How vowels point to syntactic structure: evidence from Hebrew and Italian
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0. Introduction

0.1 General

• We aim to demonstrate that Modern Hebrew (MH) and Italian (IT) show striking similarities in their morpho-syntactic nominal structure.
• In light of these similarities, we treat the properties of templaticity and non concatenativeness and characterize the two languages with respect to these concepts.

0.2 Theoretical assumptions

• This work is built on two independent studies that have been presented only in part (Faust 2008 & Lampitelli 2008b, respectively). Both works aim to demonstrate 1) that Syntax manages word formation processes, and 2) that Phonology has a specific role in interpreting terminal nodes and in constraining word formation.
• We follow the general theoretical framework of Distributed Morphology (Halle & Marantz 1993, 1994; Marantz 1997, 2008; Harley & Noyer 1999 amongst others).
• In Lowenstamm 2008, it has been argued that a templatic tier CV (that is assumed to be present in the representation of every word, as in Lowenstamm 1996) is directly manipulated by terminal nodes. In this work, it has also been argued that functional categories must have phonetic content (minimally CV).
• We assume that the basic structure for a noun is as follows:


A noun is created by the combination of templatic constraints and syntactic movement.
• Both MH and IT\(^1\) have a five vowels system. We propose to decompose each vowel building on Kaye, Lowenstamm & Vergnaud 1985, 1990’s Theory of Elements (henceforth KLV).

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\(^1\) Italian actually displays five vowels in unstressed position while it has seven vowels in stressed ones. As the vowels we’re talking about in this work are always unstressed, we won’t show the representation for [ɛ] and [ɔ].
Complex vowels

a. \([a] = /A/\)

b. \([i] = /I/\)

c. \([u] = /U/\)

d. \([e] = /I.A/\)

e. \([o] = /U.A/\)

- Our proposal will touch on the different possible types of spell-out:

Nature of spell-out (for a given functional category or a given feature)

A. a. segmental spell-out;
  b. skeletal spell-out;
  c. combined.

B. a. \(/ka/\)
  b. \(//\)
  c. \(/ka/\)

(Cf. Bendjaballah & Haiden 2008)

I. MH nouns and their structure: some theoretical implications

- Semitic roots are triconsonantal abstract entities.

A. MH root:

\[C_1C_2C_3\]

B. examples (Root √msr)

Nouns/Adjectives: Verbs:

a. \(méser\) 'message' \(masar\) 'pass on, deliver'

b. \(mi-msar\) 'intermed. transfer' \(hit-mas er\) 'pass (football)'

c. \(masór-et\) 'tradition'

d. \(ta-msér\) 'handout'

e. \(masur\) 'devoted'

C. Two general assumptions:

a. A consonantal root bears a basic lexical meaning.

b. Vocalization is used for morphological purposes.

- In what follows, we show the MH data we want to focus on:

Only three type of basic MH nouns

<table>
<thead>
<tr>
<th>prosody</th>
<th>sg.</th>
<th>g.</th>
<th>pl.</th>
<th>g.</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>/CVCeC/</td>
<td>a.</td>
<td>séfer</td>
<td>M</td>
<td>sfarim</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>b.</td>
<td>pircet</td>
<td>F</td>
<td>pircot</td>
<td>F</td>
</tr>
<tr>
<td>/CCVC/</td>
<td>c.</td>
<td>kfic</td>
<td>M</td>
<td>kficim</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>d.</td>
<td>bdixa</td>
<td>F</td>
<td>bdixot</td>
<td>F</td>
</tr>
<tr>
<td>/CaCVC/</td>
<td>e.</td>
<td>camid</td>
<td>M</td>
<td>cmidim</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>f.</td>
<td>kvuca</td>
<td>F</td>
<td>kvucot</td>
<td>F</td>
</tr>
</tbody>
</table>

- Some observations:

a. When the basic masculine form has two vowels, the first must be \([a]\). Clearly, this is not a phonological restriction.

b. In penultimately-stressed nouns (5.a), the second vowel is always \([e]\).

\(^2\) The prosody of the feminine nouns in (5.d) and (5.f) is identical. Semantic principles show that (5.f) is underlyingly /CaCVCa/ whereas (5.d) is /CCVCa/.
c. Plural forms of (5.b-f) are concatenative (camid-cmidim); plurals of nouns like (5.a) - and only those - are less obviously so (séfer-sfarim).

- We build a noun stemming on the structure given in (1):


\[
\begin{align*}
\text{a. } & \text{kfic ‘spring’} & \text{b. } & \text{camid ‘bracelet’} \\
\text{n} & \overline{\text{nP}} & \text{CV} & \overline{\text{CVCVCV}} & \text{n} & \overline{\text{nP}} & \text{CV} & \overline{\text{CVCVCV}} \\
\text{i} & \text{k} & \text{f} & \text{c} & \text{a} & \text{i} & \text{c} & \text{m} & \text{d}
\end{align*}
\]

- According to the view in (6), vocalization is lexical. Such a view is incompatible with the restricted nature of MH vocalization; it predicts any vocalization to be a possible basic one (this is very far from true, as seen in (5)). We thus reject this view.

- Something constrains vocalic patterns. We assume that it is syntactic structure:

**Question**: what is the syntactic structure of MH nouns?

In a word like kfic ‘spring’ (6.a), the vowel is lexical. But in a word like camid ‘bracelet’ (6.b), only the second vowel is lexical (recall that any CVCVC item is actually CaCVC). Faust 2008 concludes that there must be a projection between the category head, which provides the regular information, and the root which is purely consonantal. This projection is called Tem(plate)P.

(7) MH noun (Faust 2008).

\[
\begin{align*}
\text{n} & \overline{\text{nP}} & \text{temP} & \text{camid ‘bracelet’} \\
\text{a} & \text{i} & \text{cmd}
\end{align*}
\]

- Before showing the right structures for MH nouns, we introduce Italian data: we will see how these data raise other theoretical issues.

2. Italian nouns and their structure: some structural similarities

- Non-templatic languages, such as IT, usually display unpredictable root shape and length:

(8) Italian roots

\[
\begin{align*}
\text{a. } & \text{CVCV..} \\
\text{b. } & \text{(C)CCVCVC..} \\
\text{c. } & \text{other}
\end{align*}
\]

- We thus assume that IT roots have a templatic tier formed by CV units.
We show the Italian nominal paradigm (variable nouns) in (9):

(9)  sg.  g.  pl.  g.  gloss
a.  lupo  M  lupì  M  ‘wolf(ves)’
b.  rosa  F  rosiè  F  ‘rose(s)’
c.  poeta  M  poetì  M  ‘poet(s)’
d.  ala  F  ali  F  ‘wing(s)’
e.  cane  M  canì  M  ‘dog(s)’
f.  nave  F  navì  F  ‘ship(s)’

Italian has a particular site reserved for nominal inflection: final Vs on nouns (henceforth Vfin).

Some observations about Vfin:

a. Vfin is always unstressed.
b. Vfin can be [a], [e], [i] and [o], only [u] being excluded from the vocalic inventory in final unstressed syllable.
c. If the final vowel is stressed, then the noun is invariable in gender and number; no exceptions are observed: cf. [cittá] ‘town’; [supplí] ‘fried rice’; [virtú] ‘virtue’; [obló] ‘porthole’; [kaffé] ‘coffee’.


(10)  sg.  gender  pl.  gender  examples (as in (8))
  a.  A.U  M  Ipl.-U  M  lupo
  b.  A.A  F  Ipl.-A  F  rosa
  c.  A.ø  M/F  Ipl.-ø  M/F  poeta, ala
  d.  A.I  M/F  Ipl.-I  M/F  cane, nave

The Elements /A/ and /I/ are the markers of singular and plural, respectively. Their presence is predictable and therefore not lexical.

Lampitelli 2008 claims that a projection VfinP introduces the lexical vocalic Element in the structure of the noun. VfinP spells out both lexical vowels and their position.

We want to demonstrate that the architecture of nominal structure in IT is the same as the one in MH nouns. We will account for the differences, too.

We claim that TemP exists in Italian noun structure, too (another label for VfinP).

We claim that TemP is the same projection for both Hebrew and Italian and that it takes √ as its compliment.

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3 KLV’s Theory of Elements predicts that in a five-vowels language as Italian, front rounded vowels can’t exist (*[y], *[œ], *[ø], etc.). the combination /LU/ should then result in [y]. We propose that only /U/ surfaces because of its plural marking specification. Cf. Passino 2008 and Lowenstamm P.C.

4 Lampitelli 2008b assumes that two different /A/ exist in the structure of rosa-type nouns.
3. The unified analysis: Hebrew and Italian use the same ingredients

3.1 TemplateP

(11) **TemP definition**
Tem P is a projection that contains lexical information that does not belong to the root and that is unpredictable.

- This implies that the structure in (1) must be modified and replaced by what follows:

(12) MH and IT nouns structure (default):

$$\begin{array}{c}
\text{numP} \\
\text{nP} \\
\text{temP} \\
\text{tem} \\
\text{CV} \quad \text{CV} \quad \text{CV} \quad \text{CV..}
\end{array}$$

- The spell-out of each terminal node can be either segmental, skeletal or both.
- The possible choice between the three types of spell-out leads to the differences between the languages.

3.2 Syntactic Structures in Hebrew and Italian nouns

3.2.1 Hebrew

- The MH analysis in Faust 2008 assumes the following:

(13) Assumptions of MH analysis
a. Semitic consonantal roots enter the derivation with no skeleton.
b. The skeleton that eventually hosts the root consonants is provided by the structure.
c. Root consonants (as opposed to other segmental markers) have to be allotted skeletal positions.
d. The phonology may provide such skeletal positions through a default process, but these positions will not behave like those positions provided by the syntactic structure.
e. The vowel /a/ is the spell-out of a nominalizing head n.

(14) kfic ‘spring’, M sg.

$$\begin{array}{c}
\text{nP} \\
\text{n} \\
\text{temP} \\
\text{tem} \\
\text{CV} \quad \text{CV}_2 \\
\text{CV} \quad \text{CV} \\
\text{a} \quad \text{i} \quad \text{c}
\end{array}$$

- The vowel introduced by the tem head is mapped to the V$_2$ position as a general principle. Another CV is added by the nominal head. The triconsonantal root is provided two CV
units by the structure: one through the spell-out of tem and one through n. The latter also provides /a/, but this segmental spell-out, as opposed to that of temP, is independent of the skeletal unit provided by the same head; the spell-out of n is a floating segment /a/.

- /a/ looks for a place to land: final V-slots must stay empty in MH. V2 is occupied by another vowel.
- The phonology provides a third CV unit, to accommodate the first root consonant. This CV unit is marked with angled brackets <CV>. We observe that this skeletal position is not a suitable landing site for /a/, and suspend the explanation for this.

(15) kficim ‘springs’, M pl.

\[
\begin{array}{c}
\text{numP} \\
\text{num [pl]} \\
\text{nP} \\
\text{n} \\
\text{temP} \\
\text{tem} \\
\text{temCV} \\
\text{-CV} \\
\text{CV} \\
\text{CV_2} \\
\text{CV} \\
\text{-CV} \\
\hline
\text{/i m/} \\
\text{/a/} \\
\text{/i/}
\end{array}
\]

\[
\text{<CV.CV.tem.CV.n.CV.num => [kficim]}
\]

- The spell-out of the [pl] feature is both segmental and skeletal: it is a suffix /-im/ attached to a skeletal unit CV.

(16) Segolate Reminder (stems of the form: CVČCeC)

ms. fm. pl.
a. kélev kalba klavim 'dog'
b. generalizations:
  i. The stem of both singulars is underlyingly /kalb/.
  ii. Traditional ms. derivation: kalb => kálb => káleb => kélev.
  iii. Only in kélev is there a non-concatenative plural.
c. questions:
  i. One can't apply stress where it is convenient. Why doesn't stress take into account the epenthetic vowel?
  ii. Why is it that only (masculine) segolates have non-concatenative plurals?

(17) kélev ‘dog’, M sg. (No TemP!)

\[
\begin{array}{c}
nP \\
\text{n} \\
\text{\sqrt{klv}} \\
\text{CV} \\
\text{a ; /a/}
\end{array}
\]

\[
\text{CV_n <CV.CV> => kalb => kélev}
\]
In the structure of kélev, there is no temP. The only lexical information besides the root consonant is provided by the head n, in this case in the form of a vowel /a/ linked to the usual nominal CV unit. Alongside this /a/, we find the nominal floating /A/ (which we have still not motivated).

There is only one CV unit provided by the structure. Two more root consonants have to be linked. The phonology provides two CV units, but these units will be ignored by stress, which looks only at morphological CV's and their content.

Again, the floating /a/ cannot land on the extrametrical, phonological CV's.

\[(18)\] klavím ‘dogs’, M pl.

\[
\begin{array}{c}
\text{numP} \\
\text{num [pl]} \\
\text{n} \\
\text{\textbackslash klb} \\
\text{-CV} \\
\text{CV} \\
\text{/im/} \\
\text{/a/}
\end{array} \rightarrow \begin{array}{c}
\text{C V\textbackslash kCV\textbackslash k-CV} \\
\text{kalavím} \Rightarrow \text{klavím}
\end{array}
\]

• The phonologically inserted CV's can no longer be extra-metrical, as they are no longer at the edge of the morpho-phonological word. The floating /a/ can land in the V₂ position, and we derive */kalavim/; the first [a] is deleted because it is too far from the stress (see pakid-pkida /pakidá/ ‘clerk ms.-fm.’).

• The floating /a/ is found, according to Faust (in preparation) in the "feminine" suffix /a/ of kalba above, as well as in other nouns which we will not look at today.

**Conclusion of MH structures:**
We've assumed that the Semitic root enters the derivation with no skeletal positions. We've also assumed that there is a TemP, which always introduces a V2 vowel. Some items (the segolates) do not have this projection, and thus have less CV units provided by the syntactic structure. This has been shown to account for their exceptional behaviour in terms of templaticity and stress. The only difference between segolates and other nouns is the lack of a projection TemP.

3.2.2. Italian

• Lampitelli 2008b proposes the following structure for IT nouns:

\[(19)\] a. Italian roots enter the derivation with a /CVCV../ skeleton.

b. Vfin spellout is both segmental (lexical vowel) and skeletal (CV position).

c. Two main groups exist in IT nominal morphology depending on Vfin:

i. -o/-a expressing ms. and fm., respectively;

ii. -i expressing both genders.

d. IT has two markers for number; the projection numP is always used by the structure.

e. The spellout of NumP is exclusively segmental (a predictable vowel).

f. nP contains only the gender feature.

g. An agreement operation between n and tem (Vfin) creates the right lexical vowel.
(20) *lupo* ‘wolf’, M sg.

\[
\begin{array}{c}
\text{numP} \\
\text{num} \\
\text{n} \\
\text{agr} \\
\text{[\text{[-pl]} \text{[-f]} \text{[1CV_{\text{fin}}]} \text{CVCV}]}
\end{array}
\rightarrow
\begin{array}{c}
\text{CVCV-1CV} \\
\text{1u p}
\end{array}
\Rightarrow
\begin{array}{c}
\text{lupo}
\end{array}
\]

- TemP always introduces a final CV unit.
- IT plurals are built by the same structure creating the singular the only difference being in the spellout of the number feature (/I/).

(21) *nave* ‘boat’, F sg.

\[
\begin{array}{c}
\text{numP} \\
\text{num} \\
\text{n} \\
\text{agr} \\
\text{[\text{[-pl]} \text{[+f]} \text{[2CV_{\text{fin}}]} \text{CVCV}]}
\end{array}
\rightarrow
\begin{array}{c}
\text{CVCV-2CV} \\
\text{n a v}
\end{array}
\Rightarrow
\begin{array}{c}
nave
\end{array}
\]

- For further arguments as to why a language such as IT should have a templatic tier between the root and nP, see Lampitelli 2008b.
- **Question:** does IT display structures **without** temP as MH segolates (cf. (17))? We predict that it will.
  a. *poeta*-type nouns only display number markers ([a]-[i]).
  b. many loanwords ending by a consonant CANNOT take the plural [i] but can have diminutive forms: *film* ‘movie’ sg. and pl.; *filmi* ‘movies’ but *filmino* ‘little movie’ (Passino 2008).
  c. the only V position able to take the plural /I/ is the one borne by temP (cf. Lampitelli 2008).
- **So:** in IT, the structures without temP are those of loanwords such as *film* ‘movie’. *Poeta*-type nouns have an empty temP: it contains only a CV unit.
贷款: film ‘movie(s)’, M sg. and pl.

Almost all loanwords are masculine if they end in a consonant (cf. e-mail is the only exception as far as we know).

**Conclusion of IT structures:**
We’ve assumed that IT behaves like MH in nouns structure as it has a temP. Exactly as in MH, this projection introduces both a position in the template and a lexical item: we showed that in IT the position of temP CV unit is always at the right edge of the root. Unlike in MH, however, the lexical item in IT is influenced by gender (agreement between n and tem).

4. Conclusions

- A projection exists between the category-defining head and the root in both MH and IT.
- This projection is not obligatory but its absence has implications on the form of the item: broken plurals in MH and lack of inflectional morphology in IT.
- Both languages are templatic in the sense that both build a skeleton in the structure. Only MH is non-concatenative because its roots are introduced without a skeleton while IT roots are always linked to CV constituent.

5. Bibliography

“How vowels point to syntactic structure: evidence from Hebrew and Italian”  
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