The Limits of Positive Constraints*

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1 Introduction

- Harmonic Grammar (HG; Legendre et al. 1990, Smolensky & Legendre 2006) makes available positive constraints that reward good configurations instead of penalizing bad ones.
- Kimper (2011): positive harmony-driving constraints avoid Too-Many-Solutions (TMS; e.g. Blumenfeld 2006) problems that plague negative constraints.
- Johore dialect of Malay: rightward nasal harmony blocked by liquids and obstruents (e.g. Walker 2000):

(1)

pəŋãw̃ãsan	'supervision'
mãkan	'to eat'
mĩ̃nõm	'to drink'
baŋõn	'to rise'
mãʔ̃ãp	'pardon'
pənõ̃ŋãh̃ãn	'central focus'
mãj̃ãŋ	'stalk (palm)'
mənãw̃ãn	'to capture' (active)
məratappi	'to cause to cry'

(2) Align([nasal],R,PWd,R): the right edge of a [nasal] domain must coincide with the right edge of some PWd.

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- Imagine Malay′: word-final clusters are broken up with epenethesis: /kast/ → [kasət]
- If w(Align) > w(*Complex), epenthesis is blocked:

(3)

/nawakast/	Align$_3$	*Complex$_2$	Dep$_1$	H
☞ a. nãw̃ãkast	−4	−1		−14
b. nãw̃ãkasət	−5		−1	−16

- Kimper's solution: Spread(±F): For a feature F, assign +1 for each segment linked to F as a dependent.
- This rewards each position that harmonizes, and unharmonized positions do not hamper candidates:

(4)

/nawakast/	Spread$_1$[+nas]	*Complex$_2$	Dep$_1$	H
a. nãw̃ãkast	+4	−1		2
☞ b. nãw̃ãkasət	+4		−1	3

- Kaplan (2015a,b): positional licensing (Crosswhite 2001, Walker 2004, 2005, 2011, Zoll 1997, 1998) has similar problems under HG; a positive reformulation again helps.

⇒ How many other constraint families would benefit from being recast in positive terms?

- Today: Positional Faithfulness (Beckman 1999)
  - Positional Faithfulness also introduces TMS pathologies (Jesney 2011).
  - Under the right conditions, positive Positional Faithfulness avoids those problems.
  - But those conditions are fragile, and positive constraints are not a general solution to TMS issues.

2 Two Pathologies in Positional Faithfulness

- Both pathologies modified from Jesney (2011), who shows that HS avoids them.
- Is HS the only solution, or do positive constraints provide an alternative?

2.1 Resyllabification to Facilitate Neutralization

- Final devoicing (German, Russian, Catalan, etc.):
  w(Ident(voice)-onset) > w(*VoicedObstruent)

- Jesney (2011): if both outweigh ONSET, intervocalic voiced obstruents are syllabified as codas where they can be devoiced:

(5)

/ʀaːd-ɐ/ 'wheels' (Ger.)	IDENT(voi)-onset 3	*VOIOBS 2	ONSET 1	H
a. ʀɛː.dɐ		−1		−2
b. ʀɛː.tɐ	−1			−3
☞ c. ʀɛːt.ɐ			−1	−1

(6) Positive IDENT(voice)-onset: Assign +1 to each onset consonant whose input correspondent has an identical value for [voice].

- Resyllabification is no longer advantageous:

(7)

/ʀaːd-ɐ/	IDENT(voi)-onset 3	*VOIOBS 2	ONSET 1	H
☞ a. ʀɛː.dɐ	+1	−1		1
b. ʀɛː.tɐ				0
c. ʀɛːt.ɐ			−1	−1

- Resyllabification doesn't remove a penalty anymore, and it forfeits a reward.
- We'll come back to this...

2.2 Stress Shift to Facilitate Neutralization

- Nancowry: nasal Vs appear only in stressed syllables (Radhakrishnan 1981):

(8)

ʔuŋʔó̰k	'to eat'	*ʔũŋʔó̰k, *ʔũŋʔók
ʔinkṹːʔə	'bench'	*ʔḭ̃nkṹːʔə, *ʔḭ̃nkúːʔə
ʔumpḛ́c̰tak	'narrow'	*ʔũmpéc̰tak, *ʔumpéc̰tãk ...
kumpḛ́chəŋə	'make it little'	*kũmpéchəŋə, *kumpéchə̃ŋə ...
hat̰ṹʔhət̰ə	'herd of cattle'	*hã̰t̰úʔhət̰ə, *hat̰úʔhət̰ə̃ ...
ʔá̰hcaʔ	'arrow, nib, pen point'	*ʔá̰hcãʔ, *ʔáhcãʔ
ʔǽ̰hə	'body'	*ʔǽ̰hə̃, *ʔǽhə̃

- w(IDENT(nas)-$\acute{\sigma}$) > w(*[+NAS])
- Idealized Nancowry: stress is governed by TROCHEE

- Jesney (2011): If both constraints outweigh TROCHEE, iambs appear if they permit [+nas] vowels to be neutralized:

(9)

/b̃ide/	IDENT(nas)-$\acute{\sigma}$ 3	*[+NAS] 2	TROCHEE 1	H
a. (b̃i̋.de)		−1		−2
b. (b̃í.de)	−1			−3
☞ c. (bi.dé)			−1	−1

- This time, positive IDENT(nas)-$\acute{\sigma}$ doesn't help.

(10) IDENT(nas)-$\acute{\sigma}$: assign +1 to each vowel in a stressed syllable whose input correspondent has an identical value for [nas].

(11)

/b̃ide/	IDENT(nas)-$\acute{\sigma}$ 3	*[+NAS] 2	TROCHEE 1	H
a. (b̃i̋.de)	+1	−1		1
b. (b̃í.de)				0
☞ c. (bi.dé)	+1		−1	2

- By shifting stress, the second vowel can satisfy IDENT(nas)-$\acute{\sigma}$ while the first is changed to satisfy *[+NAS].

3 Why the Difference?

- (11): stress can shop around for a syllable with an oral vowel.
  - /e/ serves as an alternative locus for IDENT(nas)-$\acute{\sigma}$'s reward, allowing denasalization of /ĩ/.
  - Stress shift doesn't forfeit a reward.
- (7): there's no alternative segment for IDENT(voi)-onset to reward.
- Generalization: Positive PF avoids TMS pathologies when there is no alternative element that can earn PF's reward.
- In fact, by manipulating the configurations, we can make positive PF work for the stress problem but not the syllabification problem.

- Stress: in monosyllables, there's no alternative for IDENT(nas)-*σ́* to reward.

(12)

/bĩi:/	IDENT(nas)-*σ́* 3	*[+NAS] 2	TROCHEE 1	CULMINATIVITY 1	*H*
☞ a. (bi̋i:)	+1	−1			1
b. (bíi:)					0
c. bi:				−1	−1

- Syllabification: with another consonant, resyllabification need not sacrifice the reward from IDENT(voice)-onset:

(13)

/ʀa:kd-ɐ/	IDENT(voi)-onset 3	*VOIOBS 2	ONSET 1	LINEARITY 1	*H*
a. ʀɛ:k.dɐ	+1	−1			1
b. ʀɛ:k.tɐ					0
☞ c. ʀɛ:t.kɐ	+1			−1	2

- Intervocalic CC surfaces faithfully except [–voi][+voi] sequences, which metathesize.
- Summary: under the right conditions, positive PF avoids TMS problems. But we can't always guarantee those conditions will hold.
  - PF for roots and initial syllables may be OK: can't substitute anything for the root; only one syllable can be initial.
  - PF for stress and onsets is not safe, as we've seen.

4 Possible Solutions: Faithfulness & Feature Theory

- The pathologies persist because the PF constraints reward maintenance of an unmarked feature value exactly as much as it reward maintenance of the marked value.
- Asymmetrical Faithfulness: reward preservation of [+voi] and [+nas] specifically (Hall 2006, Inkelas 2000, Rubach 2003):

(14)
a. IDENT(+voice)-onset: Assign +1 to each [+voice] onset consonant whose input correspondent has an identical value for [voice].
b. IDENT(+nas)-*σ́*: Assign +1 to each [+nas] segment in a stressed syllable whose input correspondent has an identical value for [nas].

(15)

/ʀa:kd-ɐ/	IDENT(+voi)-onset 3	*VOIOBS 2	ONSET 1	LINEARITY 1	*H*
☞ a. ʀɛ:k.dɐ	+1	−1			1
b. ʀɛ:k.tɐ					0
c. ʀɛ:t.kɐ				−1	−1

(16)

/bĩide/	IDENT(+nas)-*σ́* 3	*[+NAS] 2	TROCHEE 1	*H*
☞ a. (bi̋.de)	+1	−1		1
b. (bí.de)				0
c. (bi.dé)			−1	−1

- Introducing IDENT(–voice)-onset and IDENT(–nas)-*σ́* would resurrect the pathologies:

(17)

/ʀa:kd-ɐ/	ID(+voi)-ons 3	ID(–voi)-ons 3	*VOIOBS 2	LINEARITY 1	*H*
a. ʀɛ:k.dɐ	+1		−1		1
b. ʀɛ:k.tɐ					0
☞ c. ʀɛ:t.kɐ		+1		−1	2

(18)

/bĩide/	IDENT(+nas)-*σ́* 3	IDENT(–nas)-*σ́* 3	*[+NAS] 2	TROCHEE 1	*H*
a. (bi̋.de)	+1		−1		1
b. (bí.de)					0
☞ c. (bi.dé)		+1		−1	2

- Asymmetrical faithfulness works only if either:
  A. IDENT(–voi) and IDENT(–nas) don't exist, or
  B. The features [voi] and [nas] are privative (e.g. Lombardi 1994, Mester & Itô 1989, Steriade 1995)
- A: Faithfulness to unmarked features would be a TETU effect.
  - Probably OK in many cases, but we need IDENT(–voice)-onset to block intervocalic voicing, e.g.
- B: Privativity for all features is implausible (e.g. [ATR], [back])—the pathologies reemerge with these features.
- Alternative: let PF assign greater rewards for faithfulness to marked values than to unmarked values:

(19)
a. IDENT(voice)-onset: Assign +2 to each faithful [+voi] onset consonant and +1 to each faithful [–voi] onset.
b. IDENT(nas)-*σ́*: assign +2 to each faithful [+nas] vowel in a stressed syllable +1 to each faithful [–nas] vowel in a stressed syllable.

- Not a solution:

(20)

/ʀaːkd-ɐ/	*VoiObs 4	Ident(voi)-ons 2	Onset 1	Linearity 1	*H*
a. ʀɛːk.dɐ	−1	+2			0
b. ʀɛːk.tɐ					0
☞ c. ʀɛːt.kɐ		+1		−1	1

5 Conclusion

- Positive PF avoids TMS problems only if there is no unmarked alternative element that can be rewarded.
- Ensuring this requires not-quite-sound revisions to Faithfulness or feature theory.
- What does this mean for positive constraints versus Harmonic Serialism with respect to TMS problems (setting aside other TMS approaches like Blumenfeld (2006))?
  - Some cases submit only to positive constraints: harmony (Kimper 2011), Positional Markedness (Kaplan 2015a,b)
  - Some cases submit only to HS: Positional Faithfulness (Jesney 2011)
  - Some cases mentioned by McCarthy (2011) and Kimper (2011) are amenable to both approaches.
- This implies a richer typology of TMS problems.
- Despite overlapping empirical domains and similar motivations, Positional Markedness and Positional Faithfulness are actually quite different.

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