Transformational Grammarians and Their Ilk*

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1. Affix-Ambivalent Compounds

Though the analytic problems presented by English compound words like those in (1a) have been known for some time, these data have achieved a certain prominence in connection with the major claim of Lexical Phonology (hereafter LP),' namely that morphological and phonological rules are grouped into a number of ordered subcomponents (called 'levels').

(1) a. transformational grammarian
        Chinese historian

    b. transformational grammar
        Chinese history

These examples represent one subtype of what I will refer to as affix-ambivalent compounds (AACs), which are words of the form in (2a); the affixes are 'ambivalent' in the sense that they have the potential to combine with W_1 and W_2 so as to impose either of two different organizations on W - via the internal attachment (INT) pattern of (2b), or via the external attachment (EXT) pattern of (2c). In this regard they contrast with compounds like those in (3), which exhibit only internal attachment.

$$(2) \quad a. \quad W = W_1 + W_2 + Sf$$

$$b. \quad INT: \; W = W_1 \; + \; W_{23} \; (= W_2 + Sf)$$

$$c. \quad EXT: \; W = W_{12} \; (= W_1 + W_2) \; + \; Sf$$

(3) county geologist 'geologist for the county'
house grammarian 'grammarian for the house'

2. A Phonology-Semantics Conflict

Phonologically the words in (1a) are clearly A+N combinations, as in the orthography, but - at least with respect to the meanings 'a scholar or adherent of transformational grammar' and 'a scholar of the history of China'[2] - they are derivatives from the compound words in (1b). These familiar observations are restated in (4) and (5).

(4) Phonologically, an AAC has the INT structure.

(5) The semantic interpretation of an AAC is obtained via the EX structure, that is, by treating Sf as an operator on the argument W_{12}.

In general we expect both phonological and semantic organization to follow from morphological and syntactic structure, that is, to serve as direct reflections of the way in which morphological rules (in particular, rules of word formation) and syntactic rules apply. The observation in (5) about the semantics of AACs does in fact follow from the general principles in (A) and (A1), given the assumption in (6) about their morphological derivation, but then the observation in (4) runs counter to what we expect on the basis of the general principle in (B).

(A) Semantic interpretation is rule-to-rule except as stipulated otherwise. In particular:

(A1) A rule of word formation assigns a semantic interpretation to a derivative word as a function of the semantic interpretation of the source word(s).

(6) Morphologically, an AAC is described by a word formation rule that treats W_{12} as the source word.

(B) Phonological structure mirrors morphological derivation except as stipulated otherwise.

I can see at least two (not necessarily incompatible) sorts of solutions to this conflict between semantics and phonology, which I briefly sketch in the next two subsections.[3]

2.1. Solution 1: Phonological Readjustment

Given that substantial reorganizations of morphological (and syntactic) structures for the purposes of phonology are known to be necessary, the obvious solution to a conflict between observations like (4) and (5) is to assume a systematic mapping between a morphological EXT structure and a phonological INT structure; Sf must be part of a phonological word with preceding material. This is the treatment proposed by Aronoff and Sridhar (1983) (building on a rather different analysis given by Williams (1981)) for semantics-phonology misfits in examples like *compartmentalization* and *ungrammaticality*, and it extends naturally to AACs.

2.2. Solution 2: Alternatives to Concatenation

It is also possible to maintain that morphology itself assigns AACs the appropriate structure for phonological purposes. To see this, note that the observation in (6) and the general principle in (B) are rather vague about the operation that combines Sf with W_{12}. One assumes that this is simple affixation - that is, concatenation - yielding EXT as the morphological structure for an AAC. But there are at least two other plausible possibilities.

The first alternative is that Sf is combined with W_{12} by an operation I will call introjection, which attaches an affix not to a base as a whole but rather to the lowest (that is, innermost) preceding morphological constituent of the base. If Sf is combined with W_{12} by introjection, it attaches to W_2, giving the INT structure.[4]

·A second alternative, suggested by Hoeksema (1984, 47-51), turns on the fact that W_2 is the head of W_{12}. Hoeksema proposes a class of head operations, each affecting an argument by affecting its head. If Sf is combined with W_{12} by head adjunction, it attaches to W_2, again giving the INT structure.

3. AACs and Level Ordering

In any case, AACs like those in (1a) present a problem for LP that goes beyond a misfit between semantic and phonological organization: The option of morphologically deriving the forms in (1a) from those in (1b), as in (6), would appear not to be open, given the otherwise well-motivated assumption that suffixation of -ian is located in a subcomponent that precedes the one in which compounds are formed.

The crucial observation about AACs in the LP framework is the one in (7). Given the morphological organization stipulated in (7) and the theoretical assumption, not specific to LP, that the semantics of derivation is rule-to-rule, as in (A1), it follows that the interpretation of certain AACs should be obtained as a function of W_1 and W_{23}. But according to (5) the correct interpretation is obtained in a quite different way, namely as a function (associated with Sf) of W_{12}. Note that phonological organization plays no role in this discussion, which turns on observations (5) and (7) and general principle (A1), not observation (4) or general principle (B).

(7) English has AACs for which W_{23} is derived at one level in
     and W at a later level; these AACs are then assigned INT
     as their morphological structures.

3.1.   Solution 1: Alternative Subcomponent Assumptions

One response to the problem would be to revise the framework
of subcomponents in LP. This is the tack taken by Strauss (1982,
ch. 2), citing examples like those in (8a), from Allen (1978,
113), and (8b). More extreme forms of this response amount to
abandoning subcomponents in morphology entirely, perhaps while
maintaining subcomponent distinctions in phonology (along the
lines of Halle and Vergnaud (1987, 53-4), citing Sproat (1985)).

   (8) a. slave-driverish
          head-achey
          hard-boiledness

       b. brain-washable
          brain-washer 'one who brain-washes'

It is also possible to make morphological subcomponent
distinctions in quite a different way from LP. In the traditional
view of morphology, for instance, there are in effect two
subcomponents, word formation (comprising derivation and
compounding) and inflection, with the former preceding the
latter. Examples like (1a) are unproblematic in this view, since
any one rule of word formation can feed any other so long as the
specific conditions on both rules are met.
   In contrast, LP as sketched by Kiparsky (1983) assumes a
virtually orthogonal arrangement, in which separate subcomponents
of 'primary' and 'secondary' morphology each contain some
derivation and some inflection, and in which compounding is
located in the secondary morphology subcomponent. Examples like
(1a) are then problematic for LP, since -ian is certainly primary
- note in (9) the stress shifts entailed by this affix - while
compounding is secondary.

   (9) grámmar - grammárian
       hístory - histórian

Strauss's proposal (the details of which are rather complex)
is to relax these subcomponent arrangements by treating the
interspersing of compounding and suffixation (and also of
prefixation and suffixation) as the normal case. The framework I
will adopt here (sketched very briefly in Zwicky (1986b; 1986d))
is a version of the traditional view and so more similar to
Strauss's proposal than to standard LP. In it any process of word
formation can potentially feed any other, subject however to
stipulated conditions on the applicability of the latter. Before
I develop this proposal further, however, I will survey some other
solutions that might be advanced to the analytic problem presented
by examples like (1a). What these solutions share is that they are
intended to preserve the subcomponent claims of LP.
   I must stress here that not all AACs give rise to the
particular conflict (involving (5) and (7)) that calls for one or
another of these special analytic moves. For instance, so long as
the AACs in (8) can be analyzed as involving secondary derivation

(with -*ish*, -*y*, -*ness*, -*able*, and -*er*), they can be accommodated within standard LP. With compounding and secondary derivation together in a level, (7) is inapplicable, and there is no unavoidable conflict between (5) and (7). There is a semantics-phonology misfit for the examples in (8), as for those in (1a), but that is not the conflict I am concerned with here.

3.2. Solution 2: Feeding-Back

A second solution would be to weaken the restrictions on subcomponent interaction by permitting a certain amount of 'feeding back' from one subcomponent to an earlier one. This is in the spirit of a proposal made by Kiparsky (1982, 138) for examples like those in (10), which he takes to involve 'some limited recursion from phrase-level syntax back into morphology' (138). However, a feeding-back treatment for the celebrated problematic examples in (11a), involving prefixation apparently feeding suffixation, has been criticized by Kiparsky (1983, 24) as 'a severe compromise of level-ordering.' Kiparsky observes that the examples in (11b), with N+N compounding apparently feeding suffixation, are parallel to those in (11a) and so should receive a similar analysis; a feeding-back treatment here would be as objectionable as for (11a).

(10) a. American histőry teacher

   b. to stonewall
      a hands-off policy

(11) a. ungrammaticality
      decongestant
      reburial

   b. wind instrumental
      root parasitic
      set theoretical
      folk etymological
      twenty-fifth

But now reconsider AACs like *Chinese history*, which seems to be suffixed in (1a), and *American history*, which seems to be the first element in a compound in (10a). Kiparsky assumes these are syntactic phrases, but there is good reason to think they are compounds, of category N rather than N'. If so, then (10a) presents no difficulties - it merely illustrates the well-known ability of compound words to serve as bases for other compound words, as in *water meter cover adjustment screw* - but (1a) would be subject to Kiparsky's own objection about the compromise of level-ordering assumptions, for it would involve a feeding-back from secondary morphology (A+N compounding) to primary morphology.

Notice that even if A+N compounds like those in (12a) happened not to exist in English, there would still be an analytic problem involving N+N compounds like those in (12b), since they too figure in AACs, as in (13b), that involve a conflict between (5) and (7).

(12) a. relational grammar
        Liberian history

     b. juncture grammar
        Ivory Coast history

(13) a. relational grammarian
        Liberian historian

     b. juncture grammarian
        Ivory Coast historian

In any event, there are a number of reasons for treating
combinations like *Chinese history* 'history of China' in *Chinese
historian* 'historian of China' as instances of N rather than N'.[5]
Particularly striking is the fact that the As in these
combinations coordinate with Ns, as in (14), but not with true
modifying As, as in (15).

(14) relational and juncture grammars
      Ivory Coast and Liberian history

(15) *relational and adequate grammars
     *a thorough and Liberian history

3.3. Solution 3: Dual Assignments

Another response to the problem[6] would be to assign
compounding to both primary morphology and secondary morphology,
thus permitting it to interact with the derivation of Ns in -ian.
Like feeding-back, this solution undercuts the whole enterprise of
LP; when the full range of problematic examples is exposed, almost
all of secondary morphology must be assigned to primary morphology
as well.
      The result is a framework in which the fundamental
distinction is not between primary morphology and secondary
morphology, but rather between morphological rules that are
constrained in many ways with respect to the bases they operate on
and morphological rules that are relatively free in this regard.
It will follow in such a framework that rules in the highly
constrained set will be applicable to the outputs of the rules in
the less constrained set much less often than rules in the less
constrained set are applicable to the outputs of the rules in the
more constrained set. But the two sets will not constitute
subcomponents in the way that the levels of LP do.

3.4. Solution 4: Special Semantics

Another solution[7] for examples like *feature phonologist*,
South American, and *set theoretic* would be to accept the
consequences of LP level assignment and give them the INT
morphological structure uniformly, with the result that the
rule-to-rule semantics predicted by assumption (A) must be
abandoned in favor of 'noncompositional' semantic interpretation.
Just how this proposal is to be made to work in detail is not
clear to me; the interpretation assigned in primary morphology to
Ns in such examples must somehow be blocked or overridden in

secondary morphology by a special interpretation principle
applying to W as a whole, and the blocking must be optional, since
at least some examples, like *Trubetzkoy phonologist*, have both an
EXT reading ('a scholar or adherent of Trubetzkoy phonology') and
an INT reading ('a phonologist of or for Trubetzkoy').

In any case, as Kiparsky (1983, 24) has observed, the
proposal is inconsistent with a fundamental assumption of LP,
namely the Bracketing Erasure Convention (BEC), according to which
the internal morphological structure given to a construct at one
level is unavailable to rules applying at later levels; the EXT
reading for a construct consisting of W_1 and W_{23} can be obtained
only if W_{23} can be parsed in secondary morphology as itself
consisting of W_2 and Sf. Why not then just give up the BEC?
Because without it the LP enterprise is, once again, seriously
undercut.

The central observation of LP is that there is a correlation
between the degree of phonological effect of affixes on their
bases, on the one hand, and the linear ordering of affixes, on the
other - with phonologically active (or +) affixes being interior,
phonologically inert (or #) affixes exterior. Now a <u>tendency</u> to
this effect would be expected as a consequence of historical
change, interior affixes tending to represent older layers of word
formation, exterior affixes tending to represent historically
independent words that have relatively recently been analyzed as
morphological elements. LP elevates this correlation to an
exceptionless principle, the BEC, and so makes a theoretically
much more interesting claim than the observation of a mere
tendency. Without the BEC, we would expect rare, but genuine,
instances in which phonologically active affixes are exterior to
phonologically inert ones, and the enforcement of linear ordering
would be managed not by the BEC but by conditions on the bases on
which particular morphological rules operate, as in the previous
section. Without the BEC, we would then also expect rare, but
genuine, instances in which rules of secondary morphology were
subject to conditions referring to specific primary affixes.

My point here is not to defend the BEC - indeed, I believe
that it should not function as an inviolable theoretical
principle, but merely as an expression of a common, and entirely
comprehensible, association between different properties of
morphological rules - but only to point that it is central to the
whole LP framework, and that, whatever the independent demerits of
a 'noncompositional semantics' treatment of AACs, this treatment
is incompatible with the BEC.

3.5. Solution 5: Morphological Reanalysis

Discussing cases like those in (11), Kiparsky (1983, 22)
maintains, 'Any explanation of these words must account for the
fact that they in some sense "blend" two existing words:
ungrammaticality is licensed by the existence of both
ungrammatical and *grammaticality*.' The particular mechanism
Kiparsky proposes to achieve the effect of blending is a new type
of rule, of <u>morphological reanalysis</u>. The bracketing in (16a) is
converted into the one in (16b), and for AACs the INT structure is
converted into the EXT structure.

(16) a. [un + [grammatical + ity]]

b. [[un + grammatical] + ity]

As Kiparsky admits, a reanalysis treatment entails the existence of marked exceptions to the BEC. This follows because reanalysis applies in secondary morphology, and it is sensitive to the morphological structures assigned by certain rules of primary morphology - a rule deriving Ns from As by suffixing -ity, in the case of (16), and a rule deriving Ns from Ns by suffixing -ian, in the case of AACs like those in (1a). Both these rules must be stipulated to block application of the BEC at the end of their level, so that the morphological structures they impose will be available for reanalysis at a later level. That is, the default marking for a morphological rule is +BEC, but these particular rules are marked -BEC.

This step is, once again, a severe compromise of the LP framework. The metatheoretical attractions of an inviolable BEC are much diminished (though not entirely lost, since Kiparsky's proposal does not abandon the BEC completely). It also has the effect of 'putting the blame' in what is, to my mind at least, the wrong place. It marks as exceptional the rules of primary morphology that can have the semantics of external combination, rather than those that do not, and the fact is that virtually all productive rules of primary morphology can have such semantics; this is so for the rules suffixing -ity and -ian, as we have just seen, and also for those suffixing -al, -ic(al), and -th, as in (11b). INT-only primary suffixes, like -ize in (17), are the true special cases.

(17) a. fetish - fetishize
         socialism - socialize

b. leather fetish - #leather fetishize
   state socialism - #state socialize

3.6. Solution 6: Blending

It would, of course, be possible to take Kiparsky's idea of 'blending' rather more literally than he himself did, to propose that there are generalizations predicting (for instance) the existence of nouns like ungrammaticality on the basis of the existence of both ungrammatical and grammaticality, or the existence of AACs like transformational grammarian on the basis of the existence of both transformational grammar and grammarian.[*]

Blending has defects parallel to those of the reanalysis treatment discussed in the previous section. It splits the description of suffixes like -ian into two generalizations - a rule of primary morphology (for simple Ns like grammarian) and a blending principle in secondary morphology (for compound Ns like transformational grammarian) - a move that parallels the marking of the -ian rule as -BEC in Kiparsky's approach. And it too treats all the affixes with external semantics as exceptional, since these are the affixes that will require blending principles.

4. Property Inheritance

Blending, whether in the morphological reanalysis interpretation of section 3.5 or in the more direct interpretation of section 3.6, is an attempt to capture in a strict LP framework some of the facts analyzed via feature percolation in Lieber (1981) and Williams (1981), facts I will refer to under the heading of 'property inheritance'.[*]

Any analysis of deverbal nouns, for instance, must capture the generalization that the syntax of the source verbs tends to be preserved in the derivative nouns (so that both *rebel* and *rebellion*, for instance, occur either with no complement or with a PP complement having the head P *against*), or in other words that (at least in the default case) the nouns inherit certain properties of the source verbs. There is dispute as to whether the relevant properties are syntactic (involving subcategorization frames) or semantic (involving thematic roles),[10] but none, so far as I know, as to the existence of property inheritance.

Assuming that properties of sources can be expected to be inherited by derivatives can provide an account of many morphological properties of derived words. For instance, the fact that *ungrammatical* can serve as a source word for suffixation by -*ity* (*ungrammaticality*) while *unkind* cannot (**unkindity*) can be directly related to the fact that *grammatical* can so serve (*grammaticality*) while *kind* cannot (**kindity*), so long as the values of the stratum feature AS (roughly 'Ango-Saxon') are inherited in un- prefixation; *ungrammatical* is -AS because *grammatical* is, and *unkind* is +AS because *kind* is, and the rule deriving abstract Ns from As by suffixing -*ity* is constrained to apply only to -AS sources.

Similarly, the fact that *uneager* lacks an inflectional comparative and superlative while *unhappy* has these forms, as in (18), can be directly related to the fact that *eager* lacks these forms while *happy* has them, as in (19), so long as the values of the morphological-rule feature DEG are inherited in un- prefixation; *uneager* is -DEG because *eager* is, and *unhappy* is +DEG because *happy* is, and the rules for the inflectional comparative and superlative apply only to words with the feature +DEG.

(18) a. **uneagerer* b. unhappier
        *uneagerest   unhappiest

(19) a. **eagerer*   b. happier
        *eagerest   happiest

In the same vein, the availability of the N *transformational grammar* as a source word for a rule deriving Ns by suffixing -*ian* can be seen to follow from the availability of its head N, *grammar*, as a source word for this rule; that is, the compound inherits from its head N its potential for suffixation by -*ian*. In general, the availability of sources for N-to-N derivation involving the suffixes -*ian*, -*er*, and -*ist* (as in (20)) involves considerable lexical arbitrariness, which is reproduced virtually wholesale for compound sources. In (21)-(23), the (a) forms predict the (b) forms.

(20) a.   grammarian   b.   geographer   c.   folklorist
          historian   astronomer   phonologist

(21) a.   historian   b.   ancient historian
          *historer   *ancient historer
          *historist   *ancient historist

(22) a.   *geographian   b.   *human geographian
          geographer   human geographer
          *geographist   *human geographist

(23) a.   *folklorian   b.   *American folklorian
          *folklorer   *American folklorer
          folklorist   American folklorist

I am proposing here to abandon the subcomponent orderings
imposed by LP and to take free reapplication of rules of word
formation to be the unmarked situation; 'productive rules, whether
of derivation, inflection, or compounding, apply whenever their
structural descriptions are met,' as Churma (1983, 58) puts it.
Property inheritance then correctly predicts the existence of
ungrammaticality, which I am treating as having the morphological
constituents *ungrammatical* and *-ity*. It also correctly predicts
when a derived word like *transformational grammar, human
geography*, or *American folklore* is subject to suffixation with
-ian, -er, or *-ist*.

5.   A Morphology-Syntax Conflict

Unfortunately, the analysis of AACs I have just sketched,
like feeding-back analyses of these facts, makes the wrong
predictions about the syntactic structures of AACs like those in
(1a) and (13). It predicts the EXT structure for syntax as well as
morphology, but actually the INT structure is correct for all
AACs, as is evidenced by the fact that W_{23} functions as a
syntactic constituent in coordination (see (25)) and anaphora (see
(26)).

(24) Syntactically, an AAC has the INT structure.

(25) transformational and stratificational grammarians
     a generative syntactician or phonologist

(26) She's the Japanese historian, and she's the Chinese (one).

The problem here arises from the fact that the general
principle (C) predicts either that AACs have the INT structure
morphologically, contrary to (6), or that they have the EXT
structure syntactically, contrary to (24). Note that there is no
difficulty with observation (24) and principle (C) in analyses
within the LP framework, since these analyses assign AACs the INT
structure morphologically. Having solved one problem, we are,
apparently, confronted with another.

(C) The constituents of syntactic structure are those of
    morphological structure, except as stipulated otherwise.

5.1. Solution 1: Introjection or Head Adjunction

I can think of two (not necessarily incompatible) solutions to this apparent conflict between morphology and syntax in the description of AACs. The first is in several ways the simpler: Assume that Sf is combined with W_{12} by introjection or head adjunction (as in section 2.2), so that the INT structure is assigned to AACs morphologically as well as syntactically. Such an analysis has the advantage that the INT structure is also the one needed for phonological purposes.

It does not, as one might think, automatically predict the inheritance of morphological properties, however, since it is not logically necessary that an introjected or head-adjoined affix project its own distributional requirements on the morphological constituent it actually attaches to - though in fact this seems generally to be the case.[11]

What such an analysis costs is the addition of an elementary combinatory operation O (introjection or head adjunction) in the general theory of morphology, thus opening up the possibility that some morphological rules employ O while other (perhaps otherwise identical) morphological rules employ concatenation. We might, however, be able to maintain that each morphological rule either is blocked from applying to compound bases (as at least some rules suffixing -ize in English appear to be, given facts like those in (17)) or employs O when applying to compound bases - that is, that O must be used whenever it can be. If so, then O would not represent an additional degree of freedom in the general theory of morphology.

5.2. Solution 2: Matching Syntax with Morphology

Another approach to the apparent conflict between a syntactic INT structure for AACs and a morphological EXT structure for them would be to stipulate in the grammar of English that syntactic organization and morphological organization are systematically different from one another in just this way, that is, to require that a syntactic INT structure be matched with a morphological EXT structure.

Disparities between syntax and morphology are not uncommon, after all. Indeed, Sadock (1985), recognizing a variety of divergences (involving clitic words of various kinds, noun incorporation, and phrasal affixation), has developed the idea that syntactic organization and morphological organization may differ from one another into a putatively universal scheme of 'autolexical syntax'. In Sadock's proposal, the grammar of a language assigns separate syntactic and morphological structures to strings of formatives, and the two structures are matched with one another by universal principles.

The picture I have in mind has similar outlines, but differs from Sadock's in a number of important details, as presented in Zwicky (1986c). First, I would allow for a certain amount of parochiality in the matching principles (which in the scheme of Zwicky (1986b) are collected in a component of the grammar called LIAISON). Second, I would not match syntactic structures directly to the outputs of morphological rules; instead, the matching is to what we might better call morphosyntactic structures, which contain (among other things) word-like units containing clitic words in them. Morphosyntactic structures provide the domains

within which the rules of a MORPHONOLOGY component apply; they are
in turn matched with specifically phonological, or prosodic
structures, within which the rules of automatic phonology apply.

We may then ask whether AACs have the INT organization
(which is appropriate both for syntax and for phonology) or the
EXT organization (which is what morphology would predict without
introjection) at the level of morphosyntactic structures. I know
of no evidence - in particular, evidence from the morphonological
rules of English - that bears on this rather subtle technical
point. In any case, the framework provides a way to describe
either situation.[12]

5.3. A Note on Semantic Interpretation

It might seem from examples like (25) and (26) that AACs
present a special problem for semantic interpretation. In
particular, how are we to assign interpretations to the words in
(27a) individually in such a way that they can be combined into
interpretations for the phrase in (27b) and the whole construct
transformational and stratificational grammarian? Apparently the
semantics provided by morphological rules to the words in (27c)
must figure in the interpretation, even though these words
themselves do not occur as syntactic constituents.

(27) a. transformational   b. transformational and stratificational
        stratificational
        grammarian   c. transformational grammarian
                                stratificational grammarian

I am not proposing a solution to this problem here. Rather,
I merely observe that the difficulty is in no way peculiar to
AACs; it is quite general for compound nouns. Notice that the
same interpretational difficulty arises in the non-AAC examples of
(28).

(28) ballroom and belly dancing
     fire and safety wardens
     fire inspectors and wardens

6. Summary

I have argued that AACs like *transformational grammarian* and
Chinese historian have no satisfactory analysis within the Lexical
Phonology framework. If rules of word formation are instead
permitted to apply freely, so long as the conditions on their
source word(s) are satisfied, then these AACs present no special
problem. Allowance must be made, in this framework as in the LP
framework, for possible mismatches between the structures licensed
by syntactic rules and those licensed by morphological rules, and
for possible mismatches between morphosyntactic organization and
specifically phonological, or prosodic, organization.

Notes

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    University) whose support enabled me to spend the autumn of
    1985 teaching at the Beijing Language Institute, where most
    of the theoretical ideas in this paper were developed.
1 The framework is advanced in Kiparsky (1982) and Mohanan (1982),
    which build on Siegel (1974) and Allen (1978). See Kaisse
    and Shaw (1985) for summary and bibliography.
2 Throughout this discussion I disregard the interpretations of
    the examples in (1a) and (1b) in which they consist of a
    modifying A plus a head N: 'grammarian who is
    transformational,' 'historian who is Chinese,' 'grammar that
    is transformational,' 'history that is Chinese.'
3 Such solutions (perhaps in consort with property inheritance, as
    sketched in section 4 below) are applicable to many of the
    other apparent phonology-semantics conflicts that have been
    mentioned in the literature, for instance in Marantz (1982,
    478-80) and in an oft-cited but never-published 1979
    manuscript by Pesetsky.
4 Note that the effect of introjection in morphology is parallel
    to the effect obtained via the features FIRST and LAST in
    the analyses that Nevis (1986, sec 3.2.6) and Zwicky (1987)
    sketch for words and features that are located at the edges,
    or margins, of syntactic constituents (rather than on the
    heads of those constituents). This potential parallel
    between morphology and syntax would undoubtedly repay
    further investigation.
5 Several lines of evidence in favor of this position have been
    collected by Levi (1978, sec. 2.2), who incorporates
    discussion from an unpublished 1972 paper by Postal. The
    fact that such A+N combinations are stressed just like
    combinations involving true modifying As might seem to
    indicate that all these combinations belong to the category
    N' rather than N; but as I have argued in Zwicky (1986a),
    when the principles for English stress are correctly stated
    they offer no support for the position that all A+N
    combinations are phrasal.
6 Parallel to that developed by Selkirk (1982, 100-6), following
    the lead of Aronoff (1976), for various prefixations and
    affixations.
7 Proposed by Williams (1981), and adopted also by Selkirk (1982,
    11-2).
8 A proposal along these lines was advanced by Harry Bochner in a
    paper ('Bracketing Non-Paradoxes') given at the Milwaukee
    Morphology Meeting in April 1986 but not yet published.
9 The feature percolation proposals achieve the effect of property
    inheritance by having affixes be the heads of morphological
    combinations, a treatment I have criticized in Zwicky
    (1985).
10 See the discussion in Hoekstra (1986) and the references cited
    there.

[11] To the extent that it is the case, then, we must state (as
Kiparsky (1983, 24) does) that a kind of Projection
Principle applies in morphology.
[12] Sadock's framework appears to require that a syntactic INT
structure be matched with a morphological EXT structure,
which is in turn matched with a phonological INT structure.

References

Allen, M. R. (1978) *Morphological Investigations*, Doctoral
dissertation, Univ. of Connecticut, Storrs.
Aronoff, M. (1976) *Word Formation in Generative Grammar*, MIT
Press, Cambridge, Massachusetts.
Aronoff, M. and S. N. Sridhar (1983) "Morphological Levels in
English and Kannada, or Atarizing Reagan," in J. F.
Richardson, M. Marks, and A. Chukerman, eds., *Papers from
the Parasession on the Interplay of Phonology, Morphology,
and Syntax*, Chicago Linguistic Society, Chicago, 3-16.
Churma, D. G. (1983) "Jets Fans, Raider Rooters, and the
Interaction of Morphosyntactic Processes," in J. F.
Richardson, M. Marks, and A. Chukerman, eds., *Papers from
the Parasession on the Interplay of Phonology, Morphology,
and Syntax*, Chicago Linguistic Society, Chicago, 50-62.
Halle, M. and J-R. Vergnaud (1987) "Stress and the Cycle,"
Linguistic Inquiry 18, 45-84.
Hoeksema, J. (1984) *Categorial Morphology*, Ph.D. dissertation,
Rijksuniversiteit te Groningen.
Hoekstra, T. (1986) "Deverbalization and Inheritance," *Linguistics*
24.3, 549-84.
Kaisse, E. M. and P. A. Shaw (1985) "On the Theory of Lexical
Phonology," *Phonology Yearbook* 2, 1-30.
Kiparsky, P. (1982) "From Cyclic Phonology to Lexical Phonology,"
in H. van der Hulst and N. Smith, eds., *The Structure of
Phonological Representations* (Part I), Foris, Dordrecht,
131-75.
Kiparsky, P. (1983) "Word-Formation and the Lexicon," in F.
Ingemann, ed., *1982 Mid-America Conference Papers*, Univ. of
Kansas, Lawrence, 3-29.
Levi, J. N. (1978) *The Syntax and Semantics of Complex Nominals*,
Academic Press, New York.
Lieber, R. (1981) *On the Organization of the Lexicon*, Indiana
Univ. Linguistics Club, Bloomington.
Marantz, A. (1982) "Re Reduplication," *Linguistic Inquiry* 13,
435-82.
Mohanan, K. P. (1982) *Lexical Phonology*, Indiana Univ. Linguistics
Club, Bloomington.
Nevis, J. A. (1986) *Finnish Particle Clitics and General Clitic
Theory*, Ohio State University *Working Papers in Linguistics*
33.
Sadock, J. M. (1985) "Autolexical Syntax: A Theory of Noun
Incorporation and Similar Phenomena," *Natural Language and
Linguistic Theory* 3, 379-439.
Selkirk, E. O. (1982) *The Syntax of Words*, MIT Press, Cambridge,
Massachusetts.
Siegel, D. (1974) *Topics in English Morphology*, Doctoral
dissertation, MIT, Cambridge, Massachusetts.
Sproat, R. (1985) *On Deriving the Lexicon*, Ph.D. dissertation,
MIT, Cambridge, Massachusetts.

Strauss, S. L. (1982) *Lexicalist Phonology of English and German*,
        Foris, Dordrecht.
Williams, E. (1981) "On the Notions 'Lexically Related' and 'Head
        of a Word'," *Linguistic Inquiry* 12, 245-74.
Zwicky, A. M. (1985) "Heads," *Journal of Linguistics* 21.1, 1-30.
Zwicky, A. M. (1986a) "Forestress and Afterstress," Ohio State
        University *Working Papers in Linguistics* 32, 46-62.
Zwicky, A. M. (1986b) "The General Case: Basic Form Versus Default
        Form," *Berkeley Linguistics Society* 12, 305-14.
Zwicky, A. M. (1986c) "On Incorporating the Insights of
        Autolexical Syntax," Ohio State University *Working Papers in
        Linguistics* 32, 139-43.
Zwicky, A. M. (1986d) "Phonological and Morphological Rule
        Interactions in Highly Modular Grammars," *Eastern States
        Conference on Linguistics* 3.
Zwicky, A. M. (1987) "Suppressing the Zs," *Journal of Linguistics*
        23.1.