Internally structured morphemes at the Phonology-Syntax interface: evidence from the Bosnian declensional system

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The realizational process that associates a form to morphemes, i.e. Vocabulary Insertion, is a central issue in piece-based morphological theories (Halle & Marantz 1993, Marantz 2001, Embick & Halle 2005). In these models, a morpheme is a feature-matrix associated to a given terminal node. Hence, Vocabulary Items (VI) compete for insertion at node level (Embick & Marantz 2008).

In this paper, I argue for a specific interpretation of such a device. Namely I propose that only one VI corresponds to each feature-matrix, and therefore the surface exceptions are the result of either phonological processes (Lowenstamm 2008) or contextual local allomorphy rules (Embick 2010). Both processes apply post-syntactically.

The Bosnian[1] declensional system (1) provides interesting evidence to this proposal. As the correlation between gender and declension seems predictable (Corbett & Browne 2008:337-343), I consider that gender is overtly marked on nouns and that it coincides with declension.[2] Note that: (i) the suffixes on nouns are formed by one vowel;[3] (ii) only M sg. NOM displays a phonological *zero*-morpheme.

The underlying form of a Bosnian noun is shown in (2) (cf. Halle & Vaux 1998 and Halle & Nevins 2009 for similar structures).

Given (2), then M. sg. NOM must be marked by three *zero*-morphemes, i.e. gender/declension, number (#) and case (K), respectively. This is shown in (3).

A question arises now: what are the role and the structure of such a final vowel on Bosnian nouns? Standard responses within piece-based theories normally postulate processes like Fusion or Impoverishment in order to account for the mismatch between the structure (cf. 2) -where three terminal functional nodes appear- and the surface, where only one vowel is observed.

What if we look at these vowels by hypothesizing that they *do* have an internal structure (cf. Bendjaballah 2003 for a similar approach)?

For this purpose, consider the theory of Elements (Kaye et al. 1985). As far as a five-vowel language like Bosnian is concerned, this gives the results in (4) (cf. Ségéral 1995 for the use of Elements as morphemes).

As a consequence, the application of this theory to each final vowel on nouns in (1), gives the situation depicted in table (5) where case endings are shown as decomposed phonological objects.

By hypothesis in (3), NOM is marked by *zero*, therefore it is the simplest case on a phonological ground. Thus, what we observe in (5.a) is the combination of gender and # morphemes only. In (6), I recast the data including both NEU(ter) endings: *-o* and *-e* (cf. fn 7).

The analysis proceeds as follows: I_{pl} marks pl., as it appears in M and F pl. only, whereas sg. is marked by *zero*, as by hypothesis in (3). The Elements ***A*** in one side and ***I*** and ***U*** in the other, mark F and NEU, respectively. Again, (3) tells us that M is marked by *zero*. The situation is clear for M and F, but NEU needs more explications. First, notice that the surface difference between [o] and [e] is given by ***I*** vs. ***U***. Secondly, note that NEU is characterized by NOM-ACC syncretism (cf. 1), which -I claim- is formally explained by the presence of the Element A in both NOM and ACC.

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[1] My informant comes from Bosnia-Herzegovina and for this reason I refer to Bosnian-Serbo-Croatian as to simply Bosnian.

[2] A fourth small group exists, cf. *stvar* 'thing', where all the nouns are F, but the declension is different from group 1. Note that group 1 only contains M nouns whereas group 3 only NEU ones. Group 2 has some M nouns: cf. *jedan sudji**a*** 'one.M judge' vs. *jedna kuć**a*** 'one.F house'.

[3] Whenever a consonant is present (pl. DAT and INSTR), the suffix is: /Vm(a)/, where V stands for the alternating vowel. I am aware that some F nouns can have a INSTR -ju *stvarju* 'with a thing', but these belong to the marginal -i declension (cf. fn 2) which is nevertheless possibly accounted for by my approach by positing a contextual allomorphy phenomenon.

This brings us to show all the underlying morphemes, as in (7). Each terminal has only one Vocabulary Item associated to, e.g. pl.↔I_{pl}, ACC↔A or DAT/LOC↔U, etc.[4]

I propose the structure in (8.a) and the corresponding complex head at PF (8.b) in order to account for each noun in (1) (Th is inserted as by a general requirement of Bosnian): *kuće* 'houses' F, pl, NOM is taken as an example.[5] At PF, each terminal can be associated to a CV syllable (in the sense of Lowenstamm 1996, 2008): in this model, only the phonological material associated to the CVCV.. cluster surfaces.

Crucially, each node/morpheme in the structure corresponds to a phonological primitive contained in each final vowel, allowing for a one-to-one parallelism between a given node and a VI.

Mismatches between phonology and syntax can however occur, cf. double-framed cases in (8). White-framed cases are explained by the theory of Elements itself (no possible /U+I/ combinations in five-vowel languages), whereas grey ones are instances of contextual allomorphy rules which apply locally (cf. Embick 2010). Neither Fusion nor Fission must be postulated.[6]

Final vowels on Bosnian nouns are complex phonological objects that are internally structured in such a way that they reflect syntactic structure. The consequence of such an approach is a more abstract phonological representation (cf. Lowenstamm 2008) and the vacuity of the notion of "paradigm", as well-formedness is locally determined (cf. Bobalijk 2008); finally, class is not a feature of stems (cf. Halle & Marantz 2008).

(1)	group 1 (M)		group 2 (F)		group 3 (NEU)	
	sg.	pl.	sg.	pl.	sg.	pl.
a. NOM	*okvir*	*okvir-**i***	*kuć-**a***	*kuć-**e***	*sel-**o***[7]	*sel-**a***
b. GEN	*okvir-**a***	*okvir-**a***	*kuć-**e***	*kuć-**a***	*sel-**a***	*sel-**a***
c. DAT-LOC	*okvir-**u***	*okvir-**ima***	*kuć-**i***	*kuć-**ama***	*sel-**u***	*sel-**ima***
d. ACC	*okvir-**(a)***[8]	*okvir-**(e)***	*kuć-**u***	*kuć-**e***	*sel-**o***	*sel-**a***
f. INSTR	*okvir-**om***	*okvir-**ima***	*kuć-**om***	*kuć-**ama***	*sel-**om***	*sel-**ima***
	'frame'	'frames'	'house'	'houses'	'village'	'villages'

(2) *Underlying structure of a noun*: Root + gender/declension + # + K

(3) *Null Morphemes*: a. M = *zero*; b. sg. = *zero*; c. NOM = *zero*.

(4) *Decomposed vowels*: a. [a] = /A/; b. [i] = /I/; c. [u] = /U/; d. [e] = /A.I/; e. [o] = /A.U/

(5) *Decomposed vocalic case endings*

	M sg.	M pl.	F sg.	F pl.	NEU sg.	NEU pl.
a. NOM	*zero*	I	A	A.I	A.U	A
b. GEN	A	A	A.I	A	A	A
c. DAT/LOC	U	I(ma)	I	A(ma)	U	I(ma)
d. ACC	(A)	A.I	U	A.I	A.U	A
f. INSTR	A.U(m)	I(ma)	A.U	A(ma)	A.U(m)	I(ma)

[4] Note that NEU examples in 8 have I_{pl}, as by hypothesis. 6.c-d are incomplete representations of the structures.
[5] Cf. Halle 1997 and Lowenstamm 2008 respectively for case and gender featural decomposition.
[6] Note that GEN forms seem to be "impostors" like in Russian, cf. Bailyn & Nevins (2008).
[7] NEU nouns can be marked in sg. direct cases (NOM & ACC) by [e], too i.e. *srce* 'heart'. The theory proposed here accounts for both endings in NEU, as 6 below shows. The crucial issue is that a unique underlying Element A marks both ACC and NOM in the NEU paradigm as it is the spell-out for the ACC case. This accounts for the NOM-ACC syncretism.
[8] M nouns are marked by -a in sg. ACC when the referent is animate. On the other hand, Pl. ACC is always -e.

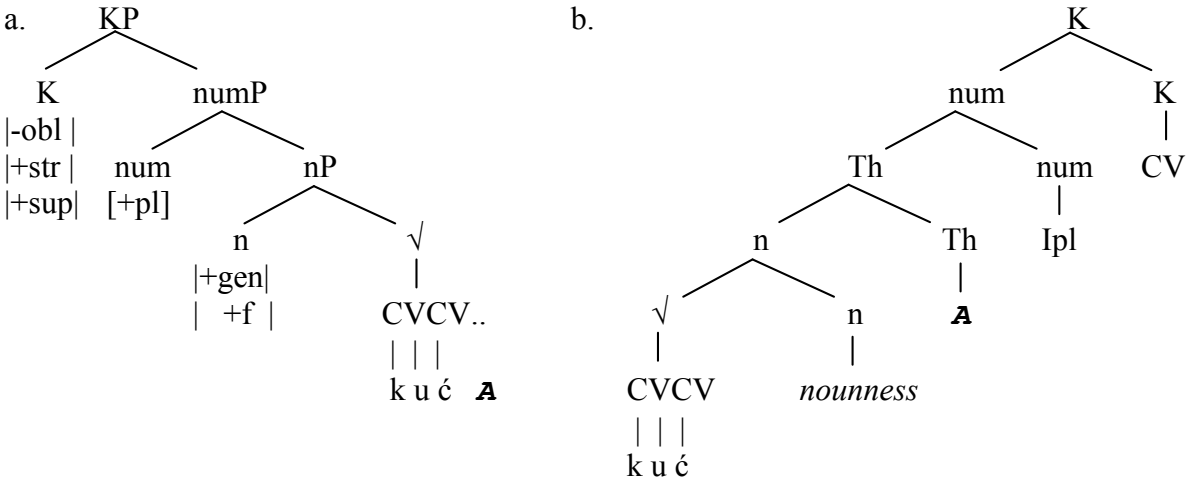
(6) *Decomposed NOM endings*

a. Masculine		b. Feminine		c. Neuter I		d. Neuter II	
sg.	pl.	sg.	pl.	sg.	pl.	sg.	pl.
zero	I_{pl}	***A***	***A***.I_{pl}	A.***I***	A	A.***U***	A

(7) *Underlying morphological structures for final vowels: gender/declension.#.K*

	M sg.	M pl.	F sg.	F pl.	NEU sg.	NEU pl.
a. NOM	ø.ø.ø	ø.Ipl.ø	***A***.ø.ø	***A***.Ipl.ø	***U***.ø.A	***U***.Ipl.A
b. GEN	ø.ø.A	ø.Ipl.A	***A***.ø.A	***A***.Ipl.A	***U***.ø.A	***U***.Ipl.A
c. DAT/LOC	ø.ø.U	ø.Ipl.U	***A***.ø.U	***A***.Ipl.U	***U***.ø.U	***U***.Ipl.U
d. ACC	ø.ø.A	ø.Ipl.A	***A***.ø.A	***A***.Ipl.A	***U***.ø.A	***U***.Ipl.A
f. INSTR	ø.ø.[A.U]	ø.Ipl.[A.U]	***A***.ø.[A.U]	***A***.Ipl.[A.U]	***U***.ø.[A.U]	***U***.Ipl.[A.U]

(8) *Structure for a noun*



output: [kuće] ‘houses’

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