

24.901/931, 2026

Introduction to Phonology

Lecture 16

- Solutions posted for Midterm (*Features, Processes*) and Problem set 4 (*OT Basics*)
- Problem set 5 posted as due 04-16 but available without penalty until 04-18.
- Optional reads: Steriade 2002 (on syllable division and typology)
Kager 1999 (chap. 3) (on OT analyses of syllable typology)

Today

- Conspiracies cont.
- Rule blockage
- Rule blockage and conspiracies in Afar (class exercise)
- Syllables

Preview

- The OT separation of M and F constraints simplifies analyses.
- Two circumstances:
 - conspiracies*: multiple rules repeat information; can't be reduced to one
 - blockage*: a rule can't apply to certain strings; their description complicates the rule's SD

Spanish conspiracy: hiatus (VV) resolution

- MidRaise [-low, +**syllabic**] → [+high] / _ [+**syllabic**]
(e, o → i, u / _V)
- HighGlide [+high, +**syllabic**] → [-syllabic] / _ [+**syllabic**]
(i, u → j, w / _V)
- V Delete [+**syllabic**] → Ø / _ [+**syllabic**]
(V → Ø / _V)

Two shared properties: (i) SD of all 3 rules refers to VV sequences.

(ii) The changed or deleted V is word-final in all 3 rules.

These properties suggest a unified function. But 3 changes require 3 rules.

OT analysis identifies the rules' shared components:

- (i) an M constraint: *VV
- (ii) 2 F constraints: MAX/#_ and IDENT/#_

Translating $i, u \rightarrow j$, $w (= \underset{\sim}{i}, \underset{\sim}{u}) / _V$

		M	F	F
	mi arbol	*VV	MAX	IDENT $\pm$ SYLL
a	mi arbol	*!		
b	marbol		*!	
c	mirbol		*!	
 d	m _~ iarbol			*

Translating e, o → i, u / _V

		M	M	F	F	F
	lo abla	*VV	*[-HIGH, -SYLL]	MAX	ID ±HIGH	ID ±SYLL
a	loabla	*!				
b.	l _o ablaa		*!			*
c.	labla			*!		
d. 	l _u ablaa				*	*

*[-HIGH, -SYLL] No non-high glide

Translating $V \rightarrow \emptyset / _V$

		M	M	F	F	F
	paga Evita	*VV	*[-HIGH, -SYLL]	ID $\pm$ LOW	MAX	ID $\pm$ SYLL
a.	paga Evita	*!				
b.	paga Evita		*!			*
c.	pagu Evita pagi Evita			*!		*
d. 	pag Evita				*	

Additional IDENT [$\pm$ BACK]/[$\pm$ FRONT]/[ROUND] violations in (c)
 Spanish glides are either front of back/round

Need MAX/#_ not just MAX

		M	M	F	F	F
	la iglesia	*VV	*[-HIGH, -SYLL]	ID LOW	MAXV#_	MAXV
a.	la iglesia	*!				
b.	la _ɨ iglesia		*!			
c.	lu _ɨ iglesia			*!		
d.	la _ɨ glesia				*!	*
☞ e.	li _ɨ glesia					*

MAX V/#_: Assign one violation for each vowel V,

iff V is word-initial in UR (#_), and V has no SR counterpart.

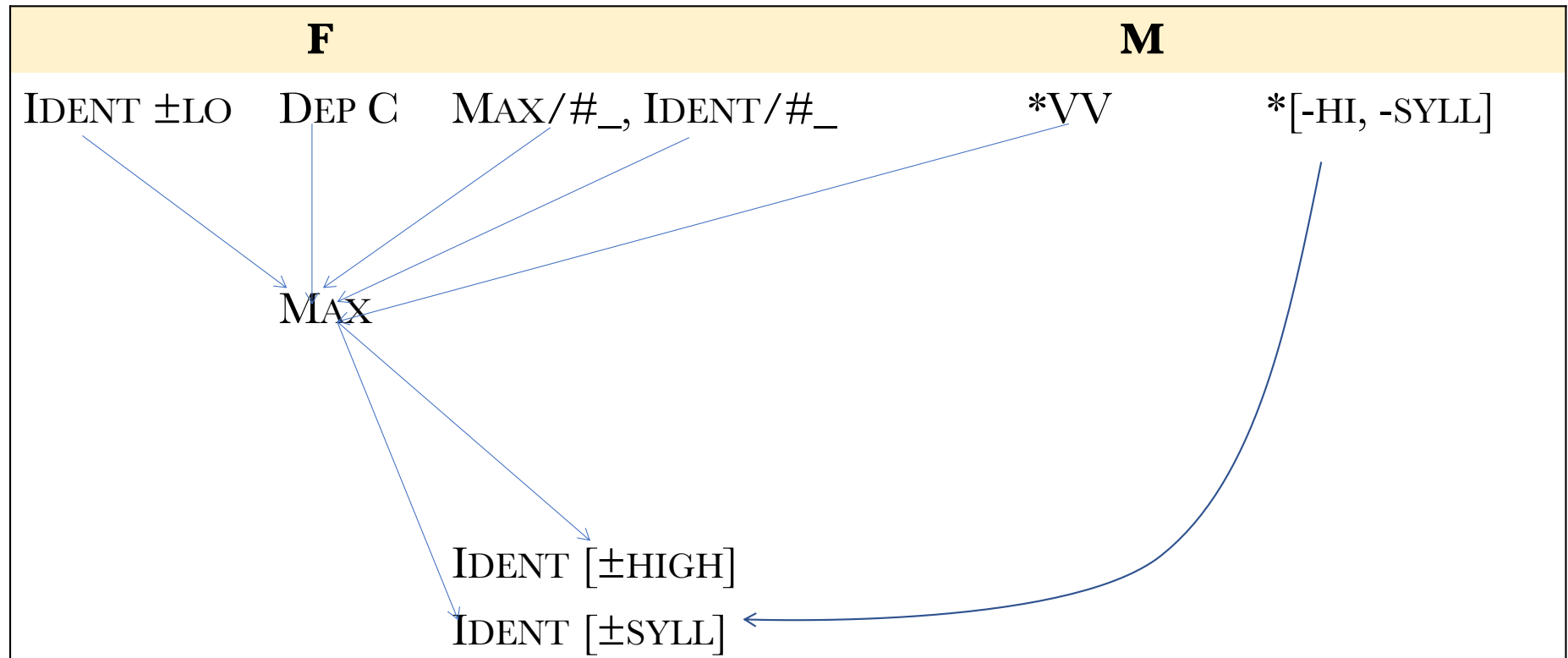
No direct evidence for ranking MAX V/#_. But it's never violated.

Need IDENT[±SYLL]/#_ not just IDENT: *la_̣iglesia

		M	M	F	F	F	F
	la iglesia	*VV	*[-HIGH, -SYLL]	ID LOW	MAX#_	MAX V	ID SYLL
a.	la iglesia	*!					
b.	la _̣ iglesia		*!				
c.	lu _̣ iglesia			*!			
d.	laglesia				*!	*	
☹e.	liglesia					*	
☹f.	la _̣ iglesia						*

IDENT/#_ : One * if first segment changes any one of its Fs

Overall



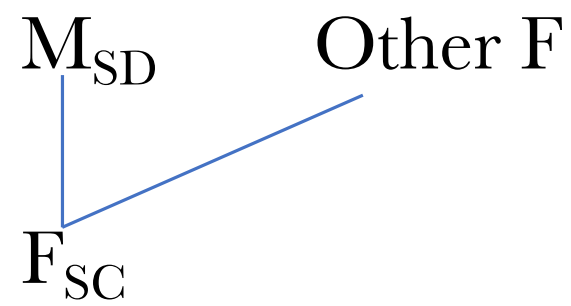
Blockage

Rule-based grammars sometimes note that processes are blocked when outcome would violate a SR condition.

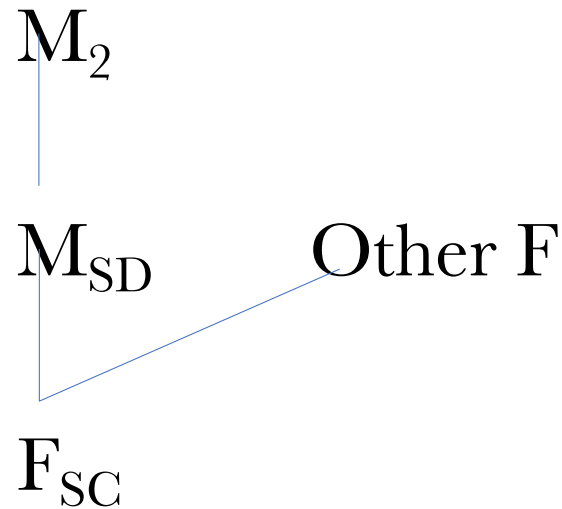
$A \rightarrow B/C_D$

Unless BC or BD meet a further condition. Then the rule doesn't apply

A process in OT



Blockage in OT



M_{SD} is the lowest ranked constraint that conflicts with M_2

M_{SD} is violated (= process blocked) in contexts where M_{SD} conflicts with M_2
(If no low F lower ranked than both M constraints satisfies both.)

Blockage in reduced auxiliaries

- Approximants, voiced fric's and [h] delete in stressless medial auxiliaries;
- Vs reduce to [ə] & eventually delete.

Full V-Auxiliary	C-deleted, $V \rightarrow \text{ə}$	$\text{ə} \rightarrow \emptyset$	e.g.
aɪ æm	aɪ əm	aɪm	I am here
ju ɑɪ	ju əɪ	ju ^ə ɪ	you are here
hi ɪz	hi əz	hiz	he is here
hi hæz	hi əz	hiz	he has been
ðeɪ hæv	ðeɪ əv	ðeɪv	they have been
ðeɪ wɪl	ðeɪ əl	ðeɪl	they will be

The last step ($\text{ə} \rightarrow \emptyset$) happens only if resulting CC satisfies general conditions, i.e. if the CC is well-formed in that context. Otherwise last step is blocked.

	Full V-Aux	C-deleted, $V \rightarrow \emptyset$	$\emptyset \rightarrow \emptyset$	e.g.
a.	ðeɪ aɪ	ðeɪ əɪ	ðe̞ɪ	they are here
b.	mɛn aɪ	mɛn əɪ	*mɛn ^ə ɪ	the men are here
c.	kæt ɪz	kæt əz	kæts	the cat is not here
d.	bʌs ɪz	bʌs əz	*bʌsz, bʌs(s)	the bus is late
e.	ðeɪ hæv	ðeɪ əv	ðe̞ɪv	they have been late
f.	boɪz hæv	boɪz əv	*bo̞ɪzv	the boys have been late
g.	ðeɪ wɪl	ðeɪ əl, ðeɪl	ðe̞ɪl	they will be late
h.	boɪz wɪl	boɪz əl, boɪzl	*bo̞ɪzl	the boys will be

Hypothesis

*V-IN-AUX: a * for each vowel in an auxiliary, in fast speech

Constraints on C-clusters (*CC) including * $[+strident]-[+strident]$.

*CC >> *V-IN-AUX

	kæt ɪz	*[+STRID]-[+STRID]	*V-IN-AUX	MAX V
a.	kæt ɪz		*!	
☞ b.	kæts			*

	bʌs ɪz	*[+STRID]-[+STRID]	*V-IN-AUX	MAX V
☞ a.	bʌs ɪz		*	
b.	bʌsz	*!		*
c.	bʌss	*!		*

	aɪ hæv	*zv	*V-IN-AUX	MAX V
a.	aɪ əv		*!	
☞ b.	aɪv			*

	boɪz hæv	*zv	*V-IN-AUX	MAX V
☞ a.	boɪz əv		*	
b.	boɪzv	*!		*

Diagnosing blockage

- Distinguish two rule-based interpretations:
 - (a) R1 applies in general, but
R1 is blocked in some context C. (Genuine blockage.)
 - (b) R1 applies, including in context C
R2 applies after R1 in C and undoes the effect of R1 in C.
- There is ə-epenthesis in English. Perhaps it applies in reduced auxiliaries.
- Corresponds to *STRID-STRID, *V-IN-AUX >> MAX >> DEP ə
- Under this analysis, no need to rank *STRID-STRID >> *V-IN-AUX
- The OT analysis offers no additional advantage over rules, in this case.

Afar, a Cushitic language

a.	xamíla	xaml-í	‘swampgrass (acc/nom.-gen.)’
	darágu	darg-í	‘watered milk (acc/nom.-gen.)’
	bacála	bacl-í	‘husband (acc/nom.-gen.)’
	kubúc-ak	kubc-é	‘swelling/he swelled’
b.	digib-t-é	digb-é	‘she/I married’
	bar-it-té	bar-t-é	‘you learned/I learned’
	xam-it-té	xan-t-é	‘she gossipped/I gossipped’
	wager-n-é	wagr-é	‘we/he reconciled’

UR of alternating morphemes?

Other cases

- midáqu midqad-í ‘fruit (acc/nom.-gen.)’
 xarar-é ‘I/he burned’
- i-xli-lé ij-xili-lé ‘I adapted/I caused to adapt’
 ʕalal-ée-ni ‘they competed’
 gonan-á ‘he searched for’
 modod-é ‘I/he collect animals to bring home’

More info

- Only stressless Vs delete: cf. *xamíla*, vs. *xaml-í*
 - Only in VC_CV: cf. *xamíla*, *digibt-é*
 - CC-sequences occur only between vowels in Afar:
e.g. *wagré* but **grab*, **garb*, **ungrab*
 - Identical Cs ([atta]) and geminate Cs ([at:a]) don't surface, except when distinct morphemes are concatenated.
- (Name of this process: *syncope* (= medial V deletion))

Rule for Afar syncope

- $[+syllabic, -stress] \rightarrow \emptyset / VC^i_C^jV$
where $C^i \neq C^j$
- Applies to the medial stressless V in VC_CV , e.g. *daragí*,
- Does not apply to $\bar{V}$ e.g. *darágu*
- Does not apply in VC_CC (*wagerné*), or in $C_i_C_i$ (*sababá*)

Any conspiracies here?

- **Conspiracy 1:** the VC_CV context of the syncope rule
Grammar must rule out *CCC, *#CC, *CC# independently of syncope:
they are impossible sequences in Afar, no matter their UR source.
- The VC_CV context in the rule repeats info about possible CC seqs.
It blocks the rule from creating CCC, #CC and CC# sequences that we know, independently of syncope, are impossible in Afar.
- **Conspiracy 2:** the $C_i_C_j$ context, $C_i \neq C_j$, of the syncope rule
But we must also rule out * $C_i C_i$ independently,
Identical Cs can't be adjacent, and C's can't be long
Constraint: * $C_i C_i$ (let's say that this also covers *C:)
- The $C_i \neq C_j$ condition on syncope rule repeats effect of * $C_i C_i$

Analysis of $C_i \neq C_j$ restriction

- M_1 triggering V-Deletion (preliminary):
 $*[+SYLLABIC, -STRESS]/VC_CV$
- $F_{SC,F}$ constraint violated by V-Deletion: $MAX\ V$
- M_2 blocks satisfaction of M_1 in $C_i_C_i$ contexts
 $M_2 : *C_iC_i : \text{assign a } * \text{ to any } C_iC_i \text{ or any } C:$

	xamil-í	*V_[-stress]/VC_CV	MAX V
a.	xamil-í	*!	
☞ b.	xaml-í		*
c.	xml-í		**!

	xamíl-a	*V_[-stress]/VC_CV	MAX V
a.	xmíl-a		*!
☞ b.	xmil		

	digibt-é	*V_[-stress]/VC_CV	MAX V
a.	digbt-é		*!
☞ b.	digibt-é		

	xarar-e	*C_iC_i	*V_[-stress]/VC_CV	MAX V
a.	xarré	*!		*
b.	xar:é	*!		
☞ b.	xararé		*	

$*C_i C_i$



$*V_{[-STRESS]}/VC_CV$



MAX V

An alternative epenthesis scenario?

- Suppose syncope is not blocked by $*C_i C_i$. Rather:

Rule 1 deletes V in VC_CV: $miqad-i \rightarrow *miqd-i$

Rule 2 inserts a V in CC if Cs are identical

$(miqad-i \rightarrow *miqd-i \rightarrow miqVd-i)$.

- One must insure that *inserted* V = *underlying* V deleted in step 1.
- But how? V varies unpredictably between a, i, o.

The VC_CV context

- We can complete the analysis by simplifying the M_1 constraint
- Currently: $M_1 = *V_{[-STRESS]}/VC_CV$
- It's possible to radically simplify M_1 .

Think of an M constraint that mentions one segment

- Let the simplified M_1 interact with other M constraints, which enforce the restriction expressed by VC_CV context.
- And with the constraint against geminates.
- This is the task in PS-5, except the data is Hindi, not Afar.

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