1. Introduction

1.1. This paper continues a research program in Tiberian Hebrew (TH) morphophonology that has as its genesis the seminal 1985 offering by E.J. Revell entitled, “The Vowelling of “i Type” Segholates in Tiberian Hebrew” and the expanded 1989 sequel, “The Tiberian Reflexes of Short *i in Closed Syllables.” Revell advances the hypothesis that phonetic conditioning, specifically the articulatory properties of neighbouring consonantal segments, is the principal diachronic factor in predicting the TH reflexes of *i, in addition to the standard syllable typology (nature, position, stress). Since the natural interpretation of the conclusions arrived at in this paper would be phonemic splitting in the history of TH, and since we would further assume that phonetic conditioning would play a role in such splitting, we would be in agreement with Revell’s primary hypothesis, to which we will return in our concluding remarks.

In the present context, Revell’s contribution is important in the following respects. The studies represent a concerted attempt to introduce order into the apparently intractable variation of *V reflexes in TH. Further, the studies register in Revellian detail just how pervasive such variation is in fact. Most importantly, such studies signal the fruitfulness of treating TH phonology as the phonology of a natural language, reflecting
what Revell calls “the natural process of linguistic change” (Revell 1989: ¶1, p.183), and therefore amenable to generative analysis, instead of resorting to arcane processes of disrupted change or widespread yet puzzlingly random analogy.

1.2. Unfortunately, the glacial shift of reflexes under phonetic conditioning does little to aid the student of synchronic TH morphophonology. This paper extends Revell’s work by considering how such apparent chaos in vowel reflexes could be handled and mentally represented by speakers of TH considered as a natural, synchronic phonological system. Specifically, we consider what the synchronic underlying representation (UR) of the TH vowel system must be in this light, independently of any constraining a priori diachronic framework.

1.3. We will address this question with a simple structuralist methodology. We start with two principles: two words must have different vowels (URs) when

(1) the vowels of two words diverge in their realizations; and
(2) such divergence in realizations cannot be explained by phonetic conditioning.

In short, divergent behaviours indicate different underlying vowels.

In the present work we deal almost exclusively with the so-called “segholate” nominal paradigms. In examining these nouns we discover eight distinctive patterns, indicating that each of the eight surface vowel qualities encoded by the Tiberian scribes

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3 The term “natural” here in its ordinary sense should in no way be confused with its technical use in the phrase “natural phonology” as a movement within the field of theoretical linguistics. For an overview of such developments in advanced phonology, see....................... ??

4 The term “segholate” refers indirectly to the name of the TH vowel diacritic seghol or [ɛ] which appears characteristically in the second syllable of such nouns, and indeed often in the first syllable as well: [mɛlɛx] “king” is paradigmatic with seghols in both syllables.

It is traditionally thought that such nouns are derived historically from a *CVCC template with a process of epenthesis operating subsequently in TH; the plural would have had, on this view, a separate template *CVCuC. DeCaen has argued at some length against this epenthesis approach (DeCaen 1992). Another view, parsimonious with stems and consistent with current theoretical phonology, would posit a unified bisyllabic stem *CVCVC for both singular and plural, the nature of the second vowel to be determined (but see below on *ə). The final consonant would necessarily be marked extrametrical to be consistent with TH prosody.
corresponds to an abstract vowel quality. We adduce further evidence from other environments that confirms the global validity of the richer phonemic inventory for TH: specifically from nouns from geminate roots; and from verbal prefixes.

2. Surface Patterns

2.1. The Tiberian scribes employed seven symbols (one with a graphic variant that does not bear on pronunciation) together with an additional “schwa” sign (literally “nothing”) that was used by itself or in combination with three of the basic symbols and might reasonably be interpreted as “reduction”: in any case it is quite clear that it was pronounced as the central vowel [u] or [ə] at least in some environments. Although we do not possess direct phonetic evidence for the precise qualities of the vowels, there is really no doubt as to their relative values: [i], [e], [ɛ], [a], [ɔ], [o], [u] (Dotan 1967; also Schramm 1964, Khan 1987, 1996, Johnson and Goerwitz 1995; see further Goerwitz 1993, Morag 1962 and esp. Chiesa 1979).

2.2. Traditionally and uncontroversially three primitive vowels are posited for Proto-Semitic, viz. *i, *a and *u. Phonemic vowel length is posited as well: *ii, *aa, *uu. The usual TH reflexes of these primitives are presented in the table in (3).

(3)

<table>
<thead>
<tr>
<th>Proto-Semitic</th>
<th>*i</th>
<th>*a</th>
<th>*u</th>
</tr>
</thead>
<tbody>
<tr>
<td>*VV</td>
<td>[iː]</td>
<td>[oː]</td>
<td>[uː]</td>
</tr>
<tr>
<td>*V</td>
<td>Full open</td>
<td>[ɛː]</td>
<td>[ɔː]</td>
</tr>
<tr>
<td>Reduced closed</td>
<td>[i]</td>
<td>[a]</td>
<td>[ɛ]</td>
</tr>
</tbody>
</table>

We see in (3) some characteristic developments in TH phonology. We see first that phonemic length is realized in TH primarily by quality distinctions; overall there is a correlation of lowering and reduced environments. The rounded reflexes of *a are traditionally considered the result of a “Canaanite Shift” *a > [ɛ]/[o] (for details with bibliography, see the recent Fox 1996). Further, the expected reflex of reduced *i is [ɛ]; it is assumed to have been subject to iotacement: [ɛ] → [i].
2.3 Upon closer examination, we find evidence for a fourth set of correspondences in the apparent TH gap in the low front region. The addition of *e, at least for TH, is necessitated on first structuralist principles, DeCaen has argued (DeCaen 1992; for comparative data n. 41, p.32; see further Anwar 1987); the general hypothesis is confirmed below. This gives an augmented table in (4).

(4)

<table>
<thead>
<tr>
<th>Tiberian Hebrew</th>
<th>*i</th>
<th>*e</th>
<th>*a</th>
<th>*u</th>
</tr>
</thead>
<tbody>
<tr>
<td>*VV</td>
<td>[i:]</td>
<td>[e:]</td>
<td>[o:]</td>
<td>[u:]</td>
</tr>
<tr>
<td>*V</td>
<td>full open</td>
<td>[e:]</td>
<td>[ɛ:]</td>
<td>[ɔ:]</td>
</tr>
<tr>
<td></td>
<td>reduced closed</td>
<td>[i]</td>
<td>[a]</td>
<td>[ɔ]</td>
</tr>
</tbody>
</table>

2.4. Unfortunately, things are never that simple in TH! For each of the columns in (4) we find evidence for another set of correspondences that differ crucially in the reduced reflexes, as indicated in (5): instead of being lowered as expected, they are radically raised.

(5)

<table>
<thead>
<tr>
<th>Tiberian Hebrew</th>
<th>*i</th>
<th>*e</th>
<th>*a</th>
<th>*u</th>
</tr>
</thead>
<tbody>
<tr>
<td>*VV</td>
<td>[i:]</td>
<td>[e:]</td>
<td>[o:]</td>
<td>[u:]</td>
</tr>
<tr>
<td>*V</td>
<td>full open</td>
<td>[e:]</td>
<td>[ɛ:]</td>
<td>[ɔ:]</td>
</tr>
<tr>
<td></td>
<td>reduced closed</td>
<td>[i]</td>
<td>[a]</td>
<td>[ɔ]</td>
</tr>
</tbody>
</table>

2.5. We are forced by our first principles, therefore, into an analysis that involves eight underlying or phonemic vowels. The burden of the remainder of this paper is to develop a feature geometry for the eightfold system (¶3), and to provide the TH tokens that support the argument together with proposed generative rules (¶4).

3. Overview of Feature Geometry

3.1. Our featural analysis of the phonemic eightfold system is provided in (6); detailed commentary follows.
Along the horizontal dimension of place in (6) we distinguish two privative features, [front] and [back], for a total of three possible positions: front or palatal; back or velar; and central or the unmarked or underspecified.

Vowel height along the vertical dimension is a somewhat more complicated issue in terms of features. Recent phonetic and phonological study (Archangeli and Pulleyblank 1994; cf. Perkell 1969) has emphasized the connection between the tongue-body height features [high] and [low] and tongue-root (TR) features: [ATR] for advanced tongue root; and [RTR] for retracted tongue root with constriction of the pharynx.

Along the vertical dimension, therefore, we distinguish two privative TR features, [ATR] and [RTR], for a total of three primary heights. The further specification of [ATR] by the feature [high] yields four heights: [ATR high], [ATR], ø and [RTR]. The feature [RTR] does not appear with any other feature; but [high] and [ATR] must appear with a place feature (see below ¶4 for details).

3.2. Such an arrangement, as charted in (6) above, allows us to capture the basic “middling” dynamic of Tiberian *V reflexes as a loss of features.6

The geometry also crucially leaves a maximally unmarked segment, the central /ə/: no place or height features. Any framework working with privative features and underspecification, such as we are employing here, will yield such a wildcard; Balcaen

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5 The [back] column is redundantly [round]: on the feature [round] as an enhancement of [back], see Keyser and Stevens (1999).

6 The term midding is borrowed from Malone (1993: esp. p. 14): there it is restricted to the shift [a] → [ɛ]. We are generalizing the term to refer, in the case of *V reflexes, to the banning of [i], [u] and [a] from open syllables.
(1995), working this apparatus, also posits such a wildcard (figure 2.3, ¶2.6.2.3, p.45). It is such a wildcard that confers explanatory power on the hypothesis detailed below.

3.3. It is of some interest to compare (6) with other published analyses. Malone (1993), e.g., distinguishes three heights (high, high-mid, mid and low) with three features, [+/-high], [+/-mid] and [+/-low] (p.29); this renders [e] and [o] somewhat counterintuitively the maximally marked segments, both [+high] and [+mid], and further does not yield an unmarked height. The feature [+/-round] is not redundant: [a] is simultaneously [+low] and [-round].

Goerwitz (1993) somewhat more satisfactorily distinguishes three heights with two features [+/-high] and [+/-low] (p.14). On this view [e] and [o] are unmarked for height, relative to [i] and [u], which more closely accords with our proposal contra Malone; [a] is separated out by its lack of a place feature, which is of course our view as well. In summary, we differ from Goerwitz only in positing a low central [ə] which in turn necessitates the fourth height distinction.

3.4. Balcaen (1995) employs surface length distinctions to supplement height distinctions; so, e.g., what we have distinguished as [e] vs [ɛ] is treated as [e:] vs [e] respectively. This follows a traditional strand of analysis.

The evidence gathered by Khan (1987), however, strongly suggests an automatic system of phonetic lengthening: a vowel is long if either (1) in an open syllable, or (2) receiving prosodic-word main stress; exceptions to the open syllable rule are marked by the composite schwas. On this cogent view, there must be both [ɛ] and [ɛ:] in TH surface representations. Phonetic length will, therefore, not enter into our discussion here, although questions of phonological length in TH remain challenging problems.

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7 Garr (1989) also advances a ə-hypothesis, but in his case the epenthetic vowel is definitely not inserted as a maximally unmarked wildcard.
4. Eight Patterns of Behaviour

4.1. We will now document the eight distinct patterns of behaviour that we observe in the segholate nouns. This material was collected by computer-assisted searching on the Michigan-Claremont text (as distributed by the Center for the Computer Analysis of Texts at the University of Pennsylvania; and also incorporated into the Westminster Morphologically Analyzed Database or MORPH). The results are consistent with standard handbooks (Gesenius xxx; Muraoka-Jouon xxx /make sure engl transl/).

4.2. The three segholate environments we are interested in are found in the initial syllables, and are detailed in (7)-(9).

(7) pausal: open syllable, stressed, prosodically prominent (“in pause”)
(8) contextual: open syllable, stressed, not prominent prosodically
(9) closed: closed syllable, unstressed

(It is not possible to obtain closed but stressed initial syllables with segholates.)

4.3. Forms in *u. For segholates uncontroversially grouped together under *u, we find two behaviours. In the majority of cases listed in (10), the vowel lowers in the closed syllable as expected (4); however, there are four cases (roughly 8%) where the vowel heads in the opposite direction to [u] in (11).

(10) pattern: /ʔzn/ “ear”: open [ʔo:zen], closed [ʔɔzne:]


(11) pattern /gdl/ “greatness”: open [go:del], closed [guðlo:] Psalm 150:11

tokens: gdl (once), sbl, rks, qmš

The most straightforward analysis for forms traditionally grouped together under *u is to posit two separate TH phonemes that differ crucially in some feature: /u/ and /o/, [ATR high] vs [ATR] respectively.
Further, we can easily explain the variants in the open syllable, descriptively a neutralizing *mid-ling*, as a ban on complex representations:

![Diagram of vowel tree]

We further notice the preponderance of the unmarked /o/-class as might otherwise be expected. The lowered reflex of /o/ in closed syllables can be captured by *[ATR]*, which correctly applies to the unmarked /o/ → [ɔ], but crucially does not apply to the complex representation of /u/ (predicted by the Elsewhere Condition [Kiparsky 1973]).

With respect to conditioning factors in (11), we notice the voiced labials closing out the initial syllable in two of the four roots; we also notice velars stops and the uvular trill. It might predicted over time that similar roots would be attracted to the /u/-class. (We will comment on the significance of the split of √gdl forms in relation to the book of Psalms below.)

4.4. Forms in *i*. We also observe two parallel behaviours for segholates uncontroversially from *i*, but only when the first consonant is a guttural: the majority have the expected (see (4)) lowered [ɛ] in a closed syllable (12); the minority in (13) have the raised [i] (roughly 31%).
(12) pattern /ʕgl/ “calf”: open [ʕeɬ], closed [ʕɛɬ]
tokens: ḥbl, ħbl, ħl, ḥlq, ḥrm, ʕbr, ʕgl, ʕdr, ʕzr, ʕrk

(13) pattern /ʕmq/ “vale”: open [ʕeɬ], closed [ʕɛɬ]
tokens: ḥmr, ḥqr, ḥq, ʕmq, ʕb

Again the most straightforward analysis is to adopt /i/ and /e/ as the URs from *i,
differing crucially in the presence of [high] as did /u/ and /o/ above. The ban on complex
representations will neutralize the reflexes to [e] in the open syllable. Again, the simple
/e/ will lower in the closed syllable: /e/ → [ɛ]. Notice also that the unmarked
representation /e/ is again in the majority: the simpler [ATR] is preferred to [ATR high].

The astute reader will observe that technically the sets (12)-(13) are, interestingly
enough, complementary when sorted by the second root consonant: voiceless sibilants,
nasals and [q] distinguish set (13). It is not clear what feature(s) might define such a
natural class. Moreover, while sibilants might form a natural subclass, we find [z] in
(12); similarly, while sonorants might form a natural class, we find [l] in (12) and [n] is
not even attested. We return, therefore, to the principle given in (2) above, viz. that
where divergent realizations cannot reasonably be explained by phonetic conditioning,
we must posit different URs. In this case, it is simply the paucity of tokens that is the
source of the misleading picture.

Where the initial consonant is not guttural, however, there is an absolute
neutralization of *i forms: instead of the [ɛ] vs [i] contrast noted above, [i] appears
exclusively in the closed syllable. We understand this to be the result of a generalized
iotacization rule operating on compatible vowels (i.e., [front] vowels and /a/) which adds
the feature [high], otherwise blocked by the feature [ATR] presumably borne by the
gutturals. Iotacization applies vacuously to /i/; but it also applies to the majoritarian /e/,
in effect obscuring the essential contrast. We will nevertheless posit the unmarked /e/ in
such instances ceteris paribus.8

8 We do not directly address the historic development of the reflexes here; nevertheless, we should flag the
diachronic difficulty with a putative /i/ vs /e/ phonemic split (Dresher pc). Would the split be general, in
the neighbourhood of 30% of cases with /i/ as might be expected on the basis of (12)-(13) above; and then
subsequently be levelled by iotacization? Or is it simply that /i/ could only develop in the restricted
4.5. **Remaining forms with low vowels.** There still remain the four sets of lower reflexes given in (14)—all with [ɛ] in contextual forms, and also four unassigned elements /ɛ/, /ɔ/, /a/ and /ə/. DeCaen (this volume) and Dresher (this volume) have analyzed the complexity of pausal behaviour and its interaction with both syntax and the prosodic phrasing. To be as conservative as possible in this light we consider only forms occurring on the major accents (*athnah* and *silluq*) as “pausal” for the purposes of this section. We will now consider how to match behaviour with representation.

![Table](https://example.com/table.png)

We observe cross-classifying behaviours in (14). On the one hand, the pair (c)-(d) show a distinctive rounding in the pausal variant with the [ɔ] reflex. On the other hand, in closed syllables the pair (b)-(d) have [i], the [ATR high] reflex, at one extreme; whereas, the pair (a)-(c) have [a], the [RTR] reflex, at the other extreme.

Traditionally, the closed-syllable reflex determines the classification. The pair (a)-(c) would be grouped together as *a*: the (a) variant is relegated to an exception list. Similarly, the pair (b)-(d) would be grouped with *i* (including all those examined above in ¶4.4); and the three types—(b), (d) and the set in (12) above—are relegated to exception lists (hence the great puzzle that attracted Revell’s attention).  

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9 For this traditional exception-list treatment, see especially Joüon.................................
4.5.1. We understand the behaviour in (14) to be the result of *adding features* to simpler representations (see again (6) above). We match up, therefore, the least marked segment with the greatest variation in reflexes: (d) is assigned */ə/* by this logic; its realization is naturally one of the least marked vowels ([ɛ], [a], [ɔ]: one feature each). As in many other languages, the default realization of */ə/* is [ɛ], the auditorially closest vowel: cf. Modern Hebrew [ɛ] for */ə/*. This default is no doubt also related to the general systemic fronting that we observe in TH. (Perhaps comparison with Latin */ə/* realized as [i]≈[ɛ]≈[u] would be fruitful in this light.) The only other vowel with a rounded reflex, (c), is assigned to */ɔ/*.

Two vowels with unrounded sets of reflexes remain, and two segments are available. On the basis of iotacization, (b) must be the higher of the two and therefore */ɛ/; therefore (a) must be */a/*.

Eight surface qualities are therefore assigned as eight underlying phonemic vowels following straightforward reasoning on phonological rules. In this light the full Tiberian inventory of vowel graphemes makes sense: the surface distinctions were phonologically real. This also accords with natural principles of orthography by native speakers (Sapir 192x), whereby they naturally gravitate to a phonemic writing system.

4.5.2. It remains to review the phonology of the low vowels in somewhat more detail. First, we observe that the neutralization of all four low vowels to [ɛ] in contextual forms is readily explained as vowel harmony, specifically agreement in the feature [front]. This brings us to the problem of the quality of the vowel in the second and final syllable, either present underlingly or inserted in the derivation epenthetically. Garr (1989) offers a detailed review of the facts. Briefly, the vowel in this syllable takes the quality of the onset where possible.

- [i], with medial C = y, e.g., [bɔ:yiθ]/[ba:yiθ]
- [a], with medial C as guttural, e.g., [bɔ:ŋal]/[bɔ:ŋal]
- [ɛ], elsewhere
This leaves one unusual case: forms such as [zɛ:ʁaŋ]/[ɛ:ʁaŋ]/[zaŋ], *add more forms*. The lowering to [a] in the final syllable, on this view, is a low-level phonetic process conditioned by a final guttural consonant.

Second, we generalize the iotacization rule to apply not only to /i/, /e/, and /ɛ/ but also crucially to /ə/. The rule should be formulated as in (15) and understood to apply to compatible representations; its application is necessarily *blocked* by the incompatible features [back] and [RTR], crucially in the cases of /a/ and /ɔ/.

\[(15) \quad V \rightarrow [\text{ATR high}] / \left[ \sigma \atop C \quad C \right] \]

On this view, iotacization would mask distinctions made elsewhere, which for us signal multiple phonemic sources. Elsewhere, *incompatible* low vowels would add [RTR] by default in the same closed environment: hence the systematic [i] vs [a] split in closed syllables.

Third, a general *pausal rounding* would similarly apply to compatible representations. The only low vowels that can accept such pausal rounding are /ɔ/ and /ə/; such rounding is blocked by the incompatible features [front] and [RTR].

4.6. **Remaining cases.** /Bill’s discussion of anomalies/.................................
5. Similar low-vowel distinctions elsewhere

5.1. The primary data for this study are the segholate classes. Nevertheless, when we scan for similar vowel reflexes elsewhere in the grammar, we find confirming evidence for the validity of our general approach.

5.2. **Nouns from final-geminate roots.** We find further support for our theory in the behaviour of nouns derived from roots in which the second and third consonants are identical: /CVC;C/. We find as a first approximation at least seven distinct behaviours, given in (16), which can be identified with the phonemes posited above.

(16) /i/  $e$:z  $izzi$:m  
/e/  $e$:s  $e$:š$x$:m  
/e/  $e$:l  $e$l  
/e/  ?  
/a/  ba:$d$  baddi:  
/a/  ba:$d$  bitti:  
/a/  yo:m  yammi:m  
/o/  ro:n  rɔ:ne:  
/o/  $o$:l  $ullo:$

5.3. **Verbal prefixes.** We also observe a fourfold distinction in reflexes in the verbal prefixes, presented in (17); further we observe one crucial set of reflexes consistent with the behaviour of our wildcard /a/.

(17) /e/  ye:ta:m  ye:heza:q  yimlb:  
/ə/  yo:qu:m  ya:$amo$:ð  yixto:v  
/ə/  yo:qi:m  ya:$ami$:ð  yaxti:v  
/o/  hu:qa:m  hɔ:$ɔma$:ð  yɔxta:v

6. Conclusions

6.1. In light of our first principles (1)-(2), we can only posit an expanded system of eight vocalic phonemes for TH (6). This system possesses all the attributes of a phonology of a natural language.
Our treatment highlights the methodological importance of pausal phonology in separating out TH phonemes: vowel harmony tends to neutralize distinctions. It also highlights the difficulty in the traditional classification of TH phonemes based solely on the reflexes of the closed syllable: the masking behaviour of iotacization lumps separate phonemes under one rubric.

6.2. **Diachronics.** In light of our analysis, it seems reasonable to posit a four-vowel system for pre-TH, that was then subject to phonemic splitting. If we assign minimal representations, our pre-TH system would appear as in (18).

\[(18)\]

<table>
<thead>
<tr>
<th>front</th>
<th>Ø</th>
<th>back</th>
</tr>
</thead>
<tbody>
<tr>
<td>high</td>
<td>i</td>
<td>u</td>
</tr>
<tr>
<td>ø</td>
<td>ø</td>
<td></td>
</tr>
<tr>
<td>low</td>
<td>a</td>
<td></td>
</tr>
</tbody>
</table>

The phonemic splits would occur along the lines suggested in (19). Presumably the phonetic environment would play a conditioning role, as suggested above and in keeping with Revell’s general approach.

\[(19)\]

\[*/i*\quad */a*\quad */ø*\quad */u*\]

/ɪ/    /ɛ/    /ɛ/    /æ/    /ɔ/    /o/    /u/

6.3. **Summary of processes.** In closed syllables we observed the lowering of /e/ and /o/ through */[ATR]; elsewhere TR extremes [i] (iotacization) and [a] were observed.

In open syllables pausal rounding and fronting harmony were the primary processes. The high vowels [i] and [u] lowered through */[high].
Addenda

Addendum 1 (VD 2011): *TH Sonority* as the Conditioning Factor in (12)-(13)?

Referring to:


The proposed TH sonority scale (p. 43)\(^{11}\) is the following:

\[
y, w, n, l, r, ś > z, s, t > h > b > s > m > š > ṣ > h, q, …
\]

Thus \{s, m, š, q\} form a natural class versus \{l, r, z, b\}; further, assume that the natural class of voiced stops \{b, d, g\} are treated as voiced fricatives, and are positioned as \(b > s\).

If some sort of conditioning can be argued for, the whole analysis will have to be carefully thought through.

—VD

Addendum 2 (VD 2011): Simplifying (18) and (19)?

(18')

<table>
<thead>
<tr>
<th></th>
<th>back(^{12})</th>
</tr>
</thead>
<tbody>
<tr>
<td>high</td>
<td>i</td>
</tr>
<tr>
<td></td>
<td>e</td>
</tr>
</tbody>
</table>

(19')

\[*/i/ *e/ *a/ *o/ *u/\]

\(11\) N.B. ś and š are dramatically distinguished, which upon further reflection, has enormous implications for the diachronics of ancient Hebrew and especially for the fidelity of the TH tradition.

\(12\) Where [back] is also [round]. Consult Dresher on contrast.
Addendum 3: Idsardi’s notes (1999)

note p. 10, section 4.5, unclear references and especially missing tokens in (14)

p. 6, section 3.3, comparison with others
Malone with non-redundant [round], Goerwitz with one less height feature:
Does it not seem extravagant to have an extra height feature, when [round] is available already to mark a/o? We should anticipate this objection. Consider the alternative:

\[
\begin{array}{c}
[a] \\
[\text{back}] \\
[\text{round}]
\end{array}
\quad
\begin{array}{c}
[\varepsilon] \\
[\text{back}]
\end{array}
\]

What’s attractive about the alternative is the way it captures the characteristic \([\varepsilon] \leftrightarrow [a]\) alternation throughout the phonology. Just *[round] would get this, as well as the behaviour around [w].
Addendum 4: DeCaen’s notes (1999)

Title should be more descriptive of hypothesis: add 8-fold somewhere

2. Correspondences of full system as well???
   2. raise featural geometry as interesting question: see U of T theses on features, etc.

3. patterns of behaviour: key is pausal variant: pride of place?? New approach.

Database: give in hebrew alphabetical order, perhaps even hebrew characters??
(11) join cells to make more conspicuous?

End 3.3 other possibilities: monosyllabic hypothesis needs to be questioned, even if we can’t explore it here.

Documentation, expansion:

1. Reference to Revell’s paper: trying to regularize crazy system with phonological conditioning: actually valuable, but as a diachronic hypothesis: synchronic methodology pure and simple produces different picture

2. Data on system: Kahn, Goerwitz, etc: sources: 7 fold plus schwa (not a vowel sign as such??)

   Also primitive attempt at feature classification.
   Kahn on positional length: internally coherent, vs. Qimhian nonsense
References


* Archangeli and Pulleyblank 1994


DeCaen. Ki-paper


Dresher. Athnah-paper


*Gesenius [how the hell do you cite this thing???]


*Keyser and Stevens 1999

*Kiparsky 1973


Muraoka 199x < Jouon 192x [use M’s english translation of J, and pagination, etc.]

*Perkell 1969*


*Sapir 1925*