Markedness in Prominent Positions

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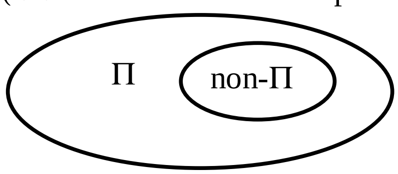
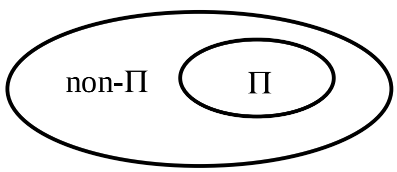
1 Empirical Issues

(1) *Prominent Positions* (Π): (i) onsets
(ii) stressed syllables ($\acute{\sigma}$)
(iii) root-initial syllables (σ_1)

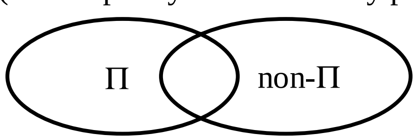
(2) *The Subset Principle in Prominent Positions*:
Contrasts in non-Π ⊆ Contrasts in Π
(i.e. neutralization in non-prominent positions)



(3) *Empirical Issue*: Do other logical possibilities exist?
(i) Contrasts in non-Π ⊂ Contrasts in Π
(i.e. neutralization in prominent positions)



(ii) Contrasts in Π and those in ~Π are disjoint
(i.e. allophony conditioned by prominent positions)



(4) *Answer*:
- Yes, all three possibilities do exist. (Trubetzkoy 1939)
- *However*, the types in (3) are more restricted than the one in (2).
- The types in (3) only apply to classes defined by *sonority*, not by individual features such as Place, [back], etc.

2 Theoretical Proposals

(5) To account for the patterns in (3), I argue that:

- Markedness constraints motivate Π-neutralization (3i) and Π-allophony (3ii).
- These markedness constraints are formed by the combination of the sonority scale with prominent positions.
- More generally, the creation of markedness constraints is fairly free.
- However, a general principle restricts the form of markedness constraints:

(6) *The Planar Accessibility Principle*:
(i) Elements that appear on the prosodic plane: Root, μ, σ, Ft, …
(ii) Elements that appear on the featural plane: Root, [labial], [coronal],…

For any markedness constraint C^M,
and for every pair of elements e_1, e_2 in C^M,
e_1 and e_2 are on the same plane.

e.g. *σ/CODA is fine since both σ and CODA are on the prosodic plane.
*σ/[labial] is ill-formed since σ is on the prosodic plane and [labial] is on the featural plane.

3 Π-Allophony in Niuafo'ou

(7) Niuafo'ou [ɲiuafoʔóu] is a Polynesian language, described by Tsukamoto (1988). The data and generalizations presented here are primarily from Tsukamoto's dissertation; I recently confirmed them with a native speaker.

(8) • Syllables are (C)V_i($V_{i/k}$)
• Stress falls on the penultimate *vowel* (like the closely related Tongan).
• Vowels = /i e a o u/

(9) *Vowel Devoicing*
High vowels devoice:
(1) between voiceless stops [p t k (ʔ?)] (C̥^{stop}_ C̥^{stop})
(2) between a voiceless stop and a word boundary (C̥^{stop}_#)

[kàpi̥kápi̥]	*wedge*	*cf* [mokimoki̥]	*shatter*
[tápi̥]	*wipe*	*cf* [táŋi]	*weep*
[hàu.ʔa.lì.ki̥.sí.a]	*attended by chiefs*		

(3) after voiceless continuants [f s h] and before another consonant (C̥$^{+cont}$_C)

[mòfi̥mófi̥]	*slight fever*	*cf* mokimoki
[pàsi̥kála]	*bicycle*	
[lahi̥lahi̥]	*somewhat many*	*cf* [mòfuíke], *[mòfu̥íke]

(10) *Analysis*:

- The exact analysis of devoicing does not affect the argument.
- It is provided in Appendix 1 for the sake of completeness.
- For the rest of this talk, I will call the set of constraints that trigger devoicing "DEVOICE".

(i) || DEVOICE » IDENT[voice] ||

3.1 Exceptions

(11) Vowels do not devoice in certain positions:

(i) Prosodic Word-initial syllables:

[kití:]	*game*	*[ki̥tí:]
[tutúku̥]	*stop*	*[tu̥túku̥]

(ii) Stressed syllables:

[lahíni]	*large+deictic*	*cf* [láhi̥] *large*
[hífo]	*descend*	*[hi̥fo]
[tùku̥túku̥]	*put down for a while*	*[tù̥ku̥tú̥ku̥]

(12) This is a case with *disjoint sets*:

In the devoicing environment, prominent positions (σ́, σ_1) contain voiced vowels while non-prominent positions contain devoiced vowels.

3.2 Analysis

(13) <u>The Challenge</u>:
How can we block the effects of DEVOICE in stressed syllables and initial syllables?

(14) <u>Faithfulness constraints aren't any use</u>:
By Richness of the Base, we have to consider an input like /ki̥ti:/, with the initial vowel already devoiced. With a faithfulness constraint on initial syllables, the vowel will incorrectly remain devoiced:

/ki̥ti:/	IDENT$_{\sigma1}$[VD]	DEVOICE
💣 ki̥ti:		
kiti:	x!	x

(15) So, we need to use a **markedness constraint**: * σ_1/V̥

/ki̥ti:/	* σ_1/V̥	DEVOICE
ki̥tí:	x!	
☞ kití:		x

(16) Ditto for stressed syllables: *σ́/V̥

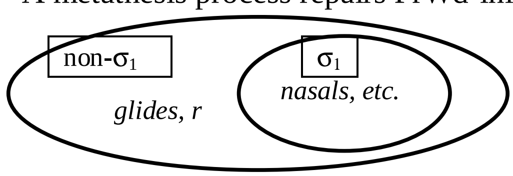
/tu̥ku̥/	* σ́/V̥	DEVOICE
tú̥ku̥	x!	
☞ túku̥		x

3.3 Π-Neutralization

(17) An example of neutralization in prominent positions is found in Campidanian Sardinian.

(18) Campidanian Sardinian (Bolognesi 1998)

- Does not allow rhotics or glides (prosodic) word-initially, but they can appear elsewhere.
- A metathesis process repairs PrWd-initial glides and rhotics



(19) Positional faithfulness is of no use here.
- There is no ranking of IDENT-σ_1-[r], *r, and IDENT-[r] that could possibly result in [r] being banned from initial position.
- Positional faithfulness constraints promote retention of contrast. Neutralization of contrast can only be effected by markedness constraints.

4 The Π-Markedness Constraints

(20) <u>Question</u>: Where do the *σ_1/V̥ and *σ́/V̥ constraints fit in?

(21) <u>Proposal</u>:
They are formed by free combination with the sonority constraints of Prince & Smolensky (1993):

(i) NUC = syllable nucleus
ONS = syllable onset
Sonority scale: | vowels > glides > liquids > nasals > fricatives > stops |

(ii) ❑ || *ONS/vowel » *ONS/glide » … » *ONS/stop ||
❑ || *NUC/stop » *NUC/fricative » … » *NUC/vowel ||

(i) We can articulate the 'vowel' part of the sonority scale more fully, based on work on sonority-driven stress (see esp. Kenstowicz 1994) and the Niuafo'ou case:

| a > e, o > i, u > ə > ɨ > V̥ |

(22) Now combine the sonority constraints with prominent positions:
❑ || *σ_1/ONS/vowel » *σ_1/ONS/glide » … » *σ_1/ONS/stop ||
❑ || *σ_1/NUC/stop » *σ_1/NUC/fricative » … » *σ_1/NUC/vowel ||

❑ || *σ́/ONS/vowel » *σ́/ONS/glide » … » *σ́/ONS/stop ||
❑ || *σ́/NUC/stop » *σ́/NUC/fricative » … » *σ́/NUC/vowel ||
…etc…
☞ Also see Kenstowicz (1996)

5 Predictions

5.1 Onsets

(23) The sonority hierarchy also applies to *onsets*:
e.g. *σ́/ONS/glide bans glides in stressed syllable onsets.

(24) Prediction borne out in Niuafo'ou:
(i) V^{+high} → glides /_ V

[juníti]	*unit*	*[iuníti]
[waéa]	*wire*	*[uaéa]
[welìŋatóni]	*Wellington*	*[ueliŋatoni]

	/iuniti/	ONSET	IDENT-μ
☞	i.u.ní.ti	x x	
	ju.ní.ti		x

(25) *except* when the glide will end up in a stressed syllable:

[iáte]	*yard*	*[játe]
[uáfu]	*wharf*	*[wáfu]
[uípi]	*whip*	*[wípi]

	/iate/	*σ́/ONS/glide	ONSET	IDENT-μ
☞	i.á.te		x x	
	já.te	x!		x

(26) Note that we cannot use positional faithfulness here either: by Richness of the Base we need to explain why input /jate/ ends up as [iate]. Positional faithfulness won't achieve this.

5.2 Π–Neutralization

(27) The **Π/sonority* constraints are predicted to effect neutralization, not just allophony:

	/wija/	*σ́/ONS/glide	IDENT-glide
	wíja	x!	
☞	vija		x

(28) Gujarati (Cardona 1965:28)

Glides are neutralized word-initially: /w/ → [v], as in the tableau above.

(29) <u>Other languages</u>:

Afrikaans	*no word-initial glides*
Golin (Bunn & Bunn 1970:4)	*no word-initial liquids*
Chamicuro (Parker 2000)	*no [h] or [ʔ] in onsets*
Huariapano (Parker 1999)	*no [h] in initial main-stressed σ*

5.3 Symmetry of Repair

(30) For any markedness constraint *α/β, either α or β can be affected depending on the ranking of constraints that *locate* (e.g. ALIGN) or *preserve* (i.e. FAITH) α/β:

(i) α is affected: || LOCATE/FAITH-β, *α/β » LOCATE/FAITH-α||
(ii) β is affected: || LOCATE/FAITH-α, *α/β » LOCATE/FAITH-β||

(31) Example of present interest: The allophony case.

*σ́/NUC/V̥, where 'α'=σ́ and 'β'=NUC/V̥

This constraint can be satisfied by either eliminating the V̥ or by *moving the stress*.

(32) Eliminate V̥:

	/tika/	STRESS=PENULT	*σ́/NUC/V̥	DEVOICE
☞	(a) tíka			x
	(b) t̥íka		x!	
	(c) t̥iká	x!		

(33) Move Stress:

	/tika/	DEVOICE	*σ́/NUC/V̥	STRESS=PENULT
	(a) tíka	x!		
	(b) t̥íka		x!	
☞	(c) t̥iká			x

(34) *Sonority-Driven Stress*
Such cases do exist (Kenstowicz 1996, de Lacy 1997, in prep.)
e.g. Jaz'va Komi (Itkonen 1955, Lytkin 1961)
Main stress falls on the leftmost syllable with a non-high vowel.

	/mijanlan^j/	IDENT-i/u	*σ́/NUC/i,u	ALIGN-σ́-L
	mijánlan^j			x
☞	míjanlan^j		x!	
	méjanlan^j	x!		

6 Impossible Π-Neutralizations and Allophonies

(35) <u>Summary so far</u>:
Π-neutralization and allophony is a response to constraints that refer to Π and classes defined by sonority.

(36) <u>Empirical Issue</u>:
Q: Do Π-neutralizations and allophonies ever refer to classes defined by feature classes like [labial], [back], etc.?
A: No.

(37) Further evidence for this comes from prominence-driven stress:
As shown above, the constraints *σ́/SONORITY can drive sonority-sensitive stress.
However, there are no prominence-driven stress systems in which stress is attracted to a particular syllable based on a single feature. (e.g. there is no stress system in which stress falls on the leftmost front vowel, ignoring back vowels).
See de Lacy (1997:esp. §1.1.3) for some discussion.

(38) Theoretical Issue:
Q: Why not? Or in present terms:

Why are there no constraints of the form *Π/F?

(39) My Answer
(i) Sonority is a property of root nodes.
(ii) *Prosodic Plane* vs *Featural Plane*
- with root nodes at the axis.

(iii) *Planar Accessibility Hypothesis*:
Every element in M (M is a markedness constraint) is on the same plane as every other element in M.

(iv) For precursors to this hypothesis, see Ito & Mester (1992) (also see Lacy (1997) for further references).

(40) Example 1: *σ́/ONS/glide (where 'glide' is a sonority level).
- More explicitly: *{A(σ́, ONSET_i) & A(ONSET_i, Root_k) & S(Root_k, *glide*)}
  (i) A(α,β) is the association relation
  (ii) S(α,β) is the 'sonority' function.
- σ́, onset, Root are all on the prosodic plane.

(41) Example 2: *+SON/-VOICE "no voiceless sonorants"
- More explicitly: *{A(Root_i, [+son]) & A(Root_i, [-voice])}
- Root, [+son], [-voice] are all on the featural plane.

(42) Example 3: *σ́/NUC/[-back]
- More explicitly: *{A(σ́, nuc_i) & A(nuc_i, Root_k) & A(Root_k, [-back])}
- σ́ and *nuc* are on the prosodic plane, but [-back] is on the featural plane.

6.1 Implications

6.1.1 Positional Markedness

(43) *Non-Π (traditional) Neutralization*:
- Must be effected by FAITHFULNESS constraints, Beckman (1998)-style:
  || FAITH-Π-F » *F » FAITH-F ||
  e.g. || IDENT-σ́-[labial] » *[labial] » IDENT-[labial] ||

(44) cf *Positional Markedness constraints*: || *non-Π/F » FAITH-F || (e.g. Zoll 1998)
|| *σ̆/[labial] » IDENT-[labial] ||

(45) The issue that positional markedness raises: if **non-Π/F* constraints are ok, why aren't **Π/F* constraints allowed?

6.1.2 Featural constraints with Prosodic Domains

(46) The PAH also means that constraints that refer to featural conditions within prosodic domains cannot exist. A classic case is the OCP, as applied to dissimilation: e.g. OCP_σ(labial) ≈ *{ [labial]…[labial] $\}_\sigma$

(47) The PAH requires the featural condition to be decoupled from the statement of domain.

- This is not an unwelcome requirement, since constraints have become more and more context-free, with domain- and environment-restrictions due to the interaction of faithfulness or related constraints.

(48) *An Advertisement*: For an OCP approach that decouples the condition and the domain, see Struijke & de Lacy (to appear (in October)).

7 Summary

(49) *Empirical*:
- Neutralization in prominent positions is attested.
- Allophony conditioned by prominent positions is attested.

(50) *Theoretical*:

The Π-markedness constraints result from relatively free combination of prominent positions with other constraints.

- Combination is limited by the Planar Accessibility Hypothesis:
  "You can have elements from different planes in the same markedness constraint."

(51) *Future Issues:*
- Is the PAH correct? Can we absolutely do without any constraint of the form *π/F (π a prosodic element, F a feature)?

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Appendix 1: Devoicing

- Since onset consonants always retain their underlying specification for [voice], $\text{IDENT}_{\text{ONSET}}$[VOICE] must be dominant.
- Since vowels adjacent to continuants devoice (e.g. *mofimofi*):
  AGREE[-voice]$^{+cont}$ “Segments adjacent to continuants must be [-voice] if the continuant is [-voice]” is high-ranked.
- The other facts are accounted for by ranking || AGREE[+VOICE] » AGREE[-VOICE] ||

(52)

	/lahilahi/	AGREE[-VOICE]$^{+CONT}$	AGREE[+VOICE]$^{+CONT}$	IDENT[VOICE]
☞	lahi̥lahi̥		x	x x
	lahilahi̥	x!		x
	lahilahi	x x!		

(53)

	/tapi/	AGREE[+VOICE]	AGREE[-VOICE]	IDENT[VOICE]
☞	tapi̥			x
	tapi		x!	

(54)

	/mokimoki/	AGREE[+VOICE]	AGREE[-VOICE]	IDENT[VOICE]
☞	mokimoki̥		x	x
	moki̥moki̥	x!		x x

Appendix 2: Onset-Sonority-Driven Stress

(55) Even *onset sonority counts*:
Alyawarra (Yallop 1977) (an Arandic language)

- Primary stress falls on either the first or second syllable.
  (i) Analyzed as undominated ALIGN-FT-L with dominated FTFORM=TROCHEE.
- Stress falls on the initial syllable *only if* it has an onset:
  rínha cf *ampá, ilípa*

(56) Analysis (after de Lacy 1997 and others)

		σ́/ONSET	FTFORM=TROCHEE
1.	/rinha/	σ́/ONSET	FTFORM=TROCHEE
☞	rínha		
	rinhá		x!
2.	/ampa/	σ́/ONSET	FTFORM=TROCHEE
☞	ámpa	x!	
	ampá		x

(57) *Exception:* Stress does not fall on the initial syllable if its onset is a glide:
e.g. *walíjmparra*, **wálijmparra*
jukúntja, **júkuntja*

	/junkuntja/	*σ́/ONS/glide	FTFORM=TROCHEE
	júkuntja	x!	
☞	jukúntja		x

(58) A similar (and more interesting situation) exists for Pirahã (see analysis and references in de Lacy 1997).