Contingent Optionality

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1. Polish data: the clitic (verbal prefix or preposition) /z/

(1) *Voicing assimilation*

a. *Voiced*

z + ɔknɑ	'from the window'
z + wɑpɑt͡ɕ	'to catch'
z + zɛgɑrkʲɛm	'with a watch'

b. *Voiceless*

s + plɛɕt͡ɕ	'to entwine together'
s + kfɑsɛm	'with acid'
s + sʊnɔ̃t͡ɕ	'to slip down'

(2) *Optional coronal place assimilation (CPA)*

a. *Alveolo-palatal*

ʑ + d͡ʑɛt͡ɕmi	or z + d͡ʑɛt͡ɕmi	'with children'
ʑ + ʑɛ̃bnɔ̃t͡ɕ	z + ʑɛ̃bnɔ̃t͡ɕ	'to become cold'
ɕ + t͡ɕpʊnɛm	s + t͡ɕpʊnɛm	'with a junkie'
ɕ + ɕɑnɑ	s + ɕɑnɑ	'from hay'

b. *Postalveolar*

ʒ + d͡ʒvi	or z + d͡ʒvi	'from the door'
ʒ + ʒɑbɔ̃	z + ʒɑbɔ̃	'with a frog'
ʃ + t͡ʃɑsɛm	s + t͡ʃɑsɛm	'with/in time'
ʃ + ʃɑʒɛt͡ɕ	s + ʃɑʒɛt͡ɕ	'to become grey'

(3) *Vowel epenthesis*

a. *Obligatory*

zɛ + zvʲɛʒɛ̃t͡ɕit͡ɕ ɕɛ̃	'to become animal-like'
zɛ + znɑkʲɛm	'with a sign'
zɛ + stɑʒɛt͡ɕ ɕɛ̃	'to become old'
zɛ + skɑwɔ̃	'with a rock'

b. *Optional*

zɛ + ʑrɛbɑkɑ	or z + ʑrɛbɑkɑ	'from a colt'
zɛ + ɕfʲɑtɛm	s + ɕfʲɑtɛm	'with the world'
zɛ + ʒbikʲɛm	z + ʒbikʲɛm	'with a wildcat'
zɛ + ʃfɛt͡sʲi	s + ʃfɛt͡sʲi	'from Sweden'

(4) *Varying forms*

a. ʑ + ʑɛmi ~ z + ʑɛmi	'from the ground'	b. zɛ + ʑrʊdwɑ ~ z + ʑrʊdwɑ	'from a spring'
ɕ + t͡ɕpʊnɛm ~ s + t͡ɕpʊnɛm	'with a junkie'	zɛ + ɕfitɛm ~ s + ɕfitɛm	'with dawn'
ʒ + d͡ʒɛmɛm ~ z + d͡ʒɛmɛm	'with jam'	zɛ + ʒbikɑ ~ z + ʒbikɑ	'from wildcat'
ʃ + ʃɔkʊ ~ s + ʃɔkʊ	'from shock'	zɛ + ʃpilkɔ̃ ~ s + ʃpilkɔ̃	'with a pin'

2. Analysis: avoidance of identical adjacent consonants (Baković 2005; see also Pająk 2007)

Epenthesis applies to avoid *identical* adjacent consonants in a cluster. If epenthesis did not apply, then – due to the independent processes of voicing assimilation (VA) and coronal place assimilation (CPA) – the result would be a sequence of identical consonants in a cluster.

a. Obligatory VA

/z + skɑwɔ̃/
(*s + skɑwɔ̃) zɛ + skɑwɔ̃

b. Optional CPA

/z + ʑrʊdwɑ/
(*ʑ + ʑrʊdwɑ) zɛ + ʑrʊdwɑ z + ʑrʊdwɑ

c. Obligatory VA & optional CPA

/z + ɕfitɛm/
(*ɕ + ɕfitɛm) zɛ + ɕfitɛm s + ɕfitɛm

3. Rule-based analysis fails

1.	Obligatory epenthesis	$C_1 = C_2$, ignoring [voi]
2.	Obligatory assimilation	regressive voicing
3.	Optional epenthesis	$C_1 = C_2$, ignoring [COR-pl] (& [voi])
4.	Optional assimilation	regressive coronal place

bleeding: 1. Ø → V / C_1 __ C_2C ; 2. [–son] → [αvoi] / __ C[αvoi]

bleeding: 3. Ø → V / C_1 __ C_2C ; 4. [COR] → [αCOR-pl] / __ C[αCOR-pl]

Epenthesis bleeds assimilation	*Both rules are skipped*	*Assimilation must be skipped!*
/z + ʑrɛbɑkɑ/	/z + ʑrɛbɑkɑ/	/z + ʑrɛbɑkɑ/
3. zɛ + ʑrɛbɑkɑ	3. *—skipped—*	3. *—skipped—*
4. *—bled—*	4. *—skipped—*	4. ʑ + ʑrɛbɑkɑ
√ [zɛ + ʑrɛbɑkɑ]	√ [z + ʑrɛbɑkɑ]	* [ʑ + ʑrɛbɑkɑ]

4. Informal definitions of the OT constraints[1]

NoGem+C	A sequence of identical segments must not be followed by a consonant
Dep(V)	No vowel epenthesis
Agree[voi]	Adjacent obstruents must agree in voicing
Ident[voi]	Voicing of obstruents must not change from input to output
Agree[cor]	Adjacent coronal stridents must agree in place of articulation
Ident[cor]	Place of articulation of coronal stridents must not change from input to output

5. Analysis of optionality with tied constraints: ranking paradox

(i)

Input: /z + d͡ʒɛmɛm/	NoGem+C	Dep(V)	Agree[cor]	Ident[cor]
a. → [z + d͡ʒɛmɛm]			*	
b. → [ʒ + d͡ʒɛmɛm]				*
c. [zɛ + d͡ʒɛmɛm]		*!		

Other inputs of this type:
/z + ʑɛmi/
/z + t͡ɕpʊnɛm/
/z + ʃɔkʊ/

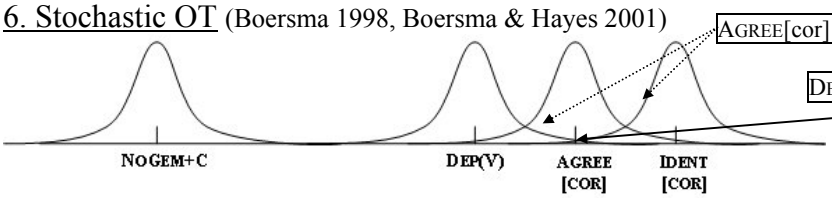
(ii)

Input: /z + ʒbikʲɛm/	NoGem+C	Dep(V)	Agree[cor]	Ident[cor]
a. → [z + ʒbikʲɛm]			*	
b. [ʒ + ʒbikʲɛm]	*!			*
c. → [zɛ + ʒbikʲɛm]		*		

Other inputs of this type:
/z + ʑrʊdwɑ/
/z + ɕfitɛm/
/z + ʃpilkɔ̃/

- Two incompatible ranking conditions would have to be met at the same time:
  Dep(V) >> Agree[cor] (i) and Dep(V) ~ Agree[cor] (ii)
- A similar ranking paradox holds for the Rank-Ordering Model of Eval (Coetzee 2006)

6. Stochastic OT (Boersma 1998, Boersma & Hayes 2001)



but!

Actual Relative Frequencies	
ʒ + d͡ʒɛmɛm	25%
z + d͡ʒɛmɛm	75%[2]
zɛ + ʒbikʲɛm	99%
z + ʒbikʲɛm	1%[3]

Predictions regarding probabilities

- the most probable ranking: NoGem+C >> Dep(V) >> Agree[cor] >> Ident[cor]
- predicted relative probabilities: **[ʒ + d͡ʒɛmɛm]** > [z + d͡ʒɛmɛm] *and* [zɛ + ʒbikʲɛm] < **[z + ʒbikʲɛm]**
- a similar problem faces the model of Partially Ordered Grammars (Anttila 1997, 2002)

7. Conclusions

- Epenthesis in 'sufficiently identical' C_1__C_2C = geminate avoidance + assimilation. (Baković 2005)
- The optionality of epenthesis is *contingent* on the optionality of coronal place assimilation.
- A rule-based analysis fails to capture both aspects of epenthesis-assimilation interaction.
- Stochastic OT (-like) grammar generates possibilities; probabilities determined by other factors. (Pająk 2007)

Selected references

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[1] For more information regarding the details of analysis and constraint definition see Pająk (in progress).
[2] Based on a production study by Osowicka-Kondratowicz (2004) on 90 subjects. In general, non-application of CPA was found more common than its application. CPA across a clitic boundary (16 tokens) occurred, on average, with a frequency of 25%.
[3] Based on a search through the IPI PAN Corpus of Polish (available at http://korpus.pl), containing over 250 million segments and about 44,000 occurrences of the clitic /z/ in the context that triggers optional epenthesis, of which the non-epenthetic forms constitute less than 1%.