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OPTIMAL GOVERNMENT PHONOLOGY (OGP)
A typology of biradical Semitic verbs

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(1) Theoretical fusion

CVCV Government Phonology (Lowenstamm 1996, Scheer 2004)	Optimality Theory (Prince and Smolensky 1993/2004)
A theory of ***structure and constraints***	*A theory of* ***constraint interaction***

Optimal Government Phonology

(2) An exercise in OGP: The perfective paradigm of **biradical Semitic** verbs

A. Inter-language/dialectal stem typology

B. Inter- and intra-paradigm relations

C. Conclusion with hope for a better future

A. STEM TYPOLOGY

(3) Given the template CVCVCV, we expect to find four biradical stem forms*

Empty V_2:	nadda	(nadVda)	'to burn'	Tigre (Raz 1980)
Empty V_3:	garar	(gararV)	'to drag'	Hebrew
Empty V_2 &V_3:	ħabb	(ħabVbV)	'to love'	Palestinian Arabic (PA) & Egyptian Arabic (EA)
All full:	*ħababa			*Not attested*

*We ignore here forms with a complex onset; *ħbab* (*ħVbabV*) and *ħbaba* (*ħVbaba*)

(4) GP structure: Restrictions on unrealized V-slots

a.
		√			
C	V	C	V	C	V
ħ	a	b		b	a

ħabba is "perfect" since the empty V is governed

b.
			*		*
C	V	C	V	C	V
ħ	a	b		b	

ħabb is far from perfect since it has two ungoverned empty Vs (though the final is legally ungoverned)

Nevertheless both are attested

(5) GP structural (markedness) constraints

a. *⊙V^{G} No full governed V
- Prevents realization of all Vs and thus a sequence of surface CV syllables (≈ two-sided open syllable deletion; Kuroda 1967/2003)
- Rules out *ħababa*, …

b. *⊙V]$_{ω}$ No full final V
- Prevents realization of a final vowel (≈ FINALC; McCarthy 1993)
- Rules out *ħabba*

c. *○V^{UG} No empty ungoverned V
- An ungoverned V-slot is associated with segmental material
- Rules out surface *ħabb* (ħabVbV)

d. Note that the interaction between *⊙V]$_{ω}$ (b) and *○V^{UG} (c) reflects the parametric approach to the final V-slot in the GP framework.

(6) Constraint interaction accounting for the typology – CON1, CON2 ➢ CON3 (no evidence for a crucial ranking between CON1 and CON2)

a. Tigre (empty V_2): *⊙V^{G}, *○V^{UG} ➢ *⊙V]$_{ω}$

	*⊙V^{G}	***○V^{UG}**	*⊙V]$_{ω}$
a. ☞ nadVda			*
b. nadVdV		*!*	
c. nadadV	*!		
d. nadada	*! *		*

b. Hebrew (empty V_3): *○V^{UG}, *⊙V]$_{ω}$ ➢ *⊙V^{G}

	*⊙V]$_{ω}$	***○V^{UG}**	*⊙V^{G}
a. garVra	*!		
b. garVrV		*!*	
c. ☞ gararV			*
d. garara	*!		**

c. PA (empty V_2 &V_3): *⊙V^{G}, *⊙V]$_{ω}$ ➢ *○V^{UG}

	*⊙V^{G}	*⊙V]$_{ω}$	***○V^{UG}**
a. ħabVba		*!	
b. ☞ ħabVbV			**
c. ħababV	*!		
d. ħababa	*!*	*	

B. PARADIGMATIC RELATIONS

(7) Paradigms

	Base		*Base + C-initial suffix*	
Hebrew	garar	(gararV)	garar-ti	(gararVti)
Tigre	nadd-a	(nadVda)	nadad-ko	(nadadVko)
PA	ħabb	(ħabVbV)	ħabbe:-ti	(ħabVbeCeti)
cf. MSA	ħabb-a	(ħabVba)	ħabab-ti	(ħababVti)
Not attested	nadd-a		*naddi-ko	(nadVdiko)
	ħabb		*ħabbi-tu	(ħabVbiti)

i / *i* - Epenthetic vowel

(8) **Q1**: Why don't we get the **intra**-paradigmatic faithful counterpart?

	Base		*Base + C-initial suffix*		
Empty V_2	nadd-a	(nadVda)	*naddi-ko	(nadVdiko)	Tigre
Empty V_2&V_3	ħabb	(ħabVbV)	*ħabbi-ti	(ħabVbiti)	PA

A1: With a faithful suffixed form we get a **new paradigm type**, i.e. a paradigm that does not exist in the verbal system.

(9) a. INTER-PARADIGM UNIFORMITY (INTERPU)
Every two structurally contrasting paradigms contrast in meaning / function

b. INTERPU is violated by the paradigms in (8), which constitute additional paradigm types with no contrasting function.

c. Motivation

i. The Principle of Contrast (Clark 1987:1) "Every two forms contrast in meaning"

ii. Clark cites Bolinger (1977): "any word which a language permits to survive must make its semantic contribution" (p. ix); "the same holds for any construction that is physically distinct from any other construction" (p. ix-x).

d. This constraint is heavily violated in Semitic languages, where each verb class (*binyan*) has several sub-classes, where sub-classes do not have any function in the grammar. E.g.

Hebrew sub-classes: (Zadok 2012)	*B1*	*B2*	*B3*	*B4*	*B5*	*Total*
	45	22	25	10	7	109

i. Nevertheless, it is more likely for a language to reduce the number of paradigm types than to create new ones (Zadok 2012, Zadok and Bat-El 2014).

ii. When two paradigm types are similar enough, verbs from the less populated paradigm migrate to the other, thus potentially reducing the number of paradigms.

(10) Back to what *does* happen

	Base	*Base + C-initial suffix*
Tigre	nadd-a (nadVda)	nadad-ko (nadadVko)
PA	ħabb (ħabVbV)	ħabbe:-ti (ħabVbeCeti)

Vowel-final base ⇒ Pre-C geminate splitting

Geminate-final base ⇒ Pre-C vowel-final stem

(11) The biradical paradigms in both languages are modeled on existing paradigms in the language, though different ones:

a. Tigre

			i. Strong	*ii. Faithful*	*Biradical*	*iii. Weak*	*iv. Binyan shift*
3	SG	MS	rakb-a	nadd-a	nadd-a	sat-a	hall-a
	SG	FM	rəkb-ət	nədd-ət	nədd-ət	sətə:-t	həlle:-t
	PL	MS	rəkb-əw	nədd-əw	nədd-əw	sət-əw	həll-əw
	PL	FM	rakb-aya	nadd-aya	nadd-aya	sat-aya	hall-aya
2	SG	MS	**rakab**-ka	*naddi-ka	**nadad**-ka	sətə:-ka	həlle:-ka
	SG	FM	**rəkəb**-ki	*nəddi-ki	**nədəd**-ki	sətə:-ki	həlle:-ki
	PL	MS	**rəkəb**-kum	*nəddi-kum	**nədəd**-kum	sətə-kum	həlle:-kum
	PL	FM	**rəkəb**-kən	*nəddi-kən	**nədəd**-kən	sətə-kən	həlle:-kən
1	SG		**rəkəb**-ko	*nəddi-ko	**nədəd**-ko	sətə:-ko	həlle:-ko
	PL		**rakab**-na	*naddi-na	**nadad**-na	sətə:-na	həlle:-na
			'find'		'burn'	'drink'	'be'

b. PA

			i. Strong	*ii. Faithful*	*Biradical*	*iii. Weak*	*iv. Binyan shift*
3	SG	MS	kátab	ħább	ħább	rám-a	rább-a
	SG	FM	kátb-at	ħább-at	ħább-at	rám-at	rább-at
	PL		kátab-u	ħább-u	ħább-u	rám-u	rább-u
2	SG	MS	katáb-t	*ħábbi-t	**ħabbé:**-t	ramé:-t	**rabbé:**-t
	SG	FM	katáb-ti	*ħábbi-ti	**ħabbé:**-ti	ramé:-ti	**rabbé:**-ti
	PL		katáb-tu	*ħabbi-tu	**ħabbé:**-tu	ramé:-tu	**rabbé:**-tu
1	SG		katáb-t	*ħábbi-t	**ħabbé:**-t	ramé:-t	**rábbé:**-t
	PL		katáb-na	*ħábbi-na	**ħabbé:**-na	ramé:-na	**rabbé:**-na
			'write'		'love'	'throw'	'educate'

(12) **Q2**: Given the multiple paradigms available, how is a model paradigm selected for the inflected biradicals?

A2: Intuitively, the base of the suffixed forms must be as similar as possible to the base of the paradigm.

Q3: Given this intuition, why is the strong paradigm selected with the vowel-final base (Tigre), and binyan-shift preferred for the geminate-final base (PA)?

A3: Binyan-shift allows the empty ungoverned nucleus of the base to remain empty throughout the paradigm.

(13) Uniformity within the paradigm

a. INTRAPU-○V^{UG} — An ungoverned empty V in the base corresponds to an empty V in the derived form

b. Motivation: Preservation of the Marked (PoM): "marked elements can be specifically targeted for preservation. Consequently, highly marked elements can survive a process that less-marked elements undergo" (de Lacy 2006:146).

c. INTRAPU-⊙C — A realized C in the base corresponds to a realized C in the derived form

d. *LONG GEMINATE (*LONGGEM) — Two identical consonants are not separated by a realized nucleus

(14) Constraint interaction

a. PA

ħabb			**ħabVbV**	INTERPU	INTRAPU -○V^{UG}	INTRAPU -⊙C	*LONGGEM
*ħabbi-ti	a.	Epenthesis	ħabVbi-ti	*!			
*ħabb-ti	b.	Faithful	ħabVbV-ti	*!			
*ħabab-ti	c.	Gem. split	ħababV-ti		*!		*
*ħabe:-ti	d.	Degemination	ħabeCe-ti		*!	*	
ħabbe:-ti	e. ☞	Binyan shift	ħabVbeCe-ti			*	

b. Tigre

nadda			**nadVda**	INTERPU	INTRAPU -○V^{UG}	INTRAPU -⊙C	*LONGGEM
*nadda-ko	a.	Epenthesis	nadVda-ko	*!			
*nadd-ko	b.	Faithful	nadVdV-ko	*!			
nadad-ko	c. ☞	Gem. split	nadadV-ko				*
*nade:-ko	d.	Degemination	nadeCe-ko			*!	
*nadde:-ko	e.	Binyan shift	nadVdeCe-ko			*!	

c. The constraint that draws the distinction between the two language types is the one preserving the marked structure – INTRAPU-○V^{UG}:

i. violated when the base ends in a geminate (PA)

ii. not violated (vacuously) when the base ends in a vowel (Tigre)

d. The same constraint ranking explains

i. the exact target of the shift

ii. the distribution of the shift among Semitic languages

C. CONCLUSION

(15) Theoretical fusion

a. We showed that there is no principled contradiction between Optimality Theory on the one hand and CVCV phonology on the other.

i. CVCV phonology is a theory of representations and constraints that follow from these representations; it does not have an inherent principle regarding the violability of constraints.

ii. Optimality Theory is a theory of constraint interaction; it does not have an inherent view regarding representations.

b. CVCV GP ➥ representation and constraints
OT ➥ constraint violabitlity **OGP** + inter- and intra-paradigm relations

c. We applied these tools to two issues raised by biradical verbs:

i. The form of the 3ms.sg. base: *ħabba*, *ħabb* or *ħabab*

ii. The form of this base when inflected with a C-initial suffix

d. We hope to have shown that

i. The two theories are not incompatible

ii. Their combination can be a **fruitful endeavor**

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