Squibs
and
Discussion

1. McCarthy (1986) posits a process of Tier Conflation by which
independent segmental tiers, which correspond to distinct mor-
phemes, are folded onto a single linearized tier. Tier Conflation,
identified with Bracket Erasure, removes morphemic distinc-
tions with the result that following rules are “not sensitive to
any phonological or morphological information that Tier Con-
flation/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 lan-
guages, which exhibit CV-segregation in their lexical represen-
tation, requires linear segmental representation like that of the
more familiar languages.¹

One piece of evidence for Tier Conflation is the antigemi-
nation effect found in Tiberian Hebrew, where schwa is deleted
in two-sided open syllables, as in /haa:lɔxu/ → haalɔxu ‘they
walked’. This rule fails to apply when schwa is flanked by iden-
tical consonants, as in daalɔluu (‘daallu’ ‘they hung’). The
structural description of Schwa Deletion must specify the vo-
calic tier and the CV-skeleton. But there is nothing in the struc-
ture of /haa:lɔxu/ and /daa:luu/ in (1) from which the appli-
cation of Schwa Deletion to one but not the other would follow.

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

¹ As argued in McCarthy (1981), in Semitic languages vowels and
consonants, which correspond to distinct morphemes, are lexically rep-
resented on separate tiers. CV-segregation has been proposed for non-
Semitic languages as well, for example, Ya’elman (Archanegli (1984)),
Gut (McCarthy 1982), and Rotman (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 hy-
thesis that in Semitic languages distinct morphemes appear on sepa-
rate tiers.
(1) a. 
\[ \text{CVVCVCVV} \]
\[ \text{h \ x} \]

b. 
\[ \text{CVVCVCVV} \]
\[ \text{d \ i} \]

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).

(2) a. 
\[ \text{CVVCVCVV} \]
\[ \text{h \ x} \] \rightarrow \text{OCP violation}
\[ \text{CVVCVCVV} \]
\[ \text{h \ a \ l \ a \ x \ u} \]

b. 
\[ \text{CVVCVCVV} \]
\[ \text{d \ i} \] \rightarrow \text{OCP violation}
\[ \text{CVVCVCVV} \]
\[ \text{d \ a \ l \ a \ x \ u} \]

Schwa is, however, deleted between identical consonants when these are heteromorphemic, as in (/hinn + eiti/ Vowel Reduction and Degemination \( \rightarrow \) /hinulii/ \( \rightarrow \) hinulii '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 /daelaai/; 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 tautosynthetic 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.
Metathesis applies between the prefixed /t/ of the verb template /hit+CaC₁eC/ and a stem-initial sibilant (/s, z, s/).²

(6) /hit+galem/ → /higalem/
   ‘he took pictures of himself’

   /hit+serek/ → /higarek/
   ‘he combed his (own) hair’

   /hit+šamer/ → /higšamer/
   ‘he preserved himself’

   (compare /hit+raxec/ → /hitraxec/
   ‘he took a shower’)

Metathesis does not apply if the /t/-plus-sibilant sequence is tautomorphemic. Thus, /hi+ṭis/ ‘he fermented’ and /hi+tis/ ‘he exhausted’ do not become *hitis and *hitis 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+CaC₁eC/. Thus, /ṭ+šuva/ ‘reply’ does not become *ṭuva (compare ḥesiv ‘he replied’).

In order to block Metathesis from applying to tautomorphemic /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.³ A rough formulation of the rule is given in (7):

(7) \[ [\text{-son}] + \text{VERB} \rightarrow [\text{-son}] \]

1 \[ \text{2} \rightarrow \text{2} \]

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

(8) [\text{-son}] → [\text{voiced}] / [\text{son}] [\text{voiced}]

² /hit+CaC₁eC/ is an abbreviation of the multi-tiered representation in (6).

³ 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 \( \text{hit} + \text{CaC}_{1} + \text{C} \) (9b), where it is obligatory.

(9) a. \(/\text{zkenim} / \rightarrow \text{zkenim} \rightarrow \text{skenim} \quad \text{'old masc. pl.'} \)
   \(/\text{rakad} + \text{ti} / \rightarrow \text{rakadji} \rightarrow \text{rakadii} \quad \text{'I danced'} \)

b. \(/\text{hit} + \text{gderer} / \rightarrow \text{hidgderer} (\text{'hidgderer'}) \quad \text{'he declined, rolled down'} \)
   \(/\text{hit} + \text{blet} / \rightarrow \text{hidblet} (\text{'}\text{bhidblet}') \quad \text{'he became prominent'} \)

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 \([e] \)) is optionally inserted between heteromorphemic coronal stops; just in case Voicing Assimilation does not apply. Thus, \(/\text{rakad} + \text{ti} / \) can surface as \(/\text{rakadeti} / \) if Voicing Assimilation does not apply (recall that it is optional) but can never surface as \(*\text{rakati} / \) if Voicing Assimilation does apply. Epenthesis never applies to the forms in (9b), where Voicing Assimilation is obligatory; thus, \(*\text{hitgderer} / \) is wrong.

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).

```
  [voiced]
  / \    \\
  \  /    \\
  [ - son ]
  +---+
   \  \\
    [- son]
  ---
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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.

This case of Epenthesis is not due to the OCP, since the rule does not apply in \(/\text{tiken} + \text{ni}/ \rightarrow \text{tikanenu} (\text{'}\text{tikanenu}') \) '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 \(/\text{kafit} + \text{ti} / \rightarrow \text{kafiti} (\text{'}\text{kafit} \quad \text{'}\text{kafiti}') \) 'jumps'.

Some speakers may exhibit hypercorrection, thus pronouncing the form \(/\text{hidgderer} / \). Nevertheless, Epenthesis is still inapplicable.
(11) a. \[ \text{[avoi\textit{ced}]} \]
   \[ \text{C} \]
   \[ \text{\lbrack \text{\textit{son}}\rbrack} \]
   \[ \text{V} \]
   \[ \text{C} \]

b. \[ * \text{\lbrack \text{\textit{son}}\rbrack} \text{[avoi\textit{ced}]} \]
   \[ \text{C} \]
   \[ \text{\lbrack \text{\textit{son}}\rbrack} \]
   \[ \text{V} \]
   \[ \text{C} \]

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) \( \text{/hit+gaken/} \overset{VA}{\rightarrow} \text{hidzaken} \overset{M}{\rightarrow} \text{hizdaken} \)
   \( \text{\textquote{he grew old}} \)

\( \text{/hit+zarez/} \overset{VA}{\rightarrow} \text{hidzurez} \overset{M}{\rightarrow} \text{hizdarez} \)
   \( \text{\textquote{he hurried}} \)

As can be seen from these examples, Voicing Assimilation must precede Metathesis, since otherwise they would produce *his\textquote{taken} and *hiz\textquote{tarez}. 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. However, if Tier Conflation removes morphemic distinctions, Metathesis could not be sensitive to morpheme boundaries; it could not

\* 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.
s multiple which structures like guous with undesirable ion should follow Tier initial sibii and Veic...
phological cue (the morpheme nodes) remains intact, as illustrated in (13) for the Modern Hebrew form /hitbareru/ 'they were clarified'.

(13)

\[ 
\begin{align*}
\text{CVCCVCVCV} & \rightarrow \text{CVCCVCVCV} \\
\text{hitb} & \text{eralu} \\
\end{align*}
\]

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 /daalalu/ but not in /hin-umil/ 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)

\[ 
\begin{align*}
\text{a. } & \text{CC} \\
\text{b. } & \text{CC} \\
\end{align*}
\]

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.
A NOTE ONBOUND PRONOUNS
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1. Three nominal expressions are recognized in binding theory: anaphors, pronouns, and referential expressions. The distribution of these three nominal expressions and their positions relative to their antecedents in a sentence are regulated by Principles A, B, and C of the binding theory, respectively. By virtue of these conditions, anaphors impose a locality restriction on

For their help, I would like to thank Neil Smith, Rita Manzini, Michael Brody, Dick Hudson, and two LI reviewers.