Underlying Vowel Length in Modern Hebrew:
The Many Realizations of the Vowel /a/

Noam Faust*
Hebrew University of Jerusalem
faustista@yahoo.com

Abstract

In the nominal morphology of Modern Hebrew, the vowels [a] and [e] alternate with each other and syncopate in several contexts. These contexts have received separate phonological and/or morphological analyses in the past. The phonological analyses have yielded phonologically unnatural rules; the morphological analyses have turned to the unconstrained concept of stem-allomorphy. In the first part of this paper, a unifying account of these vocalic alternations is provided in the framework of cvcv-Phonology (Lowenstamm 1996), relating the contexts to one another. Specifically, it is proposed that some vowels are phonologically long, either lexically or through a rule of pretonic lengthening. In the second part of the paper, an alternation which resists the strictly phonological explanation is shown to follow from morpho-syntactic principles of derivation by phase (Embick 2010). While certain phonological processes apply whenever the domain of a category head is processed, only the merger of the head ▽ triggers the realization of the underlying phonological string.

Keywords


* To the memory of Yehuda Falk, who ignited the phonologist in me.
1 Introduction: Puzzle and Proposals

In the nominal system of Modern Hebrew (henceforth MH), the vowels [a], [e] alternate with each other and with the absence of a vowel in a systematic but complex manner. These alternations are illustrated by the three paradigms in (1).¹

(1) Three paradigms

<table>
<thead>
<tr>
<th>MS.SG</th>
<th>FM.SG</th>
<th>MS.PL</th>
<th>DIMINUTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. šafan</td>
<td>šøfan-a</td>
<td>šøfan-im</td>
<td>šøfan-on</td>
</tr>
<tr>
<td>b. calam</td>
<td>calém-et</td>
<td>calam-im</td>
<td>calam-on</td>
</tr>
<tr>
<td>c. kélev</td>
<td>kaløb-a</td>
<td>kølav-im</td>
<td>kaløb-on</td>
</tr>
</tbody>
</table>

In the first horizontal paradigm (1a), the first vowel of the stem is [a] when the stem is unsuffixed, but ø when a suffix is added. In the second paradigm, the first [a] of the stem persists throughout the paradigm, even though it seems to be in the same position (c_cvc) as the [a] of (1a). Instead, it is the second [a] that alternates with [e], when it is followed by the unstressed feminine suffix [-et], but not before other suffixes.

The third paradigm is that of the “Segholates”. In the unsuffixed masculine, both vowels of the stem are [e], and stress is penultimate—this pattern constitutes an exception to the final stress of the great majority of unsuffixed native nouns in MH. In the feminine and diminutive forms, the first [e] vowel becomes [a], and the second disappears; in the plural form, it is the first vowel which becomes zero, while the second is realized as [a] (the [b]~[v] alternation will not be discussed here). The suffixed forms are not exceptional with respect to stress.²

¹ Throughout this paper, stress is marked only when non-final; the symbol ⟨ø⟩ marks the absence of vowel. Deviations from the IPA are: ⟨c⟩ = [ʦ], ⟨y⟩ = [j], ⟨š⟩ = [ʃ].
² “Segholates” denotes the class of nouns exemplified in (1c). The label itself is a derivative from segōl, the proper name of Biblical Hebrew short [e] in traditional Jewish scholarship. The vocalization of Segholates can be influenced by the presence of historical gutturals in the root. Moreover, it is important to note here that not all QeTel segholates alternate with QaTL- stems in derivatives. There are many cases where the derivative displays [i] instead of [a] (e.g. përed ’male mule’—pirda ’female mule’) or in some cases [e] (nexed ’grandson’—nexda ’granddaughter’). The discussion in this paper will be limited to alternations of the
Finally, two feminine suffixes appear in (1), [-a] and [-et]. As will be shown below, [-a] is underlyingly /-at/. Thus, there are two feminine suffixes, /-at/ and [-et], which have the same function but differ in their phonological form. This is yet another alternation between [a] and [e].

Most studies dealing with these alternations treat them as both independent for one another and non phonological. For instance, in the case of Segholates it is concluded that speakers must memorize several stems, e.g. kélev/kalb-/klav-. I argue here for the opposite position, and I will propose that speakers memorize a unique underlying form, which includes length distinctions. Two phonological processes are responsible for the different surface realizations:

Process 1  Pretonic lengthening: short vowels lengthen in the pretonic syllable.
Process 2  Short /a/ syncope: short /a/ syncopates in open syllables

It will further be shown that -a and -et are two surface realizations of the same underlying sequence /at/, but realize two different strategies of associating this sequence to the available part of the skeletal tier. In addition, I will claim that this suffix depends on its base for skeletal support; this dependence, in conjunction with the processes above, results in the change of the stem vowel incurred by the addition of -et (1b above).

After most of the alternations in (1) have been explained in a strictly phonological manner by the two processes above, one realization (the [ø] in [kaløbon]) will be shown to resist such an account. We will see that the morpho-syntactic structure that underlies such items is minimally different from those of the other forms under consideration, in that it involves an additional cycle. This minimal difference motivates this last alternation, leaving the phonological account intact.

A note is due regarding the two processes above. For Semiticists, these processes cannot be new: both have been proposed in the past (Malone 1990, 1993 and references therein) for Biblical Hebrew. If so, the present paper can be regarded as claiming, against most current research in the generative framework, that mh morphophonology is not so different from the morphophonology of the language with whose vocabulary it has been revived six or seven generations ago.

The paper will proceed as follows. First, the theoretical framework of CVCV Phonology (Lowenstamm 1996, Scheer 2004 and references therein) is briefly presented in the next section. In section 3, the alternation in the form of the type illustrated in (1c), but the account I will offer carries over to all other cases, cf. Faust (2011).
feminine suffix is explained by assuming underlying length. This choice of this framework is vindicated by its success in accounting for all the differences between the allomorphs of the feminine suffix. In section 4, the šafan-šøfanim 'hare(s)' alternation and lack thereof in calam-calamim ‘photographer(s)’ are accounted for by assuming a process of Pretonic Lengthening and short /a/ syncope. In section 5, it is shown that both short /a/ syncope and pretonic lengthening are active in the kélev-kølevim ‘dog (sg.-pl.)’ alternation, thus confirming both proposals. Section 6 discusses the last two alternations. kélev-kølobon and kélev-kølobon. The appearance of [a] in kølobon ‘dog.DIM’ is shown to obey a phonological specification on /a/ reduction, and the difference between this stem the plural stem kølev- is shown to follow from a specific view of the morpho-syntactic derivation-by-phase. Section 7 concludes.

2 Theoretical Framework

This section presents a very brief summary of the relevant aspects of cvcv Phonology, the theory that this analysis adopts. Consider the preliminary representation of the word šfanim ‘hares’ in (2). The representation includes a skeletal tier and a segmental tier, as in autosegmental phonology (e.g. McCarthy 1981). Unlike in cv phonology (Clements & Keyser 1983), the most basic skeletal unit is cv, not c and v; this results in a strict alternation of cv units on the skeletal tier. For the same reason, the skeletal tier always ends in a v-slot, or nucleus; this is a feature inherited from the theory of Government Phonology (Kaye et al. 1990), from which cvcv Phonology descends. Another result of strict cv is that initial cluster such as [šf] in (2) are represented as separated by an empty nucleus.

(2) Preliminary representation šfanim ‘hares’ in cvcv

\[
\begin{array}{cccccc}
\hat{\text{s}} & \text{f} & \text{a} & \text{n} & \text{i} & \text{m} \\
| & | & | & | & | \\
C & V_1 & C & V & C & V & V_2
\end{array}
\]

Empty nuclei such as \( V_1 \) and \( V_2 \) in (2) remain unrealized only under very specific configurations. Final empty nuclei are allowed to remain unrealized parametrically in languages that display word-final consonants. Medial empty nuclei must be “governed” from the nucleus to their right, where government is a relation between a realized nucleus and the nucleus that precedes it.
Otherwise, the empty nucleus must be realized, usually through the association to neutral segmental material, or an “epenthetic vowel”.

To illustrate, consider the word for ‘dog’ in the Semitic language Tigre. In the unsuffixed stem (3a), the nucleus separating the last two consonants is empty, and may not be governed by the following nucleus, which is itself empty. It is therefore realized by an epenthetic vowel. In contrast, because the final nucleus is occupied by the possessive suffix in (3b), the preceding nucleus is governed and will remain silent:

(3) Government and epenthesis in CVCV

\[
\begin{align*}
\text{a. } /\text{kalb}/ & \Rightarrow [\text{kaləb}] \text{ ‘dog’} \\
/k/ & \quad a \quad l \quad e \quad b \\
\mid & \quad \mid & \quad \mid \\
C & \quad V & \quad C & \quad V \\
\hline
\text{b. } /\text{kalb+u}/ & \Rightarrow [\text{kalbu}] \text{ ‘his dog’} \\
/k/ & \quad a \quad l \quad b \quad u \\
\mid & \quad \mid & \quad \mid & \quad \mid \\
C & \quad V & \quad C & \quad V \\
\hline
\end{align*}
\]

Finally, segmental length in CVCV is represented as a segment branching onto two positions of the same nature, as in (4):

(4) The representation of length in CVCV

\[
\begin{align*}
\text{a. vocalic length} & \\
C & \quad V & \quad C & \quad V \\
\hline
\text{b. consonantal length} & \\
C & \quad V & \quad C & \quad V \\
\hline
\end{align*}
\]

With these tools in hand, we may proceed to the analysis of the first alternation.

3 First Alternation: Feminine Suffixes

As discussed in the introduction, there are two allomorphs for the feminine suffix: stressed [-a] and unstressed [-et]. These two suffixes stand in complementary distribution, in that for a given well-defined stem, only one of the two is attested (with a few marginal exceptions). This is especially apparent in par-
ticiple forms, presented in (5): for Binyan I and II participles, [-a] is used if the stem (represented by the masculine) ends in a vowel, whereas [-et] is used if the stem ends in a consonant.

(5) Participles

<table>
<thead>
<tr>
<th>BINYAN</th>
<th>STEM</th>
<th>MS</th>
<th>FM</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>c-final</td>
<td>koren</td>
<td>korén-et</td>
<td>‘glow’</td>
</tr>
<tr>
<td></td>
<td>v-final</td>
<td>kore</td>
<td>kor-a</td>
<td>‘happen’</td>
</tr>
<tr>
<td>II</td>
<td>c-final</td>
<td>menaser</td>
<td>menasér-et</td>
<td>‘saw’</td>
</tr>
<tr>
<td></td>
<td>v-final</td>
<td>menase</td>
<td>menas-a</td>
<td>‘saw’</td>
</tr>
</tbody>
</table>

That the two suffixes are used for the same grammatical purpose suffices to prove their allomorphic status. Given two realizations of the same morpheme, it may be asked whether the allomorphy is phonologically-conditioned or an arbitrary fact of the language. I will now provide evidence in favor of the first view, by showing that phonologically, there is little difference between the two suffixes.

Modern Hebrew has two other singular feminine suffixes in -it and -ut, and one plural feminine suffix -ot. Looking at the set {-a,-it,-ut,-et,-ot}, one is compelled to hypothesize that [t] is the exponent of feminine gender, and that this -t is somehow absent from the first suffix [-a]. This hypothesis is confirmed by the form that this suffix takes in the construct state (a head-initial genitive compound-like N+N construction): for a feminine noun like *pin-a* ‘corner’, one

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3 For reasons having to do with the architecture of Binyan III, the regular allomorphic selection illustrated in (5) is suspended in that Binyan. While the makeup of Binyan III need not concern us here, I give the relevant forms below for the sake of completeness:

(i) Participles of Binyan III

<table>
<thead>
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<th>FM</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>III</td>
<td>c-final</td>
<td>marcin</td>
<td>marcin-a</td>
<td>‘become serious’</td>
</tr>
<tr>
<td></td>
<td>v-final</td>
<td>marce</td>
<td>marc-a</td>
<td>‘lecture’</td>
</tr>
</tbody>
</table>

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4 See Faust (2013) for an analysis of the entire array of feminine suffixes in MH.
derives pin-at yeladim ‘children’s corner’. Thus, it can be concluded that [-a] is underlingly /at/, and that for some reason, the /t/ is not realized outside the construct state.5

Assuming that the difference in stress is derived rather than lexical, the underlying difference between [at] and [et] reduces to one of vowel quality. An analysis may be proposed that represents this difference as in (6). The suffix /at/ disposes of one cv unit (6a), and thus only the /a/ is realized, and the /t/ must remain unassociated and therefore unrealized. In contrast, the suffix /et/ is deployed over two cv units (6b), which will host both the vowel and the consonant.

(6) Suffixes -a(t) and -et: first approximation

a. -a(t)  b. -et

```
       a  t        e  t
      |          |  |
  c  v      c  v  c  v
```

In the representations in (6), the two suffixes resemble each other only in that they include t. Otherwise, they are structurally different: they involve a different number of cv units and a different vowel. In other words, these representations do nothing more than formalize the differences between the two suffixes. They do not capture the complementary distribution between the two suffixes. More specifically, (6) does not explain the behavior of the two suffixes with respect to stress: why would [-et] be unstressed, whereas [-a] stressed?

My proposal is presented in (7). I assume segmental and skeletal identity between the two suffixes; the only difference between the two is the linking pattern:

5 The [t] of [pinat] in [pinat yeladim] is not the exponent of the syntactic relation between the two nouns (the equivalent of a preposition binding the two nouns), but rather truly represents the gender of the head noun. This becomes obvious when considering the behavior of masculine—feminine pairs like mélex ‘king’—malka ‘queen’ in the construct state: a [t] appears after the feminine noun [malkat carfat] ‘queen of France’ but not after the masculine noun [mélex carfat] ‘king of France’.

The suffixes -\(a(t)\) and -\(et\)

\[
\begin{array}{c}
\text{a. } -a(t) \\
\text{b. } -et \\
\end{array}
\]

The difference in the association pattern follows from the autosegmental analysis: provided an identical skeleton and an identical segmental sequence /at/ (and assuming that CV units must be identified when possible), there are two logical linking patterns (7a) and (7b). This minimal difference fits the complementary distribution between the two realizations.6

The proposal in (7) carries a strong claim: in (7b) the vowel of the suffix is /a/, but it is realized as [e]. Thus, treating -\(a(t)\) and -\(et\) as identical points to the following generalization: /a/ is realized as [a] only when linked to two v-slots. Otherwise, it is realized as [e].

This situation is not unheard of in Semitic or Afro-asiatic languages. A very similar analysis has been proposed for the vowels of Moroccan Arabic (Kabbaj 1990; Lowenstamm 1991, 2011) and Egyptian Arabic (Fathi 2013), as well as several Ethiopian languages (Lowenstamm 1991), for Gɛez in particular in Ségéral (2006) and for several different varieties of Berber (starting with Bendjaballah 1999; most recently Lahrouchi & Ségéral 2010). In all these languages, the true quality of a vowel can be realized only when the vowel branches onto two templatic positions; when such conditions are not met, an epenthetic vowel is inserted in accordance with the phonotactics of the language. It is thus not surprising that [e] is the epenthetic vowel of mh in final, doubly closed syllables cvcc (cf. loans such as popkoren), and that final consonant clusters are not permitted in the native vocabulary of mh.

The length-based analysis in (7) accounts for the complementarity of [-\(a(t)\)] and [-\(et\)] and for the floating of the /t/ in one, but not the other. It has an additional advantage in that it can explain the behavior of the two suffixes with respect to stress. The suffix [-\(a\)] is always stressed because it is long, whereas the vowel of the suffix [-\(et\)] is ignored because it is short. I propose to implement this idea in the form of a general stress algorithm for Modern Hebrew nouns:

---

6 Although the difference between the two allomorphs is now reduced to the association of the segments to the skeletal tier, it remains to explain why one of the association patterns is chosen over the other in a given context. I leave this question for further investigation.
Stress algorithm

Build an iambic foot starting from the last vowel if it is long. If it is short, start from the penultimate vowel.

The diagrams in (9) illustrate this view for two words, one for each allomorph of the feminine suffix. In (9a), the iambic foot is built from the vowel of the feminine suffix -a, because it is long. In (9b) we see the underlying representation of the feminine suffix when the /t/ is allowed to associate to a skeletal position. As proposed, the vowel of the suffix is then short and therefore ignored by the stress algorithm. As a result, stress is penultimate.7

Metrical representations of words with feminine suffixes

b. [šfana] ‘hare (fm.)’

c. [calémet] ‘photographer (fm.)’

\[
\begin{array}{c}
\text{b. } \begin{array}{c}
\text{F} \\
\text{w} \\
\text{s} \\
\text{š f a n a a}
\end{array} \\
\text{c. } \begin{array}{c}
\text{F} \\
\text{w} \\
\text{s} \\
\text{c a l e m - a t}
\end{array}
\end{array}
\]

We will return to the metrical representations of other words in section 6.

To summarize, the analysis in this section accounts for all the differences between the two suffixes by assuming a minimal difference between them, and moreover is able to make falsifiable predictions as to the rest of the language. All that said, an objection can be raised that there are no length distinction on the surface in MH (besides stressed vowels being pronounced slightly longer, Becker 2003). The issue becomes one of economy: how much more insight into the system is added by assuming such distinctions? As we will see in the following sections, the analysis and the algorithm above are very much corroborated by the insight that they provide into the other alternations mentioned.

Second Alternation: šafan-šøfanim ‘Hare(s)’

Consider the first two paradigms repeated here from the introduction, with the alternation sites and lack thereof in bold, underlined scripts:

7 The representations in (9) focus on the relation between length and metrical structure. Several aspects of the segmental representations in (9) will be reconsidered below.
In the first paradigm, the first vowel of the stem syncopates when a suffix is added. The traditional explanation for this syncope in Biblical Hebrew is that the /a/ is too far from the stressed syllable and therefore reduced (See for instance Malone 1993). Thus the form, which was presumably realized [šəfaaniim] ‘hares’ (initial clusters were prohibited in Biblical Hebrew), is underlingly /šaafaaniim/, but because stress is on the suffix, the first vowel /a/ is reduced. In contrast, nominal paradigms of the type illustrated in (10b) contained a medial geminate in Biblical Hebrew, and therefore were not expected to syncopate. Both the alternating and the non-alternating paradigms in (10) remain a significant and productive part of Modern Hebrew.

Some linguists, such as Ornan (2003), maintain the rule of /a/-deletion for Modern Hebrew, while arbitrarily exempting from this rule such paradigms as those in (9b). However, most linguists currently working on the language have abandoned the traditional explanations, and opt for accounts including listed allomorphs. For instance, for the paradigms in (9), Bat El (2008) proposes that for the alternating paradigm speakers learn two stems, šafan and šfan. The selection of one or the other depends on a constraint for Paradigm Uniformity in number of syllables: by selecting the šafan for the unsuffixed stem and šfan for the suffixed one, all of the forms in the paradigm have the same number of syllables. In the case of non-alternating paradigm, according to Bat El’s account, there is nothing to explain: speakers simply do not learn two allomorphs.

This view can be criticized on several counts. First, the alternating paradigm is much more productive than the non-alternating one: in Bat El’s terms, this would mean that speakers prefer to memorize two stems rather than one, possibly an undesirable result. Secondly, in Bat El’s account, the number of syllables

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8 The item in (10b), [calam], is a lexical creation of Modern Hebrew. It has been used here in order to document the full paradigm discussed in (10) including the -on diminutive, which is not attested in BH. However, the nominal paradigm itself is certainly present in Biblical Hebrew with realizations such as [ʔayyaal] ‘deer’ [ʔayyélet] ‘doe’, etc.
in *pakid* affects the allomorph to be chosen not only in the formation of items which belong to the same inflectional paradigm, but also in derivatives such as the diminutive or the abstract noun (as in *pakid* ‘clerk’—*pkid*-ut ‘clerkhood’). The notion of paradigm thus has to be extended to include such derivatives. A challenge is therefore raised immediately by pairs of derivationally-related nouns such as *olam* ‘world’ (2 syllables) and *olami* ‘world-wide’ (3 syllables, *olmi*), or even the inflectionally related *olamot* ‘worlds’, *olmot*. It can again be claimed that in such cases, there are no alternative allomorphs. But this weakens the original analysis considerably: the fact that allomorphs exists only in the derivational paradigm of nouns like *pakid* seems ad-hoc.

But is Ornan’s view preferable? Ornan does not discuss his rule or motivate it beyond the fact that it is useful. In what follows, I propose an analysis that is based on the insights from the previous section, namely the stress algorithm, the underlying length distinctions and their surface reflexes. The analysis not only covers both paradigms, but also paves the way for the understanding of the alternations between the vowels elsewhere in the language.

In the alternating paradigm in (10a) above, a vowel /a/ syncopates, creating a consonant cluster. As we saw in the theoretical background, in the framework of CVCV, the segments of surface clusters such as [śfanim] are in fact separated by an unrealized nucleus. Still, the first nucleus of the paradigm in question is not really empty: when it is realized, it is with [a], not with the epenthetic vowel. It is here that the analysis of *a(t)*~*et* becomes relevant: as we saw, singly-linked /a/’s are in fact equivalent to empty nuclei. Initial clusters are allowed in mh, and so if the first nucleus of the suffixed [śofanim] were occupied by a short /a/, it would still surface as if it were empty. This leads to the representations in (11): /a/ is realized if and only if it is long, as in (11a) (this additional length will be motivated presently); if it is short, as in (11b), it does not get realized. Notice, in addition, that the stressed vowels are represented long, in accordance with the stress algorithm: if they are stressed, they must be long.

(11) Representations of *šafan*-śfanim ‘hare(s)’ in CVCV

a. /šaaafan/ => [šafan]

```
<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>V</td>
<td>C</td>
<td>V</td>
</tr>
</tbody>
</table>

\[\text{ś} \quad \text{a} \quad \text{f} \quad \text{a} \quad \text{n}\]
```
b. /šafaaniim/ => [šfanim]

\[
\begin{array}{ccccccc}
\text{š} & a & f & a & n & i & m \\
\hline
\text{C} & \text{V} & \text{C} & \text{V} & \text{C} & \text{V} & \text{C} & \text{V}
\end{array}
\]

In (11), the only difference between the suffixed and unsuffixed stems is the additional CV unit, framed in (11a), to which the /a/ is associated when the stem is not suffixed. Leaving the analysis at that would amount to admitting two underlying stems, as in Bat El’s analysis. In order to do away with the memorization of two stems, one must posit that one of the representations is more basic, and the other a result of a phonological process. There are thus two options: either the /a/ is short underlyingly, and lengthened in the plural (12a), or it is long underlyingly and shortened in the singular (12b):

(12) Two possible unifying analyses

a. Lengthening analysis

\[
\begin{array}{c}
\text{/šafaan/} \\
\text{lengthening} \\
\text{šaafaan} \\
\text{[šafan]} \\
\text{[šfanim]}
\end{array}
\]

b. Shortening analysis

\[
\begin{array}{c}
\text{/šaafaan/} \\
\text{shortening} \\
\text{– šafaaniim} \\
\text{[šafan]} \\
\text{[šfanim]}
\end{array}
\]

In order to decide on the correct analysis, one must consider the non-alternating paradigm in (10b). In items like calamim ‘photographers’, the first vowel is not syncopated: it must therefore be underlying long /caalaamiim/. Given this underlying length, the shortening analysis makes the wrong prediction: the singular is expected to syncopate. The lengthening analysis, in contrast, is not falsified by this paradigm. If so, I propose the following rule of pretonic lengthening:

(13) Pretonic Lengthening

Lengthen the pretonic vowel, i.e. the vowel under the weak branch of the iambic foot (whose strong branch bears main stress).
Thus, the vowel of the stem is underlyingly short, and templatic space—the framed CV unit in the singular form in (11a) above—is added as a result of Pretonic Lengthening. This analysis explains both paradigms in (10) without the need for assuming the memorization of two stems or the exemption of any group of nouns from the proposed generalization.

In the previous section, it was suggested that there are underlying length distinctions in MH. These distinctions were justified on independent grounds in this section, by showing that they allow one to account for another alternation without having recourse to stem-allomorphy or exempting items from the application of rules. The analysis involved the formalization of a rule of Pretonic Lengthening which, as it stands, is supported only by its coverage of the facts that it was formalized to cover. In the next section, I will extend the empirical coverage of the proposals above to include the alternations of the Segholate class of nouns.

5 Segholates

The third alternating paradigm is repeated for convenience in (14). The alternations to be treated in this section are again underlined and in bold.

(14) “Segholate” paradigm

<table>
<thead>
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<tr>
<td>kélev</td>
<td>kalōb-a</td>
<td>kalav-im</td>
<td>kalōb-on</td>
</tr>
</tbody>
</table>

‘dog’

The reason that these nouns have merited a special appellation is the exceptionality of their unsuffixed stem, mentioned in the introduction: this stem not only exhibits two [e] vowels that do not appear anywhere else in its paradigm and derivatives, but is also stressed penultimately, unlike all other unsuffixed nouns in native vocabulary of the language. In this section, we will see that the alternations in (14) are in fact all accounted for by the tools established in the preceding sections. The analysis will further enable us to explain another alternation from the introduction, that of calam-calēmet ‘photographer (ms.-fm.).’

The traditional analysis of Segholates in Biblical Hebrew assumes an underlying CVCC structure and a lexical vowel in the first vocalic position of the stem.
Underlying vowel length in modern Hebrew

Thus [kélev] is underlingly /kalb/ (Prince 1975, Malone 1990 and references therein). As shown in (15), the derivation of the surface form under this view first places stress on the lexical vowel; then epenthesis occurs, and then a rule of “Segholation”, which is essentially a harmony rule, transforming the lexical vowel of the stem into a mid vowel (again, spirantization of /b/ into [v] is irrelevant for the present purpose):

(15) Traditional analysis of Segholate singulars

<table>
<thead>
<tr>
<th></th>
<th>/kalb/</th>
<th>kálb</th>
</tr>
</thead>
<tbody>
<tr>
<td>stress</td>
<td></td>
<td>káleb</td>
</tr>
<tr>
<td>epenthesis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Segholation (v =&gt; mid /__́Ce)</td>
<td></td>
<td>kéleb</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[kélev]</td>
</tr>
</tbody>
</table>

There are several shortcomings to this analysis, even for Biblical Hebrew. I will mention two. First and foremost, it has nothing to say about the plural forms of Segholates. Again, the plural stem is treated as allomorphic. Second, the analysis includes a rule which looks ad hoc: why should there be harmony only between these vowels and only in this situation, where the first is stressed and the second isn’t? Why is there no vowel in a word like [xaver] ‘friend’?

Bolozky (1978, 1995) rejects the adoption of derivations such as (15) for Modern Hebrew, presenting several other reasons. However, he offers no alternative solution, opting for the simple memorization of three grammatically-conditioned allomorphs. Bat El (1989), seeking to explain the exceptionality with respect to stress, proposes that the second vowel of the stem is a “zero-level” vowel, which has to be distinguished from the absence of a vowel. But the plural form is still allomorphic for Bat El, too. Falk (1996) is the only researcher of mh to have proposed a unifying analysis of the singular and plural stems of segholates. In his analysis, which concentrates on the second vowel of the pattern, that vowel is /a/, and its true quality is revealed in the plural. This proposal will be endorsed by the present analysis, too. However, Falk’s analysis does not relate his proposal with the other alternations in the language, and most importantly leaves unexplained the quality of both of the vowels of the singular as well as the stress pattern of the singular. All of these facts can be accounted for by the stress algorithm, length distinctions and pretonic lengthening of the present proposal.

First, let us examine the second vowel of the stem. This vowel is final, unstressed [e] in the singular (kélèv’dog’) and pretonic [a] in the plural (klav-im
dogs’. We know that in the latter position, this vowel should be lengthened, and we have already seen a vowel which alternates between [a] when it is long and [e] when it is short: the vowel of the feminine suffix [a(t)]~[et]. Falk’s proposal is thus confirmed by our analysis: the second vowel of seholidays is short /a/ underlingly, and therefore realized as [e] in the singular (16a; recall that final clusters are impossible in the native vocabulary). It is lengthened pretonically in the plural and thus surfaces as [a] (16b, where the additional templatic space due to lengthening is framed).

The analysis in (16) also explains the quality of the first vowel in both singular and plural. I assume that this vowel is also /a/, because of feminine forms like kalba ‘bitch’ and derivatives like kalbon ‘dog (dim.)’ (to which I return below). If this is the case, then one expects this vowel to disappear in the plural (16b), because it is short, unstressed, and not pretonic, just like the first vowel of /šaanaaim/ ‘hares’. This is exactly what happens. As for the singular in (16a), again we find the vowel /a/ attached to a single position. In this configuration, it is expected to be realized as [e], but only if it is needed for prosodic reasons. The prosodic reason in the singular is very simply stress: the stress algorithm requires the penultimate vowel to be stressed if the final one isn’t. Thus, it is only expected that this short /a/ will be realized as stressed [é], as indeed it is. Although we have not yet seen cases of a stressed short /a/, nothing must be added to our account beyond what was already said.

(16) Representations of seholidays kélev-klavim ‘dog(s)’

a. /kalab/ => [kélev]

\[
\begin{array}{cccc}
\text{k} & \text{a} & \text{l} & \text{a} & \text{b} \\
\text{C} & \text{V} & \text{C} & \text{V} & \text{C} & \text{V}
\end{array}
\]

b. /kalabim/ => [klavim]

\[
\begin{array}{cccccc}
\text{k} & \text{a} & \text{l} & \text{a} & \text{b} & \text{i} & \text{m} \\
\text{C} & \text{V} & \text{C} & \text{V} & \text{C} & \text{V} & \text{C} & \text{V}
\end{array}
\]

The tools we have developed in previous sections thus easily account for the forms of unsuffixed singular and suffixed plural Seholidays. No allomorphy
is called for and no special stress rule or tool is needed. Unlike all previous accounts, where specific rules had to be devised especially for Segholates, in the present account singular and plural Segholates are perfectly normal MH words.

Having explained “Segholation” in Segholates, we may proceed to explain it in the feminine form of the second paradigm of the paper, that of calam—calém-et ‘photographer (ms-fm)’. This alternation is mentioned in passing in Bat El (2008), where it is claimed that the suffix has the idiosyncratic properties of being unstressed and requiring a mid vowel in the stem-final syllable. Because of the latter property, the vowel of the stem calam becomes mid. This is once again little more than stating the facts. In the present account, in contrast, we have already seen that there is no need to assume that the suffix is idiosyncratic with respect to stress; it now remains to be explained why the vowel of the base is altered and becomes [e].

We have seen, in section 3, that unstressed [et] was underlingly /at/, with a short /a/. The base calam, according to the present analysis, must be /caalaam/, as shown in (17a), because its first vowel does not syncopate. The concatenation of base and affix /caalaamat/ is almost identical phonologically to /kalab/ in (16) above, with the exception that the first /aa/ is long. All other things being equal, our analysis incorrectly predict that the form will be *calámet. However, consider the autosegmental representation in (17b), which is the representation that would give the correct result /caalamat/ => [calémet]:

(17) Representations of segholation in calam—calém-et ‘photographer
(ms-fm)’

a. [calam]

<table>
<thead>
<tr>
<th>c</th>
<th>a</th>
<th>l</th>
<th>a</th>
<th>m</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>V</td>
<td>C</td>
<td>V</td>
<td>C</td>
</tr>
</tbody>
</table>

b. [calémet]

<table>
<thead>
<tr>
<th>c</th>
<th>a</th>
<th>l</th>
<th>a</th>
<th>m</th>
<th>a</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>V</td>
<td>C</td>
<td>V</td>
<td>C</td>
<td>V</td>
<td>C</td>
</tr>
</tbody>
</table>

It now remains to explain why the representation in (17b) is the correct representation. The peculiar aspect of this representation is that even though it
involves a suffix, it employs the same number of CV units as the unsuffixed stem. As a result, the second long vowel of the stem must shorten. What would justify this shortening? I submit that this is because the suffix /at/ is not accompanied by its own skeletal support, and must use that of its base. The proposal is sketched out in (18). In (18a), the floating suffix is added to a stem whose segments are associated to the skeletal tier. The right edge of this association must change to harbor the suffix, resulting in (18b). Because the last two vowels are singly-linked /a/‘s, both will be realized as [e].

(18) Representations of segholation in calam—calém-et ‘photographer (ms-fm)’

a. /caalaam+at/

```
c a l a t +at
|   |   |
C V C V C V C V C V
```

b. [calémet]

```
c a l a m a t
|   |   |   |
C V C V C V C V C V
```

Once again, the analysis of one alternation sheds light on the logic behind another alternation. The result is a unifying account for both alternations, rather than one that accumulates independent idiosyncratic explanations for each phenomenon. By way of summary, the table in (19) lists each alternation and its account in the present paper:

(19) Alternations and accounts

<table>
<thead>
<tr>
<th>Alternation</th>
<th>Account</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. stressed -a(t)—</td>
<td>Both are /at/. Differences follow from the different mappings of segments to skeleton. Singly-linked /a/ does not get stressed and is realized as [e] if syllabification requires its realization; doubly-linked /a/ gets stressed and realized as [a], /t/ floats.</td>
</tr>
<tr>
<td>unstressed -et</td>
<td></td>
</tr>
</tbody>
</table>
b. \(\text{ša}f\text{a}n—\text{ša}f\text{a}n\text{i}m\) Base is /ša\text{a}\text{a}n/. First vowel is lengthened and realized as [a] pretonically in singular, syncopated because short in plural.

c. \(\text{c}a\text{l}a\text{m}—\text{c}a\text{l}a\text{m}\text{i}m\) Base is /\text{c}a\text{a}\text{l}\text{a}a\text{m}/. No syncope predicted here and in d extend the underlining to both bold a’s.

d. \(\text{c}a\text{l}a\text{m}—\text{c}a\text{l}è\text{m}-\text{e}t\) Base is /\text{c}a\text{a}\text{l}\text{a}a\text{m}/, but suffix is parasitic on the base’s skeleton, and shortens vowel.

e. \(\text{k}e\text{l}e\text{v}—\text{k}o\text{l}\text{a}v\text{i}m\) Base is /\text{k}a\text{a}\text{l}\text{a}b/ (cf. [k\text{alba}]), vowel is realized ø in plural because it is short, and [e] in the unsuffixed singular because it must be stressed.

f. \(\text{k}e\text{l}e\text{v}—\text{k}o\text{l}\text{a}v\text{i}m\) Base is /\text{k}a\text{a}\text{l}\text{a}b/, vowel is unstressed [e] because short in singular, and lengthened and realized as [a] pretonically in plural.

As mentioned, the seven alternations (or lack thereof) in (19) have all been previously treated as arbitrary facts of the language. In this paper, they have been accounted for by assuming underlying length, a rule of Pretonic Lengthening and a stress algorithm that ignores final short vowels. There are nevertheless two alternations that the three tools above do not cover. Both are apparent in the base-derivative Segholate pair \(\text{gè}\text{v}e\text{r}—\text{gavri}\) ‘man—manly’. They are 1) the realization of the first /a/ as [a] in the derivative; and 2) the syncope of the purported second /a/ of the base in the derivative. In the next section, I will provide accounts for these last two alternations.

6 The Limits of Segholation: The Roles of Government and Morpho-Syntax

6.1 Retention of /a/ in gavri: The Role of Government
The first challenge facing the account of the preceding sections was the appearance of [a] in the first vocalic position of the stem, whenever the syllable was closed. This is a problem because if the first vowel of [gè\text{v}e\text{r}] is /gavri/, and it is realized as [e] because it is singly-linked, why does it retrieve its original quality in the derivative [gavri] ‘manly’? Until now, all the cases we have seen of surface [a] were analyzed as long. But surely, the [a] of gavri ‘manly’ cannot be long, if only because it is extremely rare for closed syllables to allow long vowels (many languages have closed syllable shortening, none has closed syllable lengthening).
That said, the analysis in the previous sections did not treat cases wherein [a] is positioned in a non-final closed syllable. If so, at least the generalization is clear: underlying /a/’s are retained in non-final closed syllables. In the pretonic position, non-final closed syllables can be distinguished from open syllables using the relation of government. As explained in the theoretical background, the nuclei of open syllables are governed by the following associated nucleus (20a). In a non-final closed syllable, the following nucleus is itself governed. It is therefore unassociated and cannot govern the preceding nucleus (20b).

(20) Vowels in internal empty nucleus unlicensed

\[
\begin{align*}
\text{a.} & \quad \text{C V C V} \\
\text{b.} & \quad \text{C V C C V}
\end{align*}
\]

\[
\begin{align*}
\text{government} & \quad \text{government} \\
\text{government} & \quad \text{government}
\end{align*}
\]

Therefore, in order to describe the reduction pattern of /a/, one may make the following statement:

(21) Short /a/ is retained only before (unassociated) governed nuclei.

The statement in (21) is formalized to allow the reduction of the second /a/ of /kalab/ (> [kélev] ‘dog’): in the representation of such items, the final segment is followed by the final empty nucleus /kalabø/, which is not governed.

6.2 Syncope in [gavøri]: The Role of Morpho-Syntax

The last alternation to be discussed in this paper is also the biggest challenge for the account developed in it. Having explained the retention of [a] in [gvarim] as a consequence of the pretonic lengthening of an underlying vowel /a/, one may wonder why the same scenario in [gavri] does not yield *[gvari]. In other words, if the underlying /a/ of /gavar/ lengthens in /gavarim/ ‘men’ because of its pretonic position, why does it not lengthen in /gavari/, where it is also pretonic?

Faced with this minimal pair, one of two options may be taken. Either the analysis of plural [gvarim] from /gavar+im/ is to be abandoned, or the idea that [gvarim] and [gavri] are derived from the same base must be reconsidered. As we saw in (15) above, the traditional analysis opts for the first solution, by assuming that the plural appears in another morphological template than
the singular. Bat El (1989) and Bolozky (1978, 1995) both adopt this view. I will now show that the second option, the one explored here and first proposed by Falk (1996), is preferable to the traditional one. It will then be shown that if their morpho-syntax is examined carefully, [gvarim] and [gavri] indeed turn out to be derived from two minimally different morphosyntactic structures. The difference in form will be shown to stem from this morphosyntactic difference. In order to see exactly how, some digression into the general principles of morpho-syntactic is necessary.

Consider the following morpho-syntactic representations of a (singular or plural) noun (22a) and a denominal (adjectival) derivative (22b):

(22) Morpho-syntactic representations

\begin{align*}
\text{a. noun: sg/pl} & \quad \text{b. denominal adjectival derivative} \\
\text{DP} & \quad \text{DP} \\
D & \text{numP} & D & \text{adjP} \\
\text{num}_{[\text{sg/pl}]} & \text{nP} & \text{adj} & \text{nP} \\
\text{n} & \sqrt{\text{gvr}} & \text{n} & \sqrt{\text{gvr}}
\end{align*}

In the theory of Distributed Morphology (Halle & Marantz 1993), the derivation of complex items proceeds in syntactically-determined stages called “phases” (Chomsky 2001). Category heads like \( n \) and \( \text{adj} \), along with \( D \) but to the exclusion of \( \text{num} \), are deemed to be “phasal” heads, (Marantz 2007, Embick 2010, Lowenstamm 2014). According to the theory, at the merger of each such phasal head, the structure of the complement of this head is realized, i.e. associated with a phonological representation which then undergoes the phonological rules of the language (see also Marvin 2003). Thus, the realization of the information that corresponds to the phasal head itself takes place when the next phasal head is merged. Crucially, the product of one phase cannot be altered by the product of the following stage. I will now propose a refinement of this view that will enable us to understand the syncope in Sgeholate derivatives.

9 Adjectives in mh agree with the noun in definiteness. I take this to indicate that they are positioned under a DP. Nothing in the present analysis hinges on this theoretical choice.
The view of morpho-syntactic derivation just sketched out is challenged by the derivation of the plural [šfanim] ‘hares’ from the singular [šafan]. The derivation of the singular, presented in (23a), begins with the insertion of the complement of n which, as we saw, is /šafaan/. This underlying form then undergoes pretonic lengthening, and in consequence the first vowel of the stem is realized as [a]. No exponent is inserted at num, and the following phase, triggered by d, adds nothing to the process. However, in the derivation of the plural form in (23b), num introduces a feature [plural], which is associated with a realization. At the next phasal head, this exponent is added to the inalterable realization of the first stage. Because that realization is inalterable, we incorrectly derive *[šafanim], without the syncope.

(23) Morpho-syntactic representations of [šafan]—[šfanim]: wrong prediction for plural

a. Singular

```
DP => [šafan]
  D   numP
     num[sg]  nP /šafaan/ => /šaafaan/ => [šafan]
        n √šfn
```

b. Plural

```
DP => [šafan]+/iim/ => *[šafanim]
  D   numP
     num[pl]  nP /šafaan/ => /šaafaan/ => [šafan]
          /im/ n √šfn
```

From the structure of the plural, it is clear that if there is a phonological product to the merger of the first category head, this product cannot be frozen. For this reason, Embick (2010) proposes that the first category is an exception to the generalization about the phasal status of category heads. Along those lines, I propose the following principle:
(24) Phonology applies only to underlying representations associated with category heads.

Because the complement of the first category head by definition does not include any category head, whatever phonological sequence is inserted at this stage will not be taken through the phonological filter until the next phasal head. Therefore, in the derivation of a plural like /šfanim/, the stem and the suffix will both be realized together once D is merged, and no cyclic effect is to be expected. In what follows, the product of the merger of the first category head will be ignored.

We may now return to the structures of the Segholate plural [gvarim] ‘men’ and adjectival derivative [gavri] ‘manly’. In (25), the derivation of the plural proceeds as that of [šfanim] above: the plural suffix and the stem are subjected to phonological transformations at the same stage, namely when D is merged. The stress algorithm is applied to the resulting concatenation; an iambic foot is built on the last long vowel, that of the suffix. The vowel under the weak branch of the foot is lengthened, and the first vowel of the stem remains short. As argued for above, the resulting sequence /gavaariim/ will be realized as [gvarim].

(25) Morpho-syntactic derivation of a Segholate plural

```
F

w

s

DP /gavar+i:m/ => /gavaariim/ => /gavaariim/ => [gvarim] ‘men’

D numP

num[pl] nP

| /im/ n √gvr
```

The denominal adjectival structure in (26) below is minimally different from the plural one in (25). In the derivative, the nP is selected by an adjectival head adj. Unlike num in (25), adj is a phasal head.
The difference in the number of phases is the only morpho-syntactic difference between the plural and derivative structures. I will now show that this difference is the reason that the syncopated vowel of the derivative is the first vowel of the stem in the plural [gøvarim], but its second vowel in the adjectival derivative [gavøri]. I submit that because the adjective is based on the noun, there emerges a cyclic effect: the first vowel of the stem /gøvar/ is stressed in the noun, and so this vowel, and not its second vowel /gavør/, will be preserved in the suffixed noun.

The derivation is presented in (27). At the first phase, triggered by the adjectival head, the base word is metrified. Since the second vowel of the stem is underlyingly short, it is ignored by the stress algorithm, and the iambic foot is built on the first stem vowel. Because the strong branch of this foot reposes on the first nucleus of the word, the foot is degenerate. This metrified structure is the inalterable input to the realization second phase, which is triggered by D. Metrification is applied again. Because the vowel of the derivative is long, an iambic foot is created with its strong branch on that vowel. The weak branch, crucially, will not attach to the preceding vowel, but to the already existing structure. It is therefore the first vowel of the stem, not its second vowel, which will be lengthened. Unlike in the Segholate plural, the second vowel of the stem is not metrified at all, remains short, and as a consequence not realized. Whether the first vowel of the stem is shortened or not is irrelevant for the output: because the following nucleus is unassociated and governed, the /a/ will be realized as [a].
(27) Morpho-syntactic representations of a Segholate plural

\[
\text{DP} \xrightarrow{\text{adjP}} \text{gavar/+/ii/} \Rightarrow \text{gavarii/} \Rightarrow \text{gaavarii/} \Rightarrow \text{gavri} \text{ `manly'}
\]

The account in (27) tacitly assumes that the effect of the merger of \textit{adj} is not like the merger of \textit{D}. The merger of \textit{adj} triggers metrification, but it does not trigger realization, as shown by the absence of square brackets in its output. If it did, the input to \textit{D} would be \textit{[géver]}, not \textit{/gávar/}, and all of it would be inalterable, which would incorrectly predict at least \textit{*[géveri]}. Thus, for the account to work, one must assume that the merger of category heads is not identical to the merger of \textit{D}:

(28) In Modern Hebrew, category heads trigger metrification, but not realization; \textit{D} triggers both a phonological cycle and realization.

The segmental content of the output of the merger of \textit{adj} is not frozen. The computation triggered by \textit{D} will apply to the metrified underlying representation provided by the first phase.\(^{10}\) Note that although the generalizations in (24) and (28) constitute attenuations to a theory of derivation-by-phase, they express a phenomenon that is far from rare, namely the preservation of only some of the aspects of a base in a cyclic derivation. With the aid of these

---

\(^{10}\) Note that the account provided here is not falsified by the derivative \textit{šfani} `hare-like (sg.-pl.)'. The first phase would metrify \{ša\textsubscript{a}, faan\textsubscript{a}\} but not realize it or lengthen the pretonic vowel. Once /ii/ is added, the iambic foot built from this vowel will extend its weak branch on the strong branch of the preceding phase, i.e. \{[ša\textsubscript{a}, faan\textsubscript{a}'], ii \}. This vowel, and not the first vowel of the stem, will be subject to pretonic lengthening (vacuously, because it is already long). The first stem vowel will remain short and syncopate.
generalizations, we have managed to relate the sole difference in morpho-syntactic structure to a difference in form, while keeping the phonological analysis intact.

A final piece of evidence will now be adduced in support of the idea that -im attaches as just argued for. As it turns out, the suffix -im is also used in the derivation of tens from singular numerals:

(29) -im derives tens

| 3  | šaloš | 30 | šlošim |
| 4  | árba(ʔ) | 40 | arbaim |
| 5  | xameš | 50 | xamišim |
| 6  | šeš | 60 | šišim |
| 7  | šéva(ʕ) | 70 | šiv(ʕ)im |
| 8  | šméne | 80 | šmonim |
| 9  | téša(ʕ) | 90 | tiš(ʕ)im |
| 10 | éser | 20 | esrim |

The suffix -im in (29) does not have the plural interpretation it has elsewhere. It cannot be represented as realizing a feature [plural]; rather, it has to be represented as a derivational suffix. The numerals for 7, 9 and 10 (šéva(ʕ), téša(ʕ), éser respectively) are Segholates (if the last consonant of the segholate is a guttural, the preceding vowel is [a] in the singular, too). Accordingly, the Segholate stem takes the same form it does when the suffix is derivational, namely QvTL-, and not QTaL- (see ft. 2 for the quality of the vowel of the stem). This constitutes further support for the claim that the surfacing of the /a/ in the Segholate plural is not an effect of the form of the suffix -im, but rather of the morpho-syntactic configuration involved in pluralization, where -im is employed as the realization of a [plural] feature. The analysis developed in the previous sections thus naturally accounts for the difference between Segholate plurals and Segholate tens of numerals.

To summarize, this section of the article tackled two unresolved questions regarding Segholates, which had to be addressed if the preceding account was correct. These were: i) the [a] of gavrī, and ii) the syncope of gavøri. In both cases, we saw that independently motivated distinctions render these cases different from the cases previously examined. The [a] of gavrī was in a non-final closed syllable, and therefore lent itself to an account in terms of government. The syncope in gavøri was equally shown to take place in an environment which is minimally different from that of gvarim, although this time the phonological difference had a morpho-syntactic origin. Using the notion of phases,
and under the hypothesis that the form of roots is not processed by the phonological component, a cyclic account of Segholate derivatives was provided and the syncope accounted for.

7 Conclusion

The study of Biblical Hebrew and other Semitic languages has a long tradition, often characterized by the abstract conceptualizations of morpho-phonological structures. Modern Hebrew, however, has for twenty years now been used to argue for a different perspective, one that privileges rote memorization of stems and surface-based derivations. The present paper constitutes an attempt at showing that such an approach fails to capture the regularities of Modern Hebrew.

The paper discussed the rather complex set of alternations between the vowels [a], [e] and ø. The vowel [a] alternates with [e] before an unstressed [e]; when it does not immediately precede main stress it alternates with ø, though not in all cases; it also alternates with ø after main stress; and in a non-final closed syllable, it remains [a]. The vowel [e] alternates with ø is some cases where it is not required to appear for syllabic purposes, and with [a] when immediately preceding the stressed vowel, but only if that stressed vowel is the vowel of the plural suffix -im.

Three assumptions about phonological structures and their phonetic interpretation were made:

a. There are underlying length distinctions which result in distinctions in surface quality.
b. Pretonic vowels are lengthened.
c. Stress is on placed on the last underlyingly long vowel. If there is no such vowel, it is placed on the penultimate vowel.

These three assumptions, combined with a morpho-syntactic analysis of the derivation process of nominal derivatives, manage to rid MḤ of all the irregularities that the surface-oriented studies attributed to it in this domain. Although no surface length distinctions exist in MḤ, the success of the length-based analysis in tying together the set of phenomena discussed strongly argues in favor of the existence of such distinctions.
References


