progressive [+/−VOICE]			
Bi-directional [+VOICE]			Swedish* (?)
Bi-directional [−VOICE]		Swedish' (?)	Swedish
Bi-directional [+/−VOICE]			
None	Hawaiian	German	Berber

(31) All attested patterns are accounted for (Polish, Yiddish, Ukrainian, Ya:thê, Swedish, German, Faithful, and Unmarked)[4]

(32) Predicts three unattested languages: Ya:thê' (with devoicing), Swedish' (with devoicing), and Swedish* (bidirectional [+VOICE])

- NB: Clusters will pattern with their head for purposes of assimilation

4.2 (No) Majority Rules

(33) 'Majority Rules' defines a situation where the output takes on the feature value that is most numerous in the input (e.g. Lombardi 1999, Baković 1999, de Lacy 2006, etc).

(34) *The Majority Rules Effect: the better represented value wins!*

/apzta/	→	[apsta]	/absda/	→	[abzda]
/apsda/	→	[apsta]	/abzta/	→	[abzda]

(35) *Majority Rules is caused by Faithfulness to both feature values*

/apzta/	*SPEC[V]	I(+/−)	IO(+/−)	*VoiOb
1. ☞[.ab.zda..]	1	1	1	3
2. [.ap.sta.]	$e_{1\sim1}$	$\mathbf{W}_{1\sim2}$	$\mathbf{L}_{1\sim0}$	$\mathbf{L}_{0\sim3}$
3. [.ap.zta.]	$\mathbf{W}_{1\sim3}$	$\mathbf{L}_{1\sim0}$	$\mathbf{L}_{1\sim0}$	$\mathbf{L}_{1\sim3}$

(36) *Swedish data* (Lombardi 1999:285).

(a) /sku:g/	→	[sku:g]	'forest'
(b) /vigsəl/	→	[viksəl]	'marriage'
(c) /stekde/	→	[stekte]	'fried'
(d) /ägde/	→	[ägde]	'to own (preterite)'
(e) /skug+s+brand/	→	[skuk:spran:d]	'forest (genitive) fire'

(37) *Danger: Environment for Majority Rules*

/skug/+/s/+/brand/ → [skug:zbran:d] 'forest fire'

(38) *Selective Faithfulness Theory predicts the correct output*:
Since there is only faithfulness to heads, there will only be two competing voicing specifications—that of the onset-head, and that of the coda-head

[4] Language examples are to represent an instantiation of a pattern, and is not the list of *languages* accounted for

(39) *Background Ranking Information for Swedish*

	*SPEC[V]	IH−	IHO−	IH+	*LINK[+V]	IHO+
1./sku:g/→ [.**s**ku:**g**.] ~ [.**s**ku:**k**.]	$e_{2\sim2}$	$e_{0\sim0}$	$e_{0\sim0}$	$\mathbf{W}_{0\sim1}$	$\mathbf{L}_{1\sim0}$	$e_{0\sim0}$
2. /stekde/→ [.**st**e**k**.**t**e.]~ [.**st**e**g**.**d**e.]	$e_{2\sim2}$	**W**	$e_{0\sim0}$	$\mathbf{L}_{1\sim0}$	$\mathbf{W}_{0\sim2}$	$\mathbf{L}_{1\sim0}$
3. /vigsəl/→ [.**v**i**k**.**s**ə**l**.]~ [.**v**i**g**.**s**ə**l**.]	$\mathbf{W}_{3\sim4}$	$e_{0\sim0}$	$e_{0\sim0}$	$\mathbf{L}_{1\sim0}$	$W_{2\sim3}$	$e_{0\sim0}$

(Row 1 shows that there is no final devoicing; row 2 shows the dominance of [−VOICE], as does Row 3.)

(40) *No Majority Rules!*

/skug/+/s/+/brand/	*SPEC[V]	IH−	IHO−	IH+	*LINK[+V]	IHO+
1.☞ [.**s**ku**k**:.**s**pran:**d**.]	3			1	1	
2. ~[.**s**ku**g**:.**z**bran:**d**.]	$e_{3\sim3}$	$\mathbf{W}_{0\sim1}$	$\mathbf{W}_{0\sim1}$	$\mathbf{L}_{1\sim0}$	$\mathbf{W}_{1\sim3}$	$e_{0\sim0}$
3. ~[.**s**ku**g**:.**s**bran:**d**.]	$\mathbf{W}_{3\sim5}$	$e_{0\sim0}$	$e_{0\sim0}$	$\mathbf{L}_{1\sim0}$	$\mathbf{W}_{1\sim2}$	$e_{0\sim0}$

(Row 1 is the actual output, and is predicted by Selective Faithfulness; row 2 is the Majority rules candidate, who looses due to faithfulness to [−VOICE]; Row 3 shows the faithful candidate, doomed by *SPEC[V] .)

(41) L99 can not correctly predict the Swedish data; the constraint system produces a majority rules effect, due to the IDENT constraint which makes reference to both feature values and the mistaken definition of head. [See Appendix Three for a proof]

5. Conclusions

(42) *Heads are necessary*
(a) It is necessary to define a head for each syllable constituent
(b) The onset head is the leftmost obstruent, else the leftmost segment
(c) The coda head is the rightmost obstruent, else the rightmost segment

(43) *Split Faithfulness is necessary*
(a) It is necessary to separate faithfulness constraints to each feature value
(b) There must be constraints which make reference to each feature value

(44) *Onset-head-driven assimilation*
Progressive tautosyllabic and regressive heterosyllabic assimilation can be seen as driven by faithfulness to the onset head

(45) *Predictions of Selective Faithfulness Theory*
(a) Predicts *no* voicing disagreement in monomorphemic tautosyllabic obstruent-obstruent clusters (*Absolute Assimilation*)
(b) Predicts voicing disagreement in obstruent-sonorant clusters as the result of markedness constraints, *not faithfulness*
(c) Accounts for all known voicing assimilation and neutralization patterns
(d) Avoids the Majority Rules problem

APPENDIX ONE: CZECH PROGRESSIVE AND REGRESSIVE ASSIMILATION

- Czech has both progressive and regressive Heterosyllabic regressive assimilation. But, both are *onset-head driven assimilation*.

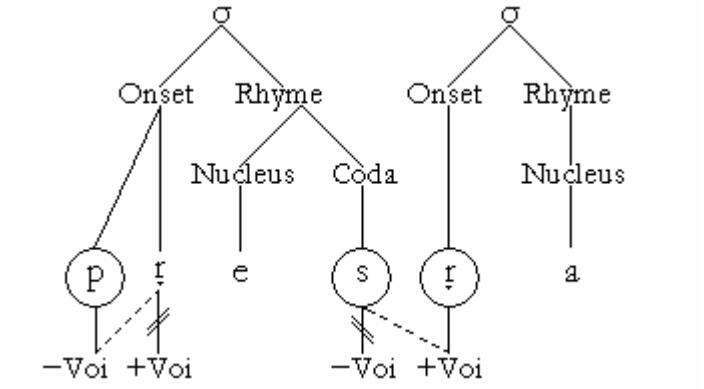
(46) Czech: /pr̥es/+/r̥adou/ → [.**p**r̥**z**.r̥a.**d**ou.] 'across (a/the) line'

/pr̥es/+/r̥adou/	*SPEC[V]	IHO−	IHO+	IH+	*LINK[+V]	IH−
1. ☞ [.**p**r̥**z**.r̥a.**d**ou.]	3				3	1
2. ~[.**p**r̥**s**.r̥a.**d**ou.]	$e_{3\sim3}$	$e_{0\sim0}$	$\mathbf{W}_{0\sim1}$	$\mathbf{W}_{0\sim1}$	$\mathbf{L}_{3\sim1}$	$\mathbf{L}_{1\sim0}$
3. ~[.**p**r̥**s**.r̥a.**d**ou.]	$\mathbf{W}_{3\sim4}$	$e_{0\sim0}$	$e_{0\sim0}$	$e_{0\sim0}$	$\mathbf{L}_{3\sim2}$	$\mathbf{L}_{1\sim0}$
4. ~[.**p**r̥**s**.r̥a.**d**ou.]	$\mathbf{W}_{3\sim5}$	$e_{0\sim0}$	$e_{0\sim0}$	$e_{0\sim0}$	$\mathbf{L}_{3\sim2}$	$\mathbf{L}_{1\sim0}$
5. ~[.**b**r̥**z**.r̥a.**d**ou.]	$e_{3\sim3}$	$\mathbf{W}_{0\sim1}$	$e_{0\sim0}$	$e_{0\sim0}$	$\mathbf{W}_{3\sim4}$	$\mathbf{W}_{1\sim2}$

NB: The shaded rows are harmonically bounded, included to show violations

- Selective Faithfulness predicts both the onset-driven heterosyllabic regressive [+VOICE] assimilation and the "progressive" tautosyllabic [−VOICE] assimilation.

(47) *First two syllables of Czech* [.**p**r̥**z**.r̥a.**d**ou.]: *Regressive and Absolute Assimilation*



APPENDIX TWO: THE SPLIT FAITHFULNESS HYPOTHESIS

(48) *Independent Assimilation*
There are languages which *independently* regressively spread either [−VOICE] (Ya:thê, Mekkan Arabic) or [+VOICE] (Ukrainian)

(49) *Account: Faithfulness to each feature value*
Splitting up [VOICE] faithfulness into two constraints, each of which favor one of the values of the [VOICE] feature. (Stringent faithfulness can't do the job!)

(50) *Ukrainian data* (Butska 1998 and de Lacy 2003)
(a) /jak/+/ze/ → [jag-ze] 'as with' cf. [jak-ɪj] 'which, what'
(b) /liʒ/+/ko/ → [liʒko] 'bed-nom.neuter', *[liʒ-ok] 'bed-gen.pl'

(51) *Ukrainian Regressive* [+VOICE] *Assimilation*

/jak/+/ze/	IHO−	IH+	IHO+	*SPEC[V]	*LINK[+V]	IH−
a. ☞ [.jag.ze.]				2	2	1
b. ~[.jak.se.]	$e_{0\sim0}$	$\mathbf{W}_{0\sim1}$	$\mathbf{W}_{0\sim1}$	$e_{2\sim2}$	$\mathbf{L}_{2\sim0}$	$\mathbf{L}_{1\sim0}$
c. ~[.jak.ze.]	$e_{0\sim0}$	$e_{0\sim0}$	$e_{0\sim0}$	$\mathbf{W}_{2\sim3}$	$\mathbf{L}_{2\sim1}$	$\mathbf{L}_{1\sim0}$

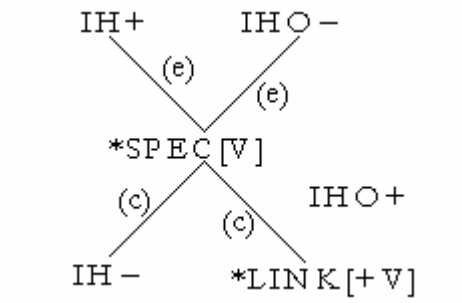
(Faithfulness to the [+VOICE] onset head prevents progressive assimilation)

(52) *No Ukrainian Regressive* [−VOICE] *Assimilation*

/liʒ/+/ko/	IHO−	IH+	IHO+	*SPEC[V]	*LINK[+V]	IH−
d. ☞ [.liʒ.ko.]				3	1	
e. ~[.liʃ.ko.]	$e_{0\sim0}$	$\mathbf{W}_{0\sim1}$	$e_{0\sim0}$	$\mathbf{L}_{3\sim2}$	$\mathbf{L}_{1\sim0}$	$e_{0\sim0}$
f. ~[.liʒ.go.]	$\mathbf{W}_{0\sim1}$	$e_{0\sim0}$	$e_{0\sim0}$	$\mathbf{L}_{3\sim2}$	$\mathbf{W}_{1\sim2}$	$\mathbf{W}_{0\sim1}$
g. (48)3.°(50)3.[5]	**W**	**W**	e	**L**	**L**	**L**

(Faithfulness to the [+VOICE] coda head prevents regressive assimilation and faithfulness to the [−VOICE] onset head prevents progressive assimilation)

(53) *Ranking for Ukrainian:*



[5] This operation is *fusion*, as in relevance logic. Two ERCS – two lines in a comparative tableau – "fuse" to form a new ERC which handles both (or all) competitions simultaneously (Prince 2002).

(54) *Ya:thê Data* (Wetzels and Mascaró 2001).

- Regressive [−VOICE] Assimilation
  - (a) /fowa/+/desa/ → [.fo.wat.sa.] 'of the stone'
  - (b) /i/+/e/+/da/+/ka/ → [.i.et.k^{j}a.] 'I let him'
- No Regressive [+VOICE] Assimilation
  - (c) /i/+/kfake/+/dode/+/ka/ → [.ik.fak.dot.k^{j}a.] 'I cannot'
  - (d) /i/+/t^{h}ate/+/de/ → [.i.t^{h}at.de.] 'from my mouth'
- No Coda Voicing Neutralization
  - (e) /a/+/ek^{h}de/+/dode/+/ma/ → [.aek^{h}.dod.ma.] 'when you do not know'

(55) *Ya:thê Regressive* [−VOICE] *Assimilation*

/i/+/e/+/da/+/ka/	*SPEC[V]	IHO−	IHO+	IH+	*LINK[+V]	IH−
1. ☞ [.i.e**t**.**k**^{j}a.]	1			1		
2. ~[.i.e**d**.**k**^{j}a.]	**W**$_{1\sim2}$	e$_{0\sim0}$	e$_{0\sim0}$	**L**$_{1\sim0}$	**W**$_{0\sim1}$	e$_{0\sim0}$
3. ~[.i.e**d**.**g**^{j}a.]	e$_{1\sim1}$	**W**$_{0\sim1}$	e$_{0\sim0}$	**L**$_{1\sim0}$	**W**$_{0\sim1}$	**W**$_{0\sim1}$

(Faithfulness to the [−VOICE] onset head prevents progressive assimilation)

(56) *No Ya:thê Regressive* [+VOICE] *Assimilation*

/i/+/t^{h}ate/+/de/	*SPEC[V]	IHO−	IHO+	IH+	*LINK[+V]	IH−
1. ☞ [.i.**t**^{h}a**t**.**d**e.]	2				1	
2. ~[.i.**t**^{h}a**t**.**t**e.]	**L**$_{2\sim1}$	e$_{0\sim0}$	**W**$_{0\sim1}$	**W**$_{0\sim1}$	**L**$_{1\sim0}$	e$_{0\sim0}$
3. ~[.i.**t**^{h}a**d**.**d**e.]	**L**$_{2\sim1}$	e$_{0\sim0}$	e$_{0\sim0}$	e$_{0\sim0}$	**W**$_{1\sim2}$	**W**$_{0\sim1}$
4. (55)2°(56)2.	**L**	e	**W**	**L**	**L**	e

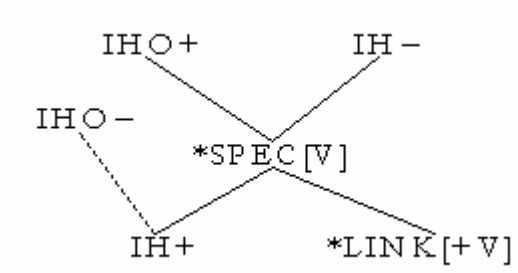
(Faithfulness to the [−VOICE] coda head prevents regressive assimilation and faithfulness to the [+VOICE] onset head prevents progressive assimilation)

(57) *No Coda Devoicing (simplified)*

/dode/+/ma/	*SPEC[V]	IHO−	IHO+	IH+	*LINK[+V]	IH−
1.☞ [.**d**o**d**.**m**a.]	3				3	
2. [.**d**o**t**.**m**a.]	e$_{3\sim3}$	e$_{0\sim0}$	e$_{0\sim0}$	**W**$_{0\sim1}$	**L**$_{3\sim2}$	e$_{0\sim0}$
3. (55)2°(57)2.	**W**	e	e	**L**	**L**	e
4. (55)3°(57)3.	**L**	e	e	**L**	**L**	**W**

(Faithfulness to the [+VOICE] coda head prevents devoicing. Line 2 of this tableau fused with line 2 of (55) shows the dominance of *SPEC[V]; line 3 of this tableau fused with line 3 in (57) shows the dominance of IH−)

(58) *Ranking for Ya:thê*



APPENDIX THREE: LOMBARDI 1999 AND MAJORITY RULES

(59) *Constraint Set from L99:*

IDENTONSET(LARYNGEAL) (=: IDONSLAR)

Consonants in the position stated in the Laryngeal Constraint (1) should be faithful to underlying laryngeal specification.

IDENT(LARYNGEAL) (=: IDLAR)

Consonants should be faithful to underlying laryngeal specification.

*LAR[6]

Do not have laryngeal features

AGREE **W**

Obstruent Clusters should agree in voicing

(60) The ranking of these constraints needed to derive the Swedish data in (48 a–d) is:

AGREE >> IDLAR >> *LAR >> IDONSLAR

as is shown in the tableau

(61) *Swedish Ranking Data*

	AGREE	IDLAR	*LAR	IDONSLAR
1./sku:g/→ [sku:g] ~ [sku:k]	$e_{0\sim0}$	$\mathbf{W}_{0\sim1}$	$\mathbf{L}_{1\sim0}$	$e_{0\sim0}$
2. /stekde/→[stekte]~ [stegde]	$e_{0\sim0}$	$e_{1\sim1}$	$\mathbf{W}_{0\sim2}$	$\mathbf{L}_{0\sim1}$
3. /vigsəl/→ [viksəl]~ [vigsəl]	$\mathbf{W}_{0\sim1}$	$\mathbf{L}_{1\sim0}$	$\mathbf{W}_{1\sim2}$	$e_{0\sim0}$
4. 1°3	**W**	**L**	**L**	L

● The Tableau in (61) gives the arguments for the ranking in (54): IDLAR dominates *LAR, as shown in line 1, to prevent coda devoicing; *LAR dominates IDONSLAR, as shown in line 2, to achieve progressive devoicing, and AGREE dominates IDLAR, as shown in line 4, given the fusion of lines 1 and 3, to predict regressive devoicing.

(62) *Majority Rules!*

This ranking, however, is does not predict the correct output for /sku:g+s+brand/ ([skuk:spran:d]); instead, it predicts the Majority Rules candidate [skug:zbran:d]

(63) /skug+s+brand/ → ☞ [skug:zbran:d] 'forest fire' (Swedish)

/sku:g+s+brand/	AGREE	IDLAR	*LAR	IDONSLAR	Remarks
1. [.skuk:.spran:d.]	0	2	0	1	actual output
2. ☞~[.skug:.zbran:d.]	$e_{0\sim0}$	$L_{2\sim1}$	$W_{0\sim3}$	$L_{1\sim0}$	predicted!!
3. ~[.skug:.sbran:d.]	$W_{0\sim2}$	$L_{2\sim0}$	$W_{0\sim2}$	$L_{1\sim0}$	faithful

[6] Violations are counted segmentally.

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