Contextual constraints on geminates: the case of Polish*

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1 Background

- Geminates – long consonants, often used contrastively in languages:
  e.g., Italian: 'be**ll**o' – 'be**l**o' ('beautiful' – 'I bleat')
  Finnish: 'ta**kk**a' – 'ta**k**a-' ('fireplace' – 'back')[1]
- The discussion includes all geminates regardless of their representation (e.g., consonants with two timing slots, a single mora projection, two adjacent identical segments, etc.).
- Constraint against geminates commonly used in Optimality Theory (OT): *Gem.
- Proposals to split *Gem into a family of segmental constraints:
  - Podesva (2002): *GemGutt ≫ *GemSon, *GemFric, *GemVoicedObs
    $\overbrace{\text{*GemGlide} \gg \text{*GemLiquid} \gg \text{*GemNasal}}$
  - Kawahara (2007): *GemGlide ≫ *GemLiquid ≫ *GemNasal ≫ *GemObs
- Geminates and context (word position & adjacent segments)
  - Previous work shows that context needs to be taken into account in the analyses of geminates in some languages (Muller 1999, McCrary 2004).
  - Typology: intervocalic geminates ← the most common
    non-vowel-adjacent geminates ← the most rare
    (G. Thurgood 1993, Muller 2001; plus informal survey of 40 languages with geminates)
  - Perception: intervocalic geminates ← the most perceptible
    non-vowel-adjacent geminates ← the least perceptible
    (Pająk 2009; see also McCrary 2004, Dmitrieva 2009)

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[1]Examples from on-line dictionaries: http://www.wordreference.com/iten and http://www.fincd.com/.

2 Proposal

- Splitting *GEM into *at least* three **contextual constraints**:

$$\overbrace{\text{*GEM/NVA}}^{\#GGC,\,CGG\#,\,CGGC} \gg \overbrace{\text{*GEM/1VA}}^{\#GGV,\,VGG\#,\,VGGC,\,CGGV} \gg \overbrace{\text{*GEM/V\_V}}^{VGGV}$$

NVA = non-vowel-adjacent, 1VA = single vowel-adjacent

3 The case of Polish

3.1 Geminates in Polish

- Geminates are used contrastively: e.g, [bu**d**a] – [bu**dd**a] ('kennel' – 'Buddha').
- There are examples of both 'true' geminates – underlyingly long (mostly borrowings from other languages), and 'fake' geminates – derived through certain morphological processes.

  (For discussion of geminates in Polish see e.g. Zajda 1977, Rubach 1986, Rubach & Booij 1990, Sawicka 1995, E. Thurgood 2002.)
- Geminates are mainly allowed in the **intervocalic** context:

(1) a. *Sonorants*

fɔnta**nn**a	'fountain'	ba**ll**ada	'ballad'
ga**mm**a	'gamma'	mu**ww**a	'mullah'
d͡ʑɛ**ɲɲ**ik	'gazette'	xɔ**rr**ɔr	'horror'

b. *Obstruents*

gɛ**tt**ɔ	'ghetto'	pi**t͡st͡s**a	'pizza'
lɛ**kk**ɔ	'lightly'	bɛ**zz**asadnɨ	'unfounded'
ɔ**dd**at͡ɕ	'to give back'	la**ss**ɔ	'lasso'

- Common repair for other contexts – **degemination** (Rubach & Booij 1990):

(2) a. *Postconsonantally*

pʲɛ̃kn-ɔ	'beauty'	+nɨ	pʲɛ̃k-nɨ	'beautiful'	*pʲɛ̃k**n-nɨ**
kupn-ɔ	'purchase'	+nɨ	pʂɛkup-nɨ	'corrupt'	*pʂɛkup**n-nɨ**

cf.

vɔd-a	'water'	+nɨ	wɔd-nɨ	'aquatic'
pɔst	'fasting'	+nɨ	pɔst-nɨ	'maigre'
sɛn	'sleep'	+nɨ	sɛn-nɨ	'sleepy'

b. *Preconsonantally*

sɛvill-a	'Seville'	+ski	sɛvil-ski	'Sevillian'	*sɛvi**ll**-ski
frant͡sus	'Frenchman'	+ski	frant͡su-ski	'French'	*frant͡su**s**-ski

cf.

ɛkfadɔr	'Ecuador'	+ski	ɛkfadɔr-ski	'Ecuadorian'
sɛrp	'Serb'	+ski	sɛrp-ski	'Serbian'

c. *Word-finally*

fɔntann-ɨ	'fountains' (Nom.)	*but*	fɔntan	'fountains' (Gen.)	*fɔnta**nn**
flɔtɨll-ɛ	'fleets' (Nom.)		flɔtɨl	'fleets' (Gen.)	*flɔtɨ**ll**
lass-a	'lassoes' (Nom.)		las	'lassoes' (Gen.)	*la**ss**

cf. palm-ɨ	'palms' (Nom.)	palm	'palms' (Gen.)	
ruzg-i	'rods' (Nom.)	rusk	'rods' (Gen.)	

d. Optionally: *preconsonantally at a clitic-stem boundary* (Sawicka 1995: 153)

bɛ**s**+**s**trɔnnɨ ∼ bɛ+**s**trɔnnɨ	'impartial'
rɔ**z**+**z**wɔɕt͡ɕit͡ɕ ∼ rɔ+**z**wɔɕt͡ɕit͡ɕ	'to enrage'

cf. bɛs+pwt͡ɕɔvɨ	'sexless'	*bɛ+pwt͡ɕɔvɨ
rɔz+gzʲat͡ɕ	'to warm up'	*rɔ+gzʲat͡ɕ

Note: degemination is optional in (d) due to the presence of a clitic boundary, which is often equivalent to word boundary. Clitics are generally not sensitive to processes that normally apply within words, and differ in several properties from suffixes (e.g., Rubach 1977).

- **Initial geminates** allowed when formed with monoconsonantal proclitics /v/ or /z/, but *only when adjacent to a vowel*:

(3) *Vowel-adjacent initial geminates: no degemination*

/v/+vɔʑit͡ɕ	→	v+vɔʑit͡ɕ	'to carry in'	*∅+vɔʑit͡ɕ
/v/+fɔtɛlu	→	f+fɔtɛlu	'in an armchair'	*∅+fɔtɛlu
/z/+zɛ̃bɛm	→	z+zɛ̃bɛm	'with a tooth'	*∅+zɛ̃bɛm
/z/+sunɔ̃t͡ɕ	→	s+sunɔ̃t͡ɕ	'to slip down'	*∅+sunɔ̃t͡ɕ

- Preconsonantal initial geminates are not allowed, repair – **vowel epenthesis**:

(4) *Consonant-adjacent initial geminates: no degemination*

/v/+vzʲɛɕɲu	→	vɛ+vzʲɛɕɲu	'in September'	*v+vzʲɛɕɲu, *∅+vzʲɛɕɲu
/v/+frunɔ̃t͡ɕ	→	vɛ+frunɔ̃t͡ɕ	'to fly in'	*f+frunɔ̃t͡ɕ, *∅+frunɔ̃t͡ɕ
/z/+znakʲɛm	→	zɛ+znakʲɛm	'with a sign'	*z+znakʲɛm, *∅+znakʲɛm
/z/+stazʲɛt͡ɕ+ɕɛ̃	→	zɛ+stazʲɛt͡ɕ+ɕɛ̃	'to get old'	*s+stazʲɛt͡ɕ, *∅+stazʲɛt͡ɕ

Note: epenthesis does not apply to simply break a cluster because Polish allows very complex onset clusters: e.g., [z+bzʲdɛkʲɛm] 'with a plunk' or [s+pʂt͡ʂɔwɔ̃] 'with a bee.'

- Exceptions to the above generalization:
  - Monomorphemic initial geminates: [**ss**at͡ɕ] 'to suck,' [**t͡ʂt͡ʂ**ɨ] 'empty,' [**d͡zʑd͡zʑ**ɔvɲit͡sa] 'earthworm,' and [**d͡zʑd͡zʑ**ɨstɨ] 'rainy.'
  - Preconsonantal initial geminate: [**s**+**s**tɔ̃pit͡ɕ] 'to descend.'

3.2 Summary

- Distribution of geminates in Polish:

(5)

intervocalic geminates	VGGV	allowed
single vowel-adjacent geminates	#G+GV	
	CGGV VGGC VGG#	degemination
non-vowel-adjacent geminates	#G+GC	epenthesis

3.3 Analysis

- The behavior of geminates in Polish constitutes a classic case of conspiracy. Two processes – deletion and epenthesis – conspire to avoid non-intervocalic geminates.

- Only intervocalic geminates seem to be freely allowed in the language.

  /la**ss**ɔ/ → [la**ss**ɔ]

- Whenever a geminate would need to surface in a different context due to morphological processes, degemination takes place instead.

  /sɛvi**ll**-ski/ → [sɛvi**l**-ski]

- However, degemination is blocked whenever it would cause deletion of an entire clitic. In these cases word-initial geminates are either tolerated (when prevocalic) or repaired by vowel epenthesis (when preconsonantal).

  /**v**+**v**ɔʑitɕ/ → [**v**+**v**ɔʑitɕ]

  /**v**+**v**ʐɛɕɲu/ → [**vɛ**+**v**ʐɛɕɲu]

- This pattern can be straightforwardly accounted for with the proposed contextual constraints on geminates:

*Gem/V_V	Intervocalic geminates are not allowed
*Gem/1VA	Geminates adjacent to exactly one vowel are not allowed
*Gem/NVA	Geminates not adjacent to any vowels are not allowed

- Additional constraints:

Dep(V)	No vowel epenthesis
Max(C)	No consonant deletion (no degemination)
Re(alize)Mor(pheme)	A morpheme must have some phonological exponent in the output (e.g., Kurisu 2001)

- Intervocalic geminates

  Dep(V) ≫ *Gem/V_V because [la**ss**ɔ] (a) ≻ [la**sɛs**ɔ] (c)
  Max(C) ≫ *Gem/V_V because [la**ss**ɔ] (a) ≻ [la**s**ɔ] (b)

(6)

/la**ss**ɔ/	Dep(V)	Max(C)	*Gem/V_V
a. ☞ la**ss**ɔ			*
b. la**s**ɔ		* !	
c. la**sɛs**ɔ	* !		

- Degemination

  DEP(V) ≫ MAX(C) because [sɛvi**l**ski] (b) ≻ [sɛvi**lɛl**ski] (c), [sɛvi**llɛ**ski] (d)
  *GEM/1VA ≫ MAX(C) because [sɛvi**l**ski] (b) ≻ [sɛvi**ll**ski] (a)

(7)

/sɛvi**ll**-ski/	DEP(V)	*GEM/1VA	MAX(C)	*GEM/V_V
a. sɛvi**ll**ski		* !		
b. ☞ sɛvi**l**ski			*	
c. sɛvi**lɛl**ski	* !			
d. sɛvi**llɛ**ski	* !			*

- Initial geminates

  REMOR ≫ *GEM/1VA because [**vv**ɔʑit͡ɕ] (a) ≻ [**v**ɔʑit͡ɕ] (b)
  DEP(V) ≫ *GEM/1VA because [**vv**ɔʑit͡ɕ] (a) ≻ [**vɛv**ɔʑit͡ɕ] (c), [**ɛvv**ɔʑit͡ɕ] (d)

(8)

/**v**+**v**ɔʑit͡ɕ/	REMOR	DEP(V)	*GEM/1VA	MAX(C)	*GEM/V_V
a. ☞ **vv**ɔʑit͡ɕ			*		
b. **v**ɔʑit͡ɕ	* !			*	
c. **vɛv**ɔʑit͡ɕ		* !			
d. **ɛvv**ɔʑit͡ɕ		* !			*

- Epenthesis

  *GEM/NVA ≫ DEP(V) because [**vɛv**ʐɛɕɲʊ] (c) ≻ [**v**ʐɛɕɲʊ] (a)
  REMOR ≫ DEP(V) because [**vɛv**ʐɛɕɲʊ] (c) ≻ [**v**ʐɛɕɲʊ] (b)

(9)

/**v**+**v**ʐɛɕɲʊ/	*GEM/NVA	REMOR	DEP(V)	*GEM/1VA	MAX(C)	*GEM/V_V
a. **v**vʐɛɕɲʊ	* !					
b. **v**ʐɛɕɲʊ		* !			*	
c. ☞ **vɛv**ʐɛɕɲʊ			*			
d. **ɛvv**ʐɛɕɲʊ			*	* !		
e. **vvɛ**ʐɛɕɲʊ			*	* !		

- Constraint ranking that accounts for the distribution of geminates in Polish:

(10)

non-vowel-adjacent geminates	#G+GC	epenthesis	*GEM/NVA, REMOR ≫ DEP(V)
single vowel-adjacent geminates	CGGV VGGC VGG#	degemination	*GEM/1VA ≫ MAX(C)
	#G+GV	allowed	
intervocalic geminates	VGGV		*GEM/V_V

4 Additional comments

- I proposed splitting the general *Gem into contextual constraints:

  *Gem/NVA ≫ *Gem/1VA ≫ *Gem/V_V

- The proposed constraints could be more specific:

  e.g., *Gem/1VA split into

  *Gem/#GGV, *Gem/VGG#, *Gem/VGGC, *Gem/CGGV

  and/or combined with segmental constraints:

  e.g., *GemObs/1VA

- Single vowel-adjacent geminates – evidence for splitting *Gem/1VA:

  There are languages that

  - allow word-initial but not word-final geminates (e.g., Chuukese; Muller 1999).
  - allow initial and final geminates, but disallow medial single vowel-adjacent geminates (e.g., Hungarian; Vago 1980).[2]
  - allow some segments to be geminated in the intervocalic and single vowel-adjacent contexts, while others to only be intervocalic (e.g, Italian; McCrary 2004).

5 Conclusion

- Context (word position & adjacent segments) is an important characteristic of geminates.
- I argued that the constraint against geminates *Gem should be split into at least three general contextual constraints: *Gem/NVA ≫ *Gem/1VA ≫ *Gem/V_V.
- I showed that these constraints correctly account for the distribution of geminates in Polish.

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[2]Siptár and Törkenczy (2000) note that there is only relative preference or dispreference for degemination of medial single vowel-adjacent geminates, depending on the nature of the adjacent segment (obstruent vs. sonorant).

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