

The template: Morpho-phonology meets Syntax in Modern Hebrew verbs¹

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1. Introduction

The aim of this paper is twofold: first, it proposes an analysis of Modern Hebrew (MH) verbal morphology, which promotes a relatively new perspective on Semitic systems in general. Second (in order, not in importance), the paper examines the isomorphism between syntactic and morpho-phonological structures. Comparison of morphological syntactic analyses shows that such isomorphism exists in various aspects of the verbal system. Moreover, what appear to be *phonological* processes (most importantly, apophony) are shown to be motivated and brought about by syntactic considerations. The conclusions reached thus argue for a view of the mapping from Syntax to Phonology that is much more direct than usually assumed.

The rationale of the paper is thus as follows: after several morpho-phonological generalizations are made for the MH verbal system, I provide an initial unifying analysis, according to which one single template underlies all active MH verbs. I then show that several questions about the form of the different items are left unanswered if one contents oneself with just the morpho-phonological analysis. These questions, I suggest, may be answered if syntactic structure is taken to have a direct influence on phonological form (Lowenstamm 2008, among others). Such a view is not at all far-fetched, since - as I show next - there is a similarity between the syntactic and morpho-phonological structures that is too striking to be accidental. I show that principled answers to the remaining questions can indeed be put forth based on properties of the syntactic structure. More specifically, a hypothesis is made as to the syntactic origin of apophonic vowel-changes; this hypothesis is tested on the passive verbal conjugation, and proved to be worth considering.

The theoretical claim advanced, if so, is that the correlation between form and structure is so strong (at least in MH), that an analysis that treats (morpho-)phonology as unrelated to syntactic structure is almost sure to overlook crucial, important generalizations.

2. Data and Morpho-phonological analysis

2.1. Introductory data and generalizations

The three active verbal paradigms of MH are presented in (1):

(1)	Basic forms of Modern Hebrew (MH) active verbs			
	<i>name of paradigm</i>	<i>past</i>	<i>future</i>	<i>gloss</i>
	QaTaL	kafac	yi-kfoc	'jump'
	QiTeL	kipec	ye-kapec	'jump around'
	hiQTiL	hikpic	y-akpic	'make jump'

¹ The following people discussed the contents of this paper with me, and I would like to thank them: Eitan Grossman, Yaar Hever, Michael Becker, Jonathan Kaye, Sabrina Bendjaballah, Philippe Ségéral, Chris Reintges. Especially helpful were the discussions with my advisor Jean Lowenstamm and with Edit Doron. Most errors were made by a certain person whose identity will not be disclosed. All remaining errors are mine (although most are still his).

As the gloss shows, the verbs in (1) are clearly related. This semantic relatedness is reflected in the three consonants {k,f/p,c} shared by all items. These three consonants are called the *root*. The vowels of an item are its *vocalization* (e.g. {i,e} in *kipec*).

The forms presented in (1) are 3sg.m. forms. In the past, such forms have no suffix or prefix. The past form is therefore perceived of as basic. The *name* of the paradigm (which is a mere classificatory tool) is achieved through replacing the consonants of this past form with the variables Q,T,L. The view of the past 3sg.m. as basic is adopted here *a-priori*; evidence for it is provided only subsequently.

Before moving on, it is worthwhile to mention that the semantic relatedness is regular. When the root is shared by items in more than one paradigm, it will always be the case that hiQTiL is a causative verb and QiTeL an active one (QaTaL is unrestricted in this sense).² Although the system is not without complication, impossibilities are revealing: for example, there is not one root in MH for which the hiQTiL version has an unaccusative meaning, and the QaTaL version has a causative one.

2.1. Morpho-phonological analysis

The MH verbal system, as those of other Semitic languages, has traditionally been analyzed as involving two types of templates: light and heavy. Without going into details, this distinction sets apart “light” QaTaL (and its language-specific equivalents) from the rest of the paradigms, referred to as “heavy”. Because of this ad-hoc nature, this distinction is a tradition that the present analysis aims to refute. The current proposal is that *all* paradigms are built on a single template, of the form CV-CVCVCV (i.e. four CV constituents with a boundary between the first CV and the rest of the template).³ This section explores some of the ways in which a single-template approach can be valuable in the analysis of the MH verbal system.

Consider the following generalizations about the data above:

(2) Generalizations about the form of active verbs in MH

- | | |
|-------------------------------|---|
| a. Prosody | Stem prosody is stable in both past and future QiTeL (kipec-yekapec) & hiQTiL (hikpic-yakpic). It changes in QaTaL: the first stem-vowel is syncopeated in the first future form (kafac-yikfoc). |
| b. Segmental allophony | [f] occurs in QaTaL (kafac); [p] does in QiTeL (kipec). Note that the surface environment is identical in the relevant way (it is intervocalic) in both. Other alternations (x~k, v~b) occur in other examples. |
| c. Prefix vowel | The future prefix is y-. The vowel that follows it is different in each paradigm (yikfoc , yekapec , yakpic). |
| d. Vocalization | i. Every paradigm has a different vocalization.
ii. Different vowels surface in past and future stems (e.g. kipec-yekapec). |

Of the phenomena in (2), only segmental allophony can be claimed to be only semi-productive (although widely attested); the others generalizations are perfectly regular. It is

² This is not an uncontroversial claim. For further in-depth discussion of MH verbal paradigms as a system, see Doron 2003, Arad 2005; for a “lexicalist” view of MH and Palestinian Arabic see Laks 2006.

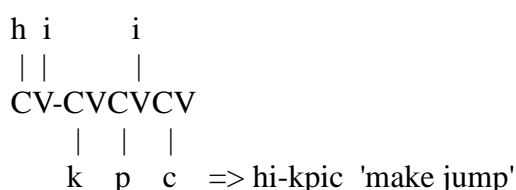
³ This template is reminiscent of the one proposed for all Classical Arabic verbs in Guerssel & Lowenstamm 1996. One difference is the lack of an internal derivational site in MH.

extremely lamentable, in my opinion, that generative research on MH has hitherto avoided accounting for any of these regularities.⁴ I take this to mean that the phenomena described are perceived of as *lexical* (or of diachronic nature), and thus uninteresting. But this is not true, as I hope to show in this analysis.

According to the view presented here, the entire verbal template is present in the structures of all three paradigms. The differences listed in (2) between the three paradigms follow from the *template satisfaction pattern* involved in each paradigm.

Let us start with the easiest paradigm, hiQTiL. This paradigm has a prefix *hi-* in the basic past form. This prefix is linked to the prefixal domain of the CV-CVCVCV template, i.e. the domain left of the hyphen, as shown in (3). As a result, the stem consonants can only be linked to the main domain (I will not discuss the vocalizations for now):

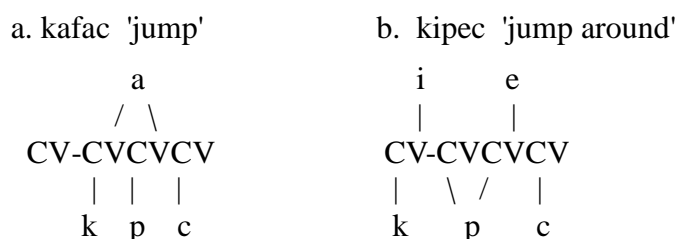
(3) Template satisfaction: hiQTiL, past form



In (3), both domains are *identified*. Domain identification is the process by which a domain is rendered accessible to segmental material. More sense and motivation will be given to this concept in the syntactic analysis.

The prefix *hi-* in (3) is linked to the prefixal domain, but the identification of the latter is independent of the existence of special phonological material to link to it. That leaves us with two more options of template satisfaction: i) no identification of prefixal domain, and ii) identification of prefixal domain with no special phonological material (no prefix). These scenarios, I submit, correspond respectively to the cases of QaTaL and QiTeL, as is shown in (4):

(4) Template satisfaction: QaTaL, QiTeL past forms:



In (4a), only the main domain is identified, and the root consonants are linked to its three positions. In (4b), the initial domain is also identified, and the root consonants spread to occupy the entire domain, with the result of the medial consonant (/p/ in this case) occupying two positions. That this representation does not result in gemination, but rather in allophony, is no big issue: the important point is that there is an underlying structural contrast.

Moreover, we will see that this allophony is only one of the cues that help the child construct this representation. Indeed, under the single template view, the underlying prosodies of QiTeL

⁴ For a poorly formalized but bibliographically-complete non-generativist treatment of some of the points in this paper, see Goldenberg 1994. For a discussion of gemination in MH, see Schwartzwald 1975-6.

and hiQTiL are identical: both are composed of two closed syllables. The lack of prosodic alternation in both hiQTiL and QiTeL, as contrasted to the prosodic alternation in QaTaL (**kafac-yikfoc**), is another cue for the “virtual” geminate.⁵ If so, from now on I will refer to QiTeL as QiTTeL.

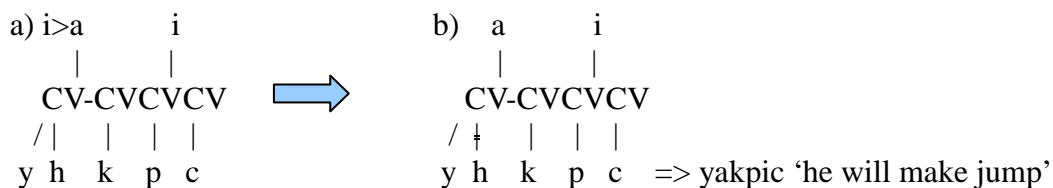
As for *kafac* (4a), we now understand why it surfaces with the weak allophone *f* (the phoneme *p* is linked to only one position). Regardless of the specific analysis of syncope, what is crucial about the data is that this syncope is blocked in QiTTeL.

Up until this point, we have seen that it is worthwhile to make the distinction in (4) for two reasons: i) prosody, and ii) segmental allophony. But we have not yet seen sufficient support for the single template approach; in other words, no good reason was given for there being an unidentified prefixal CV in (4a).

Another cue for the distinction in (4) is found in generalization (2c) above, namely the difference in the vowel that follows the future prefix in each paradigm.

Let us start again with hiQTiL. The current proposal predicts that the prefix will be external to the template, as shown in (5) (recall the assumption that future forms are derived from past ones):

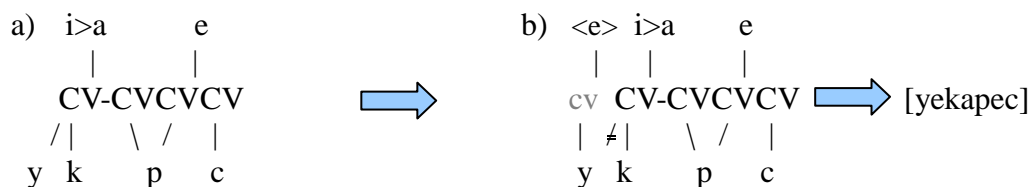
(5) Template satisfaction: hiQTiL, future form



The first stage in (5) shows the prefix *y-* competing with *h*, the prefixal consonant of the paradigm, on the initial templatic C-slot. It is a fact about MH that the *h* is deleted in this situation.⁶ The vowel [a] that ends up following the glide of the prefix is simply the past stem’s original vowel [i] that has undergone vowel change. The prefix, if so, is only /y/.

Next, (6) shows the satisfaction pattern that the single template account predicts for the future form of QiTTeL:

(6) Template satisfaction: QiTTel, future form



⁵ Virtual geminates have been shown to exist in unrelated languages in Scheer & Ségéral 2001.

⁶ In other words, I do not know why this is. Evidence for the insignificance of the loss of [h] may be drawn from the fact that it is rarely pronounced by speakers. However, the infinitival form /l+hakpic/ ‘to make jump’ does surface as [leakpic], or at least with a long a: [la:kp̩c], and very rarely *lakpic, thus constituting a minimal pair with yakpic, *ya:kp̩c. I do not know why that is.

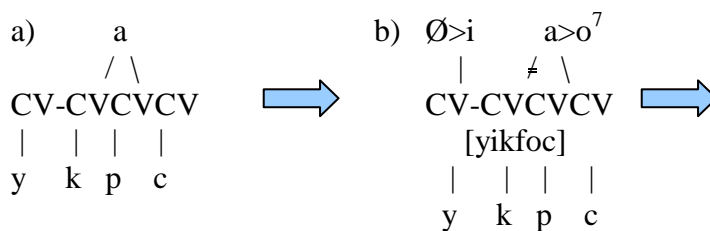
In (6a) the prefix *y* competes with a root consonant on a templatic position. In this case, as opposed to the case in (5) above, it is the stem consonant that wins (6b). The vowel that surfaces after the prefixal glide in (6b) is [e], the epenthetic vowel of MH. This is indeed the expected vowel if there is nothing special about the position it occupies, i.e. it is not a templatic position, but rather an ordinary empty V-slot (represented by *cv*).

The present unifying approach is thus able to distinguish structurally between hiQTiL and QiTTeL even though a single template is proposed for both. In the former, the vowel after the future prefix (*yakpic*) is the same as the one in the past stem (*hikpic*); in the latter, this vowel is always [e], because the position it occupies is not templatic. The prefix, if so, is only /y/, and the vowel that follows is determined by its relation to the template satisfaction pattern.

We have seen that the epenthetic vowel of MH is [e], and that the future prefix contains no lexical vowel. However, the vowel that surfaces in *yikfoc*, i.e. the future form of QaTaL, is [i].

Now consider the template satisfaction pattern that the single template account predicts for the future form of QaTaL in (7a). It is here, I suggest, that the present approach is most revealing: as mentioned, the position following the prefix is a *templatic* position. All we have to say now is that *templatic* empty nuclei are filled using another mechanism than the one used for non-templatic ones (namely epenthesis).

(7) Template satisfaction: QaTaL, future forms



Instead of being realized as [e], templatic empty nuclei are realized as [i], as (7b) demonstrates. This comes as no surprise if templatic vocalic change is perceived of as apophonic in nature.

The Apophonic chain in (8) is a sequence of vowel changes claimed to be universal. It was first proposed by Guerssel & Lowenstamm 1996, and has been influential in studies of vowel change ever since.

(8) The apophonic chain (Guerssel & Lowenstamm 1996, Ségéral 1994):
 Ø → i → a → u → u

I suggest that the initial change in the apophonic chain, Ø → i, is what yields the [i] vowel in QaTaL's future forms. Apophony, if so, is the special mechanism used to vocalize empty templatic nuclei.

To summarize, different grammatical considerations yield different realizations of empty nuclei. In *yikfoc* (7a), a templatic position needs to be filled, and this is achieved through apophony. In contrast, the prefixal glide in *yekapec* (6b) has no templatic position to link to and is thus provided a non-templatic one. The vowel that will eventually fill the V-slot of this non templatic CV is <e>. Once again, QiTTeL and QaTaL, both of which on the surface exhibit the same CVCVC prosody, have been shown to reveal differences in their underlying

⁷ The a>o change assumes yet again a past→future derivation, which we will shortly see is true. I believe that this change is apophonic as well, but leave this point out of the discussion.

structure. If so, the same distinction - the single template view - that allowed us to account for the prosodic issue and the segmental allophony has done so for the nature of the “prefix vowel” in all three forms.

We have accounted for generalizations (2a-c) above, i.e. those that concerned prosody, segmental allophony and the “prefix vowel”. Recall generalization (2d):

- Vocalization**
- i. The vowels of the stem change according to the paradigm.
 - ii. Different vowels surface in past and future stems (QiTTeL→yeQaTTeL, hiQTiL→yaQTiL).

I have given the principle (i.e., the apophonic chain) that accounts for the second fact, assuming a past→future derivation. Notice that another advantage of the single template account is that it unifies the vowel-change behavior of both QiTTeL→QaTTeL and hiQTiL→yaQTiL. In both cases, the apophonic vowel change that (tentatively) marks the future form occurs in the prefixal CV:

(9) Apophony change in QaTaL

<p>a. QiTTeL → yeQaTTeL</p> <p style="text-align: center;"> k i p e c y k a p e c / \ / \ CV-CVCVCV CV-CVCVCV </p> <p style="text-align: center; color: blue; font-size: 1.2em;">➔</p>	<p>b. hiQTiL → yaQTiL</p> <p style="text-align: center;"> h i k p i c y a k p i c CV-CVCVCV CV-CVCVCV </p> <p style="text-align: center; color: blue; font-size: 1.2em;">➔</p>
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The view proposed here can serve as a basis for a principled account of the first vocalization fact as well (for example, an analogy can be made between the [i] of yiQToL and that of QiTTeL); however, this is of secondary importance, since **the three paradigms now contrast by sole virtue of their different template satisfaction patterns**. As it stands, if some specific vocalizations that still haven’t received explanation are arbitrary, they may now at least be regarded as trivially so: they are not the important contrastive information between the paradigms.

2.2. Summary of Morpho-phonological analysis and transition to syntactic analysis

I have shown the advantages of working with one template for all MH Verbs. They are: i) a better understanding of the locus and nature of vowel change and vocalic patterns; ii) a principled account of the different vowels that follow the prefixes; and iii) an account of prosodic alternation (or lack thereof) that doesn't rely on vowel-specific constraints (e.g. Graf & Krämer, to appear).

In sum, it has been the essence of this section to suggest that assuming a single template is a powerful, illuminating tool in the treatment of several phenomena, hitherto regarded as arbitrary. I assert that the same approach is as valuable in the analysis of many other related topics, which will have to be discussed separately.⁸

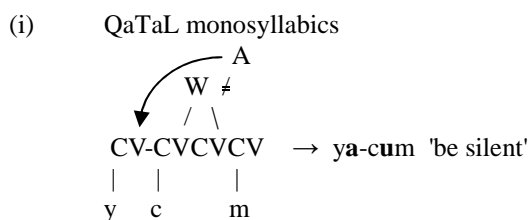
I have claimed that the three paradigms differ with respect to their template satisfaction pattern. A crucial concept in this view is domain identification, namely the assumption that the template is divided into domains that need to be rendered accessible for the segmental material. I have not, however, shown what triggers the identification of a domain. More specifically, I have not explained why the initial CV- domain should be available for verbs of the QiTTeL paradigm but not for those of the QaTaL one.

Another question that may now be asked concerns the vowel change I have been treating as apophony. We have seen how QiTTeL becomes yeQaTTeL in the future; why should this be? Notice that the pair would be contrastive even if apophony didn't apply: QiTTeL → *yeQiTTeL. It is thus worthwhile to ask why apophony occurs exactly *when* it occurs.

These two questions are answered in the following section, where form and syntactic structure are connected. The fact that answers can be found in this manner is taken to support the general view of morphology as dependent on syntactic structure.

⁸ This paper does not discuss three further advantages of the current approach. The first is the lack of monosyllabic forms in QiTTeL, which follows from the proposed view: QiTTeL is four CV's large, and no monosyllabic form can emerge in it, as vowels are maximally two CV's long.

The second topic is QaTaL's "hollow" verbs, a term that refers to a group of monosyllabic stems that present pairs such as *cam* - *yacum* 'to fast (past-fut.)'. The prefix vowel is [a] in spite of the fact that it is not followed by a guttural. Assuming that QaTaL's vocalisation consists of the element A, we note that this element is never found on the stem vowel *yacum* (unlike in regular QaTaL stems e.g. *yikfoc*; A+U=O). This state-of-affairs calls for an analysis as in (i): the element A cannot land on the main domain because it is occupied by the glide, and thus it lands on the V-slot of the initial domain. The underlying long vowel explains the exceptional stress pattern of such forms *yacúm* - *yacúmu* 'fast (fut, sg-pl)' (cf *yikfóc* - *yikfecú* 'jump'):

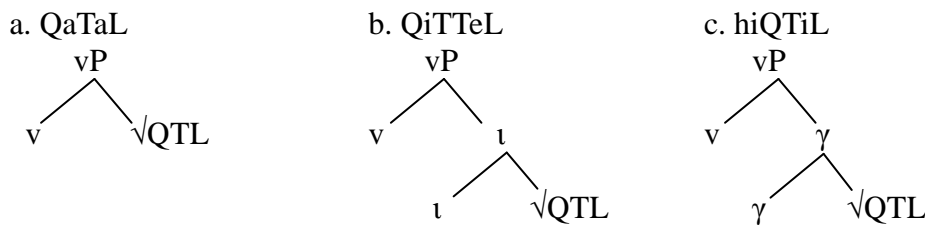


Finally, a single-template approach is also highly revealing for participial forms, marked by a prefix *m-* in QiTTeL and HiQTiL. QaTaL's participles lack this prefix. Notice that QaTaL has a non-identified initial CV-position. This unidentified position might be the cause of the failure of the prefix *m-* to attach to QaTaL stems.

3. Morpho-syntactic Analysis

Within generative research on MH syntax, Doron (2003) is unique in that it explicitly proposes syntactic structures that spell out as different verbal paradigms. These are shown in (10). At least under a strong interpretation of Doron's analysis (i.e. an interpretation where form is relevant), there is an obligatory relation between the syntactic structure of an item and its membership in a morphological paradigm. Crucially, however, her analysis treated only semantics and argument structure, with no reference whatsoever to the specific phonological form of the verbs.

(10) Doron's *principal* structures for the active paradigms (considerably simplified)



The formulation in (10a) reflects the fact that QaTal verbs have no set argument structure or semantics (they may be unaccusative, unergative, transitive etc.). In contrast, the heads *t* and γ do limit the general semantic properties of the verb, as well as its argument structure: *t* classifies the event as involving an actor, which is introduced by the higher head *v*; γ classifies the event as causative, and thus the external argument introduced by the head *v* is a causer. For the remainder of this paper I assume that Doron's structures are essentially the correct ones.

This section shows how the template proposed in section 2 is the result of the syntactic structures in (10), and how this view can contribute to the understanding of the syntax-morphophonology interface in MH.

3.1. Morphology-Syntax isomorphism

In (11), I added my templatic formulations, with curly brackets representing domain boundaries, to the rightmost column of a summarizing table taken from Doron (2003):

(11) Generalizations on syntactic structure - Doron (2003)⁹

<i>special head</i>	<i>denotation</i>	<i>template</i>	<i>Present Templatic Analysis</i>
-	-	QaTaL	{Qatal}
<i>t</i>	action	QiTTeL	{Qi{TTeL}}
γ	cause	hiQTiL	{hi{QTiL}}

⁹ A nod to Goldenberg 1994 is ethically due. Goldenberg's view is that in Semitic, two types of roots are detectable: primary and augmented roots. QaTaL here is the case of a primary non-augmented root. QiTTeL and HiQTiL (Doron's action heads, the present CV- identifiers) are root augments, in Goldberg's terms. If so, the current proposal is compatible with - and indeed renders more concrete - the (comfortably vague) analysis proposed by Goldenberg.

Readily observed in (11) is the striking similarity between Doron’s conclusions and those reached independently in the morpho-phonological section: the size of a verb corresponds to the number of action heads involved in its structure. That there are only two sizes (and not three, as there are active paradigms) is thus a direct result of the assumption that syntax drives morphology. All we have to say is that

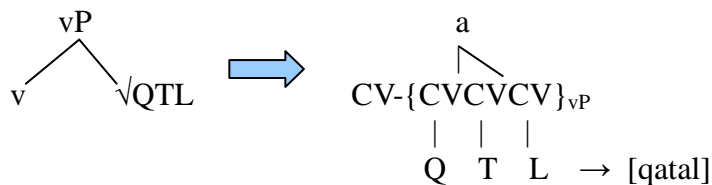
- i) **Identification of the prefixal domain (in basic past forms) corresponds to the presence of ι or γ ; and**
- ii) **Identification of the main domain corresponds to the presence of the verbalising head v .**

3.2. The morpho-syntax of past forms

This sub-section presents the derivations of different past forms. As we will see, this analysis formalizes the generalizations just made. If this adopted here view is correct, then we have a principled explanation as to the instances where the initial domain is identified. In what follows, I assume that *verbs spell out cyclically*; each of the three heads (v , ι and γ) is a cycle/phase.¹⁰

All three heads, being verbal, involve introduction of the verbal template CV-CVCVCV. Forms in QaTaL, as we have seen, are cases of direct merger of the verbalizing head and the root. As shown in (12), the presence of v activates the entire verbal template. But v identifies only the main domain (in curly brackets). Only this domain is available for the consonants to link to. As I said, the vocalization {a,a} of QaTaL is, in the current analysis, an arbitrary property of this template satisfaction pattern.

(12) Derivation of QaTaL, past form

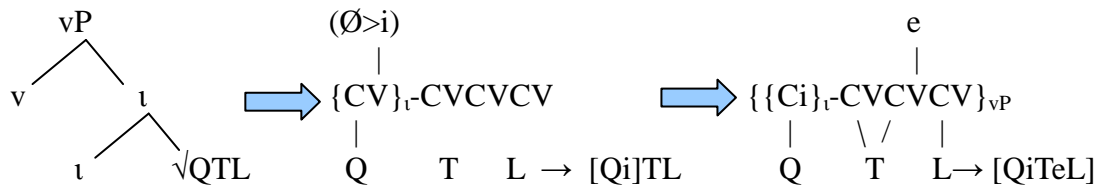


The derivation of QiTTeL is demonstrated in (13). In this case, it is the action head ι that merges first with the root. This head triggers the introduction of the template, but identifies only the prefixal domain. As ι has no segmental spell-out, the segment that is linked to the initial identified domain is the first root consonant. As mentioned, the vowel [i] of QiTTeL is arguably the result of the apophonic chain’s $\emptyset \rightarrow i$. This idea is compatible with the cyclic view, according to which a templatic V-slot has to be filled in order to be spelled out.

Higher up, the head v identifies the templates main domain. The second root consonant is linked to two positions, not one (as in QaTaL). The vowel [e] of QiTTeL is possibly an epenthetic one; whatever its origins are, this vowel is not morphologically significant, as it follows (however arbitrarily) from the template satisfaction pattern.

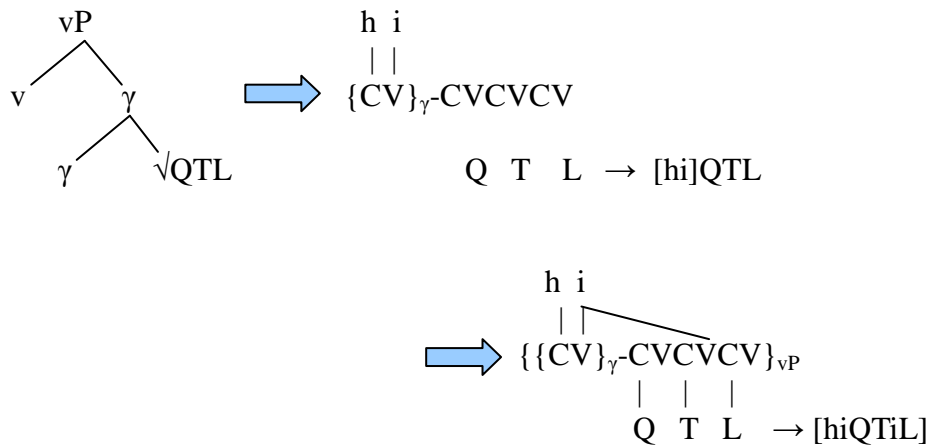
¹⁰ See e.g. Bobaljik 2008 for an insightful comparison to nouns, which he claims are not spelled-out cyclically. For further discussion of the idea that phonological cycles are syntactic phases e.g. Piggott & Newell (2006); Scheer (in press) discusses the interface in noteworthy clarity.

(13) Derivation of QiTTeL, past form



The derivation of hiQTiL follows similar lines. An important difference is that the head γ , besides identifying the initial domain in the template, also has a phonological spell-out *hi-*. The root consonants are left unlinked at the first phase γ . Higher up, when the main domain is identified, they are linked to it. The second [i] vowel is arguably a copy of the prefix's vowel.

(14) Derivation of hiQTiL, past form



There is one important difference between the current proposal and the analysis in Doron (2003). Doron does not assume that a head v exists in the morphology of all verbs (for example, she distinguishes between unaccusative and transitive verbs in QaTaL by analyzing only the latter as having a head v). In the present analysis it is crucial for the identification of the main domain. I submit that v , being the verbalizing head, has to exist in all verbal structures (for the same view, see Marantz, to appear; Marvin 2002).

3.2. The morpho-syntax of future forms

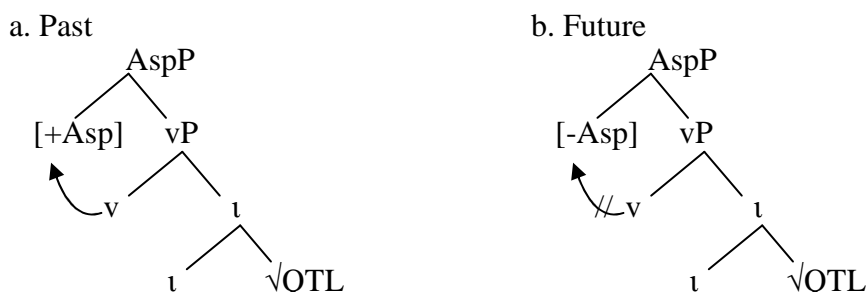
Recall the apophony in the vocalizations of the different forms, restated in (15). Recall as well the question that we asked in the end of the morpho-phonological section, namely: why does apophony occur *when* it occurs?

(15)	Basic forms of Modern Hebrew (MH) active verbs			
	<i>name of paradigm</i>	<i>past</i>	<i>future</i>	<i>gloss</i>
	QaTaL	kafac	yi-kfoc	'jump'
	QiTeL	kipec	ye-kapec	'jump around'
	hiQTiL	hikpic	y-akpic	'make jump'

A fact I have left out of the descriptive section is that the syntactic distribution of the future stems is much wider than that of the past stem. To illustrate, QiTTeL is mainly used with the past sense, whereas the stem -QaTTeL is used in future, subjunctive, past irrealis (Landau 2004), imperative, participle and infinitive forms (for QiTTeL : *yekapec*, *yekapec*, *kapec!*, *mekapec* and *lekapec* respectively). The future stem is thus underspecified/unmarked in terms of its tense/aspect properties. That as may be, we have seen that Phonology designates the future stem as the *derived* one. In other words, the past form - the marked one as far as distribution is concerned - is claimed here to be morphologically basic.

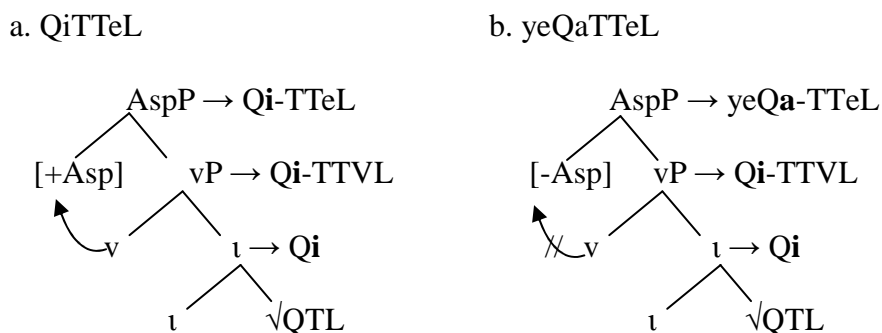
I capture the opposition past vs. future with the use of a [+/-] value contrast in some feature of the tense/aspect projection complex (uncommittedly called AspP here). The exact feature is not crucial for the present purpose (here I call it [Asp]). I further assume that the verb moves to the head of AspP, when the value of this feature is positive (as the arrow shows).

(16) Past vs. Future structures (Benmamoun 2000, Boneh 2003, Shlonsky 1997)¹¹



Beyond what was said for the past forms in the last subsection, the derivation of the actual forms proceeds as in (17): in (17a) a [+] feature attracts the head v, which moves and fills the position. No change in apophony follows, and we get the [+tense] (=past/perfective) form. In the case of (17b), the feature has a negative value. The v head is not attracted, and we derive the non-past form.

(17) Past→Future pairs (exemplified on QiTTeL)



What (17) suggests is that the apophony i→a takes place when the verb fails to move to the Head of AspP. We can now hypothesize that *apophony results from the present of a null element in the head position of a functional projection*. This is reminiscent of the claim made in Lowenstamm (2008), concerning some cases of Umlaut in Yiddish.

¹¹ Benmamoun 2000 discussion of similar data in Classical Arabic; for an in-depth syntactic analysis of tense, aspect and movement in Arabic and Hebrew, see Boneh 2003.

Moreover, we can now claim that movement to AspP is the unmarked move for verbs, and this is the sense in which the past form (17a) is unmarked. The greater compatibility of the future form (17b) with various aspects, on the other hand, can be captured in the lack of movement in its derivation. This lack of movement is another aspect of the lack of specification of the resulting form in terms of aspectual properties.

QaTaL and hiQTiL are analyzeable in the same way. Further implications of this analysis, such as stem allomorphy in the past, are beyond the scope of this talk.

Making the link between morphology and syntactic structure allowed us to hypothesize as to the origins of the vowel-change I have been calling apophony. This hypothesis in (18) can be confirmed if it is shown to apply to other cases of apophony.

- (18) The morphosyntax of apophony in MH
 Apophony expresses a negative value on a feature that in the unmarked, more basic case has a positive value.

3.1. Passive forms

This subsection shows how the hypothesis in (18) above can shed a light on yet another topic, namely the form of passive verbs in the language, shown in (19) for QiTTeL and hiQTiL (QaTaL's passives are obtained using another strategy).

- (19) Passive verbs QiTTeL, hiQTiL

<i>Paradigm</i>		<i>past</i>	<i>future</i>	<i>gloss</i>
QiTTeL	<i>active</i>	tiken	yetaken	'repair'
	<i>passive</i>	tukan	yetukan	
hiQTiL	<i>active</i>	hitkin	yatkin	'install'
	<i>passive</i>	hutkan	yutkan	

The vocalization of passive verbs is invariably {u,a}. Morpho-phonological studies (from Bat El 1994 onwards), as well as Arad (2005), treat this shared melody through positing a lexical vocalization-morpheme {u,a} which is imposed on the active verb's original vocalization and prosody. This process of imposition, shown in (20), carries the name of Melodic Overwriting (it is the result of a move called Stem Modification. See Bat El 1994):

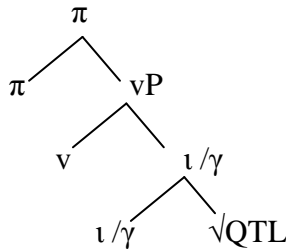
- (20) Melodic Overwriting
- | | | |
|---------------|---|----------------|
| <i>active</i> | | <i>passive</i> |
| Q ĩ TT e L | → | QuTTaL |
| ↑ ↑ | | |
| u a | | |

Melodic Overwriting is, in my opinion, far too strong as a mechanism, because it predicts that any vowel could replace any other vowel. Eventually, it also has to assume that some null element (=no vowel) can replace and be replaced by real vowels. In other words, it is more an observation than a real analysis; it merely states the fact that in the course of derivation in Semitic the vowels of the base form, if there is one, do not count.

The view of morphology as syntactic suggests that there might be much less arbitrariness to the vocalization of such forms. This will be exemplified here for QiTTeL verbs.

Passive verbs are built on top of their corresponding active from. Doron (2003) gives the structure in (21) for passive verbs, where π is the passive head.

(21) Passive structure (Doron 2003)

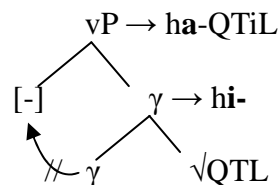
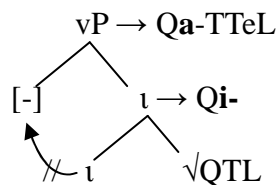


Now assume, in analogy to the [+/-Asp] distinction, that the head v in a passive construction is also marked with a negative feature, call it [-Ext]. This is no far-fetched assumption, since v is regarded as introducing the external argument (e.g. Harley 2006), only covert in passive constructions. We have seen that [-Asp] resulted in apophony. Supposing that a negative value on v has the same apophonic effect (and - again - that spell-out is cyclic), we yield the intermediate forms in (22):

(22) Intermediate forms for passive v

a. $QiTTeL \rightarrow QaTTeL$

b. $HiQTiL \rightarrow haQTiL$



The two intermediate forms in (22), $QaTTeL$ and $haQTiL$, have the same vocalization in the first (prefixal CV) position. In fact, the second vowel in the two forms, [e] in $QaTTeL$ and [i] in $hiQTiL$, is essentially identical, too, as far as apophony is concerned. How so?

According to the theory of elements (Kaye et al. 1985), the vowel [e] is a complex vocalic expression, composed of the vocalic elements I^0 and A^0 . All vocalic expressions are headed; the vocalic expression [e] is headed by I^0 . In an in-depth study of apophony in German, Ségéral (1994) claims that apophony may target only the head of a vocalic expressions, in this case I^0 . If so, the intermediate form in (22a) is equivalent to $QaTTiL$ from the perspective of the target of apophony. Both $QaTTeL$ templates in (22) have essentially the same vocalization {a,i} when an external argument is lacking.¹²

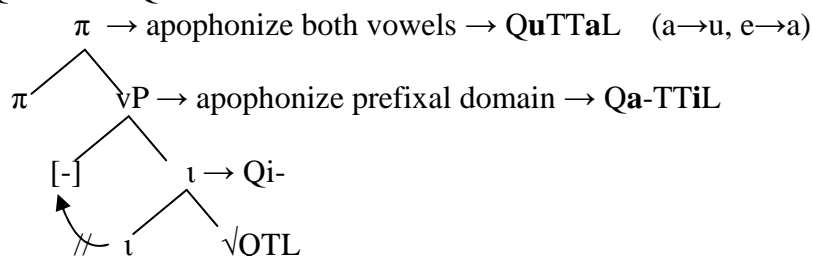
On the basis of the two intermediate forms $QaTTiL$ and $haQTiL$, we are now ready to build

¹² Another view would have it that the basic active forms are $QiTTaL$, $hiQTaL$ and that the names we have been using ($QiTTeL$, $hiQTiL$), are misleading. With respect to passive derivation, the $QiTTaL$, $hiQTaL$ view is simpler, because the spell out of π would be apophony of the vowel in the initial domain only. This is less arbitrary, since it is the sole locus of apophony in past \rightarrow future derivation. Notice that such a view would not be problematic for the rest of the account. Moreover, it is compatible with the diachronic and comparative evidence (Goldenberg 1994). The V2 [a] view is interesting and profitable from other perspectives; however, it does raise the question of why all suffixless forms (3sg.m in the past and all other verbal forms) lack this [a] vocalization, as well as why this a~e allomorphy is not attested in the passive paradigms.

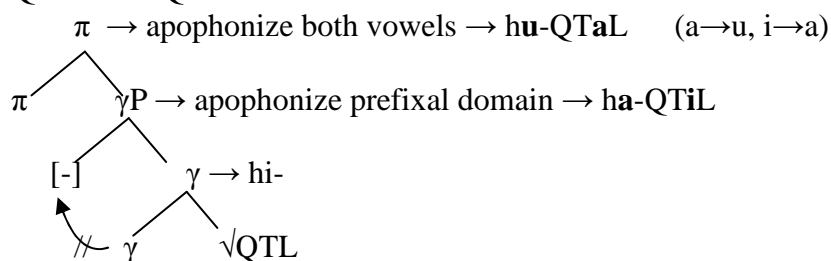
the passive template. Here, the apophonic chain (again, $\emptyset \rightarrow i \rightarrow a \rightarrow u \rightarrow u$) is revealing: apply it to both vowels, and you get the passive {u,a} vocalization. I thus propose that the spell-out of the passive head π (originally proposed by Doron) is apophony of both vowels. The relevant structures are shown in (23):

(23) Active \rightarrow passive derivation

a. QiTTeL \rightarrow QuTTaL



b. hiQTiL \rightarrow huQTaL



Let us flesh out the derivation in (23) phase by phase: first, the special action head is linked, and the initial domain of the template is identified and vocalized. Next, the head v identifies the rest of the template, and the (remaining) root consonants can be linked to it. In addition, the initial domain is apophonized as a result of the negative value of a certain feature on the head v. The intermediate form essentially has a vocalization {a,i} (in both verbs). Finally, the third cycle is passivization, whose spell-out is apophony of both stem vowels.

The discussion of passive forms in the present respect will not be complete without mentioning one more vocalization fact. As we've seen in (19), non-past forms of the passive templates, unlike those of active ones, do not exhibit change of the vowel in the prefixal domain (Qu-TTaL \rightarrow yeQu-TTaL ; hu-QTaL \rightarrow yu-QTaL). Notice however that in both QuTaL and huQTaL the vowel of the past base vowel is [u], which the apophonic chain does not alter (u \rightarrow u). That the vocalization of passive stems never changes is thus another fact predicted by the view adopted in the present account.

To summarize, if the analysis in (23) is in any way correct, then the only sense in which the Melodic Overwriting analysis is right is the following: the derivation of passive verbs starts from the active *stem*, not from a root. There is, however, no need to assume a mechanism that replaces vowels; the vowels of the passive stems are completely predictable when considering the apophonic chain and the above hypothesis about the morpho-syntax of apophony. Apophonic vowel change occurs when something is missing in the structure; passive verbs lack an external argument.

4. Conclusion

This paper showed how the assumption that all MH active verbs result from **one single template** is extremely valuable in analyzing various different morpho-phonological aspects of the verbal system, previously considered arbitrary/lexical. The following conclusions have been reached in the morpho-phonological section:

The **Prosody** of surface CVCVC items doesn't change if there is an underlying, **virtual geminate**, which is the case in QiTTeL. In addition, such virtual geminates explain away the surfacing of non-spirants allophones in post vocalic position.

The prefix vowel is no vowel at all. The vowel following the prefix is realized through apophony if the prefix is template-internal (as [i]); when the prefix is extra-templatic, the vowel is the language's epenthetic vowel.

These phenomena were analyzed as lexical or unpredictable in the past. The fact that the present analysis was able to provide principled accounts for them is taken as proof of its value as an analytical tool.

Still, two aspects - domain identification and apophonic vowel change - were arbitrary, unmotivated phenomena if things were to be left at that.

I moved to make the analogy with the syntactic structures in Doron 2003. Those proved to be strikingly analogous. In light of this easy analogy, the natural move of assuming that syntactic structure underlies morph-phonological phenomena was made. This move yielded the two following conclusions:

The action heads ι and γ identify the prefixal domain (in basic past forms). The verbalizing head ν identifies the main domain in all verbs.

Apophony expresses a negative value on a feature that in the unmarked, more basic case has a positive value.

This last hypothesis, which resulted from the analysis of future forms, was tested on apophony in passive verbs, in an equally successful way. Moreover, assuming that the same process is at play in both passivization and past→future derivation explains away the former without need for the unjustifiably strong tool of Stem Modification and Melodic Overwriting.

I take the success of this analysis, if indeed it is considered successful, to support the unifying, inter-dependent view of linguistic modules that brought it about. When a (morpho-) phonological phenomenon is studied, ignoring syntactic structure might bring about incomplete analyses, and eventually lead to cases of *obscurum per obscurius*; similarly, if morphology is regarded as the result of syntax, ignoring phonology may turn out to be equally misleading.

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