

Towards a Constrained Theory of Morphological Discongruities: “Tops-together” Parallel Representations

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Towards a Constrained Theory of Morphological Discongruities: “Tops-together” Parallel Representations

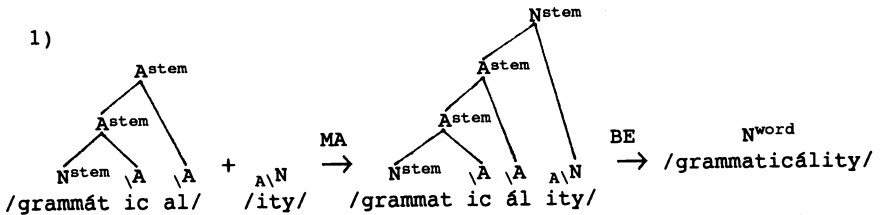
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0. Introduction

To account for bracketing paradoxes in a constrained way, compatible with Lexical Phonology, this paper proposes a new type of ‘parallel’ structure, in which the representations of two sub-components interact only weakly, through their top-most (root) nodes (so that the autonomy of modules of grammar is respected). These “tops-together” parallel representations will handle bracketing paradoxes, shed new light on the nature of Bracket Erasure, and explain syntactically-relevant morphological incorporation within a constrained morphology-syntax interface.

1. Minimal Theory of Morphology

Since the rise of the Lexicalist Hypothesis, the most constrained view of morphology (the null hypothesis) has been that morphological representations are always simple, strictly hierarchical tree representations, and that there are only two kinds of operations on these representations. First, there is morpheme addition, which is a phonologically-peripheral adjunction to the top (root) node of the morphological representation of the base. This is illustrated on the left of diagram (1), in which a pseudo-categorical-grammar notation is used to show the affix subcategorizations, and for convenience orthography is used instead of phonological representations:



Here */-ity/* cannot adjoin to a non-topmost *A^{stem}* or *A* node, and there is no way to add */-ity/* non-peripherally between */-ic/* and */-al/* in the phonological string. Non-concatenative morphology, such as melody-to-skeleton association, prosodically-governed infixation etc. can be handled within a slightly expanded definition of “peripheral” (since these phenomena make reference to either the right or left edge of the bases to which they apply: McCarthy and Prince 1990).

The second operation is *Bracket Erasure*, in which a morphological (sub-)tree is simplified by deleting all nodes except the topmost node. Any categorial (morphosyntactic) information associated with the non-topmost nodes is lost, while the phonological information percolates to the topmost node. In any lexicalist theory the syntax only sees bracket-erased morphological representations, so that words are syntactically unanalyzable atoms. In the theory of Lexical Phonology, Bracket Erasure also occurs in the morphology between strata; this is shown on the right of (1) for the simplest version of Lexical Phonology (with only an early ‘stem’ or cyclic stratum, and a late ‘word’ or non-cyclic stratum – Kiparsky 1986).

2. Bracketing Paradoxes

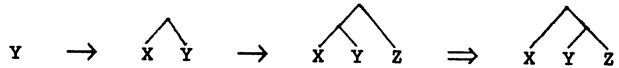
In Lexical Phonology, rules of morpheme-addition create successively larger domains for the application of phonological rules. If this assumption is combined with that of Level-Ordered morphology, the result is that the affixes which trigger cyclic and/or more deeply morphologized phonological rules must be added in earlier strata of the morphology/lexicon, while less phonologically cohering (relatively non-stem-affecting) non-cyclic affixes are added at later strata.

Here the phonological constituency of the well-known bracketing paradox *ungrammaticality* must be $un[[grammatical]ity]$, where cyclic (stress-shifting) /-ity/ is added at an earlier stratum than non-cyclic /un-/. But morphosyntax and compositional semantics requires $[un[grammatical]]ity$ (/un-/ subcategorizes to attach to an adjective, not a noun, and /-ity/ has scope over /un-/, so that the word means 'the property of not being grammatical', rather than 'not the property of being grammatical'). In Lexical Phonology, *grammaticálicity* would have undergone stem-level Bracket Erasure to unanalyzable $[Ngrammaticálicity]$ (as on the right-hand side of (1) above) before the affixation of /un-/, so that this affixation could not derive the desired output constituency $[N[Aun[AGrammatical]]ity]$.

3. Types of Bistructural Derivations

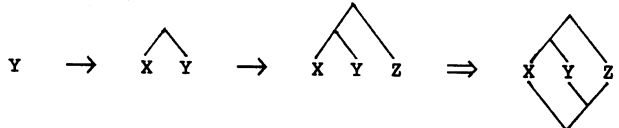
Most accounts of bracketing paradoxes are 'bistructural', i.e. represent the two conflicting constituencies separately (as opposed to the 'monostructural' theory of §1-2 above). There are several logical possibilities for representing two conflicting constituencies (the following typology is a modification and expansion of that in Sproat 1985). In a monorepresentational bistructural approach, one representation is built up during the course of a derivation, with a constituency reflecting the successive domains of morpheme-addition. The constituency of this representation is then transformed by a special operation, so that the two conflicting constituencies are never both represented at the same stage of the derivation.

2) Representation 1



In birepresentational approaches, both constituencies are represented simultaneously (i.e. the end result of the derivation is what has been called a 'parallel representation'). In a birepresentational non-parallel derivation, the second representation is derived from the first, after the first representation has been built up:

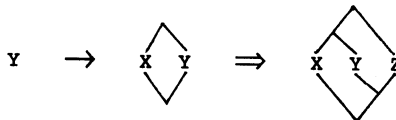
3) Representation 1



Representation 2

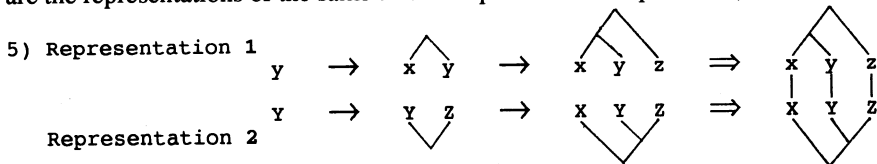
In a birepresentational parallel derivation, both representations are built up during the course of the derivation (here the representation of component 2 must undergo restructuring as part of the derivation):

4) Representation 1



Representation 2

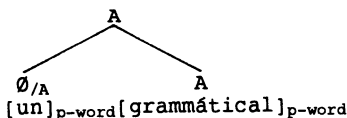
Finally, in a biderivational, birepresentational account the representation of each morphological component is built up separately, and the two representations are only correlated with each other after being fully derived. (In diagram (8), *x*, *y*, and *z* are the representations of three morphemes in component 1, and *X*, *Y*, and *Z* are the representations of the same three morphemes in component 2.)



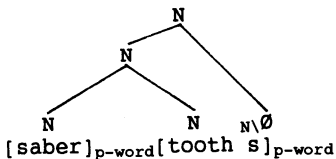
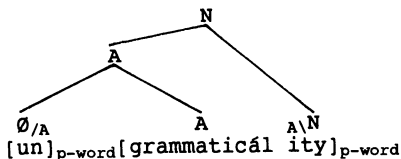
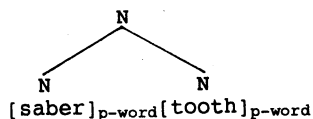
4. Prosodic Account of Cohn (1989), Aronoff and Sridhar (1983)

Aronoff and Sridhar (1983), Booij and Rubach (1984), and Cohn (1989) have pointed out that even the conventional morphological derivations of section 1 above are birepresentational in one sense: during the course of the derivation, a prosodic phonological hierarchy (syllable, foot, prosodic word) is built up which is independent of morphological constituency. Since the application of phonological rules can be restricted by such prosodic domains, these authors propose to explain bracketing paradoxes by identifying the domains within which the relevant phonological rules apply as far as possible with these prosodic categories (especially the prosodic word), rather than with the cyclic morphological domains created by successive morpheme-addition operations. So this is a birepresentational parallel derivation like that in (4) above. As in the theory of §1 above, morphemes are added in the order which reflects morphosyntactic/morphosemantic compositionality, and prosodic constituents are restructured by morpheme addition (such prosodic restructuring will take place anyway even in non-bracketing-paradox cases, such as *sabertooths* in (7) below, under almost any theoretical account).

6) A
[grammátical]_{p-word}



7) N
[tooth]_{p-word}



Prosodic restructuring occurs in the last stage of the derivations in (6)-(7), where the affixes /-ity/ and /-s/ form a close prosodic constituent only with *-grammátical-* and *-tooth-*, even though each of them is morphosemantically and categorially construed with the base as a whole. Here the former 'stem'-stratum rules of Lexical Phonology apply only within prosodic words (but not necessarily early in the derivation), while the former 'word'-stratum rules can apply across

the prosodic word boundaries within a lexical compound phonological word (what Cohn, using a somewhat unfortunate terminology, calls the 'clitic group').

In such an account of bracketing paradoxes, where the order of morpheme additions reflects morphosemantic/morphosyntactic considerations, and the domains of phonological rule application are derived by restructuring (do not reflect derivational history), Level Ordering is not obeyed. Thus in (6) the non-cyclic affix /un-/ is attached before cyclic /-ity/. However, Fabb (1988), Aronoff and Sridhar (1983), and Churma (1983), among others, have criticized strict Level Ordering. It has been observed that word/non-cyclic affixes are not always added outside stem/cyclic affixes, in English and other languages, and that most phenomena explained by Level Ordering in conventional Lexical Phonology can be accounted for by invoking selectional restrictions among affixes, marking of some affixes as [+Latinate] with subcategorization of affixes to attach only to [+Latinate], and by making a distinction between productive and non-productive inflectional endings. So such a 'morphology-driven, phonological-restructuring' account of bracketing paradoxes cannot be ruled out simply because Level Ordering is violated.

4.1 Problems for the Prosodic Account

This prosodic account has the advantages of being a very restrictive theory that differs very little from the minimal morphological theory of §1 above, and of using an independently-needed mechanism (the prosodic hierarchy of phonological theory). Unfortunately this account has some complications and inadequacies.

One problem is that the domains of phonological rule application for English cannot actually be expressed in purely prosodic terms. Only certain non-cyclic affixes form independent prosodic words, so that the remaining non-cyclic (or 'word') affixes must still be distinguished in a non-prosodic way from 'stem'/cyclic affixes. Thus the domain of the former cyclic or 'stem'-stratum rules must have a non-prosodic restriction in the new theory: such rules will apply only between a stem and an adjacent 'stem'-affix within the prosodic word. So the unification of early-stratum with prosodic-word-domain rules is not complete.

Also, there are general problems with any 'morphology-driven, phonological-restructuring' approach. The first problem is shown by a reduplication process in Tagalog (discussed in Carrier-Duncan 1984:279-80,285 and Marantz 1982:477-80, and termed "R2 reduplication" by Carrier-Duncan). When this reduplication process applies to inflected CVCVC verb stems, as in forms such as *sundinsundin* 'obey somewhat' and *tinñantinñan* 'watch somewhat', the reduplication is a "moderative" derivational affix, which forms a categorial/semantic constituent with the bare verbal stem (such as /sunod/ or /tinjin/), while /-in/ and /-an/ are inflectional "topic marker" affixes. The difficulty is that /-in/ and /-an/ must have been morphophonologically affixed before the reduplication applies, since they are copied by the reduplication. Furthermore, the phonological syncope of *sunod* → *sund-* and *tinjin-* → *tinñ-* (triggered in the verbal stem by the presence of /-in/ and /-an/) must apply between the affixation of /-in/ or /-an/ and reduplication, since this reduplication never copies three syllables. But in Cohn's morphology-driven theory, where the order of word-building follows categorial/semantic constituency, the inflectional topic-marker suffix /-in/ or /-an/ would have to be added after the derivational reduplication has applied (since reduplication is an affix which forms a semantic constituent with the uninflected verb stem). But in this case, /-in/ or /-an/ would not yet be present to be reduplicated!¹

The second problem comes from cases of prefix-prefix bracketing paradoxes, inflection inside derivation, etc. where there are apparent discontinuous morphological constituents. Here a morphology-driven phonological restructuring account would lead to the phonologically unwanted operation of morpheme infixation at word-internal morpheme boundaries, as in Speas (1986) (the location of real infixation is always governed by prosodic factors).² Such an operation, e.g. /A+B/ → /A+C+B/, would allow A to interact phonologically with B, before C was added (where the only way to avoid this would be to abandon altogether the interleaving of morphological affixation operations with phonological rules).

The third problem is the case of 'suppletion paradoxes', apparently discovered by Sproat (1985). For example, in *underwent*, /under/ idiosyncratically modifies the meaning of the verb root, while morphological past tense modifies the meaning of the whole preverb-root compound.³ In a phonological-restructuring account, /under/ must then be affixed before addition of the past tense to the verb root, leading to the phonologically unwanted operation of replacement of the phonological material [gō + d] by [went], as in Sproat (1985). Here /under/ could phonologically interact with /go/ before this replacement, so again we are messing up the phonology to accommodate the categorial/semantic side of the morphology.

So this simple morphology-driven phonological-restructuring account of Cohn (1989), and Aronoff and Sridhar (1983), with bistructural birepresentational parallel derivations (where the two parallel representations are the morphological and the prosodic), is not adequate. None of the three apparently distinct types of constituency in morphological/phonological derivations (the morphosyntactic/morphosemantic constituency, the successive cyclic domains (not necessarily prosodic) of phonological rule application, and the purely prosodic constituency of syllable, foot, prosodic word, etc.) can be eliminated.

5. Alternative Accounts

What are the possible alternatives to this prosodic account? Kiparsky (1983) proposes a monorepresentational bistructural theory of bracketing paradoxes (cf. (2) above), with 'phonology-driven morphological-restructuring' derivations (i.e. morphemes are added in the order which reflects successive domains of phonological rule application, so that /-ity/ is attached before /un-/ in the derivation of *ungrammaticality*, and it is the final morphosyntactic/morphosemantic constituency structure that does not reflect the derivational history of morpheme-addition operations). This avoids the problems with morphology-driven accounts listed in §4.1, but Kiparsky must posit the "rebracketing" of ill-formed intermediate representations such as [Nun[N[*Agrammatical*]ity]] (where the subcategorization of /un-/ for an adjective is violated) to [N[Aun[*Agrammatical*]ity]], introducing the powerful device of transformations into the morphological component. Also, since /un-/ and /-ity/ are affixes from different strata, the internal structure or bracketing [[*grammatical*]ity] must be an exception to Bracket Erasure, in order to survive into the next stratum to be available for "rebracketing" when /un-/ is added (Kiparsky 1983:25). As pointed out by Sproat (1984:111), one problem with this idea is that one might expect bracketing paradoxes to show exceptional phonological behavior, since their internal structure would be accessible to the phonology longer.

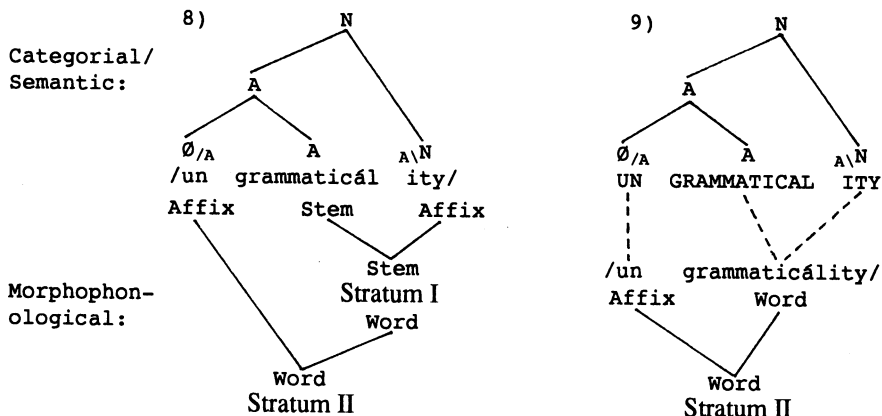
A birepresentational non-parallel account (cf. (3) above) would also introduce transformations into the morphology (such as Pesetsky's 1985 "affix raising" or Sproat's 1985 "operators"); and in Sproat's morphology-driven account, the

constituency of the successive phonological domains of rule application will have nothing to do with course of derivation, which is fatal for interleaving morpheme-addition operations with phonological rules (this is duly abandoned in Sproat 1985). In a biderivational account (cf. (5) above), for every word there would be two separate derivations, which would always exactly parallel each other, except in the case of bracketing paradoxes, leading to much needless duplication (see also the discussion of “bottoms-together separate terminals” parallel representations in §6 below). For all these reasons, this paper will adopt a ‘phonology-driven, morphological-restructuring’ theory with birepresentational parallel derivations (cf. (4) above), resulting in some type of parallel morphological representation.

6. Bottoms Together Parallel Representations

The advantage of parallel representations is that the different constituencies required by the different aspects of morphology can be represented simultaneously. But there are actually several types of parallel representations. Sproat (1984) and Chelliah (forthcoming) adopt parallel representations in which different constituencies are built up from a shared set of terminal nodes, as in (8) below; my term for this type of structure is a “bottoms-together shared terminals” parallel representation. A problem here is that the parallel representations of the two sub-components interface through their terminal nodes, so that the internal details of the representation of one component are accessible to the other component; this strong interaction violates the principle of autonomy of components of grammar.⁴ And in this theory every word has parallel representations, but these have no function except to account for the few bracketing paradox cases. Also, this approach does not extend to apparent cases of discontinuous morphological constituency.

To represent inter-stratum Bracket Erasure (or suppletion paradoxes such as *underwent*) in a “bottoms-together” manner, one would have to use a representation like (9) (which would be the output of stem-level morphophonological Bracket Erasure, as in the right-hand side of (1) above), where the two parallel representations do not share terminal nodes (as in the structures of Sadock’s 1991 *Autolexical Syntax*). This allows additional degrees of freedom, and the result, as with the transformations of §5 above, would be a too-powerful morphology.



7. "Tops-Together" Parallel Representations

In this paper, I will use a new type of parallel structure in which the representations of the different sub-components of grammar interface only through their root (topmost) nodes (thus the name "tops-together" parallel representations). The vertical double line in the schematic representations in (10) indicates only that the whole tree dominated by the topmost node of one component corresponds to the whole tree dominated by the topmost node of the other component; no correspondences between sub-trees or terminal nodes of the two components are directly encoded. Therefore the access which each sub-component has to the internal structure of the representations of the other sub-component is at a minimum. So "tops-together" parallel representations (unlike those in (8) above) are compatible with an autonomous modular relationship between the components of grammar.

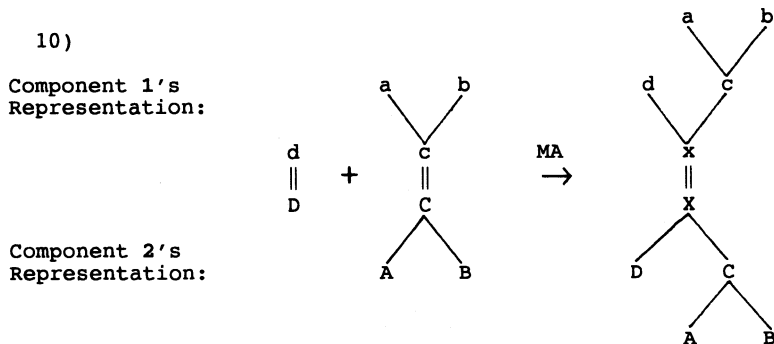
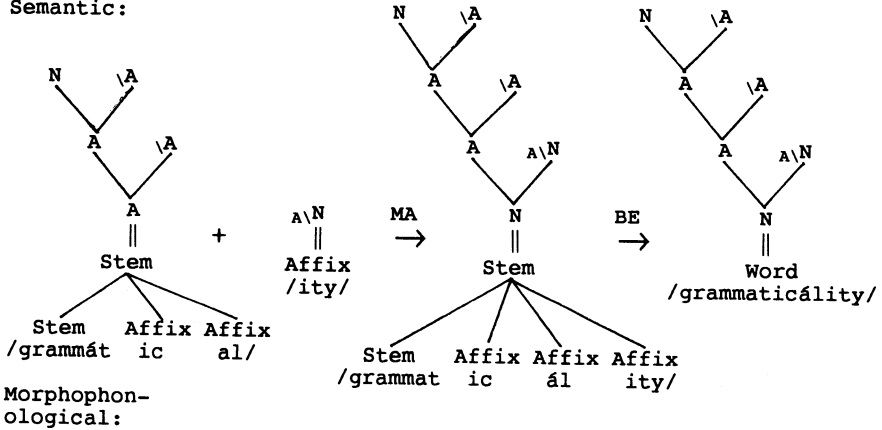


Diagram (10) schematically represents normal "non-paradoxical" word-building (as in (11) below). Here adjunction to the topmost node of the representation of the base occurs in both components, so that the former topmost nodes in each component are no longer topmost, and thus no longer directly connected (e.g. on the right hand side of (10), after the morpheme whose representation is *d* in component 1 and *D* in component 2 has been added to the base, there is no longer any direct indication that subtree *c* corresponds to subtree *C*, or that *d* corresponds to *D*). Thus the word-building operation in (10) actually *destroys* information, automatically accomplishing a part of what has been attributed to Bracket Erasure in Lexical Phonology, as a normal part of word-formation. It will get progressively harder to indirectly reconstruct the correspondence between a morpheme's two representations as they move away from each other in the course of a derivation, since the root node is the most accessible part of each component's representation.

Here is an actual linguistic example, the last morpheme-addition operation in the derivation of *grammaticality* (the "tops-together" counterpart of the left side of (1) above). On the left of (11) one can see how a morpheme's two representations (e.g. /-ic/ in the morphophonology and the most deeply embedded *A* node in the categorial/semantic representation) become more separated with each successive morpheme addition; since the two are not directly connected, a "tops-together" representation contains *less* information than a conventional representation such as $[[[[grammat_N]ic_A]al_A]ity_N]$ in (1) above. One difference between (10) and (11) is that there does not seem to be any need for a hierarchical morphophonology.

Categorial/
Semantic: 11)

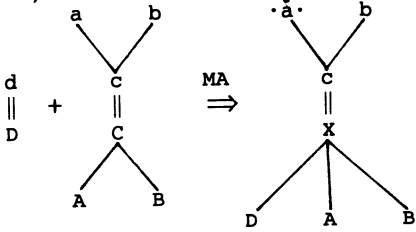


On the right-hand side of the first derivation in (11), the fact that the stem *grammatical* is an adjective is no longer directly represented (only that the overall stem *grammaticality* is a noun). This automatic dissociation between morphosyntactic constituency and phonological constituency, is both stronger and weaker than Lexical Phonology's Bracket Erasure. It is stronger because it occurs as an automatic consequence of the "tops-together" word-building operation, (10), while Lexical Phonology's Bracket Erasure can be put off until the end of a morphological stratum, and can have exceptions even then (as in Kiparsky's analysis in §5 above). But the effect of (10) is also weaker than that of Lexical Phonology's Bracket Erasure (1), since (10) only destroys information about the *correspondences* between the morphophonological and categorial/semantic representations without simplifying the two representations themselves. Therefore the "tops-together" theory will still have an explicit counterpart to the Bracket Erasure of Lexical Phonology in (1) above; this operation will simplify the morphophonology without affecting categorial/semantic structure, as seen on the right side of (11).

So in the "tops-together" theory, categorial/semantic structure can remain accessible even when the corresponding morphophonological structure is no longer accessible, since these two aspects are represented separately. Here bracketing paradoxes and discontinuous constituency cases are derived by word-building processes in which the categorial/semantic representation of the morpheme that is being added is adjoined *within* the categorial/semantic representation of the base (rather than being adjoined to its topmost node). This is more marked than normal word-building (10) since it directly manipulates non-topmost (component-internal) structure. In bracketing paradoxes, the categorial/semantic representation adjoins to that of the base as the leftmost node, and the morpheme's morphophonological representation is also adjoined as a leftmost node, as in (12); here the constituency in the representation of the categorial/semantic component on the right side of (12) is $((d=D, a=A), b=B)$, despite the fact that in the course of word-building the morpheme $d=D$ was added to the base ($a=A, B=b$). Discontinuous constituency is still more marked than bracketing paradoxes; here adjunction violates the "leftmost/leftmost" constraint.⁵ In the following schematic derivations, the nodes that are added to the representation of the base are flanked by "•" marks:

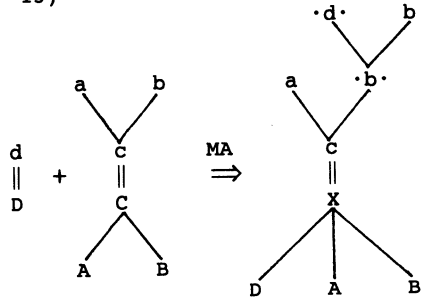
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12)



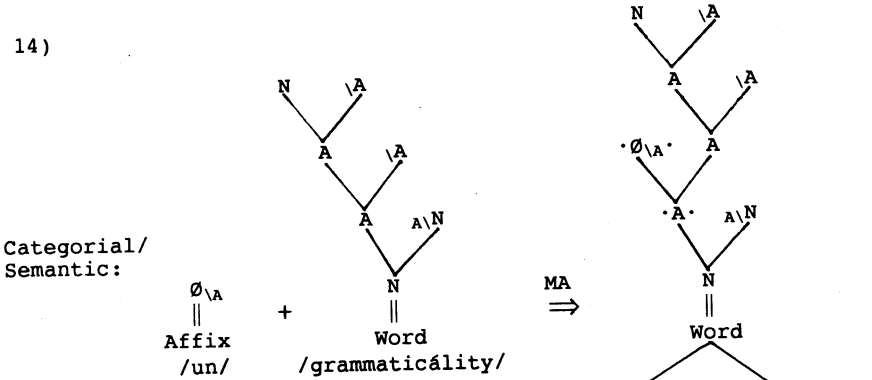
Morphophon-
ological:

13)



Using the operation of (12), bracketing paradoxes can be explained even with strict Level-Ordering and stratum-final Bracket Erasure (although Level-Ordering is not a necessary part of the “tops-together” theory of morphology):

14)



Morphophon-
ological:

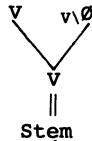
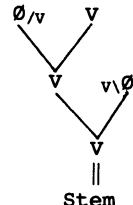
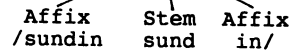
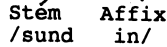
In this account there is nothing whatever exceptional about the input to /un/-affixation, whereas in Kiparsky's account bracketing paradoxes with affixes from different strata must be at least partial exceptions to Bracket Erasure, as discussed in §5. The operations in (10) and (11) clarify the various functions of Bracket Erasure (dissociating morphosyntactic and phonological constituency vs. making the morphophonology underived). Operations (12) and (13), unlike (10), result in “tops-together” representations which have no equivalent non-parallel representations. (Note that the possibility of adjoining to a non-topmost or non-peripheral node of a representation will only be permitted in the categorial/semantic sub-component. This difference between the two sub-components can be explained by the non-hierarchical nature of the representations of the morphophonology.)

Tagalog R2 reduplication, discussed in §4.1 above, is essentially the same as (14), but here there is more unequivocal evidence of the derivationally earlier morphophonological affixation of the wider-scope suffix.⁶

15)

Categorial/
Semantic:

+

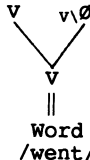
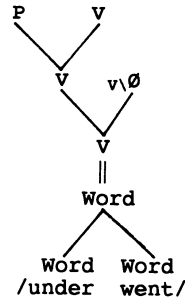
MA
⇒Morphophon-
ological:

Suppletion paradoxes also involve the application of operation (12), but here the item /went/ has a complex categorial/semantic representation in the lexicon:

16)

Categorial/
Semantic:

+

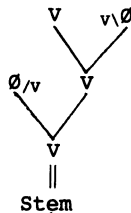
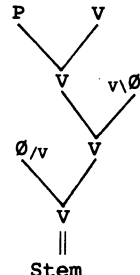
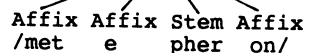
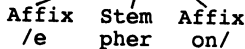
MA
⇒Morphophon-
ological:

Discontinuous morphological constituency cases often also involve preverbs and inflection, but the inflection is found between preverb and verb. Here the Greek verb *met-e-pher-on* 'among/with-PAST-carry-1ST.SING.ACT.' 'I was transferring/changing (*transitive*)' is derived using operation (13) above (this is a relatively simple case analogous to the much more complex Athabaskan verb):

17)

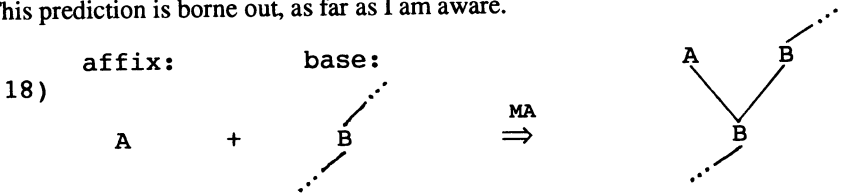
Categorial/
Semantic:

+

MA
⇒Morphophon-
ological:

One prediction of the "tops-together" theory is that a categorial/semantic element which adjoins to the non-topmost node of a categorial/semantic repre-

sensation must not change the lexical category of what it adjoins to (cf. (18) below), since the categorial subcategorization requirements of affixes must be satisfied at all stages of the derivation. Thus category-changing derivational affixes should not be able to cause bracketing paradoxes or discontinuous constituency. This prediction is borne out, as far as I am aware.



So in this “tops-together” theory the mechanism for handling bracketing paradoxes, (12), is not very different from the operation used in non-paradoxical cases of word-building, (10): the difference between (11) and (14) is only one of adjoining within the morphosemantic tree vs. adjoining at the top. It can be postulated that (12) is a more marked case because the topmost (root) node is the most accessible node in the categorial/semantic representation. And “tops-together” parallel representations are not motivated solely by the need to handle bracketing paradoxes, but also contribute to the theory of Bracket Erasure.

8. Syntactically-relevant Morphological Incorporation

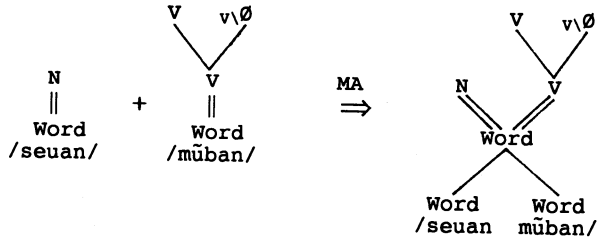
The phenomenon of “incorporation” is where two word-stems have been combined into a single morphophonological word by a word-formation process that appears to be a simple case of compounding or affixation (*not* cliticization), from the viewpoint of morphophonology (purely external form). However, the two remain syntactically separate entities (two syntactic heads, or X^0 categories). So the N^0 head of a noun phrase object can be morphologically incorporated into its governing verb (but remain syntactically independent), leaving the rest of the NP behind (determiners, adjectives, etc.), as in Southern Tiwa *Yede a-seuan-mū-ban* ‘that 2SING.-man-see-PAST’ “You saw that man” (Baker 1988a:93). This is as if the components of English N-V compounds, such as *to baby-sit*, *to grocery-shop*, or *to bar-tend*, were individually accessible to the syntax, so that the N could be modified by a “stranded” external determiner, adjective, or complement.

In the “tops-together” theory, syntactically-relevant morphological incorporation will be handled with an operation which unites two morphological representations into a single morphophonological entity, but which does not relate the two categorial/semantic representations to each other within the categorial/semantic component of the morphology. Thus in the following derivation of an incorporated lexical item, in the output of incorporation on the right side of (19) the topmost node of the single morphophonological tree is associated (in a somewhat autosegmental sense) with both the topmost nodes of the *two separate* representations in the categorial/semantic component. (Cases of multiple incorporation could be handled through the recursive creation of branching association structure, again without any categorial resolution within the morphology/lexicon.) Note that the derivation of discontinuous morphological constituency in (20) is not a violation of the leftmost/leftmost constraint, since /a-/ adjoins leftmost within the categorial/semantic representation of V (the separate categorial/semantic representations of the V and N are probably linearly unordered). (For simplicity I have assumed here that /-ban/ is a stem-level affix, without any particular evidence.)

19)

Categorial/
Semantic:

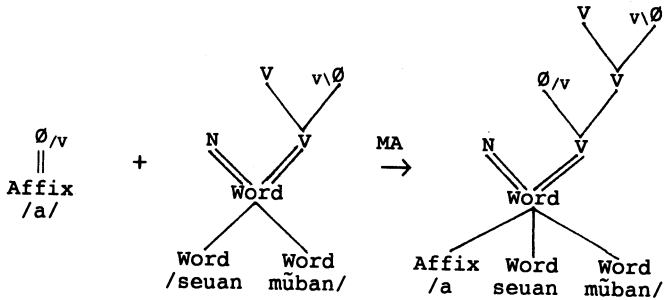
Morphophon-
ological:



20)

Categorial/
Semantic:

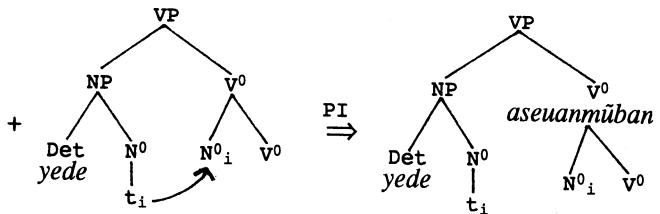
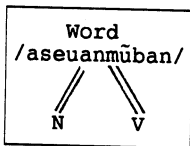
Morphophon-
ological:



8.1 Lexical Insertion vs. Phonological Insertion

In an incorporated form, the only thing accessible to the syntax, after all Bracket Erasure, is the association between the entire morphophonological entity (a phonological string of morphophonological category *Word*) and the two syntactic categories, exemplified on the left side of (21) (this is graphically inverted with respect to diagrams (19)-(20) above) – cf. Lapointe (1987). This complex item generated by the lexicon can be inserted (by a graph unification operation) into the N^0 -adjoined-to- V^0 syntactic configuration resulting from Baker's syntactic rule of head-to-head movement. Here it is necessary to assume that a lexical item's phonological representation is *not* handed over at **D**-structure (since the syntax has no use for this information). Instead, the lexicon will only hand over non-phonological information for insertion at **D**-structure, and at the end of the syntax, the syntax will "inquire" of the lexicon what the phonological representation of each word is, in order to convert **S**-structure into the input to **PF**. This delayed phonological insertion is exactly the phonology-syntax interface argued for in Hayes (1990), where he applies the same principle to the members of inflectional paradigms, and to phrasal contextual phonological variants of a word. (Cf. also the "phonology-free syntax" of Pullum and Zwicky 1989.) So in the "tops-together" account of incorporation, word-formation operations are not interspersed with syntactic rules, and the syntax is ignorant of phonology, unlike in Baker (1988b).

21) Output
of Lexicon:



9. Conclusion

This paper has argued for a new type of representation in the morphology, "tops-together" parallel structures, in order to account for syntactically-relevant morphological incorporation in a way compatible with the Lexicalist Hypothesis (i.e. a constrained morphology-syntax interface), and to handle bracketing paradoxes within a constrained theory of the internal structure of the morphological component. Unlike previously-proposed types of parallel representations, a "tops-together" structure respects the autonomy of the two sub-components of grammar (since their two representations interact only weakly through shared root nodes, rather than strongly through shared terminal nodes). The possible discrepancies between the representations of the morphophonological and categorial/semantic subcomponents of morphology are severely restricted by adopting non-hierarchical peripheral-adjointing morphophonology, the requirement that categorial subcategorizations be satisfied at all stages of the derivation, and the leftmost/leftmost constraint. In both bracketing paradoxes and incorporation, categorial/semantic structure can remain accessible even when the corresponding morphophonological structure is no longer accessible. An advantage of the "tops-together" theory is that it never complicates the phonology to accommodate morphological discontinuities (as with Speas' morphemic "infixation", Sproat's replacement of the phonological material [gō+d] by [wənt], and Kiparsky's exceptions to Bracket Erasure). The "tops-together" theory is also compatible with Lexical Phonology's interleaving of morpheme affixation operations and phonological rules, and disentangles and clarifies Bracket Erasure's various functions in Lexical Phonology.

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1 To account for such forms, Cohn would have to resort to the device of attaching an abstract reduplication marker morpheme to the verb stem, which would be phonologically realized only *after* the topic suffixes had been added.

2 Sproat actually uses *forwent*; presumably *underwent* serves just as well here.

3 Evidence in Hyman and Mchombo (1992) suggests allowing the non-prosodic circumscription of a morpheme at the edge of a word for morphophonological processes such as infixation. However, this limited relaxation of the prosodic nature of circumscription (McCarthy and Prince 1990) would not allow the unrestricted morphemic infixation necessary for the Athabaskan verb in the theories of Speas (1986) or Kari (1992).

4 The "informational encapsulation" of modules in Fodor (1983).

5 Linear order is present in the categorial/semantic representation only to be able to constrain discrepancies between the two representations. Note that the categorial counterpart to the right side of (11) is delayed until the end of the lexicon.

6 Here **F** means that the morphophonological representation of the reduplicative affix can be thought of as roughly a foot template (though there are complexities involved in the exact specification of this particular reduplication process).

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