

One-replacement, unaccusativity, acategorial roots and Bare Phrase Structure

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1. Background

In Bare Phrase Structure, nonbranching nodes are impossible (Speas 1986, 1990, Chomsky 1995). In a model-theoretic interpretive semantics for Logical Form, theta-roles are an anachronism and the Theta Criterion a peculiar requirement (Heim and Kratzer 1998). The conjunction of these two positions means that two centrally important paradigms of facts — unaccusativity and *one*-replacement — become essentially formally untreatable on usual assumptions about category, i.e. that N° and V° are terminal nodes without any internal structure.

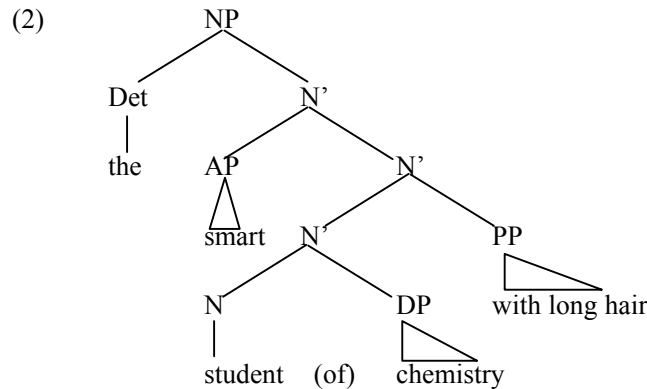
In this paper I'll argue that the Distributed Morphology approach to category resolves both these problems, allowing a natural and straightforward updating of the previously standard approaches to the central facts that were proposed when they were first examined. On this approach, the contentful, open-class part of any lexical item such as a noun, verb, or adjective is contributed by an acategorial Root ($\sqrt{}$), which acquires category by being merged with a particular functional head, v° , n° , a° .

2. One-replacement

In the original elaboration of X-bar theory by Jackendoff (1977), one significant test employed was *one*-replacement. Phrases like *the student of chemistry with long hair* were assumed to be projections of N° , i.e. NPs, and the distribution of *one* indicated that their constituent structure could be represented by the bracketings in (1a) and (1b).

- (1) a. [the [[smart [student of chemistry]] with long hair]]
 b. [the [smart [[student of chemistry] with long hair]]]

Assuming that determiners were specifiers of NP led Jackendoff to propose the labeling illustrated in (2) for the bracketing in (1b).

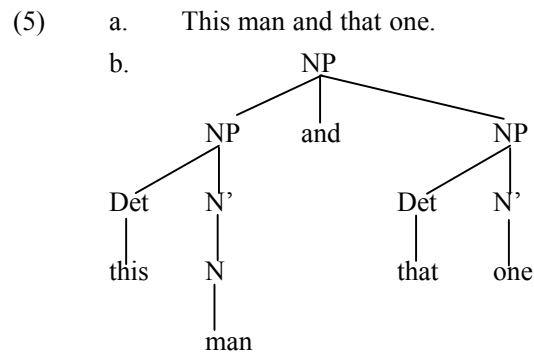


In particular, Jackendoff argued that *one* represented the replacement of a category intermediate between N and NP, N', which was neither the head nor the maximal projection of the phrase. He based this conclusion on facts like those illustrated in (3) and (4). (3) shows that *one* cannot replace elements like determiners, demonstratives and quantifiers, which Jackendoff assumed were specifiers of NP. (4) shows, perhaps more surprisingly that *one* cannot replace just N elements, leaving arguments of N behind. The minimum *one*-replacement is of the of the N and its internal argument; *one*-replacement cannot target N without targeting its internal argument.¹

- (3)
- a. The student with long hair and that one with short hair.
(understood as “that [student] with short hair”)
 - b. This student with long hair and that one.
(understood as “that [student with long hair]”)
 - c. * This student with long hair and one with short hair
(understood as “[this student] with short hair”.
 - d. * Every student with long hair and one with short hair.
(understood as “[Every student] with short hair”)
- (4)
- a. This writer of novels with long hair and that one with short hair.
(as “That [writer of novels] with short hair”)

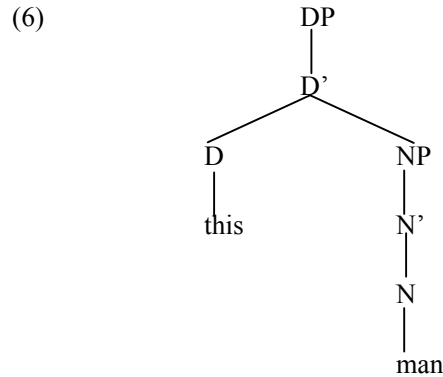
- b. This writer of novels with long hair and that one.
(as “That [writer of novels with long hair]”)
- c. *?This writer of novels with long hair and that one of poems
with short hair.
(as “That [writer] of poems with long hair”)

One-replacement, then, seemed to confirm the uniform existence of an N' level, and, under that account, entailed a need for non-branching N' nodes even in the analysis of simple Det-N sequences:

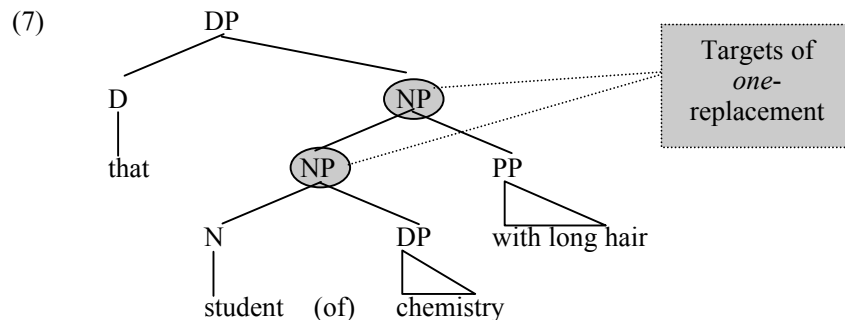


If there was no N' level in the representation of *this man*, *man* could not be replaced by *one*.

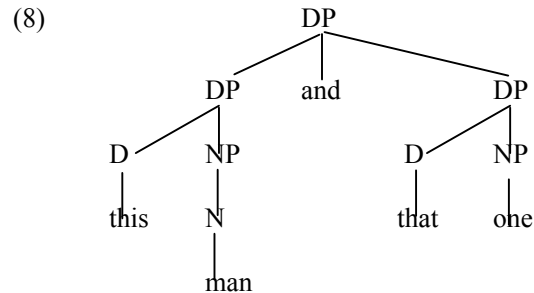
All the non-branching structure seemed fairly cumbersome, however, and it was soon accepted practice not to draw non-branching nodes when not directly addressing the question of the existence of bar-levels. Indeed, the development of the DP hypothesis by Abney (1987) meant that unmodified NPs acquired *three* levels of non-branching structure under standard X-bar assumptions:



In fact, the discovery of the DP could be understood as rendering the need for non-branching levels of N' unnecessary, at least in accounting for *one*-replacement. If adjunction is understood as Chomsky-adjunction, adjoining to a maximal projection and creating a new maximal projection of the same category, the distribution of *one*-replacement could be understood as replacing the maximal category NP: just as pronouns stand in for DPs, so does *one* stand in for NPs. Like any NP, a *one*-replaced NP can be adjoined to. However, arguments of N like *student of chemistry* or *writer of novels* were sisters to N under NP, and consequently could not be stranded under *one*-replacement:

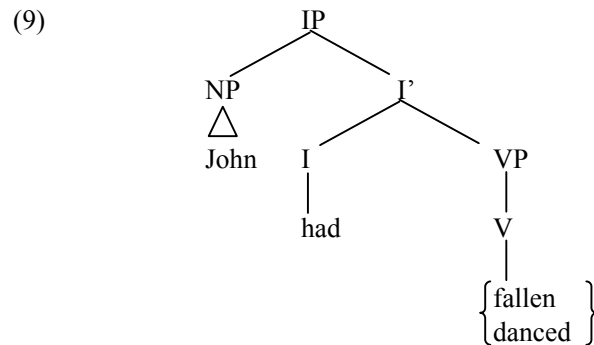


Nonetheless, a categorially-significant distinction between N and NP was still clearly necessary to take care of examples like *this man* and *that one*. That is, at least one non-branching node was still necessary to deal with the distribution of *one*-replacement. (If *one* could replace *man* at the N° level, then the theory would be back to predicting *one of physics*.) Consequently, even with the DP-hypothesis, at least N° and NP levels must be distinguished in order to treat *one*-replacement



3. The Unaccusative Hypothesis

A similar sequence of analytic steps necessitating non-branching structure arose in the analysis of the VP. Another of the most significant discoveries of the 70s and early 80s (see Pullum 1988) was the Unaccusative Hypothesis: the notion that not all intransitive verbs are derived from the same underlying structure. Prior to this discovery, the subjects of all intransitive verbs were base-generated where all subjects were: as daughters of S, or in later terms, in Spec of IP:

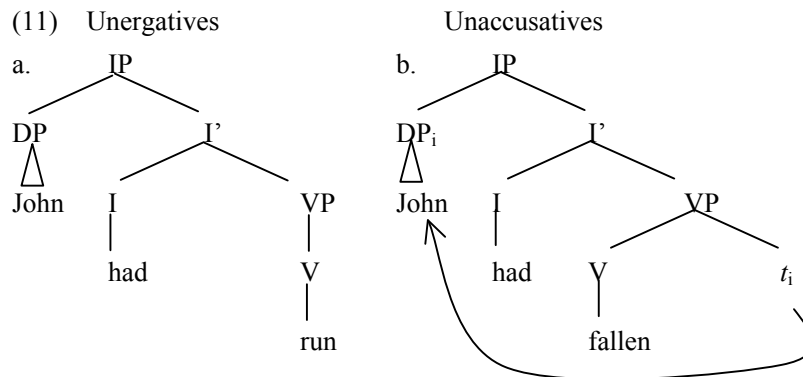


Beginning in the 1970s, Perlmutter's idea that the surface subjects of certain intransitive verbs started their lives as objects (Perlmutter 1978) began to take hold. In GB theory, which defined 'subject' and 'object' configurationally, this entailed that the single argument of such intransitive verbs was base-generated as sister to the intransitive V, and then moved to subject position by the same process and for the same reasons that the objects of passive V did (see, e.g. Burzio 1981). This allowed a unified treatment of otherwise surprising phenomena, most famously the fact that objects, subjects

of passive V and subjects of unaccusative V permitted *ne*-cliticization in Italian, while subjects of unergative V did not:

- (10) a. Gianni *ne* ha riparato tre.
 Gianni of.them has repaired three.
 “Gianni repaired three of them”
 b. *Ne* e stato riparato tre.
 of.them is been repaired three.
 “Three of them were repaired.”
 c. *Ne* e arrivato tre.
 of.them is arrived three.
 “Three of them arrived.”
 d. * *Ne* ha corso tre.
 of.them have run three.
 “Three of them ran.”

This was a natural consequence if the two kinds of intransitives had following structures:

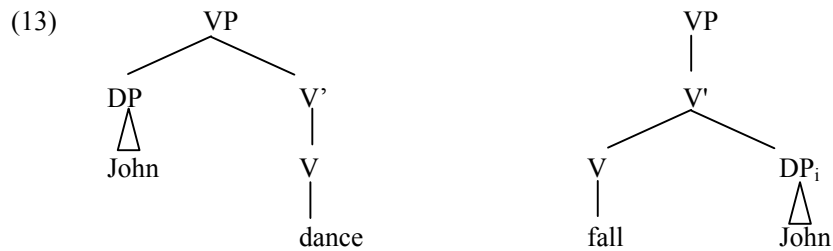


The next major development in the analysis of the VP was the VP-internal Subject Hypothesis (Sportiche, 1988, Koopman and Sportiche 1991). According to this proposal, *all* subjects are base-generated within the VP, and achieve their surface position through movement for Case to spec-IP. This allowed a principled account of several important phenomena, notably of quantifier stranding:

- (12) a. [All [the kids]]_i can [*t_i*] eat pizza.
 b. [The kids]_i can [all [*t_i*]] eat pizza.

The position of the quantifier between I and V was understood as marking the trace of DP movement from Spec-VP to Spec-IP.²

The VP-internal subject hypothesis had important ramifications for the analysis of unergatives and unaccusatives, however. Viewed one way, these ramifications could be taken as a confirmation of the fundamental assertions of X' theory. The ISH requires that Spec-VP and Comp-V be distinct structural positions even when there is no branching within VP; otherwise, there would be no distinction between the underlying structure of unergatives and the underlying structure of unaccusatives. In short, it requires that *fall* and *dance* have the distinct underlying structures in (13) below:

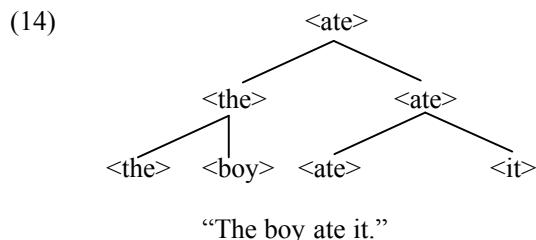


This distinction relies crucially on the presence of a non-branching V' node. If that node was not present, the structural relationship between an intransitive V and its single argument would be identical no matter whether they were unergative or unaccusative: the V and its argument would be sisters.

4. Bare Phrase Structure

Chomsky (1995), following a line first proposed by Speas (1986, 1990), proposed to eliminate the X-bar component of the grammar, reducing all structure-building to the operation of Merge. The set of two items constructed by Merge is labeled by a copy of the label of one of the items. The notion of *head* and *phrase* are then configurationally determined: a node is a *head* if it does not dominate a copy of itself, and it is a *phrase* if it is not dominated by a copy of itself. Intermediate projections—bar-levels—have no status as objects of the theory. If an element meets both criteria, it can be both a phrase and a head simultaneously, as the object pronoun in (14) is. Clitics are the paradigm example of this: they behave like phrases in receiving a theta-role and checking Case, and like heads in undergoing head-movement. A tree-notation

of the sentence *The boy ate it* in this set-theoretic approach might look like this:



(Here, the words enclosed in brackets are intended to represent bundles of syntacticosemantic and phonological features, including category. Below, I will use the category labels as a shorthand to facilitate exposition, but they should be understood to represent the entire bundle.)

For Bare Phrase Structure, therefore, non-branching nodes are a flat impossibility. Any case that looks like it requires a non-branching node requires reanalysis. Rather than a non-branching node, it must be the case that a phonologically null element of the numeration has Merged undetected.

Obviously, both *one*-replacement and the treatment of unaccusatives is problematic in this version of phrase structure, since both require the presence of non-branching nodes.

Speas recognized both problems. With respect to the problem with *one*-replacement, she concluded that an alternative treatment was necessary, and adopted a proposal concerning the licensing of *one*-replacement from Travis (1984). That treatment was based on the observation that only thematically dependent PPs could not be stranded by *one*-replacement: *one* cannot replace an N upon which some PP is dependent for theta-assignment. Its distribution as a replacement of some level of projection of N is otherwise unconstrained. Thus *one of chemistry* is out because thematically-dependent *chemistry* fails to be appropriately licensed. Panagiotidis (2003) also proposes a very similar analysis.

However, the notions of ‘thematic dependence’, theta roles and the Theta Criterion, are equally uncertain in modern syntactic theory. Hale and Keyser (1993 et. seq) propose that theta-roles are an epiphenomenon, arising as a consequence of the position an NP was merged into in their restrictive inventory of l-syntactic structures. Heim and Kratzer (1998) argue forcefully that within a model-theoretic approach to the semantic interpretation of LF, both the Theta Criterion and Full Interpretation (understood semantically) are irrelevant conditions on syntactic structure; if the appropriate interpretive mechanisms (functional composition and others) fail to be able to operate on

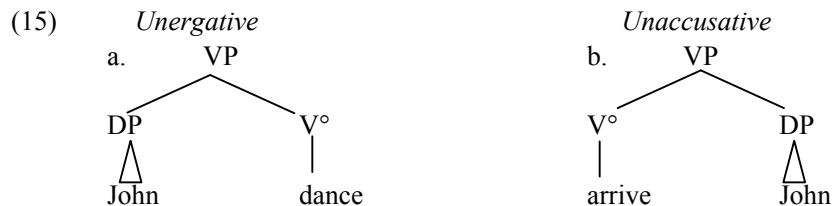
any pair of syntactic sister nodes, the derivation will ‘crash’ due to semantic ill-formedness. Surplus arguments will not be able to combine with predicates that do not have the appropriate valence; similarly, providing a predicate of a certain valence with an inadequate number of arguments will result in a failure of composition as well. The ‘requirement’ that every NP receive a θ -role and that every θ -role be assigned to an NP is not necessary. On such an approach, a Theta Criterion treatment of *one*-replacement is questionable.

If *one* is an N^0 head which, semantically, can take no arguments, then *one of chemistry* will be ill-formed because *chemistry* and *one* won’t be able to compose. However, then the question of how the NP headed by *one* gets its interpretation from its antecedent becomes tricky: *one*-replacement is only licensed under *identity* with a preceding NP, just like VP-ellipsis. If *one* is in fact interpreted at LF as, for instance, *student*, then it should be able to take an argument. The approach we will propose below allows for a simple PF-deletion approach to *one*-replacement.

The conflict between BPS and unaccusativity hasn’t been at the forefront of the phrase-structure debate, because the solution was already in place at the time of Speas’ (1990) treatment of the proposal. Hale and Keyser (1987) had already advanced their proposal that unergative verbs were covertly transitive, with incorporation of a cognate object into a causative light verb, and so the problem didn’t arise. Chomsky (1995) also adopted this proposal, and unergatives and unaccusatives were structurally distinct even without non-branching nodes. First we’ll go over the H&K solution to the unaccusative problem for BPS, and then we’ll see how the DM extension of this analysis to all categories also allows the same solution to apply to the *one*-replacement problem.

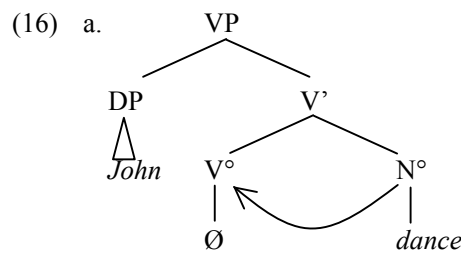
5. vP and unaccusativity

Recall that with the VP-internal subject hypothesis, in combination with BPS, presents a structural problem: (12) above becomes (15) below, on BPS assumptions



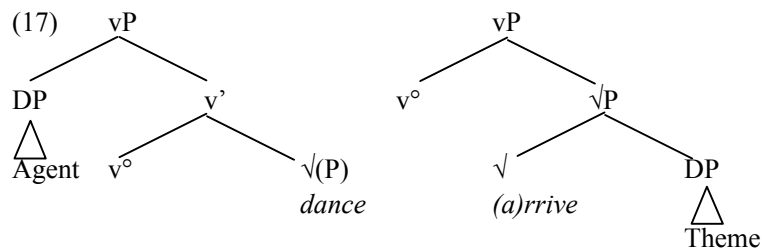
The unergative structure is supposed to contain a specifier (on the left) and the unaccusative one only a complement (on the right). But assuming that linear order does not matter in syntax, these two structures are indistinguishable, and the constellation of facts to do with the difference between the two classes of verbs has to be taken care of in some other, non-phrase-structural way (e.g. with reference to theta-roles or equivalents, as in LFG's f-structures).

Hale and Keyser proposed that unergatives actually have the structure in (16) below:



Adopting this approach allows us to maintain a BPS framework without further qualms; unaccusatives could continue to have the structure in (15b) above

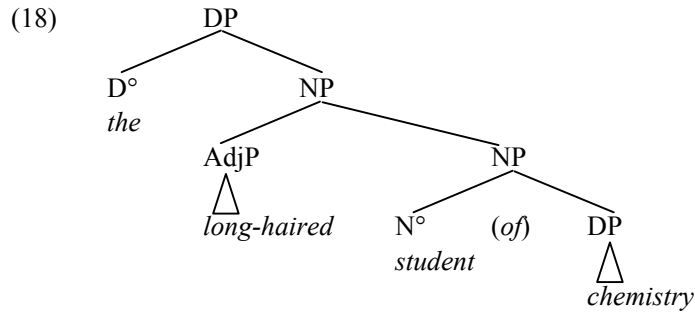
Later, Chomsky (1995) added the external-argument-selecting v° head to all transitive verbs, though not to unaccusatives. In Distributed Morphology (Halle and Marantz 1993), however, since it is axiomatic that v° created verbs from acategorial roots, unaccusatives have to have a little- v projection as well; a non-agent-selecting v° (Harley 1995, Marantz 1997). So within DM, the structures for unaccusatives and unergatives look like this:



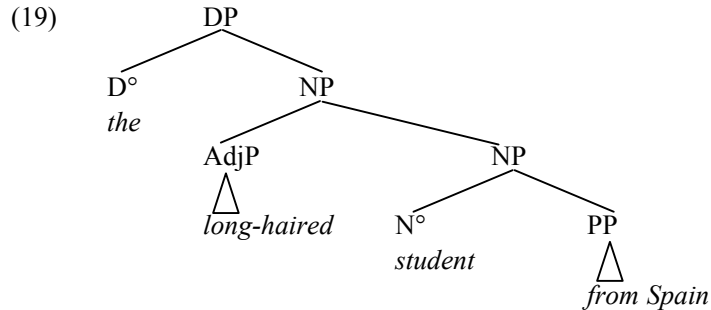
Internal arguments (as argued by Kratzer (1994, 1996) are arguments of the root.

6. nP and *one*-replacement

As noted above, the standard approach to *one*-replacement runs into trouble in BPS. The structure of *the long-haired student of chemistry* would look like this:



In this structure, of course, *of chemistry* cannot be stranded, suggesting that *one* targets NPs for replacement. But the identical structure emerges, under BPS assumptions, for an NP with no complement but a PP modifier like *the long-haired student from Spain*:

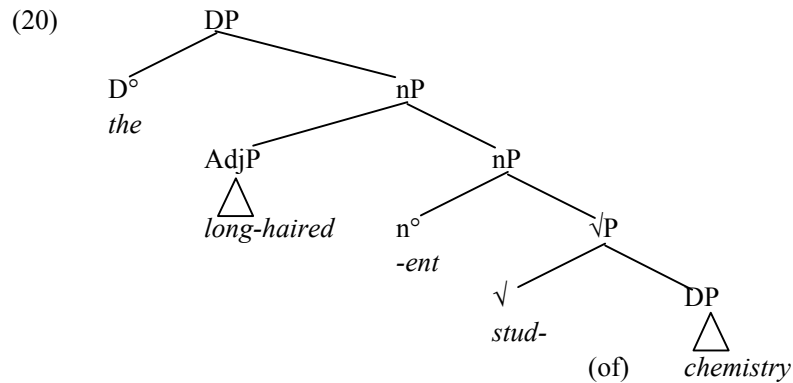


So the argument-adjunct distinction is predicted not to matter for *one*-replacement by BPS assumptions, if *one*-replacement is taken to be an NP-targeting process. Just as with unaccusativity and LFG, one avenue of retreat is towards theta-structure, and this is the approach taken by Speas and Panagiotidis. However, within DM, another possibility exists.

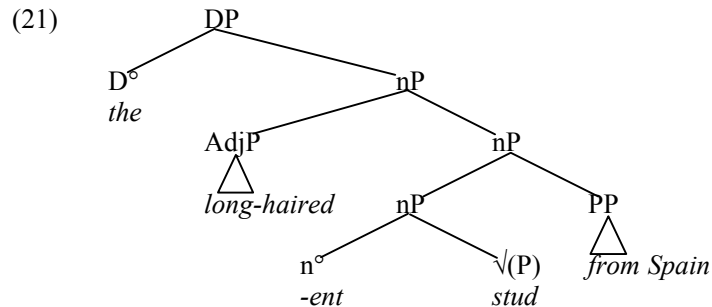
Within DM, N°s are equally the product of $n^\circ + \sqrt{}$. Little n° is a nominalizer, just as v° is a verbalizer (and a° an adjectivalizer; all can be

realized by category-changing derivational morphology, though in many cases in English they are all of course null affixes).

Consider the structure of *the long-haired student of chemistry* within this framework. (I'll assume that the argument-taking root of *student* is *stud-* and that *-ent* is a nominalizer, but this needn't be the case; *student* could be the root and the usual \emptyset nominalizer could be the head of n° .):



Head-movement of v to n° will create *student*. Now, a nP-modifying PP like *from Spain* and an argument DP like *chemistry* will be in distinct positions in the phrase structure:



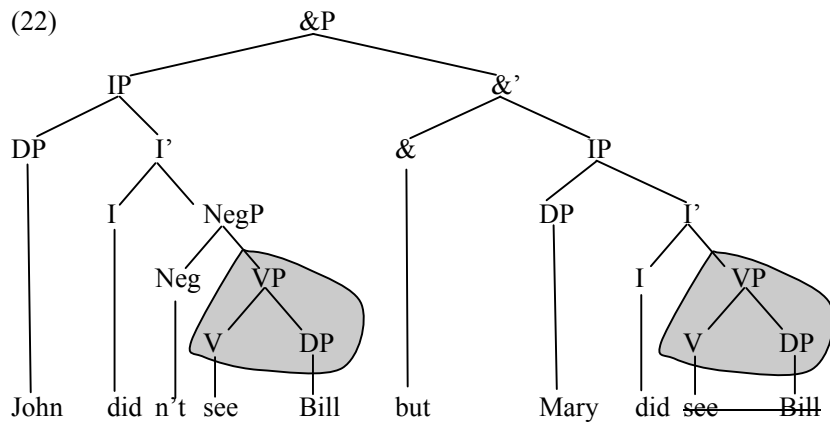
If *one* is of category n° , then it becomes clear why it cannot replace $[_{vP} v \text{stud}]$: it is of the wrong category. The presence of n° resolves the non-branching structure issue posed by *one*-replacement for BPS. Further, the resolution of the non-branching structure problem by introducing a category-defining head node is entirely analogous in the vP and nP cases.

To understand how *one* actually functions to replace an nP, however, we need to delve somewhat deeper into the mechanisms of Distributed Morphology, and in particular into late Vocabulary Insertion.

7. *One-replacement* as ‘PF-deletion’ at Spell-Out

Under BPS assumptions, *one* can’t be of ‘category’ nP, because the notions ‘phrase’ and ‘head’ are derivative. The label of the entire nP struct is just a copy of the originally merged n° item.

Recent treatments of ellipsis phenomena such as VP-ellipsis and Sluicing (see, e.g. Johnson 2001 and Merchant 2001) adopt a line of analysis whereby the entire structure associated with the elided material is present, but its identity with a suitable antecedent somehow licenses its nonpronunciation (the nature of the identity restriction is under considerable debate, contrast, e.g. Rooth 1992 and Lasnik 1995). That is, at Spell-Out, the terminal nodes of the ‘identical’ structure are identified as not needing to be pronounced. An example using the common strikethrough notation involving VP-ellipsis is presented below:



The identity of the two circled VPs licenses the non-pronunciation of the second, indicated by strikethrough.

Under Distributed Morphology assumptions, one way to treat a failure to be pronounced is as a failure of Vocabulary Insertion: the terminal nodes which are not pronounced have not had any VIs inserted in them. Alternatively, one could simply say that at Spell-Out, and before Morphology, the VP node marked for ellipsis is simply deleted from the structure. It would

still be there on the way to LF—the structural deletion would be entirely on the PF side—but it would be completely absent on the PF side and at Morphology.

On the latter approach, there would simply be no terminal nodes for which Vocabulary Insertion could compete. A phenomenon like *one-replacement*, then, would need to be treated differently than ellipsis, since there, the n° node *is* realized with a Vocabulary Item—it cannot be the case that the nP portion of the structure is simply deleted at SpellOut under identity.

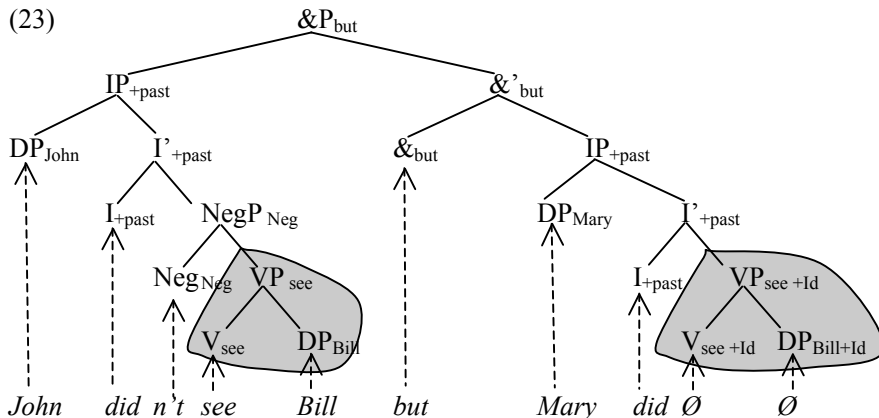
Here, however, I wish to consider the merits of the former approach—that the terminal nodes of ellipsis structures are all still present, but are marked in with a special feature that blocks the normal process of Vocabulary Insertion. This feature indicates the formal identity of this terminal node with some other node in an appropriate anaphoric licensing relationship to it. This feature, which I'll call '[+Id]', is bundled with the other features that constitute these nodes in the Numeration.

In Distributed Morphology, Vocabulary Insertion involves competition of Vocabulary Items, specified for certain feature bundles, to realize individual terminal nodes in the syntax. Vocabulary Items can only compete to realize nodes whose feature bundles are equally or more fully specified than they themselves are. The most fully specified matching Vocabulary Item wins the competition for each terminal node.

On the approach advocated here, terminal nodes which are exact equivalents of other nodes in an appropriate licensing relation are marked with [+Id]. Let us assume that most vocabulary items are specified as [-Id]. Only a few vocabulary items will contain the [+Id] specification.

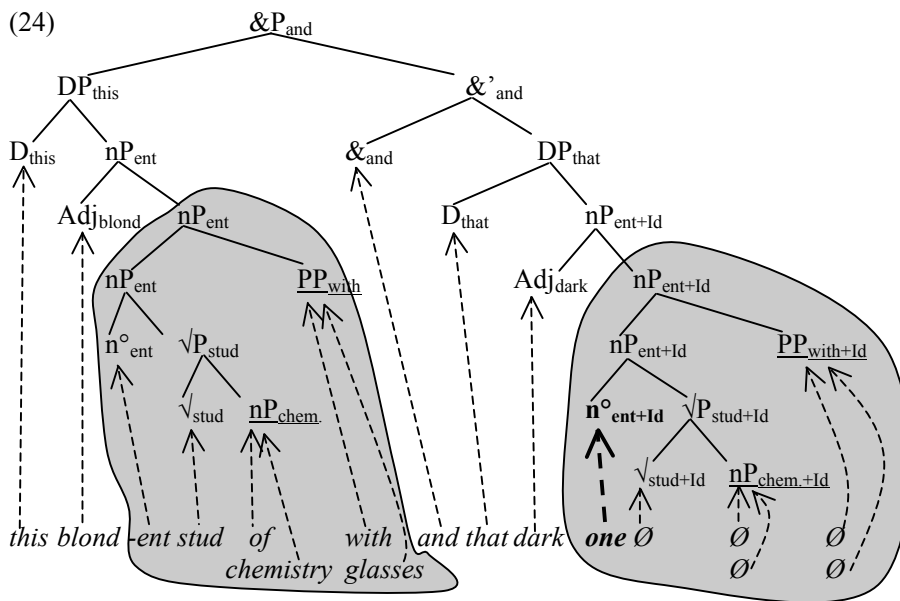
Obviously, the main [+Id] VI is simply the null morpheme \emptyset . In the VP-ellipsis example above, the strikethrough notation is understood to represent a failure of insertion of the [-Id] VIs *see* and *Bill*, and a successful insertion of the null item \emptyset in both terminal nodes. The correct representation of that VP-ellipsis example, then, is something more like this, where subscripts represent the feature bundles associated with each terminal node, and the arrows represent insertion of the winning Vocabulary Items into each node:

(23)



So, how to do *one*-replacement under identity like this? In English (though certainly not in all languages), my claim here is that there is an additional [+Id] vocabulary item specified for ([+count]) n° nodes: *one*. In a *one*-replacement situation, *one*'s feature-specification is such that it will block insertion of the less-specific [+Id] item, \emptyset , by the Elsewhere principle. In a conjoined NP such as *this blond student of chemistry with glasses and that dark one*, the structure and VI-insertion will look like this:

(24)



(The complex nP and PP nodes for *of chemistry* and *with glasses* have been underlined to indicate they haven't been drawn out in full; the two items that are both shown inserting into these nodes are each inserting into an individual daughter terminal node that isn't represented here. Further, the merger or head movement which unified $\sqrt{\text{stud}}$ and *-ent* is not shown.) The winning '+Id' vocabulary item for n° , *one*, is shown in bold.

Of course, the feature specification for *one* will have to be sensitive to the features on its c-commanding node. In particular, we don't want +Id *one* showing up in the middle of a VP-ellipsis, for instance:

(25) * Bill saw that big cat and Mary did ~~see that big~~ *one* (too).

As observed by Speas (1990: 118 n.12), *one*-insertion is sensitive to a certain kind of definiteness, where the determiner dominating the *one*-nP crucially *can't* be +Id; we'll simply assume the VI for *one* is specified contextually for insertion in that kind of -Id environment. Below are the +Id VIs *one* and \emptyset with their insertion environments:

- (26) a. *one* \leftrightarrow [n° +Id, +count] / [_{DP} Det_{-Id, +def} [_{nP}... _____ ...]]
 b. \emptyset \leftrightarrow [_x +Id]

(It is likely that other VIs are permitted to appear in +Id v° slots, for instance, such as the auxiliary verbs *have* and *be* in VP-ellipsis contexts, but this would take us too far afield here.)

8. Conclusions

The central point of the above discussion is that two extremely robust syntactic analyses—unaccusativity and *one*-replacement—run into essentially the same problem under Bare Phrase Structure assumptions: they both require a categorial distinction between terminal and non-terminal nodes, and in particular, require that there be a categorial distinction between phrase-level, bar-level and terminal nodes, which is not possible in Bare Phrase Structure.

In both cases, the general problem is solved by essentially the same, independently motivated mechanism from Distributed Morphology: an acategorial root (possibly with an argument) merges with category-creating terminal element added in the syntax by Merge.

This solves the problem in a straightforward way with respect to unaccusativity. With *one*-replacement, however, the question of how to treat the nonpronunciation of the elided structure arises: it can't just be simple elimination of the relevant nP, since *one* itself realizes the n° head of that nP,

which must still be present. A proposal was made which relies on the technical device of late Vocabulary Insertion in Distributed Morphology.

Notes

¹ Note that this applies to clausal complements as well; **John's intention to leave and his conflicting one to stay* is equally bizarre. CP and PP complements, as in *Sue's belief that John left and her conflicting one that he stayed* and *the attack on Pearl Harbor and the later one on Normandy* are much better, but this is presumably because CPs and PPs can be rightwardly extraposed in English.

² This particular analysis of floating quantifiers is still the topic of considerable debate; see, e.g. Bobaljik (1998) for useful discussion.

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Harley: Acategoryal Roots and Bare Phrase Structure

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