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# From initial CV to final CV: evidence from Italian, Bosnian and Mandarin Chinese

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## 1 The end of the word

- (1) General
  - a. This talk contributes to the debate on the representation of **word edges**.
  - b. We discuss the status of the end of words in three unrelated languages: Italian, Bosnian and (Mandarin) Chinese.
  - c. We assume the theoretical framework of Government Phonology (Kaye et al., 1990) in general; the CV-hypothesis (Lowenstamm, 1996) and the Theory of Elements in particular (Kaye et al., 1985).
  - d. We follow a syntactic approach to word formation (Distributed Morphology, Halle & Marantz 1993; Embick 2010).
- (2) Goals
  - a. To argue for the existence of an underlying final CV unit.
  - b. To sketch the shape of a minimal word in Italian, Bosnian and Chinese
- (3) How morphosyntactic information is analyzed in phonology (see Scheer 2011) ?
  - In CVCV approach, it has been argued that the minimal unit handled by morphosyntax is CV (Lowenstamm, 1999, 2003; Guerssel & Lowenstamm, 1990).
  - Templatic restrictions have been detected in languages other than Semitic: Portuguese (Brandão de Carvalho, 2004), German (Bendjaballah & Haiden, 2003), Czech (Scheer, 2003), Somali (Barillot, 2002), Turkish (Denwood, 1998), etc..
- (4) In this talk, 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.

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## 2 Final CV in Italian

- (5) It is a well known fact that:
- a. Italian roots do not display templatic restrictions
  - b. The overwhelming majority of Italian words end in a vowel.
- (6) Italian nouns
- a. VARIABLE nouns end in a **vowel**:
    - (i) the final vowel is **unstressed**
    - (ii) the final vowel **changes** between the singular and the plural
  - b. 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-a/e*)

Table 1: Variable nouns

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

- (7) The final vowel does not enforce a phonological constraint avoiding final Cs:
- a. consonant-final nouns exist, *film* ‘movie’;
  - b. if the final vowel were an epenthetic vowel, we’d expect only one and not four different ones;
  - c. some final-hiatus words exist: *mare-a* ‘tide’, *nucle-o* ‘nucleus’, etc...

- (8) Consonant-final nouns:

a. sg

					o	
	f	i	l	m		
	C	V	C	V	C	V

\*filmo

b. pl

					i	
	f	i	l	m		
	C	V	C	V	C	V

\*filmi

- (9) The representations in (8) show two things:
- a. the final vowel is not a phonological object
  - b. the final V slot remains empty (contra the traditional view of Italian empty nuclei)

- (10) The final vowel is a morpho-syntactic object:
- it is the exponent of gender and number,
  - it appears under a specific lexical condition: following Lampitelli (2011, 2014), we assume that this corresponds to the presence of the feature **Theme Element** (henceforth [TE]):
    - [TE] is a lexical property of the root
    - It spells out as a CV unit

- (11) The representation of roots

- 'wolf'  $\iff$ 

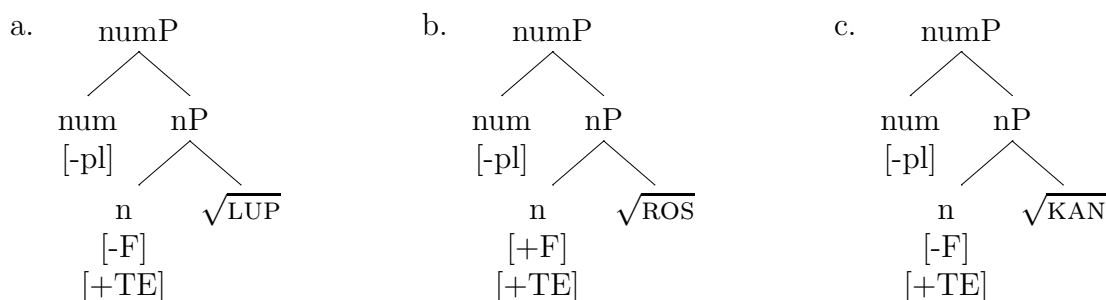
$$\begin{array}{c} \text{l u p} \\ | \quad | \\ \text{C V} \end{array}$$
- 'rose'  $\iff$ 

$$\begin{array}{c} \text{r o s} \\ | \quad | \\ \text{C V} \end{array}$$
- 'movie'  $\iff$ 

$$\begin{array}{c} \text{f i l m} \\ | \quad | \quad | \quad | \\ \text{C V C V C V} \end{array}$$

- (12) a. Roots like  $\sqrt{\text{LUP}}$ ,  $\sqrt{\text{ROS}}$  have floating consonant (in other words, **they need a template**);  
 b. Roots like  $\sqrt{\text{FILM}}$  have a fully formed template.

- (13) Basic structures of *lupo* 'wolf' M sg, *rosa* 'rose' F sg, *cane* 'dog' M sg:



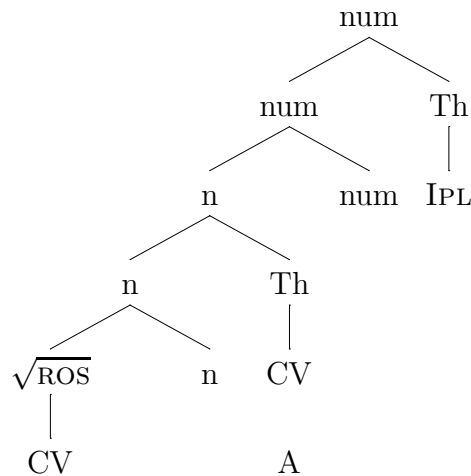
- (14) Final vowels can be decomposed (Kaye et al., 1985):

- [a] = /A.I/
- [o] = /A.U/
- etc...

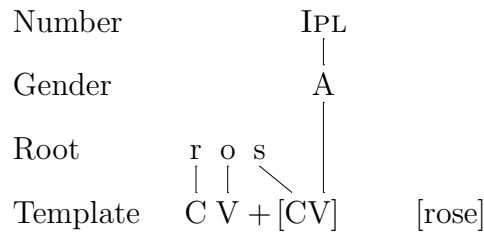
- (15) Each Element is the exponent of either number or gender (Lampitelli, 2011):

- Element /A/ = sg
- Element /I/ = pl
- Element /A/ = F
- Element /U/ = M

(16) Complex head of *rose* F, pl.



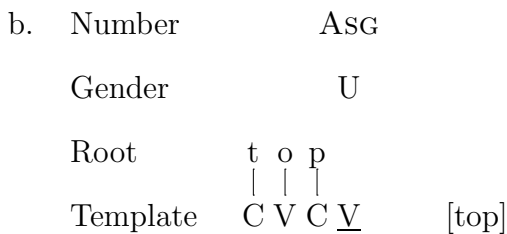
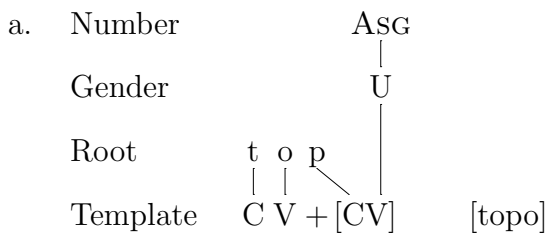
(17) Phonological linearization of *rose* F, sg.



(18) The minimal unit CV vs. Italian nouns

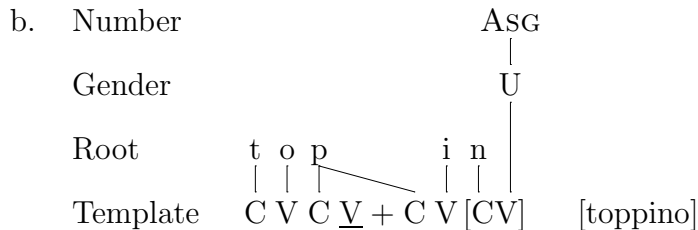
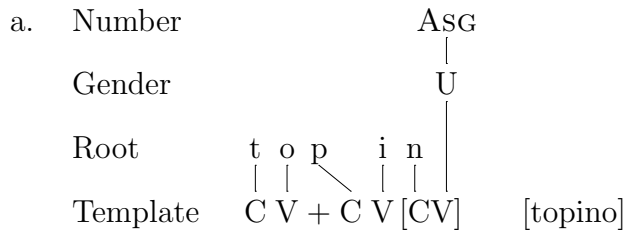
- a. morphosyntax handles minimally a CV (nor \*Cs neither \*Vs alone are tolerated in the template)
- b. in Italian, nouns end in a vowel and (the majority of) roots end in a consonant
- c. the presence of a final CV unit explains both these restrictions.

(19) *topo* 'mouse' vs. *top* 'top (bra of a bikini)'



c. The underlined V position is **not the site of inflection**.

(20) *topino* ‘small mouse’ vs. *toppino* ‘small top (bra of a bikini)’ (see Passino, 2008:100-ff)



- (21) 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’)

### 3 Bosnian

(22) Bosnian nouns

- a. Are inflected for gender, number and case<sup>1</sup>  
 b. Are organized in three main groups:  
 (i) M nouns: *okvir* sg Nom vs. *okvir-i* pl Nom ‘frame(s)’  
 (ii) F nouns: *kuća* sg Nom vs. *kuće* pl Nom ‘house(s)’  
 (iii) Neu nouns: *selo* sg Nom vs. *sela* pl Nom ‘village(s)’  
 c. Loans are generally inflected for gender, number and case:  
 (i) consonant-final loans: *facebook* M sg Nom, *facebook-a* M sg Gen, etc...  
 (ii) vowel-final loans: *tabure* M sg Nom, *tabure-a* M sg Gen, *tabure-i* M pl Nom ‘stool’; *viski* M sg Nom, *viski-(j)a* M sg Gen ‘whiskey’.

Table 2: 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>kuc-é</i>	<i>kuć-ā</i>	‘boat(s)’
3	Neu	<i>sel-o</i>	<i>sel-a</i>	<i>sel-a</i>	<i>sel-ā</i>	‘village(s)’

<sup>1</sup>Cases are: nominative, genitive, accusative, dative/locative, instrumental and vocative. We show only Nom and Gen.

- (23) The Bosnian final vowel
- a. it is the spell out of three distinct morphosyntactic properties: gender, number and case (cf. Lampitelli 2013)
  - b. is associated to an external final CV unit:
    - (i) the projection KP introduces the final CV
    - (ii) it belongs to the representation of the syntactic case.

(24) Nom and Gen spell-outs (non-exhaustive list):<sup>2</sup>

- a. Nom  $\iff$  templatic spell-out

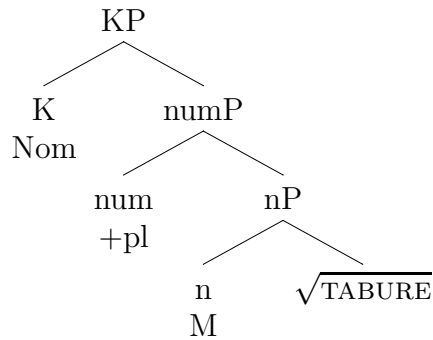
C V

- b. Gen  $\iff$  a complex spell-out

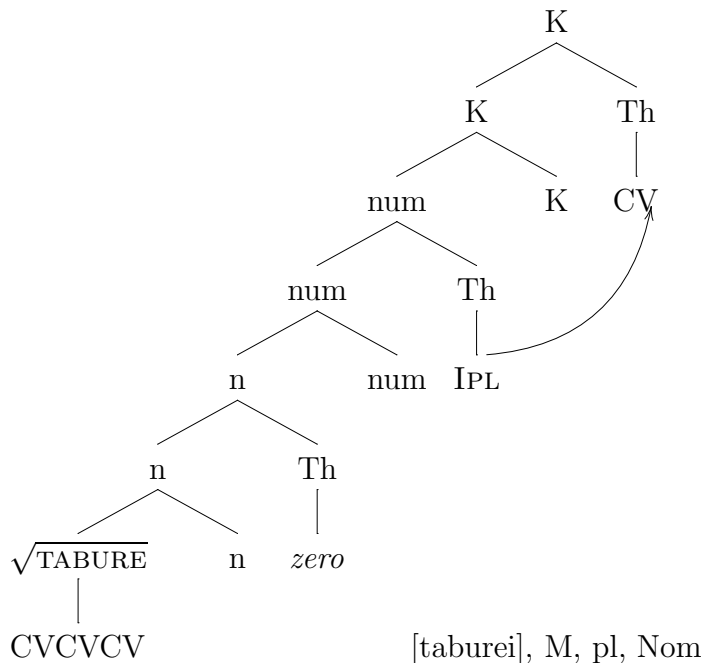
C V

(25) Structure and complex head for *taburei* ‘stools’:

a.

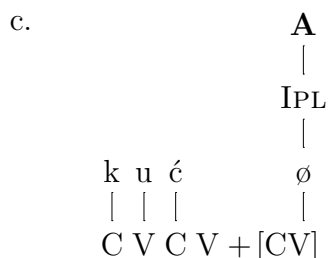
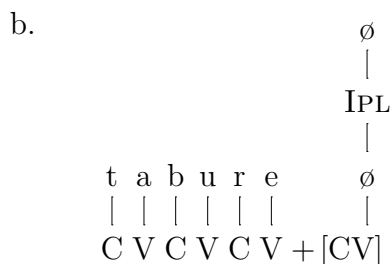


b.



<sup>2</sup>For a typology of spell-out, see Bendjaballah & Haiden (2008).

(26) *okvir* M sg. Nom *taburei* M pl. Nom and *kuće* F pl. Nom.



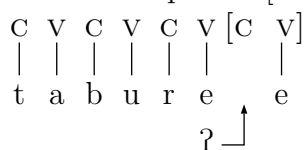
(27) **Loanwords**<sup>3</sup>

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

(28) a. *tabure* M sg Nom [tabure(e)]



b. *taburee* M pl Acc [tabure?e]



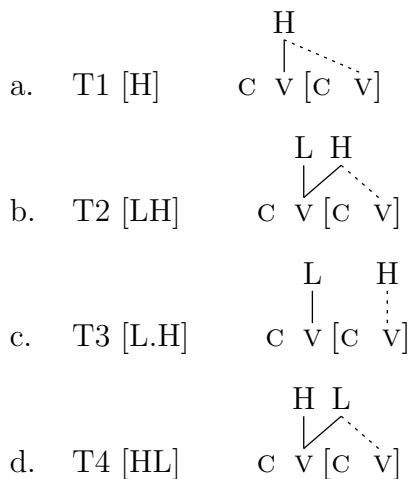
## 4 Mandarin Chinese (MC)

- (29) a. Basic syllables in MC have the following shape: CV(X) (X being a glide or a nasal)
- b. Most syllables in MC can be either morphemes or wellformed words.
- (30) 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.

<sup>3</sup>We thank Nina Rendulić for the data. Loanwords ending in a vowel can be stressed on the last syllable (*taburé*) or on the penultimate (*bífe* ‘beef’, *víski* ‘whiskey’, etc...)



- (31) 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**.
- (32) The four MC lexical tones have the following contours<sup>4</sup>:
- T1 : H, [55]
  - T2 : LH, [35]
  - T3 : B.H, [21.4]
  - T4 : HB, [51]
- (33) In addition, there is a neutral tone (absence of lexical tone), noted T0.
- (34) In MC, the Tone Bearing Unit (TBU) is the syllable.
- Minimal phonological words can be realized as long syllables or as short syllables, the length of lexical tones depending on the length of the syllable;
  - Suffixes can only be realized as short syllables, with a neutral tone (cf. (42)).
- (35) a. Long syllables:  $C\bar{V}$ , CVX<sup>5</sup>  
b. Short syllables: CV
- (36) When realized as short syllables, the four lexical tones have the following contours:<sup>6</sup>
- T1 : H, [55]
  - T2 : LH, [34]
  - T3 : L, [21]
  - T4 : HL, [53]
- (37) Following Luo (2013), we assume that the four tones are represented as follows:



e. The dotted lines represent the optional realization of the tone.

- (38) 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]

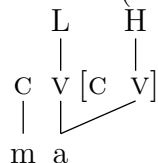
<sup>4</sup>We adopt the convention of five pitch levels (from lowest to highest: 1-5) proposed by Chao (1929). IPA follows the same system.

<sup>5</sup>The situation is slightly more complicated than shown here, cf. Luo (2013:ch. 3) for an extensive analysis of the weight of syllables in MC.

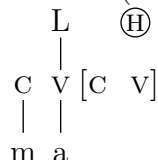
<sup>6</sup>Cf. Chao (1968); Shih (1987, 1988) for discussions on incomplete (truncated) tones

(39) In monosyllabic words, both complete and incomplete realizations are correct:

a. *maʒ* ‘horse’ (complete realization)

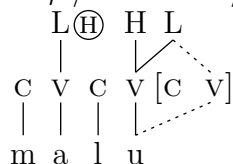


b. *maʒ* ‘horse’ (incomplete realization)



(40) In non-final positions of plurisyllabic words, only the incomplete realization is possible.

a. *maʒ-lu<sub>4</sub>* /horse-road/ ‘highway’

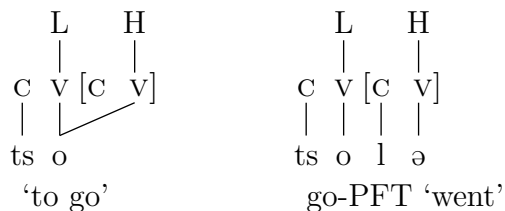


b. The floating H tone of *maʒ* can not be pronounced since it lacks a free V position to attach to.

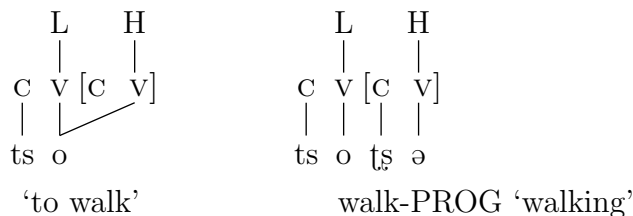
(41) MC has a limited number of suffixes (cf. Li & Thompson, 1989): we argue that the final CV unit is the realizational site of these suffixes.

(42) Examples:

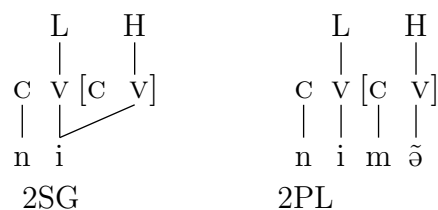
a. perfective *leθ*



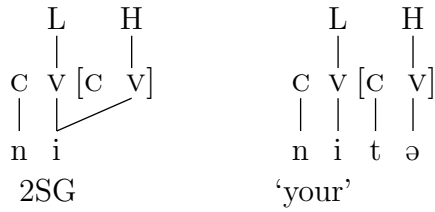
b. progressive *zheθ*



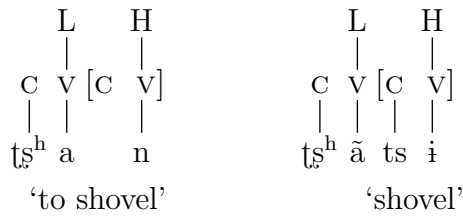
c. plural *menθ*



d. possessive *de0*

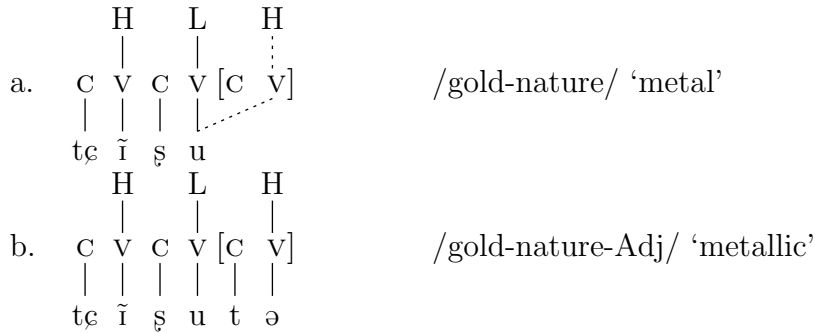


e. nounness *zi0*

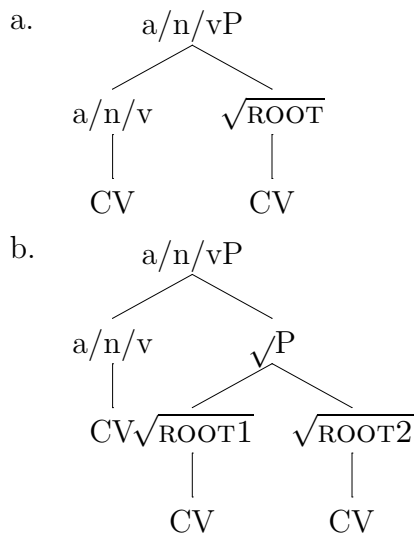


f. In the examples above, the suffix attached to a T3 lexical unit receives the floating H tone of the T3.

(43) A compound: *jin1-shu3* 'metal' vs. *jin1-shu3-de0* 'metallic'

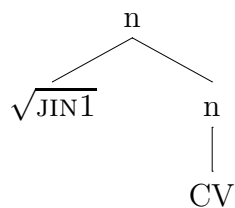


(44) Structure of Chinese words:

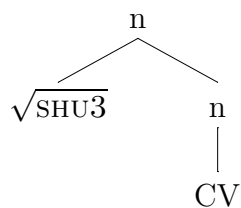


(45) Complex heads:

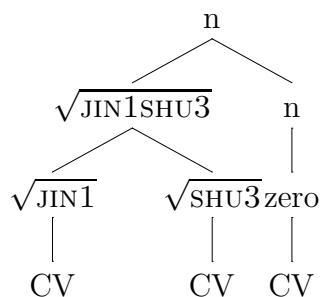
a. *jin1* ‘gold’



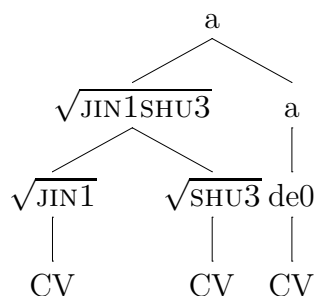
b. *shu3* ‘nature’



c. *jin1-shu3* ‘metal’



d. *jin1-shu3-de0* ‘metallic’



(46) Spell-outs of n and v (non-exhaustive list):

a.  $n \iff$  templatic spell-out

CV

b.  $a \iff$  d e complex spell-out

CV

(47) 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.

## Conclusion

- (48) In this talk we have argued that words end in a CV unit in three unrelated languages: Italian, Bosnian and Mandarin Chinese.
- (49) The final CV is a phonological object spelling out a morphological property of words:
- a. in MC, it is a property of all major categories (n, v, a), cf. the initial CV as in Lowenstamm 1999.
  - b. in Bosnian and Italian, its distribution is restricted:
    - (i) to nouns (Bosnian)
    - (ii) to nouns displaying overt inflection (Italian)

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