

Allomorphy — Selection, not optimization

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1st September 2005

“[E]verything language-specific is allocated to the lexicon”
(Green 2005:vi)

Argument

In many cases, the distribution of allomorphs appears to be phonologically sensible. This observation has stimulated the development of approaches to allomorph distribution based on optimization, assimilating the choice of allomorph to the paradigm of the emergence of the unmarked. In this paper I review a number of cases where the distribution of allomorphs goes against this tendency and argue that allomorph selection is non-optimizing and takes place after EVAL. At this point, allomorph selection is checked against inviolable language-specific constraints on pairings of host and affix (subcategorization requirements) in the MORPHOLEXICAL CONTROL module.

Contents

1	Elements of the Model	2
1.1	The Declarative Component: MORPHOLEXICAL CONTROL	2
1.2	Gaps in Norwegian imperatives	4
2	Allomorphy in concatenative morphology: optimization or selection?	5
2.1	Phonologically ‘optimal’ allomorphy	6
2.2	Non-optimal allomorphy	8
2.2.1	Haitian Creole determiner	8
2.2.2	Korean conjunctive	10
2.2.3	Dyirbal ergative	12
2.2.4	Italian definite articles	14
2.2.5	Turkana plurals	15
2.2.6	Sibe suffixes	16
2.2.7	Kentakbong imperfect	17
2.2.8	Axininca Campa genitive	18
3	Conclusions	19

1 Elements of the Model

- (1) *The ‘systematic’ vs. the ‘arbitrary’ and OT*
 - a. The essential question in all linguistic theory is the division of labour between the ‘systematic’ ($\approx$ grammar) and the ‘arbitrary’ ($\approx$ lexicon; Joseph 2000).
 - b. One possible understanding of the ‘systematic’ that squares well with OT: the systematic component is restricted to functionally grounded constraints; the ‘grammar’ has **inherent typology**.
 - c. Another possible understanding is that the systematic component encodes everything that is regular in $\mathcal{L}$, whether functionally sensible or not (structuralism).
 - d. In actual analytical practice, the goals of language-particular description and construction of factorial typologies do not necessarily mesh: the use of violable language-particular constraints has become pretty routine. This practice represents a conflation of the notions of what is *optimal* with what is *regular* or *predictable*.
- (2) *Radical Phonological Conservatism* (cf. Kager 2003)
The constraints in CON evaluate purely phonological structure (markedness and faithfulness), without reference to lexicon or morphology.¹
 - a. There are no lexical exceptions, only differing lexical frequencies.
 - b. There are no diacritics.
 - c. There are no faithfulness constraints or cophonologies relativized to lexical strata.
- (3)
 - a. Bluntly put, any phonological rule that admits of lexical or morphological exceptions is not a phonological rule.
 - b. This brings the tasks of describing a particular language and developing typologies more into line with each other.
 - c. It entails that language-particular regularities (if such there are) fall outside the OT grammar.
- (4) The constraint ranking defines the space of **potential contrasts** in $\mathcal{L}$. A separate component, the **morpholexicon**, may place additional restrictions on the utilization of the contrasts within this space to define a subspace of **actual contrasts** in $\mathcal{L}$.
 - a. arbitrary pairings of phonological form and meaning
 - b. arbitrary pairings of phonological form and phonological/morphological context (allomorphy = different phonological subcategorization requirements on synonymous affixes)

1.1 The Declarative Component: Morpholexical Control

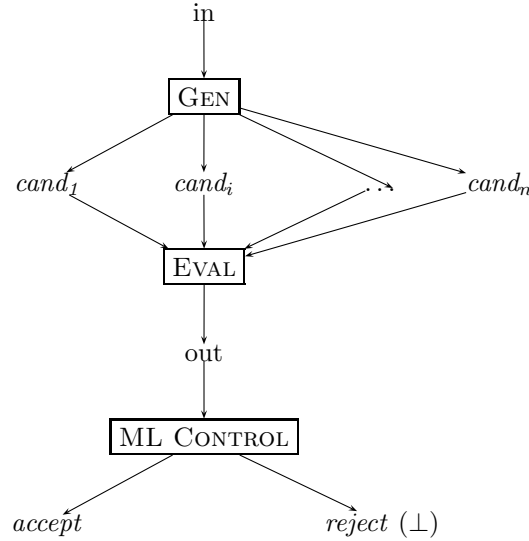
- (5) The output of EVAL is submitted to a component, MORPHOLEXICAL CONTROL, containing declarative constraints (filters).
- (6) *Properties of declarative constraints*
 - a. surface-true (non-defeasible)
 - b. irreparable (structure-checking)
 - c. non-interacting (except possibly by Elsewhere Principle)

Literature on Declarative Phonology: Scobbie (1991, 1993); Bird (1995); Scobbie et al. (1996); Coleman (1998); Ogden (1999)

¹I abstract away from the mapping between syntactic structure and phonological phrasing here.

(7) *Elsewhere Principle*

Some Declarative Phonologists, e.g. Scobbie (1993), allow for conflicts between declarative constraints to be resolved by appeal to intrinsic principles, i.e. the Elsewhere Principle. This refers to cases of conflict in which a constraint C_1 whose antecedent (structural description) SD_1 stands in the relationship general to specific with the antecedent SD_2 of some other constraint C_2 . Intrinsic interaction may be trivially reinterpreted by taking SD_1 to include the *complement* of SD_2 .

(8) *The grammar*(9) *The Berkeley School*

The idea of a declarative ‘non-optimising constraint component’ interacting with the EVAL according to the above architecture is not new in OT. To date, there are two implementations of the idea that the OT grammar interacts with a declarative component, both emanating from the Berkeley School: CONTROL Theory (a theory of gaps; Orgun and Sprouse 1999; Hansson 1999) and Enriched Inputs Theory (a theory of allomorphy; Sprouse 1997).

(10) *Morpholexical Control*

The present proposal builds heavily on the theory of CONTROL with one *major* difference. While the constraints of CONTROL are universal (they are members of the universal constraint set CON), the constraints in MORPHOLEXICAL CONTROL are subcategorization requirements pertaining to individual listed (allo)morphs (cf. Hansson 1999:13). As such they are unabashedly language-specific, making the proposal is closer to Declarative Phonology. Forerunners: Lieber (1980, 1982).

(11) *Critiques of CONTROL* (McCarthy 2003; McCarthy and Wolf 2005; Raffelsiefen 2004)

The notion that CONTROL draws its constraints from the universal constraint set CON leaves CONTROL Theory open to the criticism of duplication. Without this assumption, many of the theoretical criticisms marshalled by Raffelsiefen (2004)

evaporate.

[E]very phonological markedness constraint associated with gaps, would have to be assigned to both EVAL and CONTROL, clearly an undesirable outcome.

(Raffelsiefen 2004:118)

- (12) Morpholexical constraints are identical to the SUBCAT attribute in the lexical entry for the relevant formative, implemented here as **attribute value matrices (AVMs)**.

- (13) a.
$$\begin{bmatrix} \text{SEMANTICS} & \text{'cat'} \\ \text{MORPHSYN} & \text{N} \\ \text{PHONOLOGY} & /kæt/ \end{bmatrix}$$
- b.
$$\begin{bmatrix} \text{SEMANTICS} & \text{'plural'} \\ \text{MORPHSYN} & [\text{plural}] \\ \text{PHONOLOGY} & /-z/ \\ \text{SUBCAT} & \text{_____}]_{\text{N stem}} \end{bmatrix}$$

1.2 Gaps in Norwegian imperatives

- (14) Gaps (cases absolute ungrammaticality) arise when the optimal candidate output by EVAL is rejected as inconsistent ($\perp$) with some morpholexical constraint.

- (15) Rice (2003, 2005) describes the difference between Norwegian nominals and imperative verbs with respect to epenthesis in stem-final rising sonority clusters in terms of the theory of Optimal Paradigms (?).

- (16) *Norwegian nominals epenthesize*

/o:pɲ-/	o:pɲ-e	'open-INF'	o:pɲ	'open (A)'
/sykl-/	sykl-e	'cycle-INF'	syk <u>l</u>	'bicycle (N)'

- (17)

EVAL	/sykl _N /		SONSEQ	DEP-V
	a.	 sykel		*
	b.	sykl	*	

- (18) ...but epenthesis is disallowed as a repair strategy in imperatives

a.	skri:v-e	skri:v	'write'
	jø:r-e	jø:r	'do'
b.	o:p.n-e	*o:pɲ	'open'
	syk.l-e	*sykl	'cycle'

- (19) *Unpredictable regularity*

- a. There is no good phonological reason for the imperative gap in Norwegian. The ranking $\text{SONSEQ} \gg \text{DEP}$ entails that epenthesis is available as a resource for avoiding reverse sonority clusters. Against this background, the failure of epenthesis in this morphosyntactically circumscribed region is an unpredictable (hence lexical) fact about imperatives in Norwegian (as opposed to other morphosyntactic categories).
- b. Novel imperative formation is governed by a *post hoc* generalization over the lexicon, and so the form of any given imperative is predictable from the stem.

(20) *Lexical specification of Norwegian imperative*

[	MORPHSYN	imperative	]
	AFFIX	[PHONOLOGY $\emptyset$ SUBCAT stem S, where $\forall x \in S$, $\text{segment}(x)$, $x \sqsubset S$ (x is an exponent of S; non-underlying material in the host is disallowed)]	

(21)

EVAL		/sykl _{V_{imp}} /	SONSEQ	DEP-V
	a.	☞ sykel		*
	b.	sykl	*!	
SUBCAT			SUBCAT: $\emptyset_{\text{imp}}$	
		☞ sykel	*!	

Interim summary

- Declarative constraints are a natural choice to deal with cases in which even the best isn't good enough.
- The output of EVAL is passed to a component of declarative constraints, MORPHOLEXICAL CONTROL.
- This component is a list of subcategorization requirements for specific morphosyntactically indexed (allo)morphs.
- A gap results from the violation of some subcategorization requirement.

2 Allomorphy in concatenative morphology: optimization or selection?

(22) *Morpholexical Control Theory of Allomorphy*

Gaps arise when an output form f is rejected by MORPHOLEXICAL CONTROL. In cases of allomorphy between A and B, the forms evincing A and B (call them f_A and f_B) are accepted/rejected in complementary contexts: where f_A is accepted, f_B is rejected ($\perp$) and vice versa.

(23) *A key prediction*

If allomorphy, like gaps, reflect language-specific subcategorization requirements, we should find cases where some allomorph maps onto a gap for no good phonological reason. Specifically, we should find cases in which the distribution of allomorphs is *counter* to what one would predict on phonological grounds, i.e. cannot be understood as optimization. This prediction contrasts with those made by the two current theories of allomorph distribution as optimization.

(24) *Two optimization-based theories of allomorphy*

a. *Markedness-driven approach* Allomorph distribution represents an instance of the **emergence of the unmarked**. Rubach and Booij (2001): “While the allomorphs themselves are arbitrary, their distribution is not”.

(i) Disjunctive inputs

Allomorphs $\{A, B, \dots\}$ standing as exponents to some morphosyntactic

feature structure ϕ compete directly: all allomorphs are present in the input as a disjunction $/\{A, B, \dots\}/$ and EVAL produces a harmonic ordering on $\{f_A, f_B, \dots\}$.

- (ii) Proximity
Pairs of allomorphs differ in **proximity**. The prolix allomorph A only emerges when parsing the briefer allomorph B would entail the violation of a highly ranked markedness constraint. Given $A >_{struct} B$, then
if f_B violates *PHONO, and f_A satisfies *PHONO, then $f_A \succ f_B$ (by virtue of markedness),
otherwise $f_B \succ f_A$ (by virtue of brevity)
- (iii) Literature: Mester (1994); Anttila (1995); Kager (1996, 1999, 2003); Drachman et al. (1996); Mascaró (1996); Dolbey (1997); Perlmutter (1998); McCarthy (2001); Rubach and Booij (2001); Picanço (2002); Yip (2004); Green (2005); Wolf (2005).
- b. MPARSE
 - (i) Allomorphs $\{A, B, \dots\}$ standing as exponents to some morphosyntactic feature structure ϕ do *not* compete directly: each allomorph is input to a separate evaluation.
 - (ii) Suppose there is some phonological markedness constraint *PHONO, such that f_B violates f_A satisfies it. If $MPARSE_\phi \gg *PHONO$, then $/B/ \rightarrow \odot$, and $/A/ \rightarrow f_A$.
 - (iii) Literature: McCarthy and Prince (1993); McCarthy and Wolf (2005)

2.1 Phonologically ‘optimal’ allomorphy

- (25) Kager (1996) dubs these cases ‘partially phonologically conditioned’. Suppose brief f_B violates *PHONO, while prolix f_A satisfies it. In such cases, the preference of prolix f_A over brief f_B is governed by phonotactic or prosodic markedness constraints. The complementary preference of brief f_B over prolix f_A , however, is *not* determined by the phonotactics/prosody of the language. This raises the problem: why does the unmarked not emerge across the board?

- (26) (*Putatively*) *phonologically conditioned allomorphy; Djabugay genitive* (Patz 1991; Kager 1996; Rubach and Booij 2001)

- a. *Vowel-final*
guludu-n ‘dove’
- b. *Consonant-final*
gapal-ŋun ‘goanna’

(27)

$/gapal + \left\{ \begin{smallmatrix} \eta un \\ n \end{smallmatrix} \right\} /$	*CxCoDA	MAX	NoCoDA
a.  gapalŋun			**
b. gapaln	*!		*

(28)

$/guludu + \left\{ \begin{smallmatrix} \eta un \\ n \end{smallmatrix} \right\} /$	*CxCoDA	MAX	NoCoDA
a.  guluduŋun			*
b.  , $\odot$ guludun			*

- (29) Following a vocalic stem, there is nothing phonotactically ill-formed about the form evincing the undesired allomorph *-ŋun*, since Djabugay permits codas. Being more prolix, *-ŋun* will violate more markedness constraints, and its briefer rival *-n* will win.

- (30) *Eliminating phonotactically legitimate allomorph*

/guludu+ $\left\{ \begin{array}{c} \text{ŋun} \\ \text{n} \end{array} \right\} /$		*CxCODA	MAX	NoCODA	*ŋ	*n
a.	 guluduŋun			*	*!	*
b.	guludun			*		*

- (31) It is also possible to deal with such cases using the ‘nihilistic’ markedness constraint *STRUC.

- (32) *Eliminating phonotactically legitimate allomorph with *STRUC*

/guludu+ $\left\{ \begin{array}{c} \text{ŋun} \\ \text{n} \end{array} \right\} /$		*CxCODA	MAX	NoCODA	*STRUC
a.	 guluduŋun			*	*****!*
b.	guludun			*	*****

- (33) But not all cases of phonologically sensible allomorphy can be dealt with using the interplay of phonotactics/prosody and brevity equally well. Where *orthogonal* dimensions compete, e.g. length of segmental string and segmental complexity, the allomorphs are no longer comparable. Udihe (Tungusic) provides an example in which segmental mutation and suffixation compete to form the perfective of verbs.

- (34) *Udihe perfect* (Nikolaeva and Tolskaya 2001)

- a. *Non-high vowel-final*
- | | | |
|---------|-----------|--------------|
| etete- | etete̞²- | ‘work’ |
| zawa- | zawa̞²- | ‘take, grab’ |
| olokto- | olokto̞²- | ‘cook’ |
| tukæ:- | tukæ̞²- | ‘run’ |
- b. *High vowel-final*
- | | | |
|--------|-----------|--------|
| dogdi- | dogdi-ge- | ‘hear’ |
| bu- | bu-ge- | ‘give’ |

- (35) *Udihe perfect Class I verbs* (Nikolaeva and Tolskaya 2001:210f.)

- a. $I]_V \rightarrow I\text{-ge}]_{V.\text{perf}}$
b. $V]_V \rightarrow \tilde{V}]_{V.\text{perf}}$

- (36) This distribution is partially motivated by the fact that Udihe lacks laryngealized high vowels.

- (37) *[+high, +constricted glottis]

- (38) Where laryngealization to mark the perfective is possible, suffixation of *-ge* is not possible, e.g. **etete-ge-*, **tukæ:-ge-*. The distribution of the allomorphs apparently requires us to rank *g above *V_{Lar}. Suspicious, because these constraints are

2.2 Non-optimal allomorphy

- ### 2.2.1 Haitian Creole determiner

- (42) *Haitian determiner allomorphy* (Klein 2003:210f.)

- (43)
- | | | |
|--|--------|-------|
| papa+ $\left\{ \begin{array}{c} \text{la} \\ \text{a} \end{array} \right\}$ | NoCODA | ONSET |
| a.  papa.la | | |
| b.  papa.a | | *! |

- (44)

fat + $\left\{ \begin{smallmatrix} \text{la} \\ \text{a} \end{smallmatrix} \right\}$	NoCODA ONSET
a.  fat.a	
b.  fat.la	*!

- (46) V_[+ATR]_____ papje[_j]a ‘the paper’

batow]a	‘the boat’
lapli[j]a	‘the father’
tu[w]a	‘the hole’

- (47) ${}^*G_{[+ATR]}V_{[-ATR]}$
 A $[-ATR]$ vowel must not be preceded by a $[+ATR]$ glide.

- (48)
- | vɛ+a | *G _[+ATR] V _[-ATR] | *HIATUS | DEP(C) |
|---|--|---------|--------|
| a.  vɛ.a | | * | |
| b. vɛ.ja | *! | | * |

- (49)
- | | | | |
|--|--|---------|--------|
| tu+a | *G _[+ATR] V _[-ATR] | *HIATUS | DEP(C) |
| a. tu.a | | *! | |
| b.  tu.wa | | | * |

- (50) Allomorph selection is stated in terms of nested subcategorization requirements.
- host selects allomorph (on basis of host phonology)
 - allomorph selects attachment site on host

- (51) SUBCAT morphosyntactic features of expression
- HOST
- PHONOLOGY phonology of host
- SUBCAT
- AFFIX
- PHONOLOGY phonology of affix
- SUBCAT attachment site on host

- (52) a. SUBCAT: *-la*
 MORPHSYN definite
 HOST $\left[\begin{array}{cc} \text{PHONOLOGY} & \text{C} \end{array} \right]_{\text{stem}}$
 SUBCAT $\left[\begin{array}{cc} \text{AFFIX} & \left[\begin{array}{cc} \text{PHONOLOGY} & /la/ \\ \text{SUBCAT} &]_{\text{stem}} \end{array} \right] \end{array} \right]$
 b. SUBCAT: *-a*
 MORPHSYN conjunctive
 HOST $\left[\begin{array}{cc} \text{PHONOLOGY} & \text{V} \end{array} \right]_{\text{stem}}$
 SUBCAT $\left[\begin{array}{cc} \text{AFFIX} & \left[\begin{array}{cc} \text{PHONOLOGY} & /a/ \\ \text{SUBCAT} &]_{\text{stem}} \end{array} \right] \end{array} \right]$

- (53) Haitian permits both closed and onsetless syllables, and so MAX and DEP must dominate NOCODA and ONSET.

(54)

EVAL	/papa+a/	MAX	*G _[+ATR] V _[-ATR]	NoCODA	*HIATUS	DEP(C)
	a.  pa.pa.a				*	
	b. pa.pa.wa		*!			*
SUBCAT		SUBCAT: -a				
	 papaa	✓				

(55)

EVAL	/papa+la/	MAX	*G _[+ATR] V _[-ATR]	NoCODA	*HIATUS	DEP(C)
	a. pa.pa.a				*!	
	b.  pa.pa.la					*
SUBCAT		SUBCAT: -la				
	 papala	⊥				

(56)

EVAL	/malad+a/	MAX	*G _[+ATR] V _[-ATR]	NoCODA	*HIATUS	DEP(C)
	a.  ma.la.da					
	b. ma.lad.la		*!	*		*
SUBCAT		SUBCAT: -a				
	 malada	⊥				

(57)

EVAL	/malad+la/	MAX	*G _[+ATR] V _[-ATR]	NoCODA	*HIATUS	DEP(C)
	a. ma.la.da	*!				
	b.  ma.lad.la			*		
SUBCAT		SUBCAT: -la				
	 maladla	✓				

2.2.2 Korean conjunctive

(58) *Korean conjunctive allomorphy* (Martin and Lee 1964; Lapointe 1999)

- a. V_____
- nay c^hijkwu-wa ‘and my friend’
- coŋi-wa ‘and paper’
- wuli-wa ‘and us’
- ay-wa ‘and child’
- b. C_____
- c^hayk-kwa ‘and a book’
- ku sālam-kwa ‘and him’
- sensayŋ-kwa ‘and the teacher’
- pap-kwa ‘and rice’

(59)

ai+	$\left\{ \begin{array}{c} \text{kwa} \\ \text{wa} \end{array} \right\}$	MAX	*CxONS
a.	$\rightarrow$ ai.wa		
b.	ai.kwa		*!

(60)

pap+	$\left\{ \begin{array}{c} \text{kwa} \\ \text{wa} \end{array} \right\}$	MAX	*CxONS
a.	$\rightarrow$ pap.wa		
b.	$\ominus$ pap.kwa		*!

(61)

a. SUBCAT: *-kwa*

MORPHSYN

HOST

conjunctive

PHONOLOGY

SUBCAT

C

AFFIX

PHONOLOGY

SUBCAT

]stem

]stem_____

b. SUBCAT: *-wa*

MORPHSYN

HOST

conjunctive

PHONOLOGY

SUBCAT

V

AFFIX

PHONOLOGY

SUBCAT

]stem

]stem_____

(62)

	/ai+wa/	DEP	*CxONS
EVAL	a. aikwa	*!	
	b. $\rightarrow$ aiwa		*
SUBCAT		SUBCAT: <i>-wa</i>	
	$\rightarrow$ aiwa	$\checkmark$	

(63)

	/ai+kwa/	MAX	*CxONS
EVAL	a. $\rightarrow$ aikwa		*
	b. aiwa	*!	
SUBCAT		SUBCAT: <i>-kwa</i>	
	$\rightarrow$ aikwa	$\perp$	

(64)

	/pap+wa/	DEP	*CxONS
EVAL	a. papkwa	*!	*
	b. $\rightarrow$ papwa		
SUBCAT		SUBCAT: <i>-wa</i>	
	$\rightarrow$ papwa	$\perp$	

(65)

EVAL	/pap+kwa/		MAX	*CxONS
	a.	 papkwa		*
	b.	papwa	*!	
SUBCAT			SUBCAT: -kwa	
		 papkwa	✓	

2.2.3 Dyirbal ergative

(66) *Stress assignment in Dyirbal* (Dixon 1972:274f.)

(ɲí.nay) ‘sit’
 (wáyɲ.d.i).ɲu ‘motion uphill REL’

(67) *Dyirbal ergative allomorphy* (Dixon 1972; McCarthy and Prince 1993)

- a. *Head-foot*
 (yaɽa.ɲ)gu ‘man’
 b. *Outside head-foot*
 (yama)(ni-gu) ‘rainbow’
 (bala)(gara)-gu ‘they’

(68) AFX-TO-FT (McCarthy and Prince 1993)

The base to which /-ɲgu/ is affixed is the head foot.

(69) On attempting to describe the distribution from the perspective of the markedness-driven approach, the briefer allomorph wins in all cases.

(70)

/yaɽa+ $\left\{ \begin{smallmatrix} \text{ɲgu} \\ \text{gu} \end{smallmatrix} \right\} /$		AFX-TO-FT	MAX	NoCODA
a.	 (yaɽa ɲ)gu			¡*!
b.	 (yaɽa) gu			

(71)

/yamani+ $\left\{ \begin{smallmatrix} \text{ɲgu} \\ \text{gu} \end{smallmatrix} \right\} /$		AFX-TO-FT	MAX	NoCODA
a.	(yama)(ni ɲgu)		*!	*
b.	 (yama)(ni gu)			

(72) MPARSE Theory fares only slightly better. Descriptive success comes at a cost. As McCarthy and Wolf (2005) admit (p. 28), ‘A key property of this analysis is the need for a stipulated priority relationship among allomorphs’ (cf. Wolf 2005:40). In the case at hand, -ɲgu must be ‘tried’ before -gu, so that if -ɲgu is successful, -gu isn’t even attempted. This plainly goes against the Richness of the Base.

(73)

/yamani+ɲgu/		AFX-TO-FT	MPARSE _{erg}
a.	(yama)(niɲgu)	*!	
b.	 		*

(74)

/yaɽa+ɲgu/		AFX-TO-FT	MPARSE _{erg}
a.	 (yaɽaɲ)gu		
b.			*!

- (75)
- Allowing -gu in input to disyllabic noun yields wrong result*

/yaɽa+gu/	AFX-TO-FT	MPARSE _{erg}
a.  , ⊕ (yaɽa)gu		
b. ⊙		*!

- (76) a. SUBCAT: -ɲgu

MORPHSYN	ergative				
HOST		PHONOLOGY	Ft'] _{stem}		
		SUBCAT		AFFIX	PHONOLOGY /ɲgu/
					SUBCAT] _{stem} _____

- b. SUBCAT: -gu

MORPHSYN	ergative				
HOST		PHONOLOGY] _{stem}			
		SUBCAT		AFFIX	PHONOLOGY /gu/
					SUBCAT] _{stem} _____

- (77)

	/yamani+ɲgu/	MAX	NoCODA
EVAL	a.  (yama)niɲgu		*
	b. (yama)nigu	*!	
SUBCAT		SUBCAT: -ɲgu	
	 (yama)niɲgu	⊥	

- (78)

	/yamani+gu/	MAX	NoCODA
EVAL	a. (yama)niɲgu		*!
	b.  (yama)nigu		
SUBCAT		SUBCAT: -gu	
	 (yama)nigu	✓	

- (79)

	/yaɽa+ɲgu/	MAX	NoCODA
EVAL	a. (yaɽaɲ)gu		*
	b.  (yaɽa)gu	*!	
SUBCAT		SUBCAT: -ɲgu	
	 (yaɽaɲ)gu	✓	

- (80)

	/yaɽa+gu/	MAX	NoCODA
EVAL	a. (yaɽaɲ)gu		*!
	b.  (yaɽa)gu		
SUBCAT		SUBCAT: -ɲgu	
	 (yaɽa)gu	⊥	

2.2.4 Italian definite articles

(81) *Italian masculine definite plural allomorphy* (Lepschy and Lepschy 1988 [1977])

- a. *Before consonant cluster/geminate*
- | | |
|---------------------|---------------|
| Δi spuntini | ‘the snacks’ |
| Δi studi | ‘the studies’ |
| Δi ttsii | ‘the uncles’ |
| Δi ɲɲɔkki | ‘the gnocchi’ |
- b. *Before vowel*
- | | |
|---------------------|--------------------|
| Δi albergi | ‘the hotels’ |
| Δi ambienti | ‘the surroundings’ |
| Δi inglezzi | ‘the English’ |
- c. *Elsewhere*
- | | |
|-----------|---------------|
| i padri | ‘the fathers’ |
| i ragatzi | ‘the boys’ |
| i vini | ‘the wines’ |

(82) a. SUBCAT: gli_1

MORPHSYN	[GENDER masculine NUMBER plural STATE definite]	
	[PHONOLOGY [_{stem} CC ...]]	
HOST	SUBCAT	[AFFIX [PHONOLOGY / Δi / SUBCAT _____]]
		[_{stem}]]

b. SUBCAT: gli_2

MORPHSYN	[GENDER masculine NUMBER plural STATE definite]	
	[PHONOLOGY [_{stem} V ...]]	
HOST	SUBCAT	[AFFIX [PHONOLOGY / Δi / SUBCAT _____]]
		[_{stem}]]

c. SUBCAT: i

MORPHSYN	[GENDER masculine NUMBER plural STATE definite]	
	[PHONOLOGY [_{stem} ...]]	
HOST	SUBCAT	[AFFIX [PHONOLOGY / i / SUBCAT _____]]
		[_{stem}]]

2.2.5 Turkana plurals

(83) In concrete nouns, the plural is marked by the prefixation of *ɣa-/ɣI-* and a suffix, whose shape depends on the prosody of the root (Dimmendaal 1983, 1987, 2000).

(84) *Concrete noun pluralization in Turkana* (Dimmendaal 1983:226, 2000:44,235)

SINGULAR	PLURAL	
a-kɪɲaɲ	ɣa-kɪɲàɲ-a	‘crocodile’
a-ɲaɟɛp	ɣa-ɲàɟɛp-a	‘tongue’
a-ɲasɛp`	ɣa-ɲàsɛp-a	‘placenta’
ɛ-kàal	ɣɪ-kààl-a	‘camel’
a-kwap`	ɣa-kwap-in`	‘land’
e-rot`	ɣɪ-rot-in`	‘road’
a-røk	ɣa-røk-in	‘hump’
a-kvɲ	ɣa-kvɲ-in	‘knee’
a-muɲ	ɣa-muɲ-in	‘snake’
e-wòrù	ɣɪ-wòrù-i`	‘cloth’
e-suro`	ɣɪ-suro-i`	‘dik-dik’
a-pɔɔ	ɣa-pɔɔ-i`	‘hare’

- (85) a. SUBCAT: *-In*
- $$\left[\begin{array}{l} \text{MORPHSYN} \\ \text{HOST} \end{array} \left[\begin{array}{l} \text{plural} \\ \left[\begin{array}{l} \text{PHONOLOGY} \\ \text{SUBCAT} \end{array} \left[\begin{array}{l} \text{CVC}]_{\text{stem}} \\ \left[\begin{array}{l} \text{AFFIX} \\ \text{SUBCAT} \end{array} \left[\begin{array}{l} \text{PHONOLOGY} \\ \text{SUBCAT} \end{array} \left[\begin{array}{l} /In/ \\]_{\text{stem}} \end{array} \right] \right] \right] \end{array} \right] \right] \right] \right]$$
- b. SUBCAT: *-I*
- $$\left[\begin{array}{l} \text{MORPHSYN} \\ \text{HOST} \end{array} \left[\begin{array}{l} \text{plural} \\ \left[\begin{array}{l} \text{PHONOLOGY} \\ \text{SUBCAT} \end{array} \left[\begin{array}{l} \text{V}]_{\text{stem}} \\ \left[\begin{array}{l} \text{AFFIX} \\ \text{SUBCAT} \end{array} \left[\begin{array}{l} \text{PHONOLOGY} \\ \text{SUBCAT} \end{array} \left[\begin{array}{l} /I/ \\]_{\text{stem}} \end{array} \right] \right] \right] \end{array} \right] \right] \right] \right]$$
- c. SUBCAT: *-a*
- $$\left[\begin{array}{l} \text{MORPHSYN} \\ \text{HOST} \end{array} \left[\begin{array}{l} \text{plural} \\ \left[\begin{array}{l} \text{PHONOLOGY} \\ \text{SUBCAT} \end{array} \left[\begin{array}{l}]_{\text{stem}} \\ \left[\begin{array}{l} \text{AFFIX} \\ \text{SUBCAT} \end{array} \left[\begin{array}{l} \text{PHONOLOGY} \\ \text{SUBCAT} \end{array} \left[\begin{array}{l} /a/ \\]_{\text{stem}} \end{array} \right] \right] \right] \end{array} \right] \right] \right] \right]$$

2.2.6 Sibe suffixes

- (86) Sibe, a variety of Manchu, has five suffixes whose initial consonant varies between velar /x/ and uvular /q/ (Li 1996:201ff., 306–310). Other analyses: Halle et al. (2000) and Wolf (2005).
- (87)
- | | | | | |
|--------|--------|--------|--------|-------------------------------|
| -kin | -kun | -qin | -qun | adjectival diminutive |
| -kindi | -kundi | -qindi | -qundi | comparative |
| -xi | -xu | -xi | -xu | self-perceived immediate past |
| -xvi | -xui | -xvi | -xui | non-self-perceived past |
| -xiŋ | -xuŋ | -xiŋ | -xuŋ | self-perceived remote past |
- (88) The uvular allomorphs attach to stems containing a low vowel in any *position*.
- (89)
- a. *Low vowel in stem*
- | | |
|----------|---------------------------|
| tykɛ-xu | ‘become more-SP IMM PAST’ |
| bɔdu-xu | ‘consider-SP IMM PAST’ |
| lavdu-xu | ‘become more-SP IMM PAST’ |
| ɕemi-xi | ‘drink-SP IMM PAST’ |
- b. *No low vowel in stem*
- | | |
|---------|-----------------------|
| gini-xi | ‘go-SP IMM PAST’ |
| tyry-xu | ‘rent-SP IMM PAST’ |
| utu-xu | ‘dress-SP IMM PAST’ |
| tisu-xu | ‘satisfy-SP IMM PAST’ |
- (90) The pattern is unlikely to instantiate synchronic assimilation, since it goes against Strict Locality (Flemming 1995; Gafos 1996; Chiosáin and Padgett 2001; Walker 1998): a high front vowel may intervene between the low vowel and the allomorph.
- (91) There are velar-initial suffixes that do not have a uvular-initial allomorph, and so by (2), the alternation cannot be a phonological one.
- (92)
- | | |
|---------|--------------------|
| bu-kin | ‘give-3.IMP’ |
| ari-kin | ‘make/write-3.IMP’ |
| tɔ-kin | ‘curse-3.IMP’ |
| va-kin | ‘kill-3.IMP’ |
- (93) There is no bar to low vowels and velars occurring within roots.
- (94)
- | | |
|---------|-------------|
| jɔnuxun | ‘dog’ |
| ɛdki | ‘neighbour’ |

- (95) a. SUBCAT: $-\chi I$
- | | | | |
|---|----------|---|---|
| [| MORPHSYN | self-perceived immediate past |] |
| | HOST | PHONOLOGY $\dots A \dots$] _{stem} | |
| | | SUBCAT [AFFIX [PHONOLOGY $/\chi I/$
SUBCAT] _{stem}] | |
- b. SUBCAT: $-xI$
- | | | | |
|---|----------|---|---|
| [| MORPHSYN | self-perceived immediate past |] |
| | HOST | PHONOLOGY] _{stem} | |
| | | SUBCAT [AFFIX [PHONOLOGY $/xI/$
SUBCAT] _{stem}] | |

2.2.7 Kentakbong imperfect

- (96) In Kentakbong, an Austro-Asiatic language of Malaysia (Omar 1975:292f.; Yu 2004:215ff.), the imperfect is marked by prefixing ʔən- to a monosyllabic stem, but *infixing* $-\text{ən-}$ in a disyllabic stem.

- (97) a. *Prefixed imperfective*
- | | | | |
|-----|-----------|------------------|---------------------|
| co | ‘speak’ | ʔən-co | ‘is speaking IMPF’ |
| cās | ‘excrete’ | ʔən-cās | ‘is excreting IMPF’ |
- b. *Infixed imperative*
- | | | | |
|--------|---------|------------|--------------------|
| ciɔh | ‘cook’ | c-ən-itɔh | ‘is cooking IMPF’ |
| sapoh | ‘sweep’ | s-ən-apoh | ‘is sweeping IMPF’ |
| tanɛm | ‘plant’ | t-ən-anɛm | ‘is planting IMPF’ |
| caŋkol | ‘dig’ | c-ən-aŋkol | ‘is digging IMPF’ |
| kayi? | ‘make’ | k-ən-ayi? | ‘is making IMPF’ |

- (98) a. SUBCAT: ʔən-
- | | | | |
|---|----------|---|---|
| [| MORPHSYN | imperfect |] |
| | HOST | PHONOLOGY $[\sigma]$] _{stem} | |
| | | SUBCAT [AFFIX [PHONOLOGY $/\text{ʔən}/$
SUBCAT] _{stem}] | |
- b. SUBCAT: $-\text{ən-}$
- | | | | |
|---|----------|--|---|
| [| MORPHSYN | ergative |] |
| | HOST | PHONOLOGY $[\sigma\sigma]$] _{stem} | |
| | | SUBCAT [AFFIX [PHONOLOGY $/\text{ən}/$
SUBCAT] _{stem}] | |

2.2.8 Axininca Campa genitive

- (99) In Axininca Campa, nouns are intrinsically [+possessed] or [−possessed]. Nouns appear with a suffix whenever they bear the marked (unexpected) value of [pos-
sessed]. Thus, a [+possessed] noun must bear the suffix $-ts^hi$ when possessed, while a [−possessed] noun must bear a ‘genitive’ marker $-ni$ or $-ti$ depending on the bimor-
aicity or otherwise of the stem.

- (100) *Axininca Campa genitive allomorphy* (Payne 1981:50, 77f., 244–9)

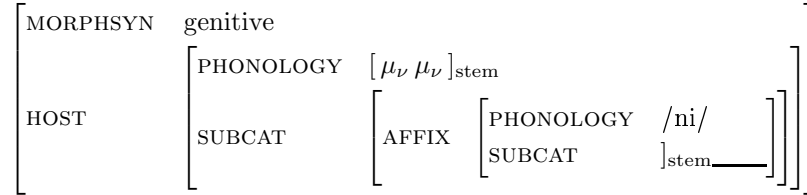
- a. *Following stem with 2 nuclear moras*

kor ^ʷ a	‘manioc worm’	no-yor ^ʷ a-ni	‘my manioc worm’
pito	‘monkey’	pi-wito-ni	‘your monkey’
ɕaa	‘anteater’	i-ɕaa-ni	‘his anteater’
ts ^h imi	‘waterhole’	o-ts ^h imi-ni	‘her waterhole’
sari	‘macaw’	a-sari-ni	‘our macaw’

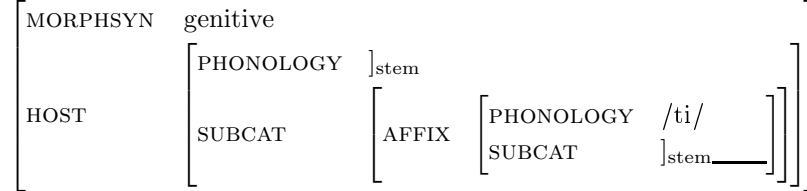
- b. *Elsewhere*

kairo	‘termite’	no-yairo-ti	‘my termite’
t ^h oŋkiri	‘humming bird’	pi-t ^h oŋkiri-ti	‘your hummingbird’
pisiro	‘small toucan’	i-wisiro-ti	‘his small toucan’
ʈʰokori	‘large armadillo’	o-ʈʰokori-ti	‘her large armadillo’
yaarato	‘black bee’	a-yaarato-ti	‘our black bee’

- (101) a. SUBCAT: $-ni$



- b. SUBCAT: $-ti$



3 Conclusions

- (102) Several cases of allomorphy turn out to be impossible to square with the assumptions of the emergence of the unmarked and difficult to square with the assumptions of MPARSE without violence to fundamental tenets of OT (ROTB).
- (103) Not everything that is phonologically predictable should be treated as the result of optimization. Some phonological regularities belong with the morpholexicon as subcategorization requirements on individual affixes. Here we have only reviewed concatenative allomorphs. Although not addressed here, non-concatenative allomorphy provides further support for the present model.
- (104)
 - a. The theory of MORPHOLEXICAL CONTROL implies a hybrid vision of grammar as consisting of violable and inviolable constraint components.
 - b. Such a hybrid model might be criticized as being ‘tantamount to giving up on the entire enterprise’ of Optimality Theory (cf. Halle and Idsardi 1997).
 - c. If *some* patterns represent *post hoc* generalizations over a static lexicon, perhaps we should be able to deal with *all* generalizations in this way.
- (105) Nevertheless, it is possible to look with a more nuanced eye on such hybridization, and, in particular, show how it might go some small way to bringing about a synthesis of the two opposing views in today’s debate on the place of substantive considerations in phonological theory.
 - a. Naturalness is emergent; phonological rules/constraints are essentially arbitrary and are induced over the lexicon.
Hellberg (1978, 1980); Anderson (1981); Dolbey and Hansson (1999); Hale and Reiss (2000); Blevins and Garrett (1998); Blevins (2004)
 - b. Naturalness is inherent; phonological rules/constraints are essentially natural and induced over phonetic knowledge (which may or may not itself be acquired).
- (106)
 - a. Those on the side of *emergent* naturalness argue that incorporating substantive considerations of naturalness into the grammar, e.g. by restricting CON to the set of functionally grounded constraints, duplicates the patterns that emerge independently as a result of diachronic processes.
 - b. Thanks to loss of conditioning environments, telescoping, rule reversal, etc. diachronic processes also leave a residue of patently unnatural alternations, which they argue favour the view that substantive considerations of naturalness do *not* reside in the grammar.
- (107) Recent work by Hayes (1996); Boersma (1998); Wilson (2002, 2003), and others suggests that “Children are not arbitrary inductive sponges” (Hayes quote, 13th Manchester Phonology Meeting).
 - a. Wilson (2002, 2003): experimental evidence suggests human beings are unable to acquire unnatural phonological patterns (or find them very difficult to learn)
 - b. Fleischacker, Zuraw: speakers have access to constraints which could not possibly be the result of induction over the lexicon, but reflect phonetic knowledge.
- (108) The present view: phonology consists in both *post hoc* generalizations over the lexicon and grounded constraints. If the hybrid model is on the right track, it is interesting to try and relate the conditions under which the constraints are acquired

and the way they are dealt with computationally.

- (109) *Grounding and computational power*
- a. Phonological knowledge that children acquire through self-exploration supported by a ‘library’ of phonetic knowledge (Kingston and Diehl 1994; P-map Steriade 2002). The robustness of this knowledge licenses a computational cost: extrinsic ordering and defeasibility of constraints. Children can afford to make constraints acquired under physiological supervision violable.
 - b. Learning unnatural constraints is also within the capability of the child, but they may only be learnt with a reliable morphosyntactic environment and sufficient exposure as inductive generalizations over the static lexicon. Their fragility fails to license costly extrinsic ordering and so violation/satisfaction is computed declaratively.
- (110) The picture that emerges is of a UG that provides the computational resources for both transformational (non-monostratal) and declarative computation, but the conditions under which each of these modes of computation is licensed depend on whether the constraints were crystallized out of phonetic or lexical knowledge.

References

- Anderson, Stephen R. 1981. Why phonology isn’t “natural”. *Linguistic Inquiry* 12:493–539.
- Anttila, Arto. 1995. Deriving variation from grammar: a study of Finnish genitives. Rutgers Optimality Archive #63. Available at <http://roa.rutgers.edu>.
- Bernabé, Jean. 1987. *Grammaire créole. Fondas Kréyol-la. éléments de base des créoles de la zone américano-caraïbe*. Paris: L’Harmattan.
- Bhatt, Parth, and Emmanuel Nikiema. 2000a. Le statut de la nasalité en créole de Sainte-Lucie. *Revue québécoise de linguistique* 28:23–45.
- Bhatt, Parth, and Emmanuel Nikiema. 2000b. Nasality and the definite determiner in St. Lucia Creole. In *Proceedings of the 13th Biennial Conference of the Society of Caribbean Linguistics, Jamaica*, 61–73.
- Bird, Steven. 1995. *Computational Phonology: A Constraint-based Approach*. Cambridge: Cambridge University Press.
- Blevins, Juliette. 2004. *Evolutionary Phonology. The Emergence of Sound Systems*. Cambridge: Cambridge University Press.
- Blevins, Juliette, and Andrew Garrett. 1998. The origins of consonant-vowel metathesis. *Language* 74:508–556.
- Boer, Bart de. 2000. Self-organization in vowel systems. *Journal of Phonetics* 28:441–465.
- Boersma, Paul. 1998. *Functional Phonology*. The Hague: Holland Academic Graphics.
- Cadely, Jean Robert. 1995. Élisition et agglutination en créole haïtien: Le cas des pronoms personnels. *Études créoles* 18:9–38.
- Cadely, Jean Robert. 2002. Le statut des voyelles nasales en créole haïtien. *Lingua* 112:435–464.
- Carrington, Lawrence. 1984. *St. Lucian Creole. A descriptive analysis of its phonology and morphology*. Hamburg: Helmut Buske Verlag.
- Chiosáin, Máire Ní, and Jaye Padgett. 2001. Markedness, segment realization, and locality in spreading. In *Constraints and Representations: Segmental Phonology in Optimality Theory*, ed. Linda Lombardi, 118–156. Cambridge: Cambridge University Press.

- Coleman, John. 1998. *Phonological Representations*. Cambridge: Cambridge University Press.
- Dimmendaal, Gerrit J. 1983. *The Turkana Language*. Dordrecht: Foris.
- Dimmendaal, Gerrit J. 1987. Drift and selective mechanisms in morphological changes: The Eastern Nilotic case. In *Papers from the Seventh International Conference on Historical Linguistics*, ed. Anna Giacalone Ramat, 193–210. Amsterdam: John Benjamins.
- Dimmendaal, Gerrit J. 2000. Number marking and noun categorization in Nilo-Saharan languages. *Anthropological Linguistics* 42:214–261.
- Dixon, R. M. W. 1972. *The Dyirbal Language of North Queensland*. Cambridge: Cambridge University Press.
- Dolbey, Andrew. 1997. Output optimization and cyclic allomorph selection. In *WCCFL 15 Proceedings*, ed. B. Agbayani and S.-W. Tang, 97–112.
- Dolbey, Andrew E., and Gunnar Ólafur Hansson. 1999. The Source of Naturalness in Synchronic Phonology. In *Chicago Linguistic Society (CLS) 35. Vol. I: The Main Session*, ed. Sabrina J. Billings, John P. Boyle, and Aaron M. Griffith, 59–70.
- Drachman, Gaberell, René Kager, and A. Malikouti-Drachman. 1996. Greek allomorphy: An optimality-theory account. *OTS Working Papers* 10:1–12.
- Flemming, Edward. 1995. Auditory Representations in Phonology. Doctoral Dissertation, UCLA.
- Gafos, Adamantios. 1996. The Articulatory Basis of Locality in Phonology. Doctoral Dissertation, Johns Hopkins University.
- Green, Tonio. 2005. Phonology Limited. Rutgers Optimality Archive #745. Available at <http://roa.rutgers.edu>.
- Hale, Mark, and Charles Reiss. 2000. Phonology as Cognition. In *Phonological Knowledge*, ed. Noel Burton-Roberts, Philip Carr, and Gerry Docherty. Oxford: Oxford University Press.
- Halle, Morris, and William J. Idsardi. 1997. *r*, hypercorrection, and the Elsewhere Condition. In *Derivations and Constraints in Phonology*, ed. Iggy Roca, 331–348. Oxford: Clarendon Press.
- Halle, Morris, Bert Vaux, and Andrew Wolfe. 2000. On feature spreading and the representation of place of articulation. *Linguistic Inquiry* 31:387–444.
- Hansson, Gunnar Ólafur. 1999. ‘When in doubt...’ Intraparadigmatic dependencies and gaps in Icelandic. In *Proceedings of NELS 29*, ed. Pius N. Tamanji, Mako Hirotani, and Nancy Hall, 105–119. Available at <http://www.linguistics.ubc.ca/People/Gunnar/>.
- Hayes, Bruce P. 1996. Phonetically-Driven Phonology: The Role of Optimality Theory and Inductive Grounding. Rutgers Optimality Archive 158. Available at <http://roa.rutgers.edu>.
- Hellberg, Staffan. 1978. Unnatural phonology. *Journal of Linguistics* 14:157–177.
- Hellberg, Staffan. 1980. Faeroese. *Nordic Journal of Linguistics* 3:1–24.
- Joseph, John E. 2000. *Limiting the Arbitrary*, volume 96 of *Studies in the History of the Language Sciences*. Amsterdam: John Benjamins.
- Kager, René. 1996. On affix allomorphy and syllable counting. In *Interfaces in Phonology*, ed. Ursula Kleinhenz, volume 41 of *Studia Grammatica*, 155–171. Berlin: Akademie Verlag.
- Kager, René. 1999. *Optimality Theory. A Textbook*. Cambridge University Press.
- Kager, René. 2003. Lexical irregularity and the typology of contrast. In *The Structure of Words*, ed. Kristin Hanson and Sharon Inkelas. Cambridge, MA: The MIT Press.
- Kingston, John, and Randi L. Diehl. 1994. Phonetic Knowledge. *Language* 70:419–454.

- Klein, Thomas B. 2003. Syllable structure and lexical markedness in creole morphophonology: Determiner allomorphy in Haitian and elsewhere. In *The Phonology and Morphology of Creole Languages*, ed. Ingo Plag, 209–228. Tübingen: Max Niemeyer.
- Kochetov, Alexei. 2002. Modeling emergent markedness effects through agent interactions. Ms., Simon Fraser University.
- Lapointe, Steven G. 1999. Stem selection and OT. In *Yearbook of morphology 1999*, ed. Geert Booij and Jaap van Marle, 263–297. Dordrecht: Kluwer.
- Lepschy, Anna Laura, and Giulio Lepschy. 1988 [1977]. *The Italian Language Today*. London: Hutchinson, 2nd edition.
- Li, Bing. 1996. *Tungusic Vowel Harmony*. The Hague: Holland Academic Graphics.
- Lieber, Rochelle. 1980. The Organization of the Lexicon. Doctoral Dissertation, MIT.
- Lieber, Rochelle. 1982. Allomorphy. *Linguistic Analysis* 10:27–52.
- Martin, Samuel E., and Young-Sook C. Lee. 1964. *Beginning Korean*. New Haven, CT: Yale University Press.
- Mascaró, Joan. 1996. External allomorphy as emergence of the unmarked. In *Current Trends in Phonology: Models and Methods*, ed. Jacques Durand and Bernard Laks, 473–483. Salford: European Studies Research Institute.
- McCarthy, John J. 2001. *Thematic Guide to Optimality Theory*. Cambridge: Cambridge University Press.
- McCarthy, John J. 2003. Richness of the base and the determination of underlying representations. Rutgers Optimality Archive 616. Available at <http://roa.rutgers.edu>.
- McCarthy, John J., and Alan S. Prince. 1993. Prosodic Morphology I. Ms., University of Massachusetts at Amherst and Rutgers University.
- McCarthy, John J., and Alan S. Prince. 2001 [1993]. Prosodic Morphology: Constraint Interaction and Satisfaction. Rutgers Optimality Archive #482. Available at <http://roa.rutgers.edu>.
- McCarthy, John J., and Matthew Wolf. 2005. Less than zero: Correspondence and the null output. Rutgers Optimality Archive 722. Available at <http://roa.rutgers.edu>.
- Mester, Armin. 1994. The quantitative trochee in Latin. *Natural Language and Linguistic Theory* 12:1–64.
- Nikiema, Emmanuel. 1999. De la variation du déterminant /la/ dans les créoles haïtien et St-Lucien. *Lingua* 107:69–93.
- Nikolaeva, Irina, and Maria Tolskaya. 2001. *A Grammar of Udihe*, volume 22 of *Mouton Grammar Library*. Berlin: Mouton de Gruyter.
- Ogden, Richard. 1999. A declarative account of strong and weak auxiliaries in English. *Phonology* 16:55–92.
- Omar, Asmah Haji. 1975. *Essays on Malaysian Linguistics*. Kuala Lumpur: Dewan Bahasa dan Pustaka.
- Orgun, Cemil Orhan, and Ronald L. Sprouse. 1999. From MPARSE to CONTROL: deriving ungrammaticality. *Phonology* 16:191–224.
- Patz, Elizabeth. 1991. Djabugay. In *The Handbook of Australian Languages*, ed. R.M.W. Dixon and Barry J. Blake, 245–347. Melbourne: Oxford University Press.
- Payne, David L. 1981. *The Phonology and Morphology of Arinca Campa*. Arlington, TX: Summer Institute of Linguistics.
- Perlmutter, David M. 1998. Interfaces: Explanation of allomorphy and the architecture of grammars. In *Morphology and its Relation to Phonology and Syntax*, ed. Steven G. Lapointe, Diane K. Brentari, and Patrick M. Farrell, 307–338. Stanford, CA: CSLI.
- Picanço, Gesianne. 2002. Tonal polarity as phonologically conditioned allomorphy in Mun-

- durukú. In *Proceedings of the 28th Annual Meeting of the Berkeley Linguistics Society (BLS)*, ed. Julie Larson and Mary Paster, 237–248. Berkeley: Berkeley Linguistic Society.
- Raffelsiefen, Renate. 2004. Absolute ill-formedness and other morphophonological effects. *Phonology* 21:91–142.
- Rice, Curt. 2003. Syllabic well-formedness in Norwegian imperatives. *Nordlyd* 31:372–384. Rutgers Optimality Archive #642. Available at <http://roa.rutgers.edu>.
- Rice, Curt. 2005. Optimal gaps in optimal paradigms. *Catalan Journal of Linguistics* Special issue on phonology in morphology edited by Maria-Rosa Lloret and Jesús Jiménez. Available at LingBuzz <http://ling.auf.net/buzzdocs/>.
- Rubach, Jerzy, and Geert Booij. 2001. Allomorphy in Optimality Theory: Polish iotation. *Language* 77:26–60.
- Scobbie, James M. 1991. Attribute Value Phonology. Doctoral Dissertation, University of Edinburgh.
- Scobbie, James M. 1993. Constraint Violation and Conflict from the Perspective of Declarative Phonology. *Canadian Journal of Linguistics* 38:155–168.
- Scobbie, James M., John S. Coleman, and Steven Bird. 1996. Key aspects of declarative phonology. In *Current trends in phonology: models and methods*, ed. Jacques Durand and Bernard Laks, 685–710. Salford: ESRI.
- Sprouse, Ronald. 1997. A case for Enriched Inputs. Talk given at TREND, May 3, 1997. Rutgers Optimality Archive #193. Available at <http://roa.rutgers.edu>.
- Steriade, Donca. 2002. The Phonology of Perceptibility Effects: the P-map and its consequences for constraint organization. Available from <http://web.mit.edu/linguistics/www/bibliography/steriade.html>.
- Taylor, Douglas. 1977. *Languages of the West Indies*. Baltimore, MD: Johns Hopkins University Press.
- Valdman, Albert. 1978. *Le créole: Structure, statut et origine*. Paris: Klincksieck.
- Walker, Rachel. 1998. Nasalization, Neutral Segments, and Opacity Effects. Doctoral Dissertation, University of California, Santa Cruz. Rutgers Optimality Archive #405. Available at <http://roa.rutgers.edu>.
- Wilson, Colin. 2002. Analytic bias in artificial phonology learning: consonant harmony vs. random alternation. UCLA presentation, November 12, 2002.
- Wilson, Colin. 2003. Experimental investigation of phonological naturalness. In *WCCFL 22 Proceedings*, ed. G. Garding and M. Tsujimura, 101–114.
- Wolf, Matthew. 2005. For an autosegmental theory of mutation. Rutgers Optimality Archive #754. Available at <http://roa.rutgers.edu>.
- Yip, Moira. 2004. Phonological markedness and allomorph selection in Zahao. *Language and Linguistics* 5:969–1001.
- Yu, Alan Chi Lun. 2004. The Morphology and Phonology of Infixation. Doctoral Dissertation, University of California, Berkeley.