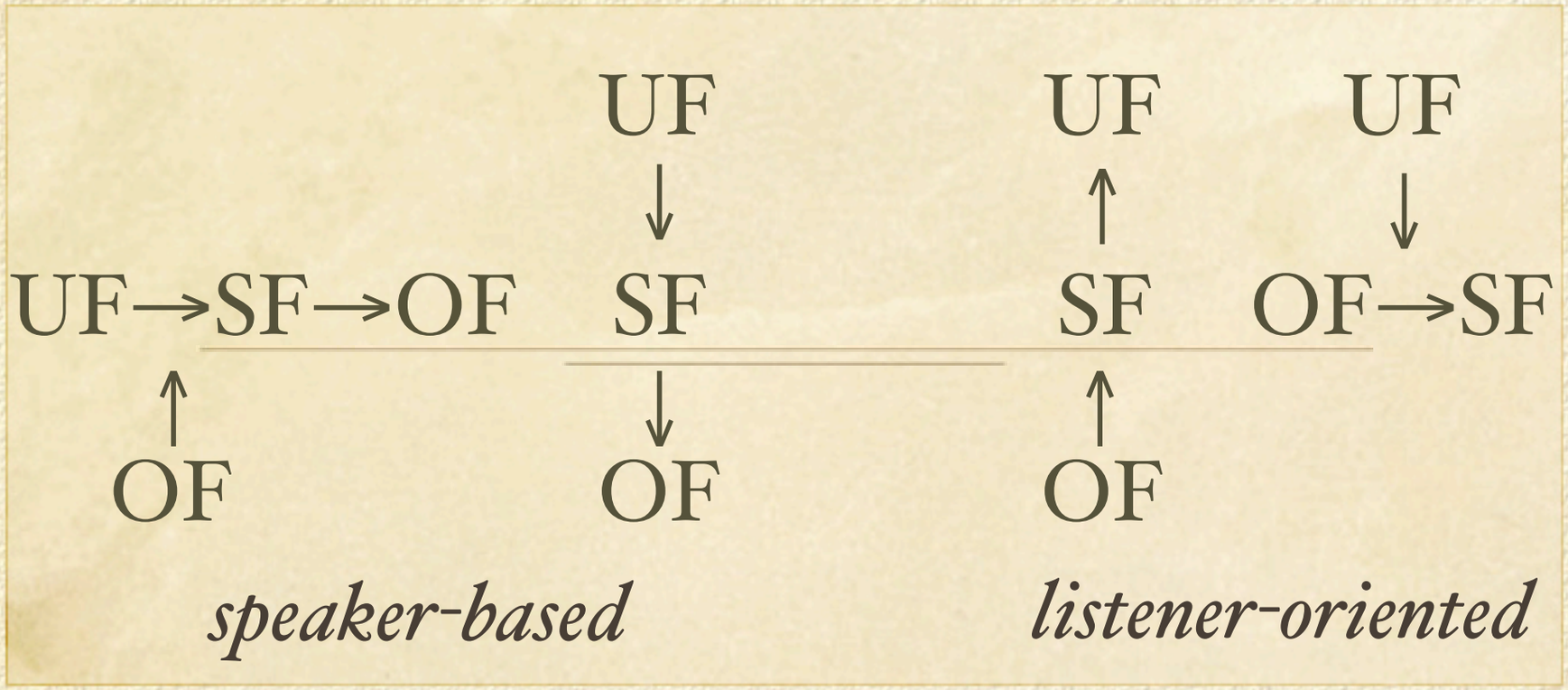
Listener-oriented phonology



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Three French word onsets

- Consonant:
  - |gaʁsɔ̃| ‘boy’, |fam| ‘woman’
- Hache-aspiré:
  - |ʔazaʁ| ‘coincidence’, |ʔos| ‘rise’
- Vowel:
  - |ɔm| ‘man’, |ide| ‘idea’

- Hache-aspiré sometimes acts like a consonant, sometimes like a vowel, *sometimes like neither*.

Neutralization

- Phrase-initial:
  - [(ʔ)azaʁ], [(ʔ)os], [(ʔ)ɔm], [(ʔ)ide]

- Phrase-initially, hache-aspiré acts like a vowel, or perhaps a vowel acts like hache-aspiré.

Process 1: elision

- |lə+NounMasc| ‘the+Noun’:
  - [ləgaʁsɔ̃], [ləazaʁ], [lɔm]
- |la+NounFem| ‘the+Noun’:
  - [lafam], [laos], [lide]

- Elision of schwa or *a* only for vowel-initial words.
- Hache-aspiré blocks elision,
  like a consonant does.

Derivation of elision

lə+gaʁsɔ̃		ləgaʁsɔ̃		ləgaʁsɔ̃
lə+ʔazaʁ	elision →	ləʔazaʁ	*ʔ →	ləazaʁ
lə+ɔm		lɔm		lɔm

- Hache-aspiré blocks elision, because it *is* still a consonant when elision applies.
- Counterfeeding rule order (predicts some opacity for OT).

Underlying representation

- Hache-aspiré is a consonant (vs. vowel):
  - Abstract consonant (Dell 1970)
  - [+consonantal] (Hyman 1985)
  - No features (Prunet 1986)
    - |ʔazaʁ| vs. |ɔm| (Meisenburg & Gabriel 2004)
- Syllable structure:
  - Empty onset vs. no onset (Clements & Keyser 1983), or the reverse (De Jong 1990)
  - Syllable island, i.e. |.azaʁ| vs. |ɔm| (Tranel 1995)
- And so on.

Process 2: enchainment

- |kɛl+NounMasc| ‘which+Noun’:
  - [kɛlgaʁsɔ̃], [kɛlʔ̃azaʁ], [kɛlɔm]

([ʔ̃] observed by Meisenburg & Gabriel 2004)

- Enchainment only for vowel-initial words.
- Hache-aspiré blocks enchainment,
  like a consonant does.

Derivation of enchainment

kɛl+gaʁsɔ̃		kɛl.gaʁsɔ̃		kɛl.gaʁsɔ̃
kɛl+ʔazaʁ	enchain →	kɛl.ʔazaʁ	*ʔ →	kɛl.azaʁ
kɛl+ɔm		kɛ.lɔm		kɛ.lɔm

- Hache-aspiré blocks enchainment, because it *is* still a consonant when enchainment applies.
- Counterfeeding rule order (predicts some opacity for OT).

Surface representation

- Overt consonant (*SPE*-style):
  - [kɛlʔazaʁ] vs. [kɛlɔm]
- Hidden syllable structure (non-linear style):
  - /kɛl.azaʁ/ vs. /kɛ.lɔm/
- Both (OT-style):
  - “kɛl.ʔazaʁ” vs. “kɛ.lɔm”
- And so on…

- How much detail do surface reps contain?

Process 3: liaison

- |le͡z+NounPl| ‘the+NounPl’:
  - [legaʁsɔ̃], [leazaʁ], [lezɔm]
  - [lefam], [leos], [lezide]

- Liaison only for vowel-initial words.
- Hache-aspiré blocks liaison,
  like a consonant does.

Derivation of liaison

leZ̲+gaʁsɔ̃	liaison →	le.gaʁsɔ̃	*ʔ →	le.gaʁsɔ̃
leZ̲+ʔazaʁ		le.ʔazaʁ		le.azaʁ
leZ̲+ɔm		le.zɔm		le.zɔm

- Hache-aspiré blocks liaison, because it *is* still a consonant when liaison applies.
- Counterfeeding rule order (predicts some opacity for OT).

Liaison underlyingly

- Extraskeletal:
  - $|k_C \varepsilon_V l_C|$ vs. $|l_C e_V z|$ (Hyman 1985, Charette 1988, Prunet 1986)
- Extrasyllabic:
  - $|k\varepsilon l|$ vs. $|lez_{ex}|$ (Clements & Keyser 1983)

- Provisionally settle for a diacritic:
  - $|k\varepsilon l|$ vs. $|le\underline{z}|$

Process 4: schwa drop

- |ynə+NounFem| ‘a+Noun’:
  - [ynfam], [ynəos], [ynide]

- Schwa drop both for vowel-initial and for consonant-initial words.
- Hache-aspiré blocks schwa drop, *unlike* a consonant does.

Derivation of schwa drop?

ynə+fam	*ə	yn.fam	*ʔ	yn.fam
ynə+ʔos	→	yn.ʔos	→	**yn.os**
ynə+ide	enchain	y.nide		y.nide

- This predicts [ynr̃ʔos], analogously to [kɛlr̃ʔazaʁ], rather than [ynəos].
- While [ynr̃ʔos] actually does occur (Meisenburg & Gabriel 2004), the form [ynəos] is usual (mentioned as the only form by Tranel 1995), and has to be explained (assuming that *[kɛləazaʁ] is out).

Why is *une hausse* special?

- Tranel (1995:812):
  - "a possible strategy for resolving the conflict caused on the one hand by the phonological pressure exerted by forward syllabification in VCV sequences and on the other hand by the syllable-island constraint characteristic of *h*-aspiré words"

Speaker-based non-answer

- Hache-aspiré acts like a consonant:
  - [ləazaʁ], [lɔm]
  - [kɛlʔazaʁ], [kɛlɔm]
  - [leazaʁ], [lezɔm]
  - ?[ynʔos], [ynide]

- Only three of the four processes are handled correctly.

Listener-oriented answer

- Improvement of auditory difference between vowel-initial and hache-aspiré-initial words:
  - [ləazaʁ] vs. [lɔm]: good (vowel)
  - [kɛlʔ̰azaʁ] vs. [kɛlɔm]: okayish (creaky pause)
  - [leazaʁ] vs. [lezɔm]: good (consonant)
  - *[ynos] vs. [ynide]: bad (no difference)
  - ?[ynʔ̰os] vs. [ynide]: okayish (creaky pause)
  - [ynəos] vs. [ynide]: good (vowel)
- All four processes can be understood.

Formalization

- Formalize it within the framework of Optimality Theory (Prince & Smolensky 1993).
  - Two possible formalizations:
    - speaker-based OT;
    - listener-oriented OT.

Speaker-based constraints

- Structural constraints:
  - *[CC: "certain initial consonant clusters are out": *[lgaʁsɔ̃], *[lʔazaʁ]; never violated.
  - *C̲C: "liaison consonants never followed by C": *[lezgaʁsɔ̃], *[lezʔazaʁ]; never violated.
- Speaker-based faithfulness (McCarthy & Prince 1995):
  - Dep(ə): "a pronounced [ə] must be underlyingly present": *[kɛləazaʁ]; never violated.
  - Max(ə): "an underlying [ə] must be pronounced": *[ynos]; but violated in [ynide], [lɔm], [ynfam].

Speaker-based grammar

- MAX(ʔ) >> *ʔ
  - [kɛlʔ̰azaʁ] > [kɛlazaʁ]
- *ʔ >> *ə
  - [ynəos] > [ynʔ̰os]
- *ə >> MAX(ə)
  - [lɔm] > [ləɔm]
  - [ynfam] > [ynəfam]

General grammar

- { *[CC, *C̲C, Dep(ə) } >>
  Max(ʔ) >> *ʔ >> *ə >> { Max(ə), Max(C̲) }

- This *is* my proposal for the correct ranking.

- I will now show, quite unfairly, that 3 of the 12 forms are handled incorrectly under the usual speaker-based view of faithfulness.

Speaker-based elision (C)

/lə+gaʁsɔ̃/	*[CC *C̲C	Dep (ə)	Max (ʔ)	*ʔ	*ə	Max (ə)
☞ləgaʁsɔ̃					*	
lgaʁsɔ̃	*!					*

Speaker-based elision (ʔ)

/lə+ʔazaʁ/	*[CC *C͟C	Dep (ə)	Max (ʔ)	*ʔ	*ə	Max (ə)
☞ ləʔazaʁ				*	*	
lʔazaʁ	*!			*		*
√ ləazaʁ			*!		*	
lazaʁ			*!			*

Speaker-based elision (V)

/lə+ɔm/	*[CC *C̲C	Dep (ə)	Max (ʔ)	*ʔ	*ə	Max (ə)
ləʔɔm				*!	*	
lʔɔm	*!			*		*
ləɔm					*!	
☞ lɔm						*

Speaker-based enchainment (C)

|kɛl+gaʁsɔ̃|	*[CC *C͡C	Dep (ə)	Max (ʔ)	*ʔ	*ə	Max (ə)
√☞ kɛlgaʁsɔ̃						
kɛləgaʁsɔ̃		*!			*	

Speaker-based enchainment (ʔ)

|kɛl+ʔazaʁ|	*[CC *C͡C	Dep (ə)	Max (ʔ)	*ʔ	*ə	Max (ə)
√☞ kɛlʔazaʁ				*		
kɛləʔazaʁ		*!		*	*	
kɛləazaʁ		*!	*		*	
kɛlazaʁ			*!			

Speaker-based enchainment (V)

/kɛl+ɔm/	*[CC *C͡C	Dep (ə)	Max (ʔ)	*ʔ	*ə	Max (ə)
kɛlʔɔm				*!		
kɛləʔɔm		*!		*	*	
kɛləɔm		*!			*	
☞ kɛlɔm						

Speaker-based liaison (C)

/lez+gaʁsɔ̃/	*[CC *C͡C	Dep (ə)	Max (ʔ)	*ʔ	*ə	Max (C͡)
lezgaʁsɔ̃	*!					
lezəgaʁsɔ̃		*!			*	
☞ legaʁsɔ̃						*

Speaker-based liaison (ʔ)

/lez͡+ʔazaʁ/	*[CC *C͡C	Dep (ə)	Max (ʔ)	*ʔ	*ə	Max (C͡)
lez͡ʔazaʁ	*!			*		
lez͡əazaʁ		*!	*		*	
lez͡azaʁ			*!			
√ leazaʁ			*!			*
☞ leʔazaʁ				*		*

Speaker-based liaison (V)

|lez̲+ɔm|	*[CC *C̲C	Dep (ə)	Max (ʔ)	*ʔ	*ə	Max (C̲)
√☞	lez̲ɔm						
	leʔɔm				*!		*
	leɔm						*!

Speaker-based schwa drop (C)

/ynə+fam/	*[CC *C͡C	Dep (ə)	Max (ʔ)	*ʔ	*ə	Max (ə)
ynəfam					*!	
☞ ynfam						*

Speaker-based schwa drop (ʔ)

/ynə+ʔos/	*[CC *C̲C	Dep (ə)	Max (ʔ)	*ʔ	*ə	Max (ə)
ynəʔos				*	*!	
☞ ynʔos				*		*
√ ynəos			*!		*	
ynos			*!			*

Speaker-based schwa drop (V)

/ynə+ide/	*[CC *C̲C	Dep (ə)	Max (ʔ)	*ʔ	*ə	Max (ə)
ynəide					*!	
ynəʔide				*!	*	
√☞ ynide						*
ynʔide				*!		*

Three failures

- My unfair speaker-based account has three failures, all cases where the surface form has hiatus:
  - [ləʔazaʁ] instead of [ləazaʁ].
  - [leʔazaʁ] instead of [leazaʁ].
  - [ynʔos] instead of [ynəos].

Patching up the hierarchy

- Three patches by Meisenburg & Gabriel (2004):
  1. outlaw [ləʔazaʁ] and [leʔazaʁ] with *VʔV;
  2. outlaw the new winners [lazaʁ] and [leʒ̲azaʁ] with ALIGN-L (ʔ̲, σ) (cf. Tranel & Del Gobbo 2002);
  3. outlaw [ynʔos] with MAX(ə/_ʔ).

My objections

- While *VʔV and Align-L (ʔ͡, σ) sound reasonable, I object to Max(ə/_ʔ).
  - Max(ə/_ʔ) is not crosslinguistically validated.
  - Its sole purpose seems to be to preserve some underlying material (ə) if some other underlying material (ʔ) does not surface.

Listener-oriented faithfulness

- Speaker-based:
- MAX(ʔ): “pronounce an underlying |ʔ| as /ʔ/.”

- Listener-oriented:
- MAX(ʔ): “pronounce an underlying |ʔ| as something that the listener will perceive as /ʔ/.”

The perception of French

- A French listener will perceive [VV] as /VʔV/ (this proposal is comparable to proposing *VʔV):
  - [ləazaʁ] is perceived as /ləʔazaʁ/.
  - [leazaʁ] is perceived as /leʔazaʁ/.
  - [ynəos] is perceived as /ynəʔos/.
  - [ləɔm] would be perceived as /ləʔɔm/.
  - [leɔm] would be perceived as /leʔɔm/.
  - [ynəide] would be perceived as /ynəʔide/.

Listener-oriented violation

- ★ Apply listener-oriented faithfulness to the perception of French.
- [ləazaʁ], [leazaʁ], and [ynəos] satisfy MAX(ʔ).
- [ləɔm], [leɔm], and [ynəide] violate DEP(ʔ).

- I will show that all 12 forms are handled correctly. If DEP(ʔ) is not included, 8 tableaus stay the same, the 4 tableaus with underlying |ʔ| change…

Listener-oriented elision (ʔ)

/lə+ʔazaʁ/	*[CC *C͡C	Dep (ə)	Max (ʔ)	*ʔ	*ə	Max (ə)
ləʔazaʁ				*!	*	
lʔazaʁ	*!			*		*
√☞ ləazaʁ					*	
lazaʁ			*!			*

Listener-oriented enchainment (ʔ)

|kɛl+ʔazaʁ|	*[CC *C͡C	Dep (ə)	Max (ʔ)	*ʔ	*ə	Max (ə)
√☞ kɛlʔazaʁ				*		
kɛləʔazaʁ		*!		*	*	
kɛləazaʁ		*!			*	
kɛlazaʁ			*!			

Listener-oriented liaison (ʔ)

/lez+ʔazaʁ/	*[CC *C͡C	Dep (ə)	Max (ʔ)	*ʔ	*ə	Max (C͡)
lezʔazaʁ	*!			*		
lezəazaʁ		*!			*	
lezazaʁ			*!			
☞ leazaʁ						*
leʔazaʁ				*!		*

Listener-oriented schwa drop (ʔ)

/ynə+ʔos/	*[CC *C͡C	Dep (ə)	Max (ʔ)	*ʔ	*ə	Max (ə)
ynəʔos				*!	*	
ynʔos				*!		*
☞ ynəos					*	
ynos			*!			*

Comparative evaluation

- Speaker-based account requires:
  - *VʔV, Align-L (ʔ̰, σ), Max(ə/_ʔ).
- Listener-oriented account requires:
  - [VV] is perceived as /VʔV/.
- Alternative, less weird-sounding account:
  - Replace |ʔ| with |.| (syllable boundary, e.g. |.azaʁ|).
  - [VV] is perceived as /V.V/.
  - [ʔ̰] is perceived as /./.

Conclusion

- Listener-oriented faithfulness succeeds where speaker-based faithfulness fails.
- Listener-oriented faithfulness requires three-level phonology (Tesar & Smolensky 1998; Boersma 1998): overt auditory forms can be concrete and maximally detailed, full phonological surface structures can be abstract and maximally economical.

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Refinement 1: more faith

- The account just presented is not listener-oriented enough, because the preference of [ynəos] over [ynʔos] is attributed to the ranking *ʔ >> *ə.
- The constraint *ʔ is superfluous; in 11 of the 12 tableaus its effects can be handled with Dep(ʔ).
- The remaining tableau is |ynə+ʔos|.
- Probabilistic faithfulness: Max(ʔ, *x%*): "pronounce an underlying |ʔ| as [something] that has x% probability of being perceived as /ʔ/."

Even more listener-oriented

|ynə+ʔos|	*[CC *C̲C Dep	Max (ʔ, 20%)	Max (ʔ, 90%)	*ə	Max (ə)	*ʔ
ynəʔos				*		*!
ynʔos			*!		*	*
☞ ynəos				*		
ynos		*!	*		*	

Refinement 2: OT perception

- Perception is language-specific (French but not English listeners insert a glottal stop in hiatus), so we model this perception with linguistic means, i.e. in OT as well (Boersma's 1998 *perception grammar*, Tesar & Smolensky's 1998 *robust interpretive parsing*).
- Structural constraint */VV/: "perceive no hiatus."
- "perceive [] as /full consonant/" >>
  "perceive [] as /ʔ/"

Perception in OT

[ynəos]	*/VV/	[] *→ /C/	[] *→ /ʔ/
/ynəos/	*!		
☞ /ynəʔos/			*
/ynətos/		*!	

Refinement 3: allomorphy

- |mɔ̃n+NounMasc| ‘my+Noun’:
  - [mɔ̃gaʁsɔ̃], [mɔ̃azaʁ], [mɔ̃nɔm]
    - Can be handled with our liaison tableaus.
- |ma+NounFem| ‘my+Noun’:
  - [mafam], [maos], [mɔ̃nide]
- ★ Violation of *ChangeGender.

Gender change

|ma+ide|	*[CC *C̲C	Dep (ʔ)	Max (ʔ)	*ə	Max (a̲)	Gen der
maide		*!				
mide					*!	
√☞ mɔ̃nide						*

Refinement 4: variation

- According to Meisenburg & Gabriel (2004), there is variation [ynəos], [ynʔos], [ynəʔos], and variation [ləazaʁ], [ləʔazaʁ].

Triple attested variation

|ynə+ʔos|	*[CC *C̲C	Max (ʔ, 20%)	*ʔ	Max (ʔ, 95%)	*ə	Max (ə)
√☞ ynəʔos			*		*	
√☞ ynʔos			*	*		*
√☞ ynəos				*	*	
ynos		*!		*		*

Refinement 5: variation

- According to Tranel (1995), there is variation /kɛl.azaʁ/, /kɛ.lazaʁ/, i.e. [kɛlʔazaʁ], [kɛlazaʁ], but no variation /kɛl.eʁo/, */kɛ.leʁo/.
- According to Meisenburg & Gabriel (2004), however, there is also variation [kɛlʔeʁo], [kɛleʁo].

Stochastic ranking

Max(ʔ, 20%) = 98.0

Max(ʔ, 90%) = 96.0

*ʔ = 95.0

Max(ʔ, 95%) = 94.0

*ə = 93.0

(evaluation noise = 2.0)

- [kɛlʒazaʁ] 85.5%, [kɛlazaʁ] 14.5%
- [ynəʒos] 33.6%, [ynʒos] 5.8%,
  [ynəos] 59.8%, *[ynos] 0.8%
- [leazaʁ] 64%, [leʒazaʁ] 36%
- [ləazaʁ] 62%, [ləʒazaʁ] 36%, *[lazaʁ] 2%

Refinement 6: variation

- DEP(ʔ) is needed and must be high-ranked.
- We know this because ?[ynəfam] is much less bad than *[ləɔm] or *[ynəide], although the tableaus suggest that the difference between [ynəfam] and [ynfam] is comparable to the difference between [ləɔm] and [lɔm] or to the difference between [ynəide] and [ynide], namely the relative ranking of *ə and MAX(ə).
- If DEP(ʔ) is high-ranked, *[ləɔm] or *[ynəide] are thoroughly outruled, and a close ranking of *ə and MAX(ə) can produce a small number of ?[ynəfam].

Refinement 7: UF

- The advantage of representing hache-aspiré as |.| and /./ is that phrase-initial neutralization is automatically accounted for, since an initial syllable boundary is automatically prepended to |ɔm| if phrase-initial (prosodic hierarchy constraint).
- The disadvantage of representing hache-aspiré as |.| is that it cannot assign a reasonable perception to Meisenburg & Gabriel's example [.tʁaɑ̃.bœʁ.gœʁ.] (syllables cannot be recursive), whereas the perception /.tʁaˀɑ̃.bœʁ.gœʁ./ seems to be possible (cf. syllable-internal [ʔ] in Vietnamese or Danish).