In this paper, I examine two interesting systemic aspects of the nominal template tQuLa of Modern Hebrew, emphasizing how Jean Lowenstamm's work has contributed to the study of templates in general. First, I show that the distributional lacunae of this template can be explained if it is taken as the weak-medial equivalent of the template tiQTóLet. I show that this claim can only be made rigorous in the framework of a theory of templates such as the one advanced by Lowenstamm. I then compare the templatic prefix t- in tQuLa to the verbal person prefix t-, and show that their different behaviors can be explained if one adopts Kaye's (1995) morphological domains, themselves motivated by Lowenstamm's recent morpho-syntactic work (2010, 2011, 2012).

Keywords: Hebrew, template, morphological domains, morpho-syntax, affixes
1. Introduction

In several papers throughout his career, Jean Lowenstamm discussed Semitic languages. Through the exploration of this particular language family, he made various innovative theoretical claims regarding phonology, morphology, and recently morpho-syntax. The conclusions drawn in those papers nearly always extend well beyond Semitic. In this short squib, I will exemplify the relevance of several of his claims and conclusions through the study of one specific template in Modern Hebrew, the template tQuLa.\(^i\)

A total of 42 words exist in this template, examples of which can be seen in (1). As its name suggests, the template is characterized by a prefix [t], a stressed suffix [a] and two variable consonants, henceforth the root, separated by a vowel [u]. As for the semantic import, the vast majority of the nouns in this template have a non-concrete, non-unitary denotation, such as collectives (1a), action resultatives (1b) and other non-concrete nouns (1c).\(^ii\)

(1)  tQuLa

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>txula</td>
<td>‘contents’</td>
<td>b.</td>
</tr>
<tr>
<td></td>
<td>tnuva</td>
<td>‘yield’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>tvuʔa</td>
<td>‘crops’</td>
<td></td>
</tr>
</tbody>
</table>

Two aspects of this template will be discussed here: the templatic and the phonological. The order of the discussion parallels the chronological order of Lowenstamm’s contributions to Semitic linguistics and to linguistics in general. First, in §1, I will examine the placement of the template in the
morphological system of the language. I will show that although tQuLa has only 2 surface radicals, the root in tQuLa in fact occupies three radical positions, and that the template is exactly the same as the tripartite ṯiQTōLet. In §2, I will concentrate on the relation between the prefix and the stem in tQuLa, and compare it to the relation between the homophonous 2\textsuperscript{nd} person prefix t- and its stem. The differences between the two will be analyzed in terms of the analytic and non-analytic morphology (Kaye 1995) and the “No Straddling Effect” of Lowenstamm (2000). In §3, I will claim that the analytic vs. non-analytic distinction and the “No Straddling Effect” are in fact predicted by the recent proposals in Lowenstamm (2010, 2011, 2012).

2. The CV template of tQuLa is tripartite

It is common in studies of Semitic morphology to treat biradical templates as specific versions of triradical ones, from which bipartite roots are absent. For instance, the MH form nisa ‘he tried’ is one biradical analogue to niser ‘he sawed’, and this is supported by the absence of *nise. Technically, this distributionally-motivated claim was hard to carry over to the early autosegmental framework of McCarthy (1981), because the number of C-slots in the templatic representation depended on the number of consonants realized. Thus, nisa would be represented as CVCV, but niser would have a CVCVC template.
One possible way out is to formalize templates in terms of simple timing units, and show that somehow, the two templates occupy the same number or timing units. This method, characteristic of Government Phonology (Kaye et al. 1990) is used in Lowenstamm and Prunet (1986) to show that the Tigrinya nouns faras ‘horse’ and goza ‘house’ are in fact of the same template. Later, Lowenstamm (1996) adopted McCarthy’s C and V notation, but proposed a strictly-alternating skeleton, in which C or V slots can be left unoccupied under certain conditions. In this manner, too, a biradical template can be shown to occupy exactly the space that a triradical template does.

Let us now return to the template tQuLa. I propose that this template is the biradical version of the template ti-QToL-et, which contains some 30 items, several of which are presented in (2).

(2) tiQToLet

<table>
<thead>
<tr>
<th></th>
<th>tiQToL-eet</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>taxmőret †</td>
<td>'ammunition'</td>
</tr>
<tr>
<td></td>
<td>tišlővet</td>
<td>'network (ind.)'</td>
</tr>
<tr>
<td>b.</td>
<td>tizkőret</td>
<td>'reminder'</td>
</tr>
<tr>
<td></td>
<td>tirgőlet</td>
<td>'standardized series of actions (in army)'</td>
</tr>
<tr>
<td></td>
<td>tizmóret</td>
<td>'orchestra'</td>
</tr>
<tr>
<td></td>
<td>tisbőket</td>
<td>'a complex situation'</td>
</tr>
</tbody>
</table>

†The [a] vocalization of the prefix is a pre-guttural variant of the default [i].

The proposal is supported by the fact that no biradicals appear in tiQToL-et: <Q,T,L> are always different consonants. It is further motivated by the overall collective meaning of the items in tiQTőL-et, which parallels that of tQuLa. iii It remains to be shown that the two surface arrangements - tiQToL-et and tQuLa - occupy the same templatic space.
In order to see this, several previous analyses have to be assumed. First, it is a fact about the native vocabulary of Hebrew that the vowel [u] never appears before a word-final, unstressed [CeC] sequence. It is thus assumed here that sequences such as […]CeC] can be interpreted as underlingly /uCeC/ (see e.g. Prince 1975 for an analysis of this phenomena in Tiberian Hebrew). For the present purpose, tiQT[ó]Let is underlingly tiQT/u/Let.

Secondly, a general point about surface biradicals is in order. These come in two types: true biradicals, which reduplicate to satisfy templates, and weak triradicals, which are essentially triradicals with a “weak” consonant, usually a glide, in a specific, arbitrary position, i.e. <Q,W,L>, <W,T,L> or <Q,T,W> (“W” standing for weak). There is no reduplication in tQuLa, which implies that the root here is not a biradical, but a weak triradical. Because the first consonant immediately follows the prefix, and the last one immediately precedes the suffix, we may assume that roots of tQuLa are medially-weak roots, i.e. <Q,W,L>. The medial radical is thus prone to morpho-phonological processes of elimination.

Thirdly, the [i] of tiQTóLet alternates with [a] before gutturals (2a). In Faust (2011), I showed that such [i]’s are in fact realizations of empty nuclei, not lexical vowels. And finally, Faust (2011, To appear) shows that both feminine suffixes – stressed -a and unstressed -et – are in fact /at/. This analysis is shown in (3): under (3a), the /t/ remains afloat and the /a/ occupies two positions; in [et], both /a/ and /t/ are associated with positions in the template, but the nucleus that hosts /a/ behaves as an empty nucleus
because /a/ is associated only to it (the assumption is that /a/ must branch). As will be briefly discussed below, this underlying length can explain the stress facts, the quality of the vowel ([e] is the epenthetic vowel of Hebrew, and final clusters are illicit in native words) and the floating of feminine /t/ in one suffix but not in the other.

(3) [a] vs. [et]

Taking into account all of the above, the representation of tišlévet ‘concern, network’ is /t-šluv-et/, as in (4a). The prefix t- is followed by an empty nucleus, which is ungoverned and thus realized as [i]; the /a/ of the affix is short, which results in the [t] of the suffix being preceded by an epenthetic, unstressed [e]; the /u/ of the stem is short, stressed and realized as [o]. The parallel weak-medial root in (4b) lacks the medial radical. This lack results in the lengthening of the vowel of the template, /u/. Because the V-slot immediately following the first radical is occupied, the nucleus following the prefix is governed and remains silent. The second V-slot of a long vowel has to be licensed by a following non-empty nucleus (Lowenstamm 1996). This, I submit, is the reason that the long, stressed version of the feminine suffix is used, rather that the short one, which would leave the nucleus empty. Assuming that MH stresses only phonologically long final vowels, stress is therefore assigned to the vowel of the suffix.
tQuLa and tiQTóLet contain the same number of CV units

![Diagram of CV units]

If so, by independently-motivated principles, we have managed to unify the templates tiQTóLet and tQuLa, which have seemingly quite different forms. Such analytic moves have become more rigorous with the definition of templates in terms of strictly alternating CV units, as originally proposed in Lowenstamm (1996) and further discussed in Lowenstamm (2003). In the next section, we will encounter another aspect of the morpho-phonology of this template which is best understood using Lowenstamm’s insights.

3. Analyticity, the No-Straddling Government Effect and the peculiarity of tQuLa

In 2005, when I first met Jean in a small sandwich place near the Jussieu campus, I had just come from Israel to Paris, and I was not sure whether I wanted to write a dissertation at all. After that meeting, no doubt remained. One of the sentences that he said to convince me to that effect was something like: “I believe that different morphological and syntactic environments can have different phonological effects.”

In the previous section, we saw that the empty nucleus after the prefix t- of tQuLa remained unrealized: [txula] ‘contents’ cannot be pronounced
As pointed out by Ornan (2003), the behavior of this prefix contrasts with that of the homophonous 2\textsuperscript{nd} person, non-past \textit{te}- prefix. Before the verbal bases of the types QuTaL and QiTeL, this prefix \textit{te}- is realized either with a following [e] or without it. The forms to compare are thus \textit{t-xula, \*te-xula} vs. \textit{txulak \~ texulak} ‘you will be distributed’ or the less similar \textit{t-xalek \~ texalek} ‘you will distribute’.

The vowel [e] is the epenthetic vowel in Hebrew. That it alternates with zero in the prefix \textit{te}- attests to its epenthetic status in this context. But if so, why does epenthesis apply, albeit optionally, after one prefix and not after the other? Kaye (1995) provides a possible solution to this problem. For Kaye, there are two types of morphological relations: non-analytic \([X \ Y]\) and analytic \([X][Y]\) or \([X]Y\). In the first, phonology applies to the result of the concatenation of \(X\) and \(Y\). As a result, the concatenation cannot show any phonological peculiarity: it must conform to the phonology of simplex words in the language. In analytic morphology, in contrast, there are two possibilities: either there are two independent domains \([X][Y]\), whose phonological forms interact only after the phonology of each domain has been calculated, or one domain is embedded within the other \([X]Y\). In the latter case, phonology is first applied to the base, and then to the entire string. Interestingly, Kaye reports that analytic cases of the type \([X[Y]\), logically possible, are unattested.

The analytic vs. non-analytic distinction is useful in the comparison of the two \textit{t-} prefixes. That of the template tQuLa certainly behaves like a non-
affixal initial [t]; in other words, the morphologically complex tQuLa is phonologically simplex. Compare it, for example, to the homophonous adjective *txul-a* ‘light blue.’ (the masculine is *taxol*), or to the word *txol* ‘spleen’, which is probably non-templatic. In neither of these is the initial [t] a prefix, nor can the surface cluster which it forms with the following [x] be broken by an epenthetic [e]. What then of the 2nd person prefix *t-*?

Since [X[Y]] is not attested according to Kaye, the only possibility for the prefixed *te-xulak* to be analytic is [[X][Y]]. This is represented in (5).

The final nucleus of the second domain is licensed because it is domain-final. The final nucleus of the first domain is also final in its domain, but because it is the only nucleus of the domain, it is also the head of the domain; since domain-heads cannot be licensed, it remains unlicensed. It cannot be licensed through government across the domain boundary, since the phonologies of the two domains are first calculated separately and, by assumption, their realizations cannot be subsequently altered. The nucleus must be realized, the vowel is the epenthetic [e].

(5) The analytic morphology of *te-xulak*

\[
\begin{array}{cccccc}
O & N & O & N & O & N \\
[| & | & | & | & | & |] \\
[[x x] [x x x x x x]] \\
[| ↓ | | | | |] \\
t & e & x & u & l & a & k
\end{array}
\]

It is worth mentioning, in the present context, that government between domains has been specifically constrained in Lowenstamm’s proposal in his
2000 paper on Chaha palatalization. In that paper, it is shown that certain consonants may branch onto C positions in two domains, because they are not “vectors of government”. Lowenstamm proposes the “No-Straddling Government effect”:

(6) The No-Straddling Government Effect (Lowenstamm 2000)

A governing relation cannot be established over the boundary between the stem template and its suffixal augment.

For the present purpose, we may interpret suffixal as “affixal”. Combined with the analysis in terms of analytic morphology in (5), this effect can be revised as follows:

(7) The No-Straddling government Effect (Revised)

The phonological interpretation of a domain disallows the participation of the nuclei of that domain in government relations with nuclei of other domains.

For the first domain-final nucleus in (5) to be governed by the first nucleus of the following domain, the revised No-straddling Government effect will have to be ignored. The realization of this nucleus is thus in line with the proposed effect.

In this section, Hebrew te-xulak was analyzed as analytic morphology, thus explaining the realization of the first vowel. But why should one prefix be analytic and another non-analytic? Interestingly, at least in the case at hand, the analytic vs. non-analytic distinction respectively parallels that of
inflectional, non-templatic affixes vs. derivational, templatic ones. This parallelism, as we will see in the next section, is not a coincidence.

4. Phonology as the manifestation of morpho-syntactic structure

In the last decade or so, Jean has been interested in how phonological events reflect the morpho-syntactic structures that they realize. The product of that interest, I would like to show here, can provide an answer to the question that concluded the previous chapter, regarding the motivation for the analytic vs. non-analytic distinction.

In Distributed Morphology (Halle and Marantz 1993), derivational affixes such as English -ic are represented as realizations of category heads, as in (8a). In Lowenstamm (2010, to appear), in contrast, it is proposed that these affixes are uncategorized roots, which select for other roots, as in (8b). This view has been carried over, in my own dissertation (Faust 2011), to the derivational, templatic morphology of Hebrew. As illustrated for tQuLa in (8c), templates are themselves represented as a sort of root, which selects for triradical roots. Note that templatic morphology is represented low, below the first category head.

Lowenstamm’s (2010) proposal was made for derivational affixes. In Lowenstamm (2011, 2012), the representation of affixes as roots was applied to the realm of inflectional affixes, too. In Lowenstamm (2011), person suffixes are represented as roots under a node “PRO”, itself embedded within AgrP; in Lowenstamm (2012), the feminine affix of French is represented as a strictly templatic root, which selects for other roots below the category head and can subsequently check a feature situated above that head, in GenP.

The proposal in (2011) is more relevant for our present concern, because it deals with agreement pronominals, like our te-. The structure of te-xulak ‘you will be distributed’ is represented in (9), with a root $\sqrt{t}$ embedded under Agr.

(9) The morpho-syntactic structure of te-xulak

\[
\begin{array}{c}
\text{AgrP} => /t/+/xulak/ \text{ ‘you will be distributed’} \\
\text{Agr} \quad \text{vP} => /xulak/ \text{ ‘distribute.PASS’} \\
\text{Pro} \quad \text{n} \\
\sqrt{t} \quad \sqrt{QUTAL} \quad \sqrt{XLK} \\
\end{array}
\]
Comparing the structures in (8c) and (9), one can see a possible motivation for the non-analytic nature of *txula* in the former vs. *te-xulak* in the latter. While all the ingredients of *txula* are situated below the first category head *n* (8c), those of *te-xulak* are separated by that head, situated exactly between the prefix and its stem. Category heads are treated as significant boundaries in the derivation in a fair share of the morpho-syntactic literature (see for example Marantz 2007), as well as in Lowenstamm (2010, to appear). If indeed such heads constitute boundaries, then morpho-syntax provides us with a more primitive reason for the specific analysis of *txula* vs. *te-xulak*: a category head exists between the prefix and the base in the latter, but not in the former. This analysis depends crucially on the placement of suffixes in different positions in the morpho-syntactic structures, as in Lowenstamm’s recent articles.

5. Conclusion

In this short squib, I discussed Jean Lowenstamm’s contributions to phonology, morphology and morpho-syntax through the examination of two aspects of the template tQuLa in Modern Hebrew. These two aspects were the biradical specificity of the template and the initial cluster created by the prefix *t*-. As I hope to have shown, Jean’s many insights have contributed considerably to the study of such phenomena.
References


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\[i\] I will use the set \(<Q,T,L>\) to represent the three variable element in the template.

\[ii\] Stress is final unless marked.

\[iii\] Interestingly, tiQTőLet is more concrete than tQuLa, in that it contains collectives and resultatives, but not non-concrete nouns like those in (1c). I have no explanation for this.

\[iv\] The assumption here is that nuclei with lexical vowels are preferable to empty nuclei, even when the latter are realized. Because this process concerns allomorph selection, it cannot be viewed as purely phonological.

\[v\] This is Kaye's take on the visibility of morphological boundaries to phonological calculation.

\[vi\] A reviewer notes that the analysis could be reversed, by saying that the optionality of government in *te-xulak* is sign of non-analytic morphology, whereas the non-realization of the empty nucleus after the prefix in *t-xula* indicates that it is domain-final. This analysis must be rejected on independent grounds, namely the greater compositionality, both morphological and semantic, of *texulak*.

\[vii\] Arguing in favor of either Lowenstamm’s proposal or my own cannot be part of this short squib. Moreover, the representation in (8c) is of course simplified: the template has a prefix and a suffix, which in a fuller representation would be morphological heads themselves.

\[viii\] In this formalization, selectional restrictions are represented as uninterpretable features [u x], which must be checked by the complement of their carrier. A checked feature is represented barred.