

## Squibs and Discussion

REMARKS ON TIER CONFLATION  
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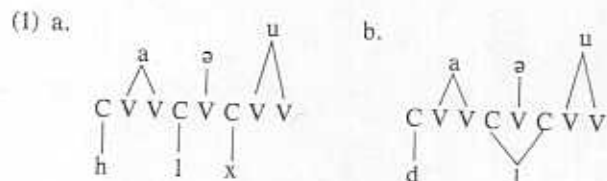
I. McCarthy (1986) posits a process of Tier Conflation by which independent segmental tiers, which correspond to distinct morphemes, are folded onto a single linearized tier. Tier Conflation, identified with Bracket Erasure, removes morphemic distinctions with the result that following rules are "not sensitive to any phonological or morphological information that Tier Conflation/Bracket Erasure would have destroyed" (McCarthy (1986, 228)).

McCarthy's argument for Tier Conflation is based on the observation that much of the phonology of Semitic-like languages, which exhibit CV-segregation in their lexical representation, requires linear segmental representation like that of the more familiar languages.<sup>1</sup>

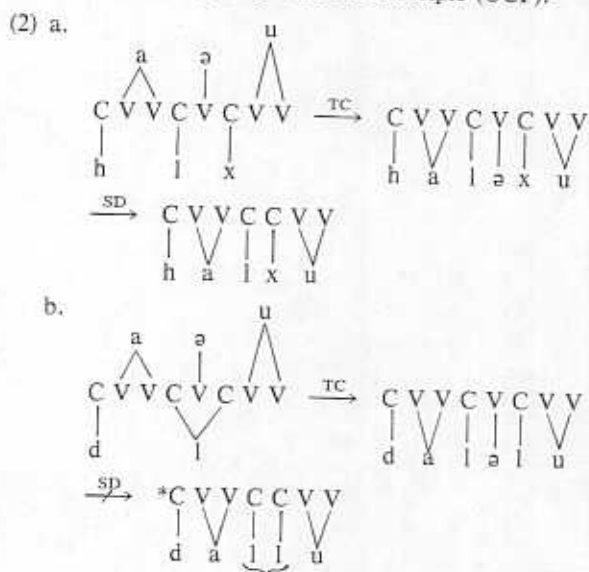
One piece of evidence for Tier Conflation is the antigemination effect found in Tiberian Hebrew, where schwa is deleted in two-sided open syllables, as in /haaləxuu/ → *haalxuu* 'they walked'. This rule fails to apply when schwa is flanked by identical consonants, as in *daaləluu* (\**daalluu*) 'they hung'. The structural description of Schwa Deletion must specify the vocalic tier and the CV-skeleton. But there is nothing in the structure of /haaləxuu/ and /daaləluu/ in (1) from which the application of Schwa Deletion to one but not the other would follow.

I wish to acknowledge the invaluable comments of Steve Anderson, David Gil, Bruce Hayes, and the anonymous LI reviewer. None of them necessarily agrees with anything said herein.

<sup>1</sup> As argued in McCarthy (1981), in Semitic languages vowels and consonants, which correspond to distinct morphemes, are lexically represented on separate tiers. CV-segregation has been proposed for non-Semitic languages as well, for example, Yawelmani (Archangeli (1984)), Gta? (McCarthy 1982)), and Rotuman (McCarthy 1986)). This issue is quite controversial, as can be seen from the discussion in Steriade (1986), Odden (1987), and Prince (1987). For the purposes of this squib I do not take a position on the more general extension of this analysis beyond Semitic. For the sake of argument I follow McCarthy's hypothesis that in Semitic languages distinct morphemes appear on separate tiers.

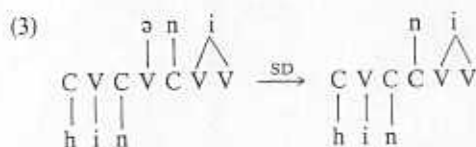


To account for the fact that Schwa Deletion applies in (1a) but not in (1b), although their vocalic tier and CV-skeleton are identical, McCarthy suggests that Schwa Deletion applies after Tier Conflation, that is, on a linear segmental representation. Schwa Deletion is blocked in the environment of two identical consonants (see (2b)), since otherwise the resulting structure would violate the Obligatory Contour Principle (OCP).

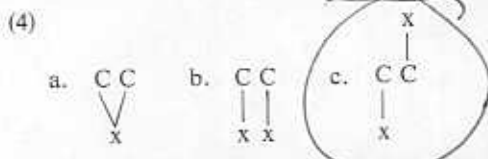


OCP violation

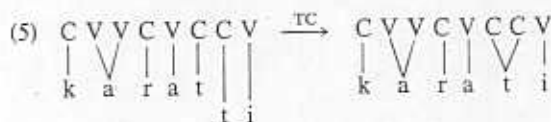
Schwa is, however, deleted between identical consonants when these are heteromorphemic, as in (/hinn + enii/ Vowel Reduction and Degemination →) /hinanii/ → *hinnii* 'behold me'. To account for this, McCarthy proposes that Tier Conflation applies twice, at different levels of lexical phonology. The multi-tiered representation of vowels and consonants is linearized before Schwa Deletion, with the result that Schwa Deletion is blocked in /daaləluu/; but the affix/stem distinction is eliminated only after Schwa Deletion. The output of Schwa Deletion between heteromorphemic identical consonants does not create a structure that violates the OCP, since at the time the rule applies the relevant consonants are on separate tiers, as shown in (3). Therefore, the OCP is irrelevant.



This analysis argues that the relevant segments must be on the same tier for the OCP to be applicable. Thus, the OCP is respected in (4a), is violated in (4b), and does not apply in (4c).

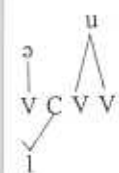


Loss of morphemic distinction is exhibited by Tiberian Hebrew Spirantization, by which nongeminated nonemphatic stops are spirantized when preceded by a vowel. Spirantization is blocked before tautomorphic geminates as well as heteromorphemic ones. It is claimed that Spirantization applies after Tier Conflation, which wipes out the stem/affix distinction. As a consequence of Tier Conflation, a fake geminate created by morpheme concatenation becomes a true geminate, as in (5), which like underlying true geminates blocks Spirantization.



In sum, Tier Conflation is required to account for the linear phonology of nonconcatenative morphological structures. Morphemic distinctions are removed by Tier Conflation for the purpose of subsequent rules.

2. In this squib I will argue against the claim that Tier Conflation removes morphemic distinctions. As a consequence, the strategy of placing morphemes on different tiers is inadequate for the purpose of distinguishing them from one another. The argument is based on a morphologically conditioned rule of Metathesis found in Modern Hebrew. The interaction of Metathesis with a voicing assimilation rule reveals that Metathesis must follow Tier Conflation; at the same time, however, it crucially refers to the morpheme boundary, which is supposed to be removed by Tier Conflation. This contradiction suggests that tier distinction is not the only cue for morphemic distinctions. Additional support for this claim is drawn from a morphological process of Extraction found in Modern Hebrew, whereby consonants are peeled away from a fully specified lexical form, resulting in a new root.



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l consonants ii/ Vowel Re- 'behold me'. er Conflation y. The multi- is linearized a Deletion is tion is elimi- hwa Deletion es not create time the rule ers, as shown

*Metathesis* applies between the prefixed /t/ of the verb template *hit* + *CaC<sub>1</sub>eC* and a stem-initial sibilant (/c, s, z, š/).<sup>2</sup>

- (6) /hit + calem/ → hictalem  
 'he took pictures of himself'  
 /hit + sarek/ → histarek  
 'he combed his (own) hair'  
 /hit + šamer/ → hištamer  
 'he preserved himself'  
 (compare /hit + raxec/ → hitraxec  
 'he took a shower')

Metathesis does not apply if the *t*-plus-sibilant sequence is tautomorphic. Thus, /hi + tsis/ 'he fermented' and /hi + tšiš/ 'he exhausted' do not become \**histis* and \**hištis* but instead persist on the surface unchanged. Nor does Metathesis take place when the morpheme boundary occurs in a form other than the verb template *hit* + *CaC<sub>1</sub>eC*. Thus, /t + šuva/ 'reply' does not become \**štuva* (compare *hešiv* 'he replied').

In order to block Metathesis from applying to tautomorphic *t*-plus-sibilant sequences, the rule must refer to morpheme boundaries. It should also be restricted to the verb class, so that the noun prefix *t*- plus stem-initial sibilant will remain intact.<sup>3</sup> A rough formulation of the rule is given in (7).

$$(7) \quad t + \begin{bmatrix} - \text{son} \\ + \text{cor} \\ + \text{strid} \end{bmatrix}_{[+ \text{VERB}]}$$

1            2                    ⇒ 2 1

Relevant to our discussion is the regressive Voicing Assimilation rule formulated in (8) (see Bolozky (1977) and Barkai and Horvath (1978) for discussion on Voicing Assimilation in Modern Hebrew).

$$(8) \quad [- \text{son}] \rightarrow [\alpha \text{voiced}] / \text{---} \begin{bmatrix} - \text{son} \\ \alpha \text{voiced} \end{bmatrix}$$

<sup>2</sup> *hit* + *CaC<sub>1</sub>eC* is an abbreviation of the multitiered representation in (i).

$$(i) \quad \begin{array}{ccccccc} & & & a & & e & \\ & & & | & & | & \\ C & V & C & C & V & C_1 & V & C \\ | & | & | & & & & & \\ h & i & t & & & & & \end{array}$$

which is the CV-skeleton (where *C<sub>1</sub>* stands for one, two, or three C-slots), the prefix, and the vocalic pattern of the hitpa'el binyan in Modern Hebrew.

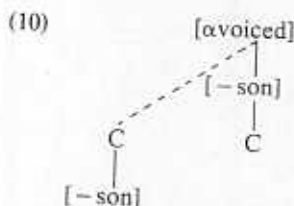
<sup>3</sup> A reviewer has suggested a level-ordering account in which the rule would not have to be specified to apply to verbs only. This requires a detailed analysis of Modern Hebrew lexical phonology that has yet to be worked out. In any event, the morphological status of the *t* must be specified, which is the point of this discussion.

Voicing Assimilation is optional everywhere (9a), except across the morpheme boundary of the verb template *hit*+*CaC<sub>1</sub>eC* (9b), where it is obligatory.

- (9) a. /zkenim/ → zkenim ~ skenim  
           'old masc. pl.'  
       /rakad + ti/ → rakadti ~ rakatti  
           'I danced'  
       b. /hit + darder/ → hiddarder (\*hitdarder)  
           'he declined, rolled down'  
       /hit + balet/ → hidbalet (\*hitbalet)  
           'he became prominent'

The output of Voicing Assimilation exhibits the integrity effect, surfacing as a doubly linked node (see Steriade (1982) and Hayes (1986)). An epenthetic *e* (phonetically schwa or [ɛ]) is optionally inserted between heteromorphemic coronal stops<sup>4</sup> just in case Voicing Assimilation does not apply. Thus, /rakad + ti/ can surface as *rakadeti* if Voicing Assimilation does not apply (recall that it is optional) but can never surface as \**rakateti* if Voicing Assimilation does apply. Epenthesis never applies to the forms in (9b), where Voicing Assimilation is obligatory; thus, \**hitedarder* is wrong.<sup>5</sup>

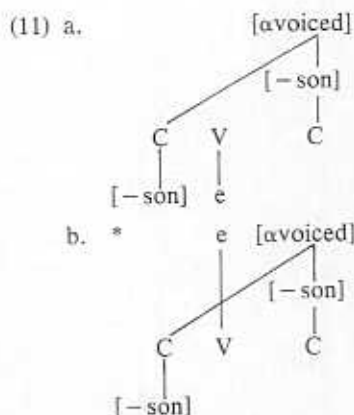
In order to achieve the integrity effect on the output structure of Voicing Assimilation, it must be assumed that the segments participating in Voicing Assimilation appear on the same tier. Indeed, as suggested by a reviewer, one could formulate Voicing Assimilation as applying across multiple tiers, as in (10).



The question is whether the output representation in (10) is subject to integrity, and the undesirable answer is yes and no; an epenthetic *e* can be inserted on one tier (11a) but not on the other (11b), because of the prohibition against crossing lines.

<sup>4</sup> This case of Epenthesis is not due to the OCP, since the rule does not apply in /tiken + nu/ → tikannu (\*tikanenu) 'we fixed'. Whether the particular environment is restricted to coronal stops or applies to any pair of stops is unclear since the only suffix-initial or prefix-final consonants are coronals. Epenthesis does not apply between the coronal affricate [c] and the voiceless coronal stop (/kafac + ti/ → kafacti) 'I jumped'.

<sup>5</sup> Some speakers may exhibit hypercorrection, thus pronouncing the form *hitdarder*. Nevertheless, Epenthesis is still inapplicable.



It seems that by allowing rules to apply across multiple segmental tiers, we evacuate the notion of integrity, which follows from the prohibition against crossing lines. Structures like (10), which result from rules of this sort, are ambiguous with respect to integrity, as shown in (11). This is an undesirable situation that the theory should avoid.

We may thus conclude that Voicing Assimilation should operate on a single segmental tier; therefore, it must follow Tier Conflation, after which the prefixed *t* and the stem-initial sibilant are on the same tier.

Consider now the data in (12), where Metathesis and Voicing Assimilation interact.

- (12) /hit + zaken/  $\xrightarrow{VA}$  hidzaken  $\xrightarrow{M}$  hizdaken  
       'he grew old'  
       /hit + zarez/  $\xrightarrow{VA}$  hidzarez  $\xrightarrow{M}$  hizdarez  
       'he hurried'

As can be seen from these examples, Voicing Assimilation must precede Metathesis, since otherwise they would produce \**hiztaken* and \**hizarez*. Since Voicing Assimilation follows Tier Conflation and Metathesis follows Voicing Assimilation, by transitivity Metathesis must apply after Tier Conflation, that is, after the affix/stem distinction has been leveled out.<sup>6</sup> However, if Tier Conflation removes morphemic distinctions, Metathesis could not be sensitive to morpheme boundaries; it could not

<sup>6</sup> In his (1981) article McCarthy observes that Metathesis in Akkadian (as well as in Tiberian Hebrew) "is restricted to a particular conjunction of morphological circumstances . . ." (p. 381). In McCarthy (1986), where he considers only stem-internal metathesis, he makes the following claim: "[T]he metathesis rules in various Semitic languages not only are consistent with application before Tier Conflation but in fact require it . . ." (p. 248). Although the latter claim is correct for the data analyzed there, it is arguably wrong for the data from Modern Hebrew.

ere (9a), except  
template hi+

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distinguish between /hit + sarek/ and /hi + tsis/, applying to the former, where the *t*-plus-sibilant sequence is heteromorphemic (resulting in *histarek* 'he combed his own hair'), but not to the latter, where the *t*-plus-sibilant sequence is tautomorphemic (*hitsis* 'he fermented').

*Extraction* provides another source of evidence for the visibility of morphemic distinctions after Tier Conflation. *Extraction* creates new consonantal roots out of fully specified lexical items, to which Tier Conflation has presumably applied (see detailed discussion in Bat-El (1985; 1986)). For example, from the loanword *telefon* 'phone' and the adjective *varod* 'pink', the roots *t-l-f-n* and *v-r-d* can be extracted, and then associated with verb templates provided by the language to yield *tilfen* 'make a phone call' and *hivrid* 'become pink'.

The facts of interest here arise when *Extraction* operates on affixed forms. Affixal as well as root consonants are subject to *Extraction*, as can be seen from the verb *mixzer* 'to recycle', whose root, *m-x-z-r*, has been extracted from the noun *maxzor* 'cycle', where the /m/ is a nominal prefix and the stem root *x-z-r* has the basic meaning 'return'.

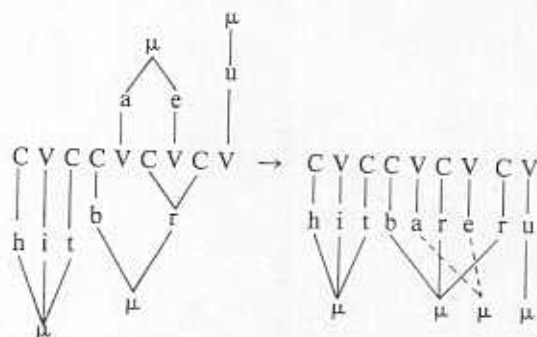
Affixes are extracted along with the original consonantal root on the basis of a need for new roots, or lexical blocking. The noun *toxnit* 'plan', where the final *t* is a suffix, has provided the base for two roots, *t-x-n*, as in *tixnen* 'to plan', and *t-x-n-t*, as in *tixnet* 'to program' (note that the noun related to *tixnet* is *toxna* 'program'). Similarly, the verb meaning 'to hebraize' derived from *ʔivrit* 'Hebrew' has two alternative forms, *ʔivret* and *ʔivrer*. The latter is not very common since it is homophonous with the one meaning 'to ventilate', derived via *Extraction* from the noun *ʔavir* 'air'. The importance of this observation is that affixes are identified on the surface forms—in other words, after Tier Conflation—and can be extracted if required. This also suggests that morphemic distinctions are always visible.

It may be concluded that although Tier Conflation may destroy the phonological cue for morphemic distinctions, as in the Spirantization case, it does not suppress morphemic distinctions entirely, since rules that follow it may refer to morpheme boundaries.

3. It is thus essential to recognize that tier segregation and Tier Conflation are relevant only to phonological representations. McCarthy (1981) suggests that morphemic distinctions are encoded phonologically, by tier segregation, as well as morphologically, by morpheme nodes ( $\mu$ ), but he fails to mention the fate of these nodes after Tier Conflation. I therefore argue that Tier Conflation, which is a phonological process, eliminates the phonological cue for morphemic distinctions, but that the mor-

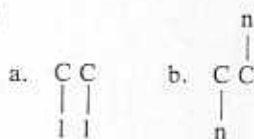
phonological cue (the morpheme nodes) remains intact, as illustrated in (13) for the Modern Hebrew form /hitbareru/ 'they were clarified'.

(13)



The data given in McCarthy (1986) exemplify pure phonological rules (rules that refer to phonological representations) and not morphologically conditioned rules (rules that refer to morpheme boundaries). The fact that Schwa Deletion is blocked in /daaləluu/ but not in /hin + əni/ is due not to the morphemic distinction in the latter form but rather to the phonological representation that Schwa Deletion would produce, (14a) versus (14b).

(14)



where the former, but not the latter, violates the OCP. Indeed, the second structure results from morpheme concatenation, but this information is not relevant for Schwa Deletion; only the phonological structure is crucial.

In order to support the claim that morphemic distinctions are removed by Tier Conflation, the following hypothetical case would be of interest: a phonological rule that was sensitive to morpheme boundaries but failed to apply after the application of Tier Conflation, even though its structural description was met. The opposite case has been provided here. Metathesis, which applies only across morpheme boundaries, takes place after Tier Conflation, referring to the boundary that was supposedly removed.

I therefore conclude that Tier Conflation is a phonological operation and does not wipe out morphemic information. The latter persists as linking to morpheme nodes.

