Idiosyncratic Hiatus Resolution: An Argument for Gradient Harmonic Grammar

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1. Overview

This paper: Implications for generative theories of phonological idiosyncrasy, from two types of pattern exemplified in vowel reduction in Palauan (Josephs 1975; Zuraw 2003)

Multiple degrees of idiosyncrasy

Palauan stem vowels occur in full forms when stressed; subject to reduction in presence of stress-attracting suffixes

Individual stem vowels vary in their degree of (non)reduction, largely conditioned by stem identity:

	Unaffixed stem	**Stem+poss.**
Faithful:	ðíŋ ‘ear’	ðiŋá-l
Reduction to mid V:	báb ‘surface’	bɛbú-l
Reduction to schwa:	ríŋəl ‘pain’	rəŋəl-él
Deletion:	ðík ‘wedge’	θk-él

Idiosyncrasy at the level of segments (not morphemes)

Stems with an input /VV/ sequence surface in multiple ways:

	Unaffixed stem	**Stem+poss.**
Both Vs preserved:	ʔɛ**ú**ʔəl ‘space between islands’	ʔɛ**u**ʔəl-él
Deletion of V_1:	bər**ó**ɛl ‘spears’	bərɛl-él
Deletion of V_2:	bó**ɛ**s ‘gun’	b**o**s-él
Deletion+reduction to mid V:	**jo**lt ‘wind’	**ɛ**lt-ék
Deletion+reduction to schwa:	d**áo**b ‘ocean’	d**ə**b-ék

Proposal: The patterns support an analysis of idiosyncrasy in Gradient Harmonic Grammar (GHG: Smolensky & Goldrick 2016)

- Multiple degrees of idiosyncratic reduction are captured by numerically continuous **activity contrasts** on one structure (the vowel root node)
- Individual segments within a morpheme may contrast in their input activity, generating idiosyncrasy in which vowel in an input /VV/ sequence deletes

2. Phonological idiosyncrasy in GHG

Segments and features in input representations are specified with a **non-integer degree of activity** between 0 and 1.0 (Smolensky & Goldrick 2016)

Key consequence: a constraint penalty is proportional to the activity of the structure that incurs the violation

Individual tokens of a given structure can be specified for different levels of input activity, resulting in idiosyncratic surface patterning (Zimmermann 2018; Hsu 2019; 2022)

3. Analysis: Constraints and gradient activity

Basic representational claims:

Each stem vowel represented with a specific input activity value between 0 and 1, ex. /$i_{0.75}$/ vs. /$i_{0.3}$/

All symbols in output candidates have 1.0 activity; gradience affects only faithfulness penalties (cf. Zimmermann 2017)

Privative vowel place features: mid vowels [ɛ, o, ə] lack [Height]; central vowels [ə] lack [Backness]

Activity of a place feature equals activity of its root node

Constraints:	**Violated by:**
*UnstressedV	Any unstressed V
*UnstressedV[height]	Unstressed non-mid V ([i, u, a])
*UnstressedV[backness]	Unstressed non-central V (all Vs but [ə])
MaxV	V deletion
Max[height]	V deletion, reduction to mid V (incl. [ə])
Max[backness]	V deletion, reduction to central V ([ə])

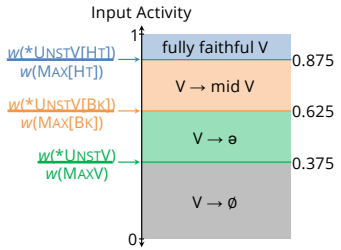
Vowels with less input activity incur lower Max penalties for segment and/or feature deletion in an output candidate

For each conflicting pair of M vs. F constraints, their relative weights determine a **threshold** input activity value:

$$\text{Faithful output activity threshold} = \frac{w(\text{M})}{w(\text{F})}$$

M-violating vowels with input activity greater than the threshold surface faithfully with respect to F in output

Weighting conditions:



Three activity threshold values, determined by each pair of conflicting M vs. F constraints

Four resulting vowel activity ranges, corresponding to each single V reduction pattern

w(*UnstV[Ht]) = 7, *w*(Max[Ht]) = 8: only vowels with input activity above 0.875 surface faithfully as high or low when unstressed

w(*UnstV[Bk]) = 5, *w*(Max[Bk]) = 8: only vowels with input activity above 0.625 surface faithfully as front or back when unstressed

w(*UnstressedV) = 3, *w*(MaxV) = 8: only vowels with input activity above 0.375 surface when unstressed

Analysis of input /VV/ patterns:

Deletion of one vowel driven by a constraint against hiatus: *VV

$$\text{Activity threshold for surfacing} = \frac{w \text{ of all 4 M constraints}}{w \text{ of all 3 F constraints}}$$

w(*VV) = 6: /VV/ surfaces with two fully preserved vowels if each one has input activity above 0.875. Otherwise, the vowel with less activity deletes: /bər$o_{0.3}$$ɛ_{0.9}$l/ → [bərɛl] vs. /b$o_{0.9}$$ɛ_{0.3}$s/ → [bos]

Degree of reduction on non-deleted vowel determined by its own input activity, with same thresholds as single /V/

4. Implications

Two theoretical approaches to phonological idiosyncrasy:

Lexical diacritics: Morpheme-specific effects on evaluation of constraint penalties, ex. **indexing** (Pater 2000), **scaling** (Coetzee & Kawahara 2013), **reweighting** (Sande et al. 2020)

- Can generate variation across stems in behavior of single vowels
- Cannot generate idiosyncratic patterning of within-morpheme /VV/ sequences. All vowels in a morpheme predicted to be equally penalized or protected without appeal to ad hoc markedness constraints, e.g. higher *[o] penalty for /bəróɛl/ than /bóɛs/

Covert structural contrasts: A difference in input representations, ex. **featural under-specification** (Kiparsky 1993), **gestural strength contrast** (Smith 2018), **gradient activity contrast** (Smolensky & Goldrick 2016)

- These theories can account for differences in idiosyncratic patterning of segments within one morpheme
- Challenges of Palauan for featural underspecification:
  - Cannot generate idiosyncrasy in segment deletion vs. nondeletion
  - Cannot easily capture patterns with 2+ degrees of idiosyncrasy

Summary: Palauan vowel reduction supports a **structural contrast** theory, in which the dimension of contrast is **multi-valent** or **continuous**, as in GHG

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