Stress Assignment in Tiberian Hebrew

Abbreviated Title: DRESHSTRESS

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1. Introduction

The metrical structure of Tiberian Hebrew, as seen through the assignment of main stress and related processes that lengthen and reduce vowels, has long been problematic for theories of metrical structure. The main problem has been that different processes have required apparently incompatible metrical structures. Thus, Tiberian Hebrew has appeared to lack metrical coherence (Dresher and Lahiri 1991): incompatible metrical constituents interfere with each other in ways that go beyond what is characteristic of metrical structure in other languages.

The simplified bracketed grid (SBG) theory of Idsardi 1992, Halle and Idsardi 1995, and Idsardi this volume offers a more elegant alternative to previous analyses of Tiberian Hebrew metrical structure. I will argue that the evidence previously taken as supporting inconsistent metrical constituents does not in fact require the construction of entire constituents but of more minimal single brackets. The marks required by the different processes do not contradict

each other; rather, metrical structure is constructed progressively without destroying previous marks.

One characteristic of earlier analyses that is retained in the current proposal is the derivational nature of the construction of Tiberian Hebrew metrical structure. The assignment of aspects of metrical structure interacts with phonological processes in intricate ways that create surface opacity. While these results follow straightforwardly from a derivation, they pose a challenge to nonderivational theories.

2. Earlier approaches: Metrical overwriting

Tiberian Hebrew is what van der Hulst 1996 has called a 'main stress first' language, in that main stress is assigned very early, prior to other metrical structure (Blake 1951, Prince 1975, Malone 1993, Balcaen 1995). For reasons to be made clear below, this early stress is assigned to a word-final syllable iff it is closed, and otherwise, to the penult. McCarthy 1979 and Hayes 1980 construct a quantity-sensitive left-headed foot (trochee) at the right edge of the word (1); sample forms are shown in (2).

INSERT (1) AROUND HERE

INSERT (2) AROUND HERE

The words in (2a) and (2c) end in closed syllables, which count as heavy. Hence, the final trochee consists only of this syllable. In (2b) and (2d) the final syllable is open, allowing for a binary foot to be constructed.

The quantity distinctions implied by this patterning classify closed syllables as heavy, and open syllables as light. However, word-final vowels in open syllables tend to be long, as in the above examples. It is typologically unusual to count long vowels as light. Moreover, such a classification contradicts that required by vowel reduction, discussed immediately below, as well as by secondary stress and the phrasing indicated by the system of accents (Dresher 1981a, b, 1994).

The earlier accounts of Tiberian Hebrew stress viewed the anomalous definition of quantity required by main stress as simply one of a number of unusual aspects of the rule. Later analyses have attempted to reconcile the treatment of final long vowels with more usual systems of syllable quantity. In

place of (1), Rappaport 1984 constructs a quantity-insensitive left-dominant binary foot at the right edge of each word. To force stress onto final closed syllables, her analysis first assigns to them an accent, thereby achieving the same result as a quantity-sensitive foot: stress a final closed syllable, otherwise stress the penult. There is little other motivation, however, for assigning lexical accents in Tiberian Hebrew; moreover, accents here are assigned precisely to syllables that are treated as heavy in the rest of the grammar.

Rather than treat final closed syllables in a special way, Balcaen 1995 proposes to reconsider the underlying quantity of final vowels. Final vowels are predictably long in Tiberian Hebrew, suggesting that a rule of final lengthening applies to underlying short vowels.[1] On this analysis, which I adopt here, long vowels can be considered as heavy syllables throughout the grammar, while allowing for main stress to treat final short vowels as light (3).

INSERT (3) AROUND HERE

While the Main Stress rule can now be seen as operating on the same quantity distinctions as the rest of the phonology, the placement of main stress in (3) is

opaque in the sense of Kiparsky 1973, in that main stress does not always surface in the position assigned in (3). In forms (3a) and (3c), main stress surfaces as shown, but this is not the case for (3b) and (3d). In these latter two forms, main stress actually surfaces, in the typical case, on the final syllable, not on the penultimate.

Evidence that the penultimate syllables in these forms are actually stressed at some stage of the derivation comes from the rule of Pretonic Lengthening (PTL).[2] This rule causes a vowel in an open syllable to lengthen when it immediately precedes the main stress. In (5), PTL applies as shown, consistent with the placement of the main stress to this point.

INSERT (4) ABOUT HERE

INSERT (5) ABOUT HERE

There is more evidence supporting the above assignment of main stress. Words that are in prominent prosodic positions, usually marked by Masoretic accents which (imperfectly) indicate Intonational Phrases (Dresher 1994), are

said to be in pause, and are called pausal forms. Forms that are not in pause are contextual forms.

When a word occurs in pause, main stress surfaces on the vowel stressed by the above rules; in many cases, this vowel is also lengthened (6a, b, c). In (6), the extra grid line represents the main phrasal stress.[3]

INSERT (6) ABOUT HERE

In contextual forms, the original main stress (and the trochaic foot) appear to be overwritten by quantity-sensitive iambic feet built from right to left (7). These feet are known as Reduction Feet (R-Feet) because they give rise to an alternating pattern of vowel reduction/deletion, illustrated in (8).

INSERT (7) ABOUT HERE

INSERT (8) ABOUT HERE

Vowels in weak position in these iambic feet are reduced; depending on various conditions, some of these reduced vowels are deleted.

INSERT (9) ABOUT HERE

Additional rules result in the final surface forms of the selected words (11, 12). Some of these rules (not necessarily in order) are given in (10).

INSERT (10) ABOUT HERE

INSERT (11) ABOUT HERE

The main difficulty in this type of analysis has been the relation between the left-headed feet assigned by Main Stress (1) and the right-headed R-feet (7) that govern vowel reduction and deletion. In sample contextual forms (b) and (d), the latter overrun the former, causing the previously stressed vowel to reduce and in some cases delete. This kind of interaction has been problematic, aside from the evident lack of metrical coherence in having two such opposed metrical constituents in the same domain.

Rappaport 1984 proposes that the R-feet are not in fact stress feet, but are constructed on a different plane from the stress feet in (1). Vowel reduction and deletion follows the R-foot plane, independent of constituency assigned by the stress feet. On this account, the R-feet do not have to overwrite the stress feet, but coexist with them.

This solution does not really solve the metrical coherence problem, however. It remains the case that two contradictory types of metrical constituents appear to be required in a single domain, whether we call them R-feet or stress feet. On an empirical level, the claim that R-Feet are simply independent of the stress plain is incorrect. The crucial cases concern the pausal forms. We have seen that in pause, the R-feet do not reduce the vowel stressed by (1), and hence do not cause a shift in stress to the right. In cases where the vowel lengthens under pause, one might suppose that this is due to the fact that the stressed syllable has become heavy, so that the normal application of the R-feet would treat it as any other heavy syllable, which is immune to reduction. An example is (13b).

INSERT (13) ABOUT HERE

In (13b), the lengthened pausal vowel is treated as an R-foot, and thus avoids reduction and loss of stress.

Such an account does not work for forms like (13d), where the stressed vowel does not undergo pausal lengthening. Nevertheless, it retains its stress and

is not reduced. Prince 1975:199 stipulates that the rule of vowel reduction does not affect pausal forms. That is, the extra measure of stress carried by pausal forms is sufficient to make them immune from reduction. While this makes intuitive sense, it is necessary to integrate this explanation into a metrical account. In a biplanar analysis such as (13), construction of reduction feet should not be influenced by marks on the stress plane. Evidently, stress does influence construction of the R-feet.

To my knowledge, none of the metrical analyses proposed for Tiberian Hebrew address the question of how pausal forms like (12d) are derived; that is, how the heightened phrasal stress prevents the construction of an iambic reduction foot that would put the stressed vowel in a weak position. Rather than speculate as to how this fact can be integrated into the above analysis, we will consider it in the context of the revised SBG analysis to be presented in the next section.

3. An SBG analysis

Using unpaired brackets allows for a more elegant derivation in which metrical structure is constructed progressively without destroying previous marks.

The key point concerns the early main stress rule. I propose that this rule does not assign a stress, or even a metrical constituent, but rather a left parenthesis. This parenthesis is assigned to the left of the last vowel of the word that is not absolutely word final. If the final syllable is closed, the parenthesis will go to its left (15a, c); if open, it will go to the left of the penult (15b, d).

INSERT (14) ABOUT HERE

INSERT (15) ABOUT HERE

This rule is followed by Pretonic Lengthening (PTL), reformulated now to be sensitive to the parenthesis assigned by LPI, not to a stress.[4]

INSERT (16) ABOUT HERE

INSERT (17) ABOUT HERE

In earlier analyses, vowel lengthening on an unstressed syllable due to PTL was taken as evidence for positing a stress on the immediately following syllable. This evidence does not necessarily point to a stress; all it shows is that

it is necessary to distinguish the syllable preceding the lengthened one in some way. The left parenthesis accomplishes this in a minimal way.

As in the earlier analyses, at this point the derivation can take two different paths, depending on the prosodic position of the word. Let us first consider the pausal forms. Recall that the surfacing of stress in pausal forms was taken as a second type of evidence pointing to the existence of an early. Unlike the evidence of PTL, pausal evidence does directly indicate an actual stress. Therefore, it is reasonable to suppose that the effect of being the head of a phrase is to cause the assignment of higher-level grid marks to the right of the parenthesis assigned by LPI. To harmonize with the rest of the analysis, in which heads of constituents are on the right, I will suppose in addition that pausal stress induces a right parenthesis to the right of the syllable bearing phrasal stress at every level of the grid.

INSERT (18) ABOUT HERE

On this account, Pausal Lengthening is a distinct process that applies to certain vowels that have pausal stress.

INSERT (19) ABOUT HERE

INSERT (20) ABOUT HERE

INSERT (21) ABOUT HERE

If we choose the contextual path, the process of assigning the R-feet that control vowel reduction and deletion can be decomposed into steps that assign a right parenthesis to the right of a heavy syllable (22), operating on the output of (14); insert a right parenthesis every two syllables, starting from the right (23); and project the rightmost element of each constituent onto line 1 (24).

INSERT (22) ABOUT HERE

INSERT (23) ABOUT HERE

INSERT (24) ABOUT HERE

INSERT (25) ABOUT HERE

As before, vowels in the weak position of a foot are reduced or deleted (26).

INSERT (26) ABOUT HERE

The head of the rightmost foot is assigned main stress (27),[5] (28).

INSERT (27) ABOUT HERE

INSERT (28) ABOUT HERE

In the pausal forms, the medial vowel is protected from reduction by the early Pausal Stress rule (18).

INSERT (29) ABOUT HERE

Applying the other rules in (10) as before, we arrive at the surface forms in (11) and (12).

4. The opacity of metrical structure assignment in Tiberian Hebrew

We have derived two surface forms for our sample verb, [hɔːrɔ́ːɣuː] in pause, and [hɔːrɣúː] in context. In the case of pause, there is no possibility of this stress clashing with a following one, since pausal forms by definition are final in their Intonational Phrase. But a contextual form may be followed in the same Phonological Phrase by a word with initial stress, and this situation will trigger Stress Retraction. Retraction moves the main stress back to the next full vowel in an open syllable, yielding [hɔ́ːrɣuː] in our example.

INSERT (30) ABOUT HERE

INSERT (31) ABOUT HERE

The challenge, for a constraint-based theory that selects optimal candidates in a single pass (Prince and Smolensky 1993), is to devise a grammar that obtains all three surface forms – pausal [hɔːrɔ́ːɣuː], unretracted contextual [hɔːrɣúː], and retracted contextual [hɔ́ːrɣuː] – from the single underlying form /harag + u/. Revell 1987:111 interprets the facts diachronically, and argues that stress retraction must have developed following vowel reduction. For if it did not, retraction would have been to the medial vowel, and the retracted form should have been the same as the pausal form.

This argument is actually a synchronic argument about the grammar of Tiberian Hebrew. Since the pausal form shows that the medial vowel is stressable, why is the same form not optimal when a form with nonfinal stress is required? Any nonderivational solution would have to overcome the considerable amount of opacity involved in the derivational approach sketched above.[6]

Notes

1 Some final vowels surface as short, but these can be shown to derive from vowel-consonant sequences.

2 There are certain restrictions on the rule; see Prince 1975:62–66, Malone 1993:85–87.

3 Notice that we must assume that words are already in place in phrases at this point in the derivation. This presupposes that some phrasing has already taken place before the phonological derivation is complete (Dresher 1983).

4 This formulation is inspired by Balcaen 2000. As before, there are restrictions on the rule that we do not discuss here.

5 This rule does not apply, or applies to no effect, in pausal forms, as they already have the main phrasal stress assigned.

6 On the particular problems caused by the opacity of spirantization, see Idsardi 1997, 1998.