Segment sequences in diatopic variation of Kabyle Berber

Outline:

a. In the case of Kabyle nouns, parametric variation does not concern melody but it due to the association of invariable melody to different singular templates.

b. Borer-Chomsky conjecture as known in the minimalist program may be a valid research strategy in phonology as well.

c. The locus of variation:
   1. The selection of particular template by a particular melody.
   2. The instruction given by a particular piece of melody regarding association.

1. Theoretical background

1.1 Kabyle plural

1 three types of plural

a. “external” plural, called “-n plural”, is characterized by the suffixation of –N to the singular

   iðbir $\rightarrow$ iðbir-n “pigeon”

b. “internal” or “A plural” is characterized by a modification of the quality of the stem vowels, as well as by the appearance of an A in the last vocalic position

   aɣanim $\rightarrow$ iɣunam “reed”

---

1 Kabyle Berber is spoken in Northern Algeria
c. a third type of plural, so-called mixed because it shows both a suffix and the appearance of an A in the last vocalic position.

\textit{iʃki} \rightarrow \textit{iʃkan}

d. note that the alternation of the initial vowel sg \rightarrow pl occurs in 97\% of nouns (Basset 1945). It is probably a prefixed (unproductive?) article (which however cannot be dissociated from the root).

1.2 Vowel system

On the surface, the vocalic system of Kabyle is made of three peripheral vowels and a schwa.

\begin{center}
\begin{tabular}{c}
\textit{i} \\
\textit{u} \\
\textit{ə} \\
\textit{a}
\end{tabular}
\end{center}

1.3 Schwa in Kabyle

The occurrence of schwa is predictable\(^2\) in Kabyle. As described by Chaker (1983), Kossmann (1995) schwa occurs in the following environments

a. between two word-final consonants C\_C\# e.g. \textit{izem}, \textit{aʃfal}

b. between C1 and C2 of a C1C2C3V cluster C1\_C2C3V e.g. \textit{iḍəflan}

c. between a consonant and geminate C\_Cx\_ e.g. \textit{aʃəbbuz}

\begin{center}
\Rightarrow \text{the sequences } |CV| \text{ and } |C#| \text{ are illegal in Kabyle.}
\end{center}

\(^2\) Schwa is not predictable in all Berber languages.
1.4 Templates

Templates are a fixed sequence of CV positions that is associated to a morpho-semantic value. The melodic material of the lexical items must comply with this skeleton when it instantiates the morpho-semantic value at hand (McCarthy 1979, Lowenstamm 2003). Table (2) shows the template of broken plural in Arabic:

(2)

<table>
<thead>
<tr>
<th>Root</th>
<th>Singular</th>
<th>Plural: CaCaaCiC</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. fnən</td>
<td>fnəaan</td>
<td>fnəaən</td>
<td>cup</td>
</tr>
<tr>
<td>srwl</td>
<td>sirwaal</td>
<td>saraawil</td>
<td>pants</td>
</tr>
<tr>
<td>b. ʔmr</td>
<td>ʔmər</td>
<td>ʔawaamir</td>
<td>order</td>
</tr>
<tr>
<td>hr</td>
<td>har</td>
<td>ʔəhaəir</td>
<td>warm</td>
</tr>
<tr>
<td>c. sfrəl</td>
<td>safərəl</td>
<td>safəərə</td>
<td>quince</td>
</tr>
<tr>
<td>ŋnkbt</td>
<td>ŋankəuut</td>
<td>ŋanaakib</td>
<td>spider</td>
</tr>
</tbody>
</table>

The broken plural is constructed on a quadrilateral root as under 2.a). But, to satisfy the template, when the root is smaller 2.b) melodic items are inserted (w in ʔawaamir) or propagated (r in ʔəhaəir). And, when the root is bigger as under 2.c), melodic elements must drop.

2. Plural formation in Kabyle

In Kabyle Berber³ there is only one plural template that accounts for all singulars. The table below illustrates the case.

³ The examples given here are from my own dialect (Michelet dialect).
<table>
<thead>
<tr>
<th>class number</th>
<th>template</th>
<th>Singular</th>
<th>Plural</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VCC</td>
<td>ifēr</td>
<td>afriw-n</td>
<td>wing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>izəm</td>
<td>izmaw-n</td>
<td>lion</td>
</tr>
<tr>
<td>2</td>
<td>VCCC</td>
<td>ɜrgəl</td>
<td>ɜrgal-n</td>
<td>precocious fig</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ɪʃrəw</td>
<td>afriw-n</td>
<td>peelings</td>
</tr>
<tr>
<td>3</td>
<td>VCVC</td>
<td>afus</td>
<td>ifass-n</td>
<td>hand</td>
</tr>
<tr>
<td></td>
<td></td>
<td>azag</td>
<td>izagg-n</td>
<td>staple</td>
</tr>
<tr>
<td>4</td>
<td>VCVCVC</td>
<td>asalas</td>
<td>isulas</td>
<td>beam</td>
</tr>
<tr>
<td></td>
<td></td>
<td>amaðay</td>
<td>imuðay</td>
<td>brambles</td>
</tr>
<tr>
<td>5</td>
<td>VCVC</td>
<td>ʔabuðəʃ</td>
<td>iðuðəʃ</td>
<td>boil</td>
</tr>
<tr>
<td></td>
<td></td>
<td>izıçəɾ</td>
<td>izuçar</td>
<td>braided rope</td>
</tr>
<tr>
<td>6</td>
<td>VCCCVC</td>
<td>açərruʃ</td>
<td>içʷerʃə-n</td>
<td>oak</td>
</tr>
<tr>
<td></td>
<td></td>
<td>azəmmur</td>
<td>izəmra-n</td>
<td>olive</td>
</tr>
<tr>
<td>7</td>
<td>VCCCVC</td>
<td>aməsluβ</td>
<td>iməsλaβ</td>
<td>mad</td>
</tr>
<tr>
<td></td>
<td></td>
<td>aβəhnuq</td>
<td>iβəhnaq</td>
<td>rag</td>
</tr>
<tr>
<td>8</td>
<td>VCCVC</td>
<td>argaz</td>
<td>ɪrgaz-n</td>
<td>man</td>
</tr>
<tr>
<td></td>
<td></td>
<td>axxam</td>
<td>ixxml-n</td>
<td>home</td>
</tr>
<tr>
<td>9</td>
<td>VCCV</td>
<td>alma</td>
<td>almaθ-n</td>
<td>green field</td>
</tr>
<tr>
<td></td>
<td></td>
<td>iðni</td>
<td>iðniʃ-n</td>
<td>double</td>
</tr>
<tr>
<td>10</td>
<td>VCVCV</td>
<td>açufi</td>
<td>içufa-n</td>
<td>jar</td>
</tr>
</tbody>
</table>
Singular forms are distributed over 22 distinct templates\(^4\), which all neutralize to one single plural template. I propose in Ben Si Saïd (2010, 2011) that plural template is uniform and it is made of 7 [CV] units.

\[(4)\]

<table>
<thead>
<tr>
<th>sg.</th>
<th>representation</th>
<th>plural: 7CV-template</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCC</td>
<td>CV CV CV CV CV</td>
<td>CV CV CV CV CV CV CV</td>
</tr>
<tr>
<td>ifr</td>
<td>I f r</td>
<td>A f r I U n</td>
</tr>
<tr>
<td></td>
<td></td>
<td>afriwn</td>
</tr>
<tr>
<td>VCCCC</td>
<td>CV CV CV CV CV CV</td>
<td>CV CV CV CV CV CV CV</td>
</tr>
<tr>
<td>urgl</td>
<td>U r g l</td>
<td>U r g A l n</td>
</tr>
<tr>
<td></td>
<td></td>
<td>urgln</td>
</tr>
<tr>
<td>VCCVC</td>
<td>CV CV CV CV CV CV CV</td>
<td>CV CV CV CV CV CV CV</td>
</tr>
<tr>
<td>argaz</td>
<td>A r g A z</td>
<td>I r g A z n</td>
</tr>
<tr>
<td></td>
<td></td>
<td>irgazn</td>
</tr>
</tbody>
</table>

\(^4\) Only full vowels are considered: VCCC = urgl [urgl]. Schwa is predictable (cf. 1.3).
1. as they cannot be predicted, all material that appears in plural forms are considered as a lexical ingredient of the root.

2. adopting the hypothesis that peripheral vowels are underlyingly long (see below).

3. all plurals are made of 7 CV units.

3. **Diatopic variation of Kabyle Berber**

3.1 **Data**

Plural formation appears to work in the same way in many, or all varieties of Berber, i.e Diatopic variation concerns only the singular forms.

<table>
<thead>
<tr>
<th></th>
<th>Grande Kabylie</th>
<th></th>
<th></th>
<th>Petite Kabylie</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Maatka</td>
<td>Michelet</td>
<td>Azazga</td>
<td>Yatafen</td>
<td>Aqbu</td>
<td>Tazmalt</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. içen &amp; içen</td>
<td>-</td>
<td>içniw</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>açniw-n</td>
<td>twin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. anaγ &amp; iney</td>
<td>-</td>
<td>-</td>
<td>inγi</td>
<td>-</td>
<td>inγiy-n</td>
<td>velum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. iweṭṭ &amp; iweṭṭ</td>
<td>iweṭ</td>
<td>-</td>
<td>-</td>
<td>iweṭṭ</td>
<td>iweṭṭ-n</td>
<td>nit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. urgil</td>
<td>urgil</td>
<td>-</td>
<td>urgal</td>
<td>urgay</td>
<td>-</td>
<td>urgal-n</td>
<td>early figs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. ibleiw &amp; iβiw</td>
<td>iβiw</td>
<td>iβiw</td>
<td>iβi</td>
<td>iβi</td>
<td>iβaw-n</td>
<td>bean</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>ajařiw</td>
<td>ajaři</td>
<td>ajařiw</td>
<td>ajaři</td>
<td>-</td>
<td>ijařiw-n</td>
<td>large fez</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>aγařɔf</td>
<td>aγařɔf</td>
<td>aγařɔf</td>
<td>aγařɔf</td>
<td>-</td>
<td>iγařaf</td>
<td>grindstone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>ihəʃʃir</td>
<td>ihʃir</td>
<td>ihəʃʃir</td>
<td>ihʃcir</td>
<td>-</td>
<td>ihəʃʃir-n</td>
<td>anger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. aẓaṛridd</td>
<td>aẓaṛridd</td>
<td>aẓrid</td>
<td>aẓaṛridd</td>
<td>-</td>
<td>-</td>
<td>iẓaṛridd-n</td>
<td>line</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>aʃasas</td>
<td>aʃasas</td>
<td>aʃasas</td>
<td>aʃasas</td>
<td>aʃasas</td>
<td>iʃasas-n</td>
<td>hand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. ajar0il &amp; ajar0il</td>
<td>ajar0il</td>
<td>ajar0il</td>
<td>ajar0il</td>
<td>ajar0il</td>
<td>ijar0yal</td>
<td>large mat</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The examples under (5) show that for each plural form correspond different singular all over the dialects.

The variation regarding singular forms does not concern melody or the segmental identity of the root: for any given root, all dialects share the same lexical entry.

3.2 Borer-Chomsky Conjecture (BCC)

The Borer-Chomsky Conjecture which is standardly known in syntax and formulated from Baker 2008 as follows:


Variation is reduced to variation in the lexicon, i.e. which means that parametric variation is exclusively due to distinctions in the lexicon.

The presentation below will show that variation is due to the association of invariable lexical entries to invariable singular templates.

The analysis of the invariability of the plural template over singulars in a given dialect, and across dialects, can only be arrived at when adopting a number of premises that are developed in Government Phonology in general, and in CV in particular including the hypothesis that peripheral vowels (i,a,u) are underlyingly long.

3.2.1 Syllable structure

In CVCV model the syllabic structure consists of a sequence of light open syllables: a non-branching onset (C) is followed by a non-branching nucleus (V) (Lowenstamm 1996).

In this framework, a final consonant, a closed syllable, a branching onset, a geminate and a long vowel are represented as under (6) below (Lowenstamm 1996, Scheer 2004):
### 3.2.2 Vowel length

Following the hypothesis proposed by Lowenstamm (1991) for the vocalic systems of Maghrebi Arabic and Semitic languages of Ethiopia, and then applied on Kabyle by Bendjaballah (1999, 2005) and Italian dialect by Bucci (2009); I adopt that peripheral vowels are underlyingly long in Kabyle,

<table>
<thead>
<tr>
<th>Final consonant</th>
<th>Closed syllable</th>
<th>Branching onset</th>
<th>Geminate</th>
<th>Long vowel</th>
</tr>
</thead>
<tbody>
<tr>
<td>C V</td>
<td>C V C V</td>
<td>C V C V</td>
<td>C V C V</td>
<td>C V C V</td>
</tr>
<tr>
<td>r # b a r</td>
<td>b r a</td>
<td>b</td>
<td>a</td>
<td></td>
</tr>
</tbody>
</table>

In this language, the opposition between VV/V is underlying and it’s realized on the surface as V/ɔ opposition. The reduction is a result of phonetic interpretation and the melody and its association are not affected.

There are also underlying consonants, called virtual geminates (Scheer 2000, Ségéral & Scheer (1999, 2001)).
3.2.3 Types of lexical entries

**lexical ingredients:**

a. Root (melody: linear sequence of melodic items). Ex. IGUI

b. Template:
   - singular: N° 1,2,3,4,……22.
   - plural: [CV CV CV CV CV CV]

The variation is due to the selection of a particular singular template by a particular root.

3.2.4 Diatopic variation

(8) singular template

<table>
<thead>
<tr>
<th></th>
<th>VCC</th>
<th>VCCC</th>
<th>VCVC</th>
<th>VCCVC</th>
<th>VCCV</th>
</tr>
</thead>
<tbody>
<tr>
<td>IGUI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

We can observe under table (8), the root IGUI selects template number 2 in Michelet, Azazga and Yatafen dialect but it selects template number 9 in Aqbu dialect and template number 1 in Tazmalt Dialect.

4. Analysis

- 1st focus of variation: singular templates

The phonologic computation is the association: always from left to right and it’s invariable.
(9) One plural: açniwən

a) Yatafen 7-CV template

\[ \text{IçnIU} \rightarrow \text{C V C V C V C V C V C V} \rightarrow \text{[içniw] “twin”} \]

\[ \begin{array}{ccccccccc}
\text{I} & \text{ç} & \text{n} & \text{I} & \text{U} \\
\end{array} \]

b) Michelet 4-CV template

\[ \text{IçnIU} \rightarrow \text{C V C V C V} \rightarrow \text{[içən] “twin”} \]

\[ \begin{array}{ccccc}
\text{I} & \text{ç} & \text{n} & \text{I} & \text{U} \\
\end{array} \]

Under 9.a) the melody is not constrained by the structure. We can observe that all melodic items find a site on the skeleton to be associated to.

Under (9.b), we have the same melody as under (9.a) but the template is smaller (three CV less). /w/ remains silent because it cannot be associated to the template and V2 which has access to one V-position remains floating and it is realized as zero.

(10) One plural: iβawən

a) Aqbu 5-CV template

\[ \text{IβIU} \rightarrow \text{C V C V C V C V C V} \rightarrow \text{[iβiw] “bean”} \]

\[ \begin{array}{ccccccccc}
\text{I} & \beta & \text{I} & \text{U} \\
\end{array} \]

b) Azazga 4-CV template

\[ \text{IβIU} \rightarrow \text{C V C V C V C V} \rightarrow \text{[iβi] “bean”} \]

\[ \begin{array}{ccccc}
\text{I} & \beta & \text{I} & \text{U} \\
\end{array} \]
Under 10.a) the segmental material is mapped to 5CV-template which allows all the melodic items to be pronounced. But under 10.b) there are restrictions on the template leaving /w/ without position in the structure and remains floating.

- 2\textsuperscript{nd} focus of variation: association under control

The association of pieces of melody and syllabic constituents is not necessarily automatic. It may be governed by:

a. grammatical control

Arabic

\begin{center}
\begin{tabular}{ll}
form II & form III \\
\hline
kattab & kaatab \\
\end{tabular}
\end{center}

\rightarrow McCarthy (1979): there are two different templates $C_1V_1C_2V_2C_3$ vs. $C_1V_1V_1C_2V_2C_3$

\rightarrow Guerssel & Lowenstamm (1990): argue that there is only one template and the difference is due to the association of the melody to the morphological site [CV]. The gemination of the middle consonant (form II) or the spreading of the first vowel (form III) may be a morpheme, i.e. only marker of grammatical category in question. $C_2$ or $V_1$ receive an "order" to associate.

\begin{center}
\begin{tabular}{c|c|c|c|c}
 & C & V & [C V] & C & V & C & V \\
\hline
Form II & | & | & | & | & | & | \\
\hline
k & a & t & a & b \\
\end{tabular}
\hspace{1cm}
\begin{tabular}{c|c|c|c|c|c|c|c}
 & C & V & [C V] & C & V & C & V \\
\hline
Form III & | & | & | & | & | & | \\
\hline
k & a & t & a & b \\
\end{tabular}
\end{center}

The association of melodic objects may be under control (Ben Si Said 2010, Guerssel & Lowenstamm 1990).

b. association under lexical control

There is another possibility of control. The association may be governed by the lexicon: melodic items are lexically specified for associating or not (Ben Si Saïd Samir, Markéta Ziková & Tobias Scheer 2009, Ziková, Markéta & Tobias Scheer 2009).
Table (11) shows three different realizations. The melody is restricted by the size of 3CV-template in Tazmalt dialect. But it has the same template in Michelet and Aqbu dialects; the difference lies in the order given by the lexicon to the association of the melody to a given template: \( I_2 \) and \( U \) are under lexical control. As represented under (12) below:

(12)

One plural: \textit{affiw\#n}

a) Michelet

\[
\begin{array}{cccccccc}
I & I & I & U & C & V & C & V
\end{array}
\Rightarrow \begin{array}{cccccccc}
\text{[iff\#w]} & \text{“corn”}
\end{array}
\]

\[
\begin{array}{c/c/c/c/c/c/c/c}
\downarrow & / & \downarrow & / & | & | & I & I & U
\end{array}
\]

b) Aqbu

\[
\begin{array}{cccccccc}
I & I & I & U & C & V & C & V
\end{array}
\Rightarrow \begin{array}{cccccccc}
\text{[iffi]} & \text{“corn”}
\end{array}
\]

\[
\begin{array}{c/c/c/c/c/c/c/c}
\downarrow & / & \downarrow & / & \downarrow & / & / & I & I & U
\end{array}
\]

c) Tazmalt

\[
\begin{array}{cccccccc}
I & I & I & U & C & V & C & V
\end{array}
\Rightarrow \begin{array}{cccccccc}
\text{[iff]} & \text{“corn”}
\end{array}
\]

\[
\begin{array}{c/c/c/c/c/c/c/c}
\downarrow & / & \downarrow & / & / & | & I & I & U
\end{array}
\]
**Conclusion**

To summarize, starting with the observation of the interaction between segments, this presentation attempted to show that some lexically present items of roots do not surface in the singular because the template of their singular class does not provide enough space. I have also shown that the variation regarding singular forms does not concern melody or the segmental identity of the root: a given root will select different singular templates in different dialects.

**References**


Guerssel, Mohamed & Jean Lowenstamm 1990. The derivational morphology of the Classical Arabic verb. Ms. Université Paris 7 & UQAM.


