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# Towards a unified representation of the right edge of words

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## The right edge of words

This contribution aims to participate to the debate on the representation of **word edges**, by discussing the status of the right edge of words in three unrelated languages, Italian, Bosnian and Mandarin Chinese, in the framework of Government Phonology (Kaye et al. 1985, 1990) and the CV-hypothesis (Lowenstamm 1996). We follow a syntactic approach to word formation (Distributed Morphology, Halle & Marantz 1993; Embick 2010).

We propose, following ideas previously found in Afuta (2002), Charette (2006) and Passino (2008), that minimal words in Italian, Bosnian and Chinese end in a CV unit.

## Italian nouns

- (1) Italian nouns
- VARIABLE nouns end in a **vowel** if i) the final vowel is **unstressed**; ii) the final vowel **changes** between the singular and the plural
  - INVARIABLE nouns i) end in a stressed vowel, *città* 'town(s)'; ii) end in a consonant (= loans), *film* 'movie(s)'; iii) are truncated forms of variable nouns, *moto* 'moto(s)' (*motociclett-ale*)

Variable nouns			
	√-M.sg	√-M.pl	
a.	<i>lup-o</i>	<i>lup-i</i>	'wol-f/ves'
c.	<i>can-e</i>	<i>can-i</i>	'dog(s)'
b.	<i>ros-a</i>	<i>ros-e</i>	'rose(s)'
d.	<i>nav-e</i>	<i>nav-i</i>	'boat(s)'

The final vowel does not enforce a phonological constraint avoiding final Cs:

- consonant-final nouns exist, *film* 'movie';
- if the final vowel were an epenthetic vowel, we'd expect only one and not four different ones;
- some final-hiatus words exist: *mare-a* 'tide', *nucle-o* 'nucleus', etc...

- (2) Consonant-final nouns: *film* sg



- (3) Consonant-final nouns: *film* pl



This shows that the final vowel is not a phonological object but a morpho-syntactic one: it is the exponent of gender and number.

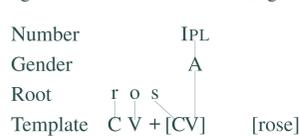
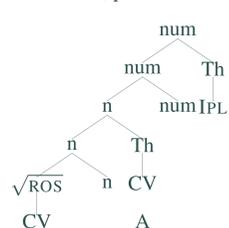
- (4) Root 'wolf' l u p (5) Root 'rose' r o s (6) Root 'movie' f i l m



Roots like √LUP, √ROS have floating consonant (in other words, **they need a template**); roots like √FILM have a fully formed template.

- (7) We assume that loans such as *film* are associated to a fully syllabified CV-sequence because they are the spell-out of the functional head n (cf. light verbs like go, do, etc.; see Embick 2010).

- (8) Complex head of *rose* F, pl. (9) Phonological linearization of *rose* F, sg.



- (10) *topo* 'mouse' vs. *top* 'top (bra of a bikini)'
- Number ASG, Gender U, Root t o p, Template C V + [CV] [topo]
  - Number ASG, Gender U, Root t o p, Template C V C V + [CV] [top]
  - The underlined V position is **not the site of inflection**.
- (11) *topino* 'small mouse' vs. *toppino* 'small top (bra of a bikini)' see Passino (2008:100-ff)
- Number ASG, Gender U, Root t o p i n, Template C V + C V [CV] [topino]
  - Number ASG, Gender U, Root t o p i n, Template C V C V + C V [CV] [toppino]
- (12) a. According to Passino (2008), an extra CV is inserted to host final consonant gemination in derivation (cf. *toppino*).  
b. In our terms, the extra CV is inserted at the right edge: this CV is the site of inflection.  
c. The final [CV] syllable appears in *toppino* but not in *top* because of the diminutive suffix *-ino* (see also: *nav-e* 'boat-F.sg' vs. *nav-in-a* 'boat-small-F.sg', *\*nav-in-e* 'boat-small-F.sg')

## Bosnian nouns

Nom and Gen nouns				
gender	singular	plural		
	Nom	Gen	Nom	Gen
1	M	<i>okvir</i>	<i>okvir-a</i>	<i>okvir-i</i> <i>okvir-ā</i> 'rose(s)'
2	F	<i>kuć-a</i>	<i>kuć-ē</i>	<i>kuć-e</i> <i>kuć-ā</i> 'boat(s)'
3	Neu	<i>sel-o</i>	<i>sel-a</i>	<i>sel-ā</i> 'village(s)'

- (13) *okvir* M sg. Nom (14) *taburei* M pl. Nom (15) *kuće* F pl. Nom
- 

We thank Nina Rendulić for the data in Serbo-Croat-Bosnian.

## (16) Loanwords

- tabure* (M sg Nom) can be pronounced as [tabure] as well as [taburee]
- taburee* (M pl Acc) is always pronounced as [tabure?e], \*[taburee]
- The final CV is always present even if there is no overt case marker (recall that Nom =  $\emptyset$ )

## Mandarin Chinese (MC)

- (17) a. Goh (1997) argues that the minimal phonological word in MC has a template CVCV.  
b. Charette (2006) considers MC as a final CV language.  
c. Luo (2013) suggests that the template of a minimal phonological word CVCV must be re-analyzed as CV[CV], [CV] being an **external final phonological unit**.
- (18) a. The four MC lexical tones (from lowest to highest: pitch 1-5 proposed by Chao 1929):  
T1 : H, [55] T2 : LH, [35] T3 : B.H, [21.4] T4 : HB, [51]  
b. Incomplete tones in non-final syllables (cf. Chao 1968; Shih 1987, 1988 for further discussions)  
T1 : H, [55] T2 : LH, [34] T3 : B.H, [21] T4 : HB, [53]
- (19) Following Luo (2013), we assume that the four tones are represented as follows:
- 
- The dotted lines represent the optional realization of the tone.

We focus on T3 [21.4]: the complete realization of T3, on long syllables, is L.H [21.4]; the incomplete realization of T3, on short syllables, is L [21].

- (20) a. In monosyllabic words, both complete and incomplete realizations are correct:  
(i) *ma3* 'horse' (complete realization)  
  
(ii) *ma3* 'horse' (incomplete realization)  
  
b. In non-final positions of polysyllabic words, only the incomplete realization is possible.  
(i) *ma3-lu4* /horse-road/ 'highway'  
  
(ii) The floating H tone of *ma3* can not be pronounced since it lacks a free V position to attach to.
- (21) MC has a limited number of suffixes (cf. Li & Thompson 1989); we argue that the final CV unit is the realizational site of these suffixes.
- perfective *le0*
  - progressive *zhe0*
- (22) A compound: *jin1-shu3* 'metal' vs. *jin1-shu3-de0* 'metallic'
- jin1-shu3* 'metal'
  - jin1-shu3-de0* 'metallic'
- (23) Structure of Chinese bisyllabic compound:
- (24) Complex heads *jin1-shu3-de0* 'metallic':
- (25) Spell-outs of n and a (non-exhaustive list):  
a. n  $\iff$  templatic spell-out  
b. a  $\iff$  complex spell-out
- (26) In MC a well-formed word requires a final CV unit.  
a. It is the site of optional (segmental and tonal) spreading when there are no suffixes;  
b. It hosts the suffix when there is one.

## Conclusions

The right edge of words in three unrelated languages: Italian, Bosnian and Mandarin Chinese can be encoded as a final CV unit.

This is a phonological object spelling out a morphological property of words:

- in MC, it is a property of all major categories (n, v, a), cf. the initial CV as in Lowenstamm (1999).
- in Bosnian and Italian, its distribution is restricted:
  - to nouns (Bosnian)
  - to nouns displaying overt inflection (Italian)