4 Stress, tonic, pretonic, and pausal lengthening

4.1 Introduction

Much of Biblical Hebrew's distinctive 'flavour' compared to related languages such as Aramaic and Arabic is the result of three separate processes of vowel lengthening (illustrated in table 4.1). These sound changes are commonly known as tonic lengthening (in stressed syllables), pretonic lengthening (in open syllables immediately preceding the stress), and pausal lengthening (in stressed syllables in utterance-final words). While the latter two are relatively straightforward, the exact nature and conditioning of tonic lengthening has been the topic of debate. Interestingly, this sound law appears to only have operated on nominal forms, while leaving verbs untouched, resulting in striking minimal pairs such as *nišbar* 'it was broken' vs. *nišbår* (< *nišbār) 'broken (m.sg.)', the participle associated with that verb. Tonic lengthening only affecting some morphological categories, as is suggested by these forms, is incompatible with the Neogrammarian requirement that sound change be conditioned by phonetic factors only, motivating numerous attempts to arrive at an alternative explanation.

As the three sound changes that are the subject of this chapter are conditioned by the position of the stress, the chapter's first section will discuss the origin and development of the Hebrew accent system. The discussion of tonic lengthening will

Table 4.1: BH *å* < lengthened *ā for Proto-Semitic *a

Arab.	BA	BH	meaning
ḏahabun	*dhaḇ*	*zåhåḇ*	'gold'
katab	*kṯaḇ*	*kåṯåḇ*	'he wrote (pause)'

then take centre stage, after which a discussion of pretonic and pausal lengthening will be included for the sake of completeness. Given the quantity and quality of previous scholarship on these topics, the evaluation of the existing literature will outweigh the presentation of new suggestions.

4.2 Stress

In the Leningrad Codex, the accented syllable of every prosodic word[1] is marked by a cantillation sign. This accent may be treated as equivalent to word stress. In Biblical Hebrew, stress is phonemic, as can be seen from minimal pairs like *qåmắ* 'standing' vs. *qắmå* 'she stood up', *bånú* 'they built' vs. *bắnu* 'in us'. Based on comparison with related languages and evidence from stress-based sound shifts such as those discussed later in this chapter, a different stress system should be reconstructed for earlier stages of Hebrew. We will review two notable proposals before examining the most plausible hypothesis, which holds that at a certain period, the ancestor of Hebrew regularly stressed the penultimate syllable of every word. Contrary to the transcription used in the rest of the present work, ultimate stress in Biblical Hebrew words will be indicated in the rest of this chapter.

4.2.1 Phonemic stress

Brockelmann (1908) believes that Proto-Semitic had phonemic stress, like Biblical Hebrew. The position of this stress was not always the same in Proto-Semitic and Hebrew; rather, it was often analogically shifted in the development from the former language to the latter. For example, the third person masculine singular and plural (respectively) of the perfect, *qaṭála and *qaṭálū in Brockelmann's reconstruction, resulted in *qaṭál and *qaṭálū after the loss of word-final short vowels. The ultimate stress found in *qaṭál was then extended to the plural, eventually resulting in *qåṭlú* (p. 100). Bergsträsser (1918: 115ff.) similarly reconstructs a system with phonemic stress, albeit a different one.

The most serious objection against these reconstructions is that they are not based on any actually attested stress patterns. The position of the stress is mainly deduced from its supposed effect on surrounding vowels. Brockelmann (1908: 108), for instance, explains the different vocalization of the construct states *zqán*

[1] Except in words with a cantillation sign that is fixed on the first or last letter of the word.

(from *zåqén* 'old (m.sg.)') and *kɛ́t̲ɛp̄* (from *kåt̲ép̄* 'shoulder') as the result of a difference in stress: in the construct state, *zaqínu > *zaqín > *zqán*, while *kátipu > *kátpu > *kɛ́t̲ɛp̄*. No such difference in accentuation between words of the same noun pattern is found in any Semitic language, however, and the reconstruction of the stress is therefore circular: the *i in *katipu was lost because the preceding vowel was stressed, and we know the preceding vowel was stressed because the *i was lost. While this is a permissible way to arrive at information about the proto-language that has not otherwise been preserved, a reconstruction with independent confirmation would be much stronger.

4.2.2 'Classical Arabic' stress

Bauer & Leander (1922: 177ff.) also reconstruct free stress for the oldest stage of Proto-Semitic, but posit an intermediate stage before the Biblical Hebrew stress system came into being. They believe that the stress system of Classical Arabic reflects the final stage of Proto-Semitic. In this system, stress is bound, i.e. its position is determined by syllable structure: the stress falls on the word's last heavy syllable, excepting the ultimate, or on the initial syllable if no heavy syllables occur in the word. Thus, the perfect third person masculine singular was stressed *qáṭala, the second person masculine singular *qaṭálta, the masculine singular participle *qā́ṭilum, the plural *qāṭilíma, etc. Several stress shifts then moved the accent to the stressed syllable attested in Biblical Hebrew.

This reconstruction assumes that Classical Arabic has preserved Proto-Semitic stress, or at least its latest phase. Unfortunately, what is taught as 'Classical Arabic' stress at modern universities is based on only one reading tradition of Classical Arabic, not attested before the seventeenth century (Blau 1972). In the cited paper, Joshua Blau investigates medieval Arabic documents which reflect a quite different stress system from that of 'Classical Arabic'. If the 'Classical Arabic' stress is a late innovation, then, it cannot possibly be held to continue the Proto-Semitic stress.

There is some evidence though, that Ugaritic was stressed according to this system at one point, based on the apparent assimilation of unstressed vowels to following stressed vowels in certain conditions (Huehnergard 2012: 28ff.). For example, *a assimilates to the quality of a following long vowel if the two vowels are separated by a geminate, as in *ṣí-ib-bi-ri* /ṣibbīri/ < *ᵗṣabbīri 'communal plot of land (genitive)' (p. 29), but not to that of a short vowel, as in *šal-li-ma* /šallima/ < *sallima 'it paid' (p. 64). This can be understood as assimilation to a stressed

vowel if Ugaritic followed the 'Classical Arabic' stress system and these words were stressed *ᵗṣabbíri, *sállima. Alternatively, these assimilations could have been conditioned by syllable weight, rather than stress. Furthermore, since these processes took place between Proto-Northwest-Semitic and Ugaritic, they do not necessarily tell us anything about Proto-Northwest-Semitic stress, or, by extension, Proto-Canaanite or Hebrew.

Regardless of the situation in other languages, there are two conceivable reasons to assume 'Classical Arabic' stress for an earlier stage of Hebrew: the stress-conditioned operation of the Canaanite Shift in forms like the participle (*qā́ṭilum > *qṓṭilum) and the stress-conditioned assimilation in the *piʿel* and *qaṭṭilum nominals proposed by Huehnergard (1992) (*qáṭṭilum > *qíṭṭilum, but not *qaṭṭíltum > **qiṭṭíltum). In chapter 3, however, it was argued that the Canaanite Shift need not have been stress-conditioned, and in chapter 7 (section 7.2.7), the phonetic plausibility of Huehnergard's proposed assimilation rule will be questioned and an alternative will be put forward. Thus, there is no evidence for 'Classical Arabic' stress at any point in the prehistory of Hebrew.

4.2.3 Penultimate stress

The idea that Biblical Hebrew stress originated in a system where the accent was regularly fixed on the penultimate syllable of each word was pioneered by Lambert (1890), but it did not receive widespread attention and acceptance until its renewed proposal by Cantineau (1931). Cantineau's argumentation is based on the following observations:

1. Pausal forms in Biblical Hebrew and their cognates in Biblical Aramaic are nearly always stressed on the same syllable, as in the perfect third person plural, Hebrew *qåṭā́lu*, Aramaic *qṭálu*.

2. The stressed syllables in these cases is the penultimate in words terminating in a (historically long) vowel, but the ultimate in words that have lost a historically short vowel; thus, Hebrew *qåṭā́lu* and Aramaic *qṭálu* < *qaṭálū, but the singular (pausal) Hebrew *qåṭā́l* and Aramaic *qṭál* < *qaṭála.

From this, he concludes that both (pausal) Hebrew and Aramaic are stressed on the syllable that was the penultimate before the loss of final short vowels. Unlike the stress systems mentioned above, this reconstruction is clearly based on attested

facts, and it is this stress system that provides the conditioning for the lengthening phenomena that will be discussed below.[2]

Biblical Hebrew has frequently changed the position of the stress, especially in context, as in the context form of the perfect third person plural, *qåṭlú*. Cantineau sees these forms as the result of analogical changes in the position of the stress, but for the most part, they are the result of regular, phonetically conditioned stress shifts. Blau (1993: 30–40) gives a clear overview, which we may summarize as follows:

1. Blau assumes 'Classical Arabic' stress as the first reconstructable stage. As was argued above, this is unnecessary.

2. Later, stress shifted to the penultimate syllable. This was the system before the loss of word-final short vowels.

3. In Blau's view, stress became phonemic when word-final short vowels were dropped, resulting in contrasts like imperfect *yaqṭúl < *yaqṭúlu vs. jussive *yáqṭul. In fact, we may postulate that stress became phonemic at an earlier stage, when triphthongs were contracted, resulting in stressed ultimate syllables as in *banáˊ < *banáya 'he built'. Besides the fact that the position of the stress was no longer predictable, the phonemic status of stress after this contraction may be illustrated by near-minimal pairs like *banúˊ 'they built' vs. *dáʿū 'know (m.pl.)'. The contraction of triphthongs must have occurred before the loss of word-final short vowels, but after the Canaanite Shift (see chapters 5 and 3).

4. After tonic, pretonic, and pausal lengthening, stress shifted from a short, open syllable to a following vowel. The now unstressed short vowel was later

[2]Strictly speaking, the stress system attested in the various vocalized forms of Aramaic does not reflect penultimate stress but follows the rules described by Birkeland (1940: 1–4): the stress was on the penultimate if the ultimate was open (e.g. *qaṭála > *qṭál*) or the open penultimate contained a long vowel (e.g. *qā́mat > *qā́maṯ* 'she stood'), but on the ultimate if it was closed and the penultimate had a short vowel (e.g. *qaṭalát > *qiṭláṯ*) or if both the ultimate and the penultimate were closed (e.g. the D-stem imperative *qaṭṭél > *qaṭṭél*). Nevertheless, it seems most likely that this system developed from one with regular penultimate stress, the cases of ultimate stress resulting from stress shifts to that syllable like those found in Hebrew. For one thing, Birkeland's rules presuppose the loss of mimation, which is most easily understood if the mimated case endings were unstressed (e.g. *málkum 'king' and not *malkúm). Secondly, the feminine *-t-suffix was regularly lost in postvocalic position in nouns and adjectives in Aramaic, e.g. *ḥadat- > Biblical Aramaic *ḥăḏā́* 'one (f.)', *malakūt- > BA *malḵū́* 'kingdom', but preserved in the perfect ending, *qaṭalat > BA *qiṭláṯ*. This may be understood as the elision of word-final *-t after stressed vowels only, if the stress was regularly on the original penultimate at this time.

reduced to *šwå* or a *ḥăṭep̄* vowel, as in *qāṭálū > *qāṭalū́ > *qåṭlú*, *ʾánī > *ʾanī́ > *ʾăní* ‘I’, etc. Long vowels stayed stressed, e.g. *qā́mū ‘they stood up’ > *qā́mu*, as did vowels in closed syllables, e.g. *qāṭáltī > *qåṭálti*. This shift did not take place in pausal forms, as the stressed vowel was always lengthened there, resulting in pausal forms like *qåṭā́lu* and *ʾā́ni*. Another sound change that must have preceded this stress shift is the change of word-final *-Cy# to *-Ci#, although *w in the same position appears to have been maintained until after the stress shift: thus, *ṣáby ‘gazelle’ > *ṣábi (before the stress shift) > *ṣabí > *ṣḇí*, but *tóhw ‘waste’ > *tóhu (only after the stress shift) > *tóhu*; *wayyɛ́hy ‘and it happened’ > *wayyɛ́hi > *wayyɛhí > *wayhí*, but *wayyištáḥw ‘and he prostrated himself’ > *wayyištáḥu*.

Two important apparent exceptions to this stress shift are the forms of the perfect second and third person masculine with the first person singular suffix, *qṭaltáni* and *qṭåláni*, presumably from *qaṭaltánī and *qaṭalánī, respectively. These forms are practically the only cases of *a in an originally open syllable reflected by *páṯaḥ*.[3] The only convincing explanation for these forms is given by Janssens (1982: 62), who believes them to be the result of analogy. Presumably, he means something like this: pausal *qāṭā́l : contextual *qāṭál = pausal *qṭālā́nī : contextual *qṭālánī. That only the first person singular suffix was affected may be explained by the unique distinction between the accusative suffix (*-ni*) and the possessive suffix (*-í*), only made in this person. Of the other personal suffixes, the second person masculine singular forms show an alternation between contextual and pausal forms on both verbs and nouns: *qṭålḵā́* / *qṭålɛ́ḵå* and *dḇårḵā́* / *dḇårɛ́ḵå* ‘your word’. The remaining suffixes do not distinguish between contextual and pausal forms, whether they are attached to a verb or a noun; cf. the third person masculine singular, *qṭåló* and *dḇåró*, or the first person plural, *qṭålā́nu* and *dḇårénu*. In all persons but the first person singular, then, the personal suffixes on verbs and nouns behave similarly as far as context and pause are concerned. Only the first person singular would have reflected a split between the verb and the noun, with an alternation between contextual

[3]Forms with *he locale* like *miḏbårå* ‘to (the) wilderness (construct state)’ and *gáṯå* ‘to Gath’ are clearly secondary analogical formations, as is shown by the lack of gemination in the second form (based on *gaṯ* < *gatt): *hammiḏbår* ‘the wilderness’ : *hammiḏbā́rå* ‘to the wilderness’ = *miḏbar* ‘wilderness (construct state)’ : *miḏbárå* ‘to (the) wilderness (construct state)’ = *gaṯ* ‘Gath’ : *gáṯå* ‘to Gath’.

****qṭålní** (the regular expected outcome of *qaṭalánī) / pausal *qṭåĺ̊ani* versus non-alternating *dḇårí* in context and pause. The paradigmatically isolated context form, ****qṭålní**, would thus be an attractive target for analogical replacement.

5. Finally, in a change known as *segolization*, remaining words ending in two consonants inserted an epenthetic vowel, resulting in segolates with penultimate stress like *kɛ́lɛḇ* 'dog' < *kálb. These words were not affected by any further stress shifts.

4.2.4 Challenges to the penultimate hypothesis

Although it is most likely that an ancestral stage of Hebrew regularly stressed the penultimate syllable, alternatives have been put forward. Two important suggestions are based on the forms of the consecutive imperfect and the jussive.

In a return to phonemic stress, Hetzron (1969) reconstructs a difference in accentuation between the jussive *yaqṭúl and the preterite ("prefix-perfect" in his terminology) *yáqṭul, based on the attested difference between jussives like *yåśém* 'let him put' and consecutive imperfects like *wayyǻśɛm* 'and he put'. Penultimate stress in the consecutive imperfect was only preserved in open syllables preceding closed ultimates (hence *wayyǻśɛm*), but shifted to the ultimate in other cases, as in *wayyáqṭul > *wayyiqṭól*, *wayyā́ḇō > *wayyåḇó*.

Hetzron's account, which is also based on Akkadian, Gəʿəz, and Arabic, fails to explain all the Hebrew data. Specifically, there is the question why those verbs that have separate forms for the normal imperfect and the consecutive imperfect usually use the former in the first person singular, as in *wå›åqúm* 'and I stood up' instead of ****wå›ǻqɔm**, like *wayyǻqɔm*. If we assume that the jussive and the preterite were originally formally identical, this is explained by the supposed rarity of the first person singular jussive: rather than using a jussive, which expresses a wish that someone else do something, speakers would have chosen a volitive (›ɛqṭlǻ) or a long imperfect, creating an asymmetry in the jussive paradigm (cf. table 4.2). If the consecutive imperfect was simply formed by adding *wa- (possibly with gemination) to the jussive form, that would explain the origin of these strange first person consecutive imperfects. This explanation only works if the jussive and the preterite shared the same form. Indeed, Hetzron explains the introduction of first person singular consecutive imperfect forms of the strong

Table 4.2: Jussive/volitive and consecutive imperfect of *qwm* (not all attested from this root)

person	jussive/volitive	consecutive imperfect
3m.sg.	*yåqóm*	*wayyǻqɔm*
3f.sg.	*tåqóm*	*wattǻqɔm*
2m.sg.	*tåqóm*	*wattǻqɔm*
2f.sg.	*tåqúmi*	*wattåqúmi*
1c.sg.	*ʾåqúm*, ʾåqúmå**	*wåʾåqúm, wåʾåqúmå*

*For expected **ʾåqóm.

verb like *wåʾɛqṭlå* in this way, as an analogical extension after the merger of the preterite and the jussive in the strong verb due to a conditioned stress shift of *yáqṭul > *yaqṭúl (pp. 16–17). But how would forms like *wåʾåqúm* and *wåʾåqúmå* then have spread to those verbs which maintained a distinction between the preterite and the jussive? After the shift of the strong preterite *yáqṭul > *yaqṭúl, the weak preterites like *yáqum would have been completely isolated, no longer similar to their strong counterparts, nor identical to their associated jussives like *yaqúm. In this situation, there would be no reason to create the precursors of *wåʾåqúm* and *wåʾåqúmå* but preserve *wayyǻqɔm*. Hetzron's suggestion is therefore inferior to the penultimate hypothesis.

Revell (1984) offers another proposal, working with a slightly different version of bound stress. In his view, the stress fell on the vowel preceding the last consonant of the word, i.e. "at the stage prior to the loss of final short vowels, words ending in a vowel had penultimate stress, words ending in a consonant had final stress" (p. 442). Thus, both jussive and preterite would have been accented as *yaqṭúl, and the imperfect as *yaqṭúlu. The penultimate stress in some consecutive imperfect forms is then the result of retraction: *wayyāśém > *wayyā́śem > *wayyǻśɛm*.

On p. 442, Revell states that "[t]here is no evidence that final stress in those *waw* consecutive forms which show it did result from a forward shift in stress position". Contrarily, as is discussed in chapter 6, a relatively late stress shift is the best explanation for the appearance of *a* < *i in both pausal consecutive imperfects like *wayyiggåmál* 'and he was weaned (pause)' < *wayyiggāmél < *wayyiggā́mɛl and jussives like (ʾal-)*tålán* '(do not) stay the night (pause)' < *tālén < *tā́lɛn

(Blau 1981). Had these forms always been stressed on their ultimate syllable, as Revell proposes, they should regularly have developed to ***wayyiggåmél* and ***tålén*. Again, the penultimate hypothesis is superior.

4.2.5 Remaining issues

Even when following the penultimate account, though, a few morphological categories are still stressed on an unexpected syllable. First of all, the jussive of strong verbs, which should be reconstructed as *yáqṭul, is attested in Biblical Hebrew as *yiqṭól*; the same goes for I-n verbs, like *yántin > *yittén* 'he will give'. Unlike in some categories of weak verbs, the same syllable is stressed in the consecutive imperfect *wayyiqṭól*. Consequently, we may posit a regular stress shift of *ÝCCVC > *VCCÝC, thus *yáqṭol[4] > *yaqṭól. The contrast between many forms of the jussive and the imperfect was neutralized by this shift, enabling the originally jussive plural forms like *yaqṭólū and second person feminine *taqṭólī to spread into the imperfect, largely replacing the original imperfect forms like *yaqṭolűna and *taqṭolĺína. These imperfect forms without *nun* are widely attested in the consonantal text of the Hebrew Bible, including the oldest layers of the Biblical text, cf. *yimṣ꞉ú* 'they are finding', *yḥallqú* 'they are dividing', both in Judg 5:30.[5] Accordingly, this replacement, and therefore the stress shift that enabled it, were probably relatively early developments.

The stress also shifted to the ultimate in both the jussive and the consecutive imperfect of verbs with an open ultimate and penultimate syllable, like *wayyåḇ́ó* 'and he came' < *wayyábō, and in I-y verbs with *a* in the ultimate, like *wayyiqáṣ*

[4]This stress shift must postdate the change of *i and *u to *e and *o. This change had already taken place by the time that tonic lengthening was operative; the locative ending was still *-ah when tonic lengthening took place, as it conditions tonic lengthening, like a closed syllable containing a short vowel, not like a word-final long vowel *-ā; as the stress shift did not take place in forms with *he locale* – *꞉árṣā 'to the ground' remaining as it was, instead of *꞉árṣah shifting to *꞉arṣáh – tonic lengthening and the shift of *i, *u > *e, *o must thus precede the stress shift. The behaviour of locative forms may be contrasted with that of *yéqra꞉ > *yeqrá꞉ > *yiqrǻ*, which indicates that analogically restored word-final *꞉ had not yet been lost when this stress shift took place.

[5]These forms do not carry any weight if Kaufman (1995) is right about the history of the verbal endings with *nun* in Hebrew. Based on hypercorrect perfect forms with these endings like *yåḏ꞉ún* 'they knew' (Deut 8:16), he argues that the word-final *-n assimilated to the initial consonant of the following word and was therefore not expressed in the consonantal spelling, except *in pausa* and before *꞉, which did not trigger assimilation. A spelling like <yḥlqw šll> 'they are dividing spoil' (Judg 5:30), then, originally reflected a pronunciation like *yaḥalleqűš šālál. Appealing as this explanation is, it fails to account for the many forms with orthographically present <n> before other consonants than <꞉>.

'and he awoke' < *wayyī́qaṣ. Thus, penultimate stress was only preserved if the penultimate syllable was open and the ultimate was closed, *unless* the ultimate contained an a-vowel (and the penultimate did not); penultimate stress was retained in forms which have a-vowels in both syllables in Biblical Hebrew, like *wayyǻnaḥ* 'and he rested', but this is due to the origin of the *páṯaḥ* of these forms in a different vowel than *a, *u in this case (*wayyǻnaḥ* < *wayyánoḥ < *wayyánuḥ). The attraction of the stress by a-vowels can be explained by the crosslinguistic association between low vowels like [a] and vowel length (Lehiste 1970: 18–19), also exemplified by the more frequent pretonic lengthening of *a than that of *i or *u (see section 4.4 below). The greater inherent length of *a may account for it behaving similarly to a long non-a vowel in this case. Considering the words with an open ultimate syllable, we must note that the shift did not affect historically long vowels, as in *yābṓ›ū 'they will come' > *yåḇó›u*. Thus, the shift of *wayyábō > *wayyåḇó* can be seen as a part of the general stress shift from a short vowel in an open syllable to a following vowel in an open syllable. The *å* in the prefix is then the result of analogical restoration, based on the imperfect.[6]

As was already mentioned in the discussion of Hetzron (1969) and Revell (1984) above, even in verbs where the consecutive imperfect maintained penultimate stress, the jussive did not, as is evidenced by doublets like *wayyǻqɔm* 'and he stood up' vs. *yåqóm* 'let him stand up', *wayyǻśɛm* 'and he put' vs. *yåśém* 'let him put'. As the only formal difference between these forms before the stress shift was the presence of *wa- before the consecutive imperfects, this could be the result of a regular development, *#CV́CV > *#CVCV́, thus *yā́qom, *yā́śem > *yāqóm, *yāśém, while *wayyā́qom and *wayyā́śem remained unaffected. Confirmation for word-initial position being the conditioning factor comes from a group of irregularly formed jussives, all preceded by the negator *›al-*: in context, we find *›al-tǻlɛn* 'do not stay the night', *›al-tósɛp̄* 'do not continue', *›al-tǻṣar* 'do not distress', *›al-tǻśɛm* 'do not put', and *›al-tǻšɛḇ* 'do not turn away', and *in pausa*, *›al-tålán* 'do not stay the night' and *›al-tosáp̄* 'do not continue', with a development of *i > *a that is seen to be the result of original penultimate stress in chapter 6. These forms may have preserved their penultimate stress because the stressed syllable was not word-initial, just like in the consecutive imperfect, as *›al-* forms a prosodic unit with the following word. The more common construction with the 'normal' form

[6]It cannot be the result of pretonic lengthening. The stress shift postdated pretonic lengthening, as can be seen from the development of *qaṭálū > *qāṭálū > *qāṭalṹ > *qåṭlú*, not *qaṭálū > **qaṭalṹ > **qaṭālṹ > ***qṭålú*.

of the jussive following *ʾal-*, as in *ʾal-yåśém* ‘may he not put’, may be analogical, after the model of verbs that also shifted the stress to the ultimate syllable from a non-initial position: *yiqṭól* ‘let him kill’ : *ʾal-yiqṭól* ‘may he not kill = *yåśém* ‘let him put’ : *ʾal-yåśém* ‘may he not put’.

To finish off the topic of jussives and consecutive imperfects, we must note that *in pausa*, the stress shifted forward to the vowel preceding the word’s last consonant (Blau 1981). Thus, *in pausa*, *wayyā́qɔm > *wayyāqɔ́m > *wayyåqóm*, and *ʾal-tā́lɛn > *ʾal-tālɛ́n > *ʾal-tålán*. As Blau shows, this must have happened after the shift of unstressed *e > *ɛ; if we assume the parallel shift of unstressed *o > *ɔ was simultaneous, this requires an additional sound law changing stressed *ɔ́ > *ó, which is unproblematic. Additionally, this pausal stress shift must have taken place before segolisation, as segolates maintain their penultimate stress even *in pausa*.

Another well-known stress shift is mentioned by Blau (1993) on page 33, where he notes the ultimate stress in *ʾattǻ* ‘you (m.sg.)’ and *ʿattǻ* ‘now’. These forms only occur in context; in minor pause – the end of a phrase, but not the end of a whole sentence – we find *ʾáttå* and *ʿáttå*, respectively, and in major pause – sentence-final position – *ʾǻttå* and *ʿǻttå* with pausal lengthening. The phonetic similarity between these two words is striking, and in fact, this stress shift also occurs in two other non-pausal forms of a similar shape: *gittǻ* (*ḥépɛr*) ‘to Gath(-Hepher)’ and *ʿittǻ* (*qåṣín*) ‘to Eth(-Kazin)’, both in Josh 19:13. These additional two examples also contain a geminate *tt*, but the shift is not limited to that consonant: context forms of verbs from geminate roots that are normally stressed on the penultimate syllable sometimes shift the stress to the ultimate in context, like *zakkú* ‘they were pure’ < *zákkū (Bauer & Leander 1922: 429). Unless this is an analogical change, based on the fact that these verbal endings are usually stressed, we may posit another rule, that *V́C$_1$C$_1$V > *VC$_1$C$_1$V́ in non-pausal environments. Verbal forms from geminate roots where this change did not take place in context can then be interpreted as analogical extensions of the minor pausal form, based on the majority of verbs that did not distinguish between contextual and minor pausal forms.

Moving from *ʾattǻ* to the other personal pronouns, we find an alternation between contextual *ʾånoḵí* ‘I’ and pausal *ʾånóḵi*. This is one of the few cases where the stress shifts away from a historically long (i.e. not lengthened) vowel. The comparison with formally very similar contextual (*ʾal-*)*tåḇóʾi* ‘(do not) come (f.sg.)’ in Ru 3:17 and related forms makes it unlikely that this is the result of a regular

shift of *ʾānṓkī> *ʾånoḵí*. Rather, this form is probably the result of contamination with its synonym *ʾănî* 'I (context)', *ʾǻni in pausa*. Both of the latter forms are the regular outcome of *ʾánī.

Finally, there are three irregular processes which affect the position of the accent: the accent retraction known as *nsiḡå*, the shift towards ultimate accentuation in the consecutive perfect, and a shift towards ultimate accentuation in some forms of the hollow verb. All of these developments are probably quite late, as they seem to be closely linked to the reading tradition of the Hebrew Bible, rather than to the rules of Hebrew as a spoken language.

nsiḡå or *nåsoḡ ʾåḥor* is the retraction of the accent from an ultimate syllable to the penultimate in certain cases where it would otherwise precede the accented first syllable of the following word, as in *qǻrå lǻylå* 'he called "night"' (Gen 1:5) < *qārā́ lā́ylā (Joüon & Muraoka 2009: 95). *nsiḡå* can occur if the affected word is closely joined to the following word (indicated by a conjunctive accent) and the syllable structure of the last two syllables is -CVCV#, as in the example given, or -CVCV̆C#, as in *tóḵal lɛ́ḥɛm* 'you (m.sg.) will eat bread' (Gen 3:19) < *tōḵál lɛ̄ḥɛm. If the ultimate syllable is preceded by a *šwå* which reflects an original short vowel, the accents may be retracted to the vowel preceding that *šwå*, e.g. *yórḏe ḇór* 'those who descend into the Pit' (Ps 28:1) < *yōr(ə)ḏé ḇór. Revell (1984: 439–440) infers from this that *nsiḡå* must have operated when unstressed short vowels in open syllables were already reduced to [ə], but not yet deleted; this probably postdated the beginning of the Common Era, since the reduction of unstressed short vowels to *ə must postdate the writing of the Dead Sea Scrolls, and their complete loss must predate the writing of the Hexapla. This dating may be too early, however. As noted by Bergsträsser (1918: 128–132), *nsiḡå* is essentially the same phenomenon as the placement of secondary stress on a proclitic word, connected to the following word by *maqqeṗ*. The secondary stress on the first syllable in *båtte-ḥómɛr* 'houses of clay' (Job 4:19) shows that the relevant factor is the phonemic length of the secondarily stressed vowel, not the presence of a reduced vowel. Accordingly, the operation of *nsiḡå* can be described in terms of the synchronic phonology of Tiberian Biblical Hebrew and need not have been operative before the loss of unstressed short vowels in open syllables.

While *nsiḡå* may apply in these conditions, it often does not. Bergsträsser (1918: 130) notes that "the number of cases in which *nsiḡå* does not operate, although it could have according to the rules given above, is extraordinarily great (around 3500); a linguistic explanation is even less possible since cases with

and without retraction are often nearly identical. One must therefore simply assume inconsistency."[7] Given the synchronic nature of *nsiḡå*, however, it seems likely that it was conditioned by prosodic factors that we cannot retreive from the written text; thus Revell (2016), who argues that *nsiḡå* only occurs at the end of an intonation phrase, but that these breaks do not always correspond to the intonation indicated by the cantillation signs.

The first person singular and second person masculine singular of the consecutive perfect of many verbs are distinguished from the regular perfect by a difference in accentuation: where the regular perfect has forms like *qåṭálti*, *qåṭáltå*, the consecutive perfect accents the ultimate in context, like *wqåṭaltí*, *wqåṭaltǻ*. This does not seem to be the result of a regular stress shift. One reason is that the first person plural, *wqåṭálnu*, maintains the original penultimate accentuation, although the syllable structure is identical to those forms that do accentuate the ultimate. Secondly, no conditioning presents itself that would affect *wəqāṭáltī > *wqåṭaltí* but not *qāṭáltī > *qåṭálti*; if the difference were that the consecutive perfect originally accented an odd syllable, while the regular perfect accentuates an even syllable, *hiṯpåʿel* forms like *hiṯqaṭṭálti* should also have been affected, shifting to ***hiṯqaṭṭaltí*. Additionally, the supposed shift does not occur in the *qal* of most III-wy and III-ʾ verbs, as in *wʿåśíṯi* 'and I will do', while it does occur in forms with a similar syllable structure like *wahăqimoṯí* 'and I will establish'. Together with the fact that the vocalization of these consecutive perfects is completely unaffected, these inconsistencies have generally been taken as indicative of the late and artificial nature of this distinction. Revell (1984: 440) deems it "highly probable that the possibility of final stress in these forms has been used to provide a means of marking a semantic category which was otherwise not distinguished" and dates the development to the same period as *nsiḡå*, as the consecutive perfect shift does not occur in contexts where that retraction could operate.

The last category we will examine is the irregular accentuation of final vowels in verbal forms from hollow roots, as in the two imperatives at the beginning of Judg 5:12: *ʿurí ʿurí dḇorǻ* 'awake, awake, Deborah', whereas the immediately following *ʿúri ʿúri dabbri-šír* 'awake, awake, utter a song' shows the expected accentuation

[7] *Die Zahl der Fälle, in denen die Nesiga nicht eintritt, obwohl sie nach den obigen Regeln möglich wäre, ist außerordentlich groß (etwa 3500); eine sprachliche Erklärung ist um so weniger möglich, als oft Stellen mit und ohne Zurückziehung fast identisch sind. Man hat also wohl einfache Inkonsequenz anzunehmen.*

of this form. Bergsträsser (1929: 145) lists four environments in which this type of accentuation is found:

1. Verse-initially;
2. hemistich-initially;
3. before a word with an initial laryngeal, especially if the affected word ends in *-å*;
4. with no clear conditioning factor.

Like the shift in the consecutive perfect, this change in accentuation seems to be an artificial, late development and is accordingly not strictly phonetically conditioned.

4.2.6 Conclusion on stress

The position of the Hebrew stress, then, developed as follows:

1. Before the contraction of triphthongs, stress was fixed on the penultimate syllable of every stressed word. As some contracted triphthongs resulted in stressed ultimate syllables (e.g. *banáya 'he built' > *banā́), this bound stress became phonemic. In most words, the position of the stress then remained unchanged until after the operation of tonic lengthening, pretonic lengthening, and pausal lengthening.
2. *V́CCVC > *VCCV́C, resulting in the merger of the jussive with the imperfect in strong and I-n verbs once the imperfect singular and first person plural forms had lost their final short vowel (jussive *yáqṭul > *yaqṭól; imperfect *yaqṭúlu > *yaqṭól). III-ʾ verbs also participated in this shift (*yéqraʾ 'let him call' > *yeqráʾ), indicating their final *ʾ was still pronounced. This shift probably antedates the earliest attested stages of Hebrew, as the resulting use of imperfect plurals in *-ū is reflected throughout the history of the language.
3. *#CV́CVC > *#CVCV́C, affecting the jussive of I-ʾ, I-wy, II-wy, and geminate roots (e.g. *yáśem 'let him put' > *yaśém, or *yā́śem > *yāśém). This shift must antedate the change of unstressed *e, *o > *ɛ, *ɔ.

4. *V́CaC > *VCáC, affecting the consecutive imperfect of some I-wy roots (e.g. *wayyí̱qaṣ ‘and he awoke’ > *wayyīqáṣ). This shift must antedate pausal lengthening, as can be seen from pausal forms like *wayyišǻn* < *wayyīšán < *wayyí̱šan ‘and he fell asleep’.

5. After pretonic and pausal lengthening had occurred, *V̆́CV# > *V̆CV́# (e.g. *qāṭálū > *qāṭalú, *yeqṭólū > *yeqṭolú). This postdated the change of *-Cy# > *-Ci#, but antedated the change of *-Cw# > *-Cu#. At some point after this change, unstressed short vowels in open syllables were reduced to *ə and later lost altogether (except after gutturals). The frequent plene spelling of these vowels in some Dead Sea texts marks the date of their composition as a *terminus post quem* for this last development.

6. *V̆́C:V# > *V̆C:V́# in context (e.g. *ʾáttā ‘you (m.sg.)’ > *ʾattá).

7. The prefix vowels in forms like *wayyåḇó* ‘and he came’ were analogically restored, based on the imperfect. In context, *ʾånóḵi ‘I’ changed to ʾånoḵí due to contamination with ʾănî ‘I’.

8. In pause, stress regularly shifted forward to the vowel preceding the word’s last consonant (e.g. *wayyélɛk ‘and he went’ > *wayyēlék). This happened after the change of unstressed *e, *o > ɛ, *ɔ and preceded Blau’s Law (see chapter 6).

9. Segolisation created a large new group of words with penultimate stress.

4.3 Tonic lengthening

Tonic lengthening is the process whereby some historically short vowels were lengthened in stressed syllables. In Tiberian Hebrew, the result of this lengthening is most clearly reflected in the difference between non-lengthened *a > *a* (*páṯaḥ*) and long *ā > *å* (*qǻmɛṣ*), as in the example cited at the beginning of this chapter, *nišbár* ‘it was broken’ < *nišbár vs. *nišbǻr* ‘broken (m.sg.)’ < *nišbā́r. Long and short *ṣere* and *ḥólɛm* are not distinguished in the Tiberian vocalization, but besides their different behaviour in unstressed position discussed in chapter 2, the difference can be seen from the short vowels’ shift to *a* before word-final gutturals, while the long vowels are maintained with the insertion of a furtive *páṯaḥ*: *šåmáḥ* ‘he rejoiced’ < *śāméḥ vs. *śåméaḥ* ‘glad (m.sg.)’ < *śāmḗḥ; *gåḇáh*

'it was high' < *gāḇóh vs. *gåḇóăh* 'high (m.sg.)' < *gāḇṓh. The length of these vowels is confirmed by Greek transcriptions, e.g. the Septuagint's ιαχωβ 'Jacob' and ραχηλ 'Rachel', parallel to the lengthened vowel in Tiberian *yiṣḥǻq* 'Isaac'. Note that *i and *u are lengthened to *ē and *ō, respectively, not *ī and *ū. This points to an earlier phonetic change of *i > *e and *u > *o.

As these examples illustrate, tonic lengthening mainly operated in nominal forms, including proper nouns and participles, but not in finite verbs. We do not, therefore, seem to be dealing with a simple lengthening of every stressed short vowel. Let us examine various proposed explanations for this apparently morphological conditioning.

4.3.1 Extension of pausal forms

Brockelmann (1908: 106) does not see tonic lengthening as a separate sound change. Instead, it is the analogical extension of pausal forms; their lengthened vowel is thus the result of pausal lengthening. While both nouns (like *dåḇǻr* 'word') and verbs (like *qåṭǻl*) show a lengthened stressed syllable *in pausa*, this pausal form was only regularly extended into context in nominal forms, as these occurred *in pausa* more frequently than verbs. This explanation is accepted by Bauer & Leander (1922: 233), among others.

This account cannot explain why tonic lengthening practically never occurs in segolates (like *kέsεp̄* 'silver') and is rare in words ending in a historical geminate (like *báḏ* 'piece' < *bádd), while these words do undergo pausal lengthening (*kǻsεp̄*, *bǻḏ*), just like verbs. It makes more sense to see tonic lengthening and pausal lengthening as two separate processes.

4.3.2 Different accentuation

Bergsträsser (1918: 115ff) traces the difference in tonic lengthening back to a difference in accentuation: *dabáru > *dåḇǻr* 'word', but *qáṭala > *qåṭál*. As was discussed in section 4.2 on stress above, this reconstruction of a different stress pattern is to be rejected. Birkeland (1940: 19ff), on the other hand, accepts the penultimate hypothesis, which would have fixed the stress on the same syllable in both *dabáru and *qaṭála, but believes that the nature of the stress differed between nouns and verbs. Loosely, we may say that nouns were more heavily

Table 4.3: Loss of final vowels and mimation and tonic lengthening according to Sarauw (1939)

stage	'word (abs.)'	'word (cs.)'	'silver (abs.)'	3m.sg. pf.
proto-form	*dabárum	*dabaru	*káspum	*qaṭála
*CV# > *C#	*dabárum	*dabar	*káspum	*qaṭál
loss of mimation	*dabáru	*dabar	*káspu	*qaṭál
*VCV# > *V̄C#, *VCCV# > *VCC#	*dabā́r	*dabar	*kásp	qaṭál
attested form	*dåb̲ā́r*	*db̲ar*	*kɛ́sɛp̄*	*qå̱t̲ál*

stressed, resulting in tonic lengthening, which did not take place under the weaker stress borne by verbs. This explanation is ad hoc and therefore not very satisfactory.

4.3.3 Compensatory lengthening, lengthening in open syllables

The view that tonic lengthening was a form of compensatory lengthening was convincingly put forward by Chr. Sarauw (1939), and later reiterated by Blau (1983). Sarauw notes that tonic lengthening did not occur in synchronically open syllables, as in the suffixed *qṭåláni*[8], most of which have later lost their originally stressed vowel, like *qå̱tlú* < *qaṭálū (p. 67). As it does occur in historically open syllables that were later closed, as in *dabáru > *dåb̲ā́r*, the lengthening of the stressed vowel may be seen as compensating for the lost final vowel: "therefore the loss is simultaneous with the lengthening, both phenomena are two sides of the same thing"[9] (p. 68). This compensatory lengthening only occurred in open syllables, which explains why the segolates are excluded. So, too, are the construct states of nouns[10] and finite verbal forms, as these had already lost their final vowel at an earlier stage, without compensatory lengthening. The case vowel of absolute nominals was protected by mimation, which was later lost itself (see table 4.3).

[8] Not the best example, as this form is to be regarded as an analogical innovation (see section 4.2 above).

[9] *... so ist der Schwund mit der Dehnung gleichzeitig, beide Erscheinungen sind zwei Seiten derselben Sache.*

[10] Alternatively, the lack of tonic lengthening in construct states may also be due to their unstressed nature, which is also reflected in the non-operation of pretonic lengthening in these forms. The loss of case vowels in construct states could then also result from the later elision of unstressed short vowels in open syllables.

Sarauw's identification of mimation as the distinctive feature of absolute nominals is firmly grounded in data from other Semitic languages, and it does away with the apparent morphological conditioning of tonic lengthening. His explanation falls short, though, in cases of tonic lengthening where no vowel was lost, as the lengthening cannot then be said to be compensatory. Such non-compensatory lengthening can be found in (contextual) forms of both nouns and prepositions with a first person plural suffix, like *lǻnu* 'to us' < *lánū, in consecutive imperfect forms with penultimate stress like *wayyǻqɔm* 'and he stood up' < *wayyáqum, and in *he locale* forms like *ʿazzǻṯå* 'to Gaza' < *ġa^{d}z^{d}zátah. Additionally, we may adduce the third person feminine perfect forms with suffixes, such as *ʾăḵǻlǻṯam* 'she ate them (m.pl.)' < *ʾakalátam, an analogical formation based on the third person masculine after the loss of word-final short vowels: *ʾakál 'he ate' : *ʾakalám 'he ate them' (regularly from earlier *ʾakaláhimma) = *ʾakálat 'she ate' : *ʾakalátam 'she ate them'. These forms show that the loss of a following vowel was not necessary for tonic lengthening to occur. Rather, tonic lengthening was conditioned by syllable structure: only open syllables were affected. This view is also held by Janssens (1982), who seemingly independently suggests mimation as the factor that protected the case vowels of nouns in the absolute state, and Florentin (2015), who does not explain the longer retention of word-final vowels in absolute states of nouns. Besides syllable structure, the other conditioning factor seems to have been the quantity of the following vowel: tonic lengthening did not occur before long vowels, as in *qaṭálū > *qåṭlú*.[11] We may thus formalize this sound change as *V́CV̆ > *V̄CV̆, operating after the first loss of word-final short vowels, which occurred before the loss of mimation.

Evidence for the history of absolute case vowels

Formulating tonic lengthening as a general change of *V̆́CV̆ > *V̄́CV̆ presupposes that an earlier stage of Hebrew preserved case endings in the absolute state of nouns and adjectives while other word-final short vowels had already been lost. Is this state of affairs attested? Such evidence is hard to come by, as may be illustrated by a consideration of the situation in Ugaritic.

Ugaritic had already lost mimation, but preserved word-final short vowels in all types of words, both nominal (absolute and construct) and verbal. This is attested

[11] The first person plural personal suffix *-nu*, ostensibly < *-nū, thus behaves anomalously in this regard. See chapter 8 for a discussion of the etymology of this suffix.

in both alphabetic and syllabic spellings: alphabetically, we find forms like <rpu> /rāpiʾu/ 'shade (absolute)', <ksu> /kussiʾu/ 'throne (construct)', and <qra> /qaraʾa/ 'he called', while syllabic transcriptions provide such examples as *a-da-nu* /ʾadānu/ 'father (absolute)', *ḫa-at-ni* /ḫatni/ 'son-in-law (gen. construct)', *ṣa-ma-ta* /ṣamata/ 'it was transferred' (Huehnergard 1987). Does this not contradict the scenario whereby an ancestor of Hebrew only preserved word-final short vowels in the absolute state of nominals?

Making the question so explicit reveals the problem. The evidence from Ugaritic does not necessarily have any bearing on the history of Hebrew, as Hebrew does not descend from Ugaritic. Even two dialects of the same language could have participated in different sound changes, all the more so for two different languages. Unfortunately, we have no attestation of any direct ancestor of Biblical Hebrew, only of its close relatives, spoken at an earlier time. Bearing this in mind, we will examine the evidence from second-millennium BCE Canaanite, attested in Egyptian transcriptions and in the Amarna Letters, and from Phoenician.

The direct evidence from Egyptian transcriptions is limited, as it almost exclusively consists of nouns, both common and proper. Evidence on the preservation or loss of word-final short vowels in verbs is lacking. Based on the spelling of names like *bn-ʿnt*[12] ('Son of Anath'), with a form of <n> that indicates it is syllable-final, Burchardt (1910: 56) concludes that the construct state had lost its case vowel when these transcriptions were made, during the New Kingdom (from the sixteenth century BCE onwards). The case endings in the absolute state, on the other hand, are clearly attested up to the thirteenth century (Albright 1934: 19). Based on a different understanding of the Egyptian orthography, however, Hoch (1994: 456) has more recently rejected the idea that these transcriptions show an earlier loss of case vowels in the construct state.

Another indication could come from the loss of mimation. If Sarauw's explanation is correct, this must have postdated the Canaanite Shift: the loss of mimation must have postdated the first loss of word-final short vowels (as *qaṭala > *qaṭal was affected, but *dabarum was not), which must have postdated the contraction of word-final triphthongs (as *banaya > *banā, not **banay), which, in turn, must have postdated the Canaanite Shift (as *banā was not affected, indicating that the form was still *banaya during the Canaanite Shift's operation). Both the presence

[12]Transliterations of Egyptian have been taken over from the cited source without alteration. As Burchardt (1910) and Hoch (1994) use a different transliteration system, this has led to some inconsistencies which I am unqualified to resolve.

and absence of mimation are attested in Egyptian transcriptions, as well as the Canaanite Shift, which first appears in transcriptions from the fifteenth century BCE like *ṯu=pi₂=–r* /ᵗsōpirV/ 'scribe' (Hoch 1994: 423). The loss of mimation, however, is attested at a much earlier date, in execratory texts from the late Twelfth Dynasty (nineteenth century BCE). In these texts, we find place names with mimation, like *bḳʿtm* (Biblical Hebrew *biqʿå*) and *3wš3mm* (Jerusalem), but many place names, like *bwtšmšw* (Biblical Hebrew *beṯ-šɛ́mɛš*), lack mimation, as do all personal names (Posener 1940). This indicates that in the early second millennium BCE, mimation had already been lost in some dialects, at least. Unfortunately, we cannot simply apply that statement to the entire Northwest Semitic speech area, but we may say that the data from Egyptian transcriptions do not corroborate the idea that absolute case vowels were preserved longer due to the protective effect of mimation.

The same goes for the Canaanite linguistic material preserved in the Amarna Letters. A complicating factor is that the Akkadian of the period had exactly the state of affairs that Sarauw postulates for pre-Hebrew: word-final short vowels had only been preserved on nouns and adjectives in the absolute state. Thus, when we find vowelless forms like *zu-ru-uḫ* LUGAL-*ri* 'the king's arm' (EA 288:14, from Jerusalem), the spelling of the construct state without a case vowel could reflect an Akkadian convention. On the other hand, there are also attestations of West Semitic perfect forms like *ḫa-ba-ta* 'he has seized' (EA 113:14, from Byblos). Here, the final vowel cannot be due to Akkadian influence and almost certainly reflects the existence of a third person singular masculine perfect form *qaṭala, in the Byblian of the period at least. Similarly, Rainey (1975) makes a convincing case that Amarna Canaanite reflects a verbal system with three different moods of the prefix conjugation: an imperfect, marked by *-u, a jussive–preterite, marked by *-Ø, and a volitive, marked by *-a. These suffixes are often attached to Akkadian forms of the stem, resulting in forms like *ia-di-nu* 'he allows'[13] (EA 105:85), *yi-id-din* 'he gave' (EA 248:11), and *yu-da-na-ni* 'may it be given to me' (EA 79:33). As mimation has been completely lost in Amarna Canaanite, this seems hard to reconcile with the loss of word-final short vowels before the loss of mimation.

Let us finally turn to the evidence from Phoenician. Besides the Canaanite Shift, Phoenician also participated in a later, second shift of *ā > *ō, unlike Biblical Hebrew. This is reflected in forms like Punic (in Latin transcription) *chon*

[13]Occurring in a main clause, so this is not the Akkadian subjunctive marker /-u/.

'he was', *nasot* 'I carried', and *corathi* (probably corrupt for **carothi*) 'I called' (Friedrich & Röllig 1999: 43), all from *ā which was preserved in Hebrew **kån* (not attested in the *qal*, but cf. *qåm* 'he stood up' etc.), *nåśå̱ṯi*, and *qårå̱ṯi*. It has been claimed that historically short, stressed *a in an originally open syllable – the same environment where Biblical Hebrew shows tonic lengthening – also shifted to *o, e.g. Phoenician λαβον 'white' < *labán, cf. Biblical Hebrew *låḇå̱n*, or Punic *adom* 'man' < *ʾadám, cf. Biblical Hebrew *ʾåḏå̱m*. If we posit that Phoenician also underwent tonic lengthening in the same cases where Biblical Hebrew did, this could simply be seen as the same shift of secondary *ā > *ō.

Again, though, things are not so simple. As Dotan (1976) points out, these are problematic examples. λαβον could be a *qaṭulum adjective, instead of *qaṭalum. Either way, the short ο is not what we would expect from a development of *labán(u) > *labā́n > *labṓn, or *labún(u) > *labṓn (with tonic lengthening of *ú > *ṓ): in both cases, /labṓn/ should probably be spelled with an omega, **λαβων. *adom* is a questionable example, as it is from Late Punic; perhaps we are dealing with a qualitative assimilation of *am > *om. In this way, Dotan problematizes all evidence for a Phoenician Shift of short *á > *ó or *ṓ, sometimes, perhaps, unfairly. The strongest indication that *á > *ṓ in Phoenician remains the vocalization of the Phoenician parallels to Hebrew names like *yhonå̱ṯǻn*, consisting of a theophoric element and a perfect form: these are well-attested, e.g. [Id]EN-*ia-a-tu-nu*, Βαλιτων, *Baliaton* /baʿlyatōn/ 'Baʿl has given', [I]*ba-ʾa-al-ia-*(*a-*)*šu-pu* /baʿlyasōp/ 'Baʿl has increased' (Friedrich & Röllig 1999: 41). Dotan (pp. 87–89) explains the second part of these names as *qaṭōl agent nouns, noting the existence of such Hebrew names as *ṣå̱ḏóq*, *ʿåmós*, and *ʾåmóṣ*; the meaning would then be 'Baʿl is giver' and 'Baʿl is increaser'. No such Hebrew names occur, however, with a preceding theophoric element: we find *yhonå̱ṯǻn* and *ʾεlyåsǻp̄*, but not ***yhonå̱ṯón* or ***ʾεlyåsóp̄*. A stronger counterargument is furnished by evidently similar Phoenician names in transcription listed by Friedrich & Röllig (1999: 41), [I]*èl-iá-ta-a-nu* /ʾilyată̆n/ 'El has given' and [I]*mil-ki-a-šá-pa* /milkyasă̆p/ 'Milk has increased'. Here, then, we see the non-occurrence of the supposed Phoenician Shift. Friedrich & Röllig attribute this to dialectal variation, but if even the strongest examples of the shift of *á > *ṓ are problematic, we cannot be sure it really took place, and Phoenician cannot be said with certainty to have undergone tonic lengthening.

Additionally, there is the evidence from Old Byblian (probably to be dated to the early first millennium BCE) that word-final short vowels were still preserved

on verbs, at least: the spellings <bny> 'he built' and <ʿly> 'he went up' probably reflect *banaya and *ʿalaya. As Phoenician shows no trace of mimation, this is another lack of corroboration for Sarauw's account, where the first loss of short vowels preceded the loss of mimation. There are also indications that word-final vowels were lost, however, and some alternative interpretations of the verbal forms in -<y> are given in Gzella (2013b).

Neither Ugaritic, nor second-millennium Canaanite, nor Phoenician, then, testifies to an earlier loss of word-final short vowels in words that did not undergo tonic lengthening in Hebrew. As was already noted, this is not damning evidence, and Sarauw's explanation for the distribution of tonic lengthening is still the only one that matches the data and is linguistically plausible. Bearing the lack of confirmation from the attested data in mind, then, we may tentatively maintain it.

4.3.4 Remaining issues

Occasionally, we find *å* where the rules given above would predict *a*, and vice versa. With *å* < *a in syllables that should not have undergone tonic lengthening, the examples are *yå̊m* 'sea (abs. and cs.)' < *yámmum, cf. the plural *yammím* < *yammī́ma; *tå̊m* 'unblemished' < *támmum, cf. the plural *tammím* < *tammī́ma; the adverb *šå̊m* 'there' < *t̲ámma, cf. the locative *šå̊mmå* < *t̲ámmah and Classical Arabic *t̲amma*; and the third person masculine plural suffix *-å̊m* < *-ám < *-ahímma, as in *db̲årå̊m* 'their word' and *qṭålå̊m*. With *a* for expected **å, there are cases like *ʾarbáʿ* 'four (f.)' < *ʾarbáʿum, cf. the masculine construct state *ʾarbáʿat̲* < *ʾarbáʿtum and Classical Arabic *ʾarbaʿun*. Blau (1983: 28–29) sees these forms, listed in table 4.4, as resulting from qualitative assimilation, which took place after *ā shifted to *å̄ in Tiberian Hebrew. In these words, then, *a was rounded to *å* before the bilabial *m*, while *å was unrounded to *a* before the pharyngeal ʿ. Especially this latter change was only maintained in uncommon noun patterns, as *å* was analogically restored in words from more frequent patterns, like *råšå̊ʿ* 'evil (m.sg.)'. Additionally, we may note that the change of *a > *å* only occurred in accented syllables, whereas *a was retained as *a* in unaccented syllables, as in *yam-súp̄* 'Sea of Reeds', *ʾăk̲ålå̊t̲am* 'she ate them'.

A problematic alternation between *pát̲aḥ* and *qå̊mɛṣ* in context is found in a number of nouns and adjectives of the *qallum pattern, e.g. *ʿám / ʿå̊m* 'people' < *ʿammum, *rá*b̲* / *rå̊b̲* 'much' < *rabbum. A small number of these words, listed in table 4.5, has the added peculiarity of always displaying the form with *å* when

Table 4.4: Assimilation of *a and *å

attested form	expected form	meaning
*a > *å*		
yǻm	***yám*	‘sea’
šǻm	***šám*	‘there’
tǻm	***tám*	‘unblemished’
-ǻm	***-ám*	3m.pl. suffix
*å > *a*		
ʾɛṣbá ʿ	***ʾɛṣbå ʿ*	‘finger’
ʾarbá ʿ	***ʾarbǻ ʿ*	‘four (f.)’
koḇá ʿ	***koḇǻ ʿ*	‘helmet’
qoḇá ʿ	***qoḇǻ ʿ*	‘helmet’
moḏá ʿ	***moḏǻ ʿ*	‘kinsman’
qaʿqá ʿ	***qaʿqǻ ʿ*	‘tattoo’
qarqá ʿ	***qarqǻ ʿ*	‘floor’

combined with the definite article, no matter the context, as in *håʿǻm håråḇ hazzɛ́* ‘this great people’.[14]

Ernest Revell (1981) investigates this issue and concludes that the choice of *a* or *å* was influenced both by the surrounding consonants and by the word’s position in the sentence, or more specifically by prosodic factors. Unlike most nominal forms, these words tend to have a special form in minor pause, where they appear with *å*. Some of these cases of minor pause can be independently identified by the occurrence of a form of the conjunction *w-* that is restricted to this prosodic environment, *wå-*. Thus, in cases like *wʿám wåʿǻm kilšonó* ‘and every people according to its language’ (Est 3:12), the second instance of *ʿam / ʿåm* has *qǻmɛṣ* because it is a minor pausal form. Most *qallum words that ostensibly occur in minor pause have *å* like this, the exception being the somewhat frequent form *wåḥáy* ‘and he will live’.

Besides these clear cases of minor pause, there are other examples of words with *å*. Unfortunately, their distribution cannot be adequately described, as it was probably greatly influenced by prosodic factors. We lack detailed information

[14] *habbǻḏ* ’the linen’, *haggǻḡ* ’the roof’, and *haggǻn* ‘the garden’ are also only attested with *å*, but this may be due to the prosodic context of the attested forms.

Table 4.5: *qallum words with *å* with the article in all positions

BH	meaning
håhǻr	'the mountain'
hεḥǻg̅	'the festival'
hå‘ǻm	'the people'
happǻr	'the bull'
*hårǻḇ**	'the numerous, much'

*There is one attestation of *hårā́ḇ*, in Num 35:8.

on the prosody of the Hebrew Bible text at the time the vowels were fixed; as Revell has repeatedly argued (1980; 1981; 2012; 2016), it differed from that indicated by the cantillation signs. We cannot, then, explain why we find *zέra‘ ráḇ toṣí haśśådέ* 'the field will bring forth much seed' in Deut 28:38 but *wg̅am-šålǻl rǻḇ bǻzzu mehέm* 'and they took much spoil from them' in 2Ch 28:8 without resorting to circular reasoning: there is a difference in the vocalization of *ráḇ / rǻḇ* because there was a difference in prosody, which can be seen from the difference in vocalization.[15] Additionally, different words exhibit the *å* reflex in different contexts, which is probably due to the effect of the consonants preceding and following the vowel. Revell (1981: 85) notes that non-alveolar voiced consonants following the vowel "had a tendency to induce the 'long' reflex of original short *a*". More precisely, only words ending in such a consonant occur with *å* outside of minor (and major) pausal position: besides those listed in table 4.5, these include *bǻr* 'grain', *ṣǻr* 'dire straits', 'enemy', *qǻw* 'measuring line', and *rǻ‘* 'evil'; it is unclear whether *ḥǻm* 'warm (m.sg.)' belongs to this group, or to the cases of *-ám > *-ǻm* listed in table 4.4. *már* 'bitter(ness)' unexpectedly maintains *a* in all positions. The further conditioning of the different reflexes of *a may be linked to the initial consonant. *bǻr* 'grain' and *pǻr* 'bull', which both start with a bilabial plosive, are the only words to occur with *qǻmεṣ* as the first half of a word pair, as in *bǻr wålέḥεm* 'grain and bread' (Gen 45:23). Like most of the other words, which have *páṯaḥ* here, they also have *a* before adjectives and restrictive relative clauses, as in *pár ʾεḥǻḏ* 'one bull' (Num 29:36 et passim), *‘ám lo yåḏá‘ti* 'a people (which) I did not know' (Ps 18:44); *rǻḇ* 'much' and *rǻ‘* 'evil', however, both starting

[15]Incidentally, *ráḇ* and *rǻḇ* bear the exact same accent in these verses.

with *r*, also occur with *qǻmɛṣ* in these positions. Finally, only those words with a non-alveolar initial consonant, listed in table 4.5, occur with *å* in all contexts when the article is added. As *qǻmɛṣ* was a back rounded vowel in the Tiberian pronunciation, it seems plausible that bilabial, velar and pharyngeal consonants are all associated with its occurrence in these words. Due to the small number of affected forms, however, the apparent correlation between the vowel quality and the initial consonant could also simply be coincidental.

To conclude the discussion of tonic lengthening, let us consider a word that is frequently grouped with the *qallum nominals listed in table 4.5, *ʾérɛṣ* 'land'. Like the former, *ʾérɛṣ* seems to take a pausal form when the article is added, yielding *håʾǻrɛṣ* 'the land'. This is the only case of the article triggering 'pausal' vocalization in a *qaṭlum noun. A similar case, however, is found in the alternation between *ʾărón* 'ark' and *håʾårón* 'the ark', hardly a pausal form. Both of these words start with ʾ, a sound which is known to have been lost and secondarily reintroduced in other cases (Bauer & Leander 1922: 223); for the loss in a similar environment to that of *ʾăron*, cf. *leʾelōhī́m > *lelohím* 'to God', for its secondary reintroduction, cf. *tōk̲lé̱hu > *tʾɔk̲lé̱hu* 'it will consume him' (Job 20:26). It seems quite possible that regular *hāʾárṣ and *hāʾarṓn changed to *hā́rṣ and *hārṓn. The *ā was then reinterpreted as belonging to the noun, not the article, and when the *ʾ was restored based on its presence in the spelling and the form of the words without the article, this led to the secondary forms, *hāʾárṣ > *håʾǻrɛṣ* and *hāʾārṓn > *håʾårón*. These forms thus reflect a different process than the seemingly similar cases like *ʿám / håʿǻm*.

4.3.5 Conclusion on tonic lengthening

Although it is not supported by the epigraphic evidence, the most plausible explanation for the different treatment of stressed vowels in nominals and verbs, from a linguistic perspective, remains that of Sarauw (1939): the affected vowels in nouns and adjectives were in an open syllable when tonic lengthening took place, as the following case vowel had been preserved due to mimation, while the word-final vowels in verbs had already been lost, closing the syllable. Tonic lengthening can then be formulated as a change of *V́CV̆ > *V́CV̆. Later, nominals that originated in the *qallum pattern and ended in voiced, non-alveolar consonants introduced *qǻmɛṣ* in some contexts, which cannot be identified with complete accuracy. The presence of *qǻmɛṣ* in *håʾǻrɛṣ* 'the land' and *håʾårón* 'the ark' is probably due to

secondary reintroduction of *ʾ, which had been lost. Finally, at some point after the Tiberian shift of *ā > *å*, assimilation took place in some words, changing *a to *å* before *m* in accented syllables and *å to *a* before ʿ.

4.4 Pretonic lengthening

Pretonic lengthening is the lengthening of *a > *ā, (*i >) *e > *ē, and a similar change affecting (*u >) *o, all in open syllables immediately preceding a word's stressed syllable. Many scholars have found the lengthening of an unstressed vowel directly before a stressed one hard to explain from a phonetic point of view, especially in cases where the stressed vowel remained short, as in *qaṭál > *qāṭál > *qåṭál*. Accordingly, much has been written about this "**riddle of pretonic lengthening**" (Blau 2010: 124, emphasis in original). As Malone (1990: 468) points out, though, the phenomenon is known from other languages, both within and outside Semitic. Indeed, the phonetic implausibility of the lengthening of pretonic vowels in open syllables may be questioned: the lengthening of vowels in open syllables is a common change, crosslinguistically, and it does not seem strange that syllables which are closer to the stress should be more prominent themselves.

We will follow the overview of the literature given by Blau (2010: 125–128). He distinguishes between two main trends of explanation: one which attributes (apparently) pretonic lengthening to the presence of stress, either primary or secondary, and one which sees it as the result of language contact.

4.4.1 'Pretonic' lengthening due to stress

Finding the lengthening of a stressed vowel easier to accept than that of a pretonic one, some scholars have hypothesised that the lengthened vowel bore either primary or secondary stress. Goetze (1939) rejects the penultimate stress hypothesis (see section 4.2 above) and holds that what is normally seen as the pretonic vowel was actually stressed: thus, for instance, the third person masculine singular perfect would have developed from *qáṭal > *qáṭal > *qāṭál > *qåṭál*. This reconstruction of the stress system is incompatible with the rest of the evidence, and Goetze's explanation must accordingly be dismissed.

Less problematically, Sarauw (1939) suggests that the pretonically lengthened vowel bore secondary stress. As is extensively detailed by Malone (1990), however, this reconstruction does not match the actual data on secondary stress preserved in Tiberian Hebrew and is only based on the secondary stress's supposed lengthening effect. Attributing pretonic lengthening to the workings of secondary stress leads to unnecessary complications and is circular.

4.4.2 Pretonic lengthening due to language contact

The second type of explanation for pretonic lengthening supposes contact between two language varieties, one which preserved unstressed short vowels in open syllables (referred to as P henceforth) and one which had reduced them (henceforth, R). Speakers of R no longer had short, unstressed vowels in open syllables in their language variety, only long ones, so if they tried to approximate a P form like /qaṭál/, they produced /qāṭál/. Different authors hold different opinions on which language varieties are to be identified as P and R, and when this contact-induced lengthening took place. Brockelmann (1908: 101) identifies P as the Hebrew reading tradition and R as the vernacular Aramaic in the post-biblical period. For Bauer & Leander (1922: 237), P is the indigenous Canaanite of the second millennium BCE, while R is the Aramaic-like language variety of the invading Israelites. Birkeland (1940: 8–14) also relates the process to the supposed conquest of Canaan by the Israelites, but in his opinion, it is Canaanite that had reduced its vowels and the language variety of the Israelites that preserved them. Blau (1978, 2010), finally, adopts Brockelmann's identification of P as Hebrew and R as Aramaic, but dates pretonic lengthening to the Second Temple period, believing that "when Aramaic syllable structure threatened to overcome Hebrew, speakers of Hebrew were anxious to preserve (originally short) vowels in open pretonic syllables and thus maintain **a contrast with Aramaic**" (2010:128, emphasis in original).

The proposals of Bauer & Leander and Birkeland are based on the highly questionable notion of Hebrew as a mixed language, which has generally been abandoned. Those of Brockelmann and Blau rely on the actually attested contact between what were undeniably two separate languages, Hebrew and Aramaic, but they run into chronological problems. As Blau (1978: 94) himself notes, the Hebrew underlying the Septuagint already reflects pretonic lengthening, as in ασηρωθ (BH *ḥăṣerót*) < *ḥaṣirā́tum. Any explanation of pretonic lengthening that

relies on contact with Aramaic, then, is contingent on Aramaic vowel reduction predating the translation of the Septuagint in the third century BCE. Beyer (1984: 128–136) states that Aramaic only reduced unstressed short vowels in open syllables in the third century CE, much later than required for this scenario, but as noted by Kaufman (1984), the evidence shows that the change was gradual: while the complete loss of unstressed short vowels in open syllables did not occur until the third century CE, they were qualitatively reduced, probably to [ə] or similar, from the Achaemenid period onwards. It is conceivable that pretonic lengthening took place to maintain the vowel quality of the Hebrew word in syllables where Aramaic no longer tolerated full vowels, although it is by no means obvious. Considering the clear phonetic conditioning of pretonic lengthening, however, an explanation from language contact is probably unnecessary.

4.4.3 The conditioning of pretonic lengthening

If we accept the possibility that pretonic lengthening simply was a natural sound change, the issue of conditioning remains, as not every pretonic vowel in an open syllable was lengthened. The development of the three originally short vowels in pretonic open syllables has been discussed in detail by Garr (1987). While we will depart from Garr's account on several points, his general conclusions adequately cover the data. They are as follows:

- *a is lengthened to *ā in all pretonic open syllables, e.g. *dabā́r- > *dābā́r- > *då̱b̲ǻr* 'word', *dagī́m > dāgī́m > *dåg̲ím* 'fish (pl.)'.
- *i in an open syllable which is not separated from the following stressed syllable by a morpheme boundary is lengthened to *ē (having changed to *e first) before *a but reduced to schwa and later lost elsewhere. Examples: *libā́b- > *lebā́b- > *lēbā́b- > *leb̲ǻb̲* 'heart', but *d̲irṓʿ- > *d̲ərṓʿ- > *zróăʿ* 'arm'.
- If a morpheme boundary separates *i from the following syllable, it is lengthened to *ē if the *preceding* syllable is light (CV) or if the syllable containing *i is word-initial, but *i is lost if the preceding syllable is heavy (closed or containing a long vowel). Examples: *d̲aqinī́m > *d̲aqenī́m > *d̲aqēnī́m > *zqením* 'old (m.pl.)', *ʾilī́m > *ʾelī́m > *ʾēlī́m > *ʾelím* 'gods', but *ʾillimī́m > ʾilləmī́m > *ʾillmím* 'mute (m.pl.)', *yōt̲ibī́m > *yōt̲əbī́m > *yošb̲ím* 'sitting (m.pl.)'.

- *u behaves like *i, with two exceptions: instead of being lengthened, *u is preserved with gemination of the following consonant, and in the word-initial syllable, pretonic *u before a morpheme boundary is reduced. Examples: *luqáḥ > *loqáḥ > *loqqáḥ > *luqqáḥ* 'it was taken', *ʾadumíḿ > *ʾadomíḿ > *ʾadommíḿ > *ʾăḏummím* 'red (m.pl.)', but *mutíḿ > *mətíḿ > *mṯím* 'men', *bukúr- > *bəkúr- > *bḵór* 'firstborn', *qudqudó́ > *qodqədó́ > *qɔḏqḏó* 'his cranium'.

  The reduction of *u in a word-initial syllable before a morpheme boundary is based on only one example, that of *mṯím*, reconstructed as *mutíḿ. The reconstruction of *u in this word, however, is uncertain: the various cognate forms are also compatible with a reconstruction as *mtum, similar to *smum 'name' and *bnum 'son' (see below), and the word is not attested in Arabic, where we might expect to see different reflexes for *mtum and *mutum. The conditioning of pretonic lengthening may thus be simplified by reconstructing this word as *mtum, plural *mtīma, and stating that both *i and *u before a morpheme boundary underwent pretonic lengthening when not preceded by a heavy syllable.

  Fox (2003: 285) reconstructs the Hebrew colour terms like *ʾåḏóm* as *qaṭullum adjectives, based on the semantically related verbal stem IX in Classical Arabic, which also has a geminate third radical: perfect *ifʿalla*, imperfect *yufʿillu*. If that is correct, the gemination in forms like *ʾăḏummím* is not due to pretonic lengthening, but other cases like *ʿamuqíḿa > *ʿămuqqím* 'deep (m.pl.)' remain.

It is interesting to note the different behaviour of *i and *u before non-low vowels, depending on whether a morpheme boundary intervenes. This may be explained by positing two waves of reduction, one affecting *i and *u in open syllables preceding non-low vowels, and one affecting *i and *u in open syllables following heavy syllables, regardless of the following vowel. In between these two sound changes, *i and *u could have been analogically restored if and only if they were preserved in other parts of the paradigm, e.g. *ḏaqiníḿa > *ḏaqəníḿa (first reduction) >> *ḏaqiníḿa (analogically restored based on the singular *ḏaqín-) > *ḏaqēníḿ. Reductions within a single morpheme, however, could not be analogically undone, resulting in cases like *ḏirōʿ- > *ḏərōʿ-. This first reduction may already be attested in the Amarna Canaanite form *zu-ru-uḫ* 'arm (construct)' (EA 288:14), possibly reflecting /zərṓʿ/; if so, it is a very early development.

The most important category that does not behave according to these rules is that of imperfect verbs with the *nun paragogicum*, i.e. those that preserve the old verbal endings *-ún* and *-ín* < *-ű́na and *-ī́na. These suffixes are always stressed, and the vowel of the preceding syllable is usually reduced in context and lengthened *in pausa*, whether it comes from *a, *i, or *u. Thus, we find *yiškb̠ún* 'they will lie' in context, but *yiškåb̠ún* 'idem' *in pausa*, both from *yiskabű́n, and similarly, *yid̠rk̠ún* 'they bend' < *yadrokű́n in context, but *yilqoṭún* 'they will gather' < *yalqoṭű́n *in pausa*. Garr attributes this to the broader application of pretonic lengthening *in pausa*. As other words with pretonic *i after a heavy syllable also tend to lengthen that vowel *in pausa*, we may accept that pretonic lengthening applied to *i and *u regardless of the syllable structure of the preceding syllable in this prosodic environment. Rather than postulating contextual non-lengthening in *yiskabű́n > *yiškb̠ún*, these forms with non-lengthened *a should be seen as analogical: pausal *yiqṭolún* : contextual *yiqṭlún* = pausal *yiqṭålún* : contextual *yiqṭlún*. This also explains why *yiqṭålún* forms are still found in context, like *yiš›ålún* 'they will ask' in Josh 4:21.

In some adjectives, *i after a heavy syllable is pretonically lengthened in context forms. Garr notes that these forms with lengthened vowels are more commonly used independently, while predicatively used adjectives tend to reduce their vowel, as in *yoled̠̊å* 'woman giving birth' vs. *yold̠̊å* 'giving birth (f.sg.)', both from *yōledā́. This is statistically borne out by the evidence given in Ben-David (1993). These nominalized adjectives with unexpected pretonic lengthening are best explained as analogical extensions of the masculine singular stem, where *i became *ē through tonic lengthening.

Several other exceptional developments listed by Garr must be considered in more detail. He attributes the occurrence of forms like *nimṣ›ím* 'present (m.pl.)' when the word is closely connected to the following word besides forms like *nimṣå›ím* 'idem' in other positions to the contextual/pausal distinction discussed above, but as is shown by Rubin (2008: 126), these are the result of "an idiosyncratic sound rule which affects masculine plural niphal participles of *lamed-›aleph* roots when one of the root letters is a voiced labial", not reflecting a general sound change.[16] On page 136, Garr claims that pretonic *a is regularly reduced in *qaṭiltum and *qaṭultum nouns, but none of his examples can securely be recon-

[16]On the other hand, the reduction of *a in Garr's other example of prosodic non-lengthening, *kikkráyim* 'two talents' < *kikkaráym, may well be the result of a construct state-like intonation with little or no stress, given the context.

structed as having had *a, except for *ḥămé̆šɛ̱t* 'five (m. construct)', which should not undergo pretonic lengthening anyway, as it is a construct form. Nevertheless, the absence of *qåṭélɛ̱t* and *qåṭólɛ̱t* forms in Hebrew, the non-reconstructibility of a *qiṭil(t)um pattern for Proto-Semitic (Fox 2003: 287), and the nice semantic match between *ʾåmén* 'surely' < *ʾaminam and *ʾĕmɛ̱́t* < *ʾamintum? 'truth' support the possibility that *qaṭiltum and *qaṭultum patterns did not undergo pretonic lengthening; we might also include the case of *nḥóšɛ̱t* 'bronze', if this should be reconstructed with the same *a in the first syllable as the corresponding masculine *hapax nåḥúš* 'idem' (Job 6:12). Whether this was a phonological or morphological change is hard to determine. It may result from the analogical spread of what was originally the non-absolute form of the stem, as is suggested by the *-t- form of the feminine suffix; see the more detailed argumentation in section 7.2.7. Finally, Garr's assertion that *mnǻ̱t* 'portion' and **qṣǻ̱t* 'end' are not Aramaic loanwords, but regular Hebrew developments of *manawát- and *qaṣawát-, is to be rejected. It requires pretonic lengthening to have operated before the contraction of triphthongs (see chapter 5), but this is contradicted by forms like *śå̱ḏó̱t* 'fields' < *śādṓt < *śadṓt- < *śadayṓt-.

Only a few forms remain which do not obey the rules stated so far. Garr rightly excludes (p. 136, n. 32) the forms like *bní* 'my son' and *šmí* 'my name', which do not show a lengthened vowel, as they did not contain an *i in the stem: as argued by Testen (1985), *bén* 'son' and *šém* 'name' should be reconstructed as *bnum and *smum (cf. Classical Arabic *ibnun*, *ismun*), respectively, which explains their different behaviour from *ʾél* 'god' < *ʾilum and *ʿéṣ* 'wood' < *ʿiṣum (Goetze 1939: 444, n. 36). The latter two do regularly show pretonic lengthening before suffixes, as in *ʾelí* 'my god', *ʿeṣǻh* 'its wood'.

We will conclude with Garr's note on page 140, where he mentions the cases of pretonic *i > *e* before high vowels following ʾ, listed in table 4.6.[17] This development has traditionally been explained as the result of Aramaic influence: in Biblical and Targumic Aramaic, both reduction and retention of unstressed vowels following word-initial ʾ is attested, and in Syriac, these vowels are regularly

[17] *ʾelón* 'great tree', listed by Garr, should be reconstructed as *ʾaylṓn, not *ʾilṓn, as is evidenced by the alternative form *ʾallón*, with assimilation of *-yl- > *-ll-* (Garnier & Jacques 2012). *ʾissår* is an Aramaic loanword (Wagner 1966: 28). The reconstruction of *ʾĕmɛ̱́t* as *ʾimitt- is based on the Greek transcription in the Hexapla, ημεθ (Brønno 1943: 155–157), which reflects /ʾēmet/, presumably with a different development of pretonic *ʾi- in this case than in the Tiberian tradition. If the non-lengthening of pretonic *a in *qaṭiltum nouns mentioned above is accepted, *ʾĕmɛ̱́t* and *ʾărɛ́šɛ̱t* are rather to be reconstructed with *ʾa- than with *ʾi-.

Table 4.6: Pretonic *ʾi-

BH	meaning
*ʾi- > ʾ*e-*	
ʾ*eḇús*	‘manger’
ʾ*ezóḇ*	‘hyssop’
ʾ*ezór*	‘loincloth’
ʾ*eṭún*	‘linen’
ʾ*ep̄óḏ*	‘ephod’
ʾ*emún*	‘faith’
ʾ*esúr*	‘fetters’
*ʾi- > ʾɛ̆-, *ʾ*ă-*	
ʾ*ăḇóy*	‘uneasiness’
ʾ*ɛ̆ḡóz*	‘nut tree’
ʾ*ɛ̆wíl*	‘fool’
ʾ*ɛ̆lóăh*	‘god’
ʾ*ɛ̆líl*	‘idol’, ‘uselessness’
ʾ*ɛ̆mɛ́ṯ*	‘truth’
ʾ*ɛ̆nóš*	‘man(kind)’
ʾ*ărón*	‘ark’
ʾ*ărɛ́šɛṯ*	‘desire’

retained (Brockelmann 1908: 110). The Biblical Hebrew situation may then be the result of inconsistent application of this Aramaic pronunciation. The difficulty of formulating a phonetic conditioning that governs the reflex of pretonic *ʾi- can be seen from the different outcome of ʾ*ɛ̆mɛ́ṯ* vs. ʾ*emún*, ʾ*ăḇóy* vs. ʾ*eḇús*, or ʾ*ɛ̆nóš* vs. ʾ*ezór*, which show that neither the following consonant nor the following vowel, taken by themselves, can account for the distribution. Additionally, different reflexes are present within the same word as found in different sources: contrary to the Leningrad Codex’s ʾ*ăḇóy*, ʾ*ɛ̆ḡóz*, and ʾ*ɛ̆mɛ́ṯ*, other manuscripts have ʾ*eḇóy* and ʾ*eḡóz* (Koehler & Baumgartner 1994–2001: 4, 10), and the Hexapla has ημεϑ (Brønno 1943: 155). Thus, word-initial ʾ*ɛ̆-*/ʾ*ă-* and ʾ*e-* seem to have been in free variation.

Dating

If the Amarna form *zu-ru-uḫ* ‘arm (construct)’ (EA 288:14) reflects the initial reduction of *i (and presumably *u) before non-low vowels that also affected

pre-Hebrew, this reduction must predate the composition of the Amarna Letters in the fourteenth century BCE. Accepting Garr's statement that it was the quality of the following vowel (non-low) that conditioned the reduction rather than its quantity (long), we must place it at a later date than the Canaanite Shift, as *ō < *ā behaves like a non-low vowel. Pretonic lengthening itself must postdate the change of *i > *e and predate its own first attestation in the Septuagint (third century BCE).

4.4.4 Conclusion on pretonic lengthening

Phonetically, pretonic lengthening is not as mysterious as it has been made out to be, and no convoluted explanation involving secondary stress or language contact is necessary. It can be broken up into the following sound changes:

1. At some point before pretonic lengthening was operative, but after the operation of the Canaanite Shift, *i and *u in open syllables were reduced to *ə before a following stressed non-low vowel. If a morpheme boundary intervened between the original *i or *u and the stressed vowel, the reduced vowel was analogically restored.

2. Before pretonic (and tonic) lengthening took place, *i and *u shifted to *e and *o, respectively.

3. Pretonic lengthening may have taken place at any point before the third century BCE. In an open syllable preceding a stressed vowel, *a > *ā. In that position, *e > *ē, except when following a heavy syllable. *o in the same environment caused gemination of the following consonant. Pretonic *e and *o in open syllables may have been lengthened *in pausa*.

4. Word-initial *ḥåṭɛp̄* vowels following ʾ were irregularly replaced by *e* under Aramaic influence.

4.5 Pausal lengthening

Of the developments discussed in this chapter, pausal lengthening is the least controversial. There is a broad consensus that it is the result of the lengthening of the stressed vowel of words in sentence-final position. This lengthening took

place before most of the stress-shifting processes discussed in section 4.2 above. Accordingly, it is the originally penultimate syllable that is lengthened, as in *qaṭála > *qåṭ́ål* (vs. contextual *qåṭál*), *qaṭálū > *qåṭ́ålu* (vs. contextual *qåṭlú*).

Bergsträsser (1918: 162) believes that pausal lengthening must have taken place in the synagogal recitation, finding it improbable that such a change would have affected the spoken language. Experimental research conducted on currently spoken languages, however, has shown that the lengthening of phrase-final words is a normal prosodic effect (Nooteboom 1997: 658). It is true, though, that it is hard to imagine the creation of phonologically distinct pausal forms such as those of Biblical Hebrew in a living language, as speakers would probably analogically introduce the more frequent context forms into pausal position. We will examine the dating of pausal lengthening after a consideration of the difference between major and minor pausal forms.

4.5.1 Major and minor pause

The existence of separate minor pausal forms, used in phrase-final[18] but not sentence-final position, has long been recognized for two words, *ʾáttå* 'you (m.sg.)' (vs. contextual *ʾattǻ* and major pausal *ʾǻttå*) and *ʿáttå* 'now' (vs. contextual *ʿattǻ* and major pausal *ʿǻttå*). Revell (1981) notes the occurrence of pausal forms of *qaṭṭum and *qaṭyum nouns, *qåṭ* (discussed in section 4.3 above) and *qɛ́ṭi*, respectively, within sentences, but does not explicitly identify them as minor pausal forms. Given their distribution, though, they appear to be just that. Pausal forms within a sentence also occur with words that originally stressed short vowels in open, penultimate syllables, such as *ʾǻni* 'I' (contextual *ʾănî*), e.g. in Gen 27:34, or the second person masculine singular possessive suffix *-ɛ́k̲å* (contextual *-k̲ǻ*), e.g. in Deut 5:14.

While only two words can truly be said to have three separate forms for contextual, minor pausal, and major pausal positions, then, the distinction between minor and major pause also applies to the rest of the lexicon. The difference is that some words show the same form in minor and major pause, while the minor pausal form is identical to the contextual form in others. Words which have undergone tonic lengthening have the same form in all three prosodic positions. The distribution of these different forms may be illustrated as in table 4.7. *qaṭṭum nouns have

[18] I.e. at the end of an intonation phrase, a prosodic unit that does not necessarily completely correspond to any single syntactic unit.

Table 4.7: Contextual, minor and major pausal forms of words from different phonotactic categories

environment	*-V́C_1C_2- 'silver'	*-V́$C_1C_1\bar{V}$ 'you (m.sg.)'	*-V́Cy- 'fruit'	*-V́C$\bar{V}$ 'I'	*V́CV- 'word'
context	*kέsεp̄*	*ʾattǻ*	*prí*	*ʾăní*	*dåḇǻr*
minor pause	*kέsεp̄*	*ʾáttå*	*pέri*	*ʾǻni*	*dåḇǻr*
major pause	*kǻsεp̄*	*ʾǻttå*	*pέri*	*ʾǻni*	*dåḇǻr*

been excluded from this overview, as their behaviour differs per individual lexeme (see section 4.3.4).

This distribution can be explained by the following two pausal lengthening rules (and the stress shift rules discussed in section 4.2), which must have operated before the stress shift from a short vowel in an open syllable to a following word-final vowel, but after the change of *VCy > *VCi.

1. In minor (and major) pause, all stressed vowels in open syllables were lengthened. Thus, *ʾánī > *ʾā́nī, etc.

2. In major pause, all stressed vowels were lengthened. Thus, *kásp > *kā́sp, *ʾáttā > *ʾā́ttā, etc.

4.5.2 Dating

Evidence for the dating of pausal lengthening is found in the Greek transcription of the Hexapla. Unlike tonic and pretonic lengthening, which seem to have operated similarly in the reading tradition underlying the Hexaplaric text and that of the Masoretic Text, pausal lengthening is only attested in some cases in the former document.

Stressed vowels in open syllables undergo pausal lengthening in the Hexapla, as is shown by forms like ιδαββηρου 'they speak' (Ps 35:20, Tiberian *yḏabbéru*) and ιεσμωρου 'they keep' (Ps 89:32, Tiberian *yišmóru*; Brønno 1943: 429). Those in doubly closed syllables do not: segolates, for instance, do not have a separate pausal form (p. 430). The evidence concerning singly closed syllables is ambiguous: ϑηληχ 'you (m.sg.) will go' (Ps 32:8, Tiberian *teleḵ*) shows a long vowel, while εχαζεβ 'I will lie' (Ps 89:36, Tiberian *ʾăḵazzeḇ*) does not. Brønno interprets ϑηληχ

Table 4.8: The origin of Hexaplaric pausal forms according to Janssens (1982)

stage	3m.pl. pf.	
	context	pause
proto-form	*qaṭálū	*qaṭálū
pretonic lengthening	*qāṭálū	*qāṭálū
contextual stress shift	*qāṭalū́	*qāṭálū
tonic lengthening	*qāṭalū́	*qāṭā́lū
reduction	*qāṭəlū́	*qāṭā́lū

as the regular form, as he already assumes pausal lengthening to have operated in this environment based on its supposed extension into contextual nominal forms with tonic lengthening; εχαζεβ is then an extension of the context form to a pausal position. Janssens (1982: 63–64), on the other hand, sees ϑηληχ as an erroneous form and concludes that pausal lengthening did not operate in closed syllables – in fact, he denies the Hexapla any operation of pausal lengthening at all. Instead, in his view, it is tonic lengthening which is responsible for forms like ιδαββηρου. In pause, he argues, stress did not shift from the penultimate syllable, and the stressed vowel was subsequently regularly lengthened *in pausa*, but not in context, as shown in table 4.8.

As may be seen from this table, Janssens assumes that tonic lengthening was not conditioned by the length of the following syllable. This is contrary to the formulation of tonic lengthening that was arrived at in section 4.3 above. While it is true that Janssen's account also arrives at the actually attested forms, it relies on a difference in accentuation between context forms and pausal forms, with no lengthening originally involved. No reason why only context forms should shift their accent forward is apparent, although a few such unmotivated stress shifts are attested (see section 4.2). It makes more sense to assume that pausal lengthening of stressed vowels in open syllables, a common crosslinguistic development, took place first, thereby providing the circumstances that maintained the stress on the penultimate syllable *in pausa* (as in table 4.9). Additionally, Janssens's explanation only works if pretonic lengthening preceded tonic lengthening, which is uncertain.[19]

[19]In table 4.9, pretonic lengthening similarly precedes pausal lengthening, but reversing their order would not affect the outcome.

Table 4.9: The origin of pausal forms in words with stressed open syllables

stage	3m.pl. pf.	
	context	pause
proto-form	*qaṭálū	*qaṭálū
pretonic lengthening	*qāṭálū	*qāṭálū
minor pausal lengthening	*qāṭálū	*qāṭ́álū
stress shift	*qāṭalú̯	*qāṭ́álū
reduction	*qāṭəlú̯	*qāṭ́álū

Regardless of the origin of pausal lengthening in open syllables, Janssens may be right that the Hexapla does not show tonic lengthening in any closed syllables. If that is the case, a parallel with the separate treatment of open and closed syllables in minor pause found in Tiberian Hebrew (see the previous section) suggests itself. Assuming the Tiberian reading tradition goes back to one that was very similar to that reflected in the Hexapla – an assumption that seems warranted as long as it does not contradict the facts – it appears that what we may call minor pausal lengthening, i.e. the lengthening of stressed, short vowels in open syllables in both minor and major pause, predates the writing of the Hexapla, while major pausal lengthening, i.e. the lengthening of all stressed vowels in major pause, postdates it. The only form that does not fit this explanation is βεχι 'weeping' (Ps 30:6), which corresponds to (minor) pausal *bɛ́k̲i* in the Masoretic Text. It seems simpler to assume that the Hexapla reflects a context form /bək̲í/ here than to postulate a different operation of pausal lengthening in these two reading traditions based on this one form.

As for the relative chronology of pausal lengthening and other sound changes that interacted with it, minor pausal lengthening preceded most other sound changes affecting the short vowels, with the exception of the shift of *i > *e and *u > *o, as well as the change of word-final *y > *i after consonants. Major pausal lengthening must precede the change of *ā > *a̋. The effects of major pausal lengthening on non-a vowels were largely obscured by the subsequent phonetic lengthening of all accented vowels, but they can still be seen in the change of short *e and *o > *a before word-final guttural consonants vs. the insertion of *páṯaḥ furtivum* between long non-a vowels and word-final gutturals, as in contextual *šāmé꞉ > *šåmá꞉* 'he heard' vs. pausal *šāmé̋꞉ > *šåméă꞉* 'idem'.

4.5.3 Conclusion on pausal lengthening

The simplest way to account for all the data, then, is to posit two separate processes of pausal lengthening:

1. Minor pausal lengthening: stressed short vowels in open syllables were lengthened in minor and major pause, i.e. when the word containing them occurred at the end of an intonational phrase. This sound change postdated the change of *i, *u > *e, *o and that of *y > *i /C_# and predated the stress shift from short vowels in open syllables to following open syllables. It is attested in the Hexapla and thus predates the third century CE.

2. Major pausal lengthening: all stressed short vowels were lengthened. This sound change postdates the third century CE and predates the change of *ā > *å̊ in the Tiberian pronunciation, as well as the change of short *e and *o > *a* before a word-final guttural.

4.6 Summary

Having considered the history of the Hebrew stress system and the three lengthening processes that are conditioned by the stress, we will now review the most important findings and give a broad relative chronology, indicating how these sound changes relate to other developments and to each other.

While tonic, pretonic and pausal lengthening could all be formulated in ways that explain their occasional non-operation based on phonetic conditioning factors, several processes involving the position of the accent seem to be irregular. These processes are the prosodically motivated retraction of the accent known as *nsigå* and the stress shifting to the verbal ending in the first and second person singular consecutive perfect and, in hollow verbs, in other forms too. All three of these processes are closely tied to the text of the Hebrew Bible as it was codified, and as they do not interact with any other changes,[20] they may well be late developments, only having taken place in the reading tradition after Hebrew had died out as a spoken language. In this case, their seeming irregularity may be due to invisible prosodic conditioning. The apparently free variation between *ḥăṭep̄* vowels and *e* after word-initial ʾ must also be a late development, postdating the elision of

[20] Except for the change of unstressed *e, *o > *ɛ, *ɔ in closed syllables, which is triggered by *nsigå*.

unstressed short vowels in open syllables in the third century CE. The alternation between *qaṭ* and *qåṭ* reflexes of *qaṭṭum nouns, on the other hand, cannot be adequately described due to the incompleteness of the data, but it may be regularly conditioned by an interplay of phonetic and prosodic factors.

The other developments can be incorporated in the following timeline (see the relevant sections above for the precise conditioning of each change and a discussion of the exceptions):

1. At some point before the contraction of triphthongs, the stress was fixed on the penultimate syllable of every word (excluding clitics and construct states, which were unstressed). This syllable would remain stressed in most cases.

2. *i and *u in open syllables were reduced to schwa when preceding a stressed non-low vowel. This explains why they did not later participate in pretonic lengthening in this position. Where a morpheme boundary intervened between *i or *u and the stressed vowel, they were analogically restored.

3. *i and *u shifted to *e and *o, respectively. This is a purely phonetic change, but it caused the lengthened versions of these vowels to merge with *ē and *ō rather than *ī and *ū.

4. After the change of *i and *u to *e and *o, tonic lengthening took place. This sound change may be formulated as *$\acute{\breve{\text{V}}}$CV̆ > *$\acute{\text{V}}$CV̆. When tonic lengthening was operative, only nouns in the absolute state had maintained their word-final vowels, which had been protected from the first apocope of word-final short vowels by the presence of mimation. Tonic lengthening must have antedated the second apocope, which deleted these vowels, which had become word-final due to the loss of mimation.

5. Pretonic lengthening may have taken place at any point between the change of *i and *u to *e and *o and the creation of the Septuagint (third century BCE). Pretonic *a in open syllables was regularly lengthened to *ā, *e was lengthened to *ē, except when following a heavy syllable, and *o caused gemination of the following consonant when not following a heavy syllable.

6. Minor pausal lengthening affected short, stressed vowels in open syllables in phrase-final position. It must postdate the change of *i and *u to *e and *o and the change of word-final *-Cy > *-Ci, but predate the stress shift from

short vowels in open syllables to the following vowel. It is already attested in the Hexapla and must therefore predate the third century CE.

7. Major pausal lengthening affected all short, stressed vowels in sentence-final words. It took place after the third century CE and before the Tiberian change of *ā > *å̊. It also antedated the assimilation of *e and *o > *a before word-final gutturals, as well as Blau's Law.

8. The phonetic lengthening of all accented vowels finally obscured much of the operation of tonic and pausal lengthening, but the results of these sound changes can still be seen in the Masoretic Text as differences in the position of the stress and alternating vowel qualities.