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Merge, conflation, and head movement: The First Sister Principle revisited*

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1. Head-movement is a problem in the Minimalist Program

Head-movement is something of a conundrum in modern syntactic theory. At the beginning of the 1990s, it fit beautifully into the system of assumptions that were gradually coalescing into the Minimalist Program. The Head Movement Constraint of Travis 1984 was unified with other constraints on movement as an instance of Rizzi's 1990:11 Relativized Minimality, the first overarching vision of how economy principles might restrict move- α . The extremely elegant account of the relative positioning of verbs, auxiliaries, negation, tense and C° in English, French and German that head-movement affords is a paradigm case for Principles and Parameters theory, included in essentially every modern syntax textbook (e.g. Haegeman 1991:522-30, Radford 1997:216-34, Carnie 2002:189-210).

Nonetheless, getting the structural mechanism of head-movement to interact properly with the other fundamentals of the theory was a headache even within X-bar theory (Rizzi 1991:117 n. 19 decided that it must be substitution, rather than adjunction; Chomsky and Lasnik 1993: ex. 51, 58, concluded the opposite). When Chomsky 1994 introduced Bare Phrase Structure as a fundamental part of the Minimalist Program, it became essentially impossible. In Bare Phrase Structure, the notion 'segment of X° ' becomes incoherent, since 'head' is equivalent to 'terminal node' and an X° is simply a terminal element with something adjoined to it, so that it projects; anything dominating a branching node is not an X° . Consequently, within BPS, an adjunction-to- X° account of head-movement violates not only Extend Target (since adjunction is to a non-root node), but also Chain Uniformity, as outlined by Chomsky 1995: 321:

"We have so far sidestepped a problem that arises in the case of ordinary head adjunction. Take α , K to be X° 's in (120) [they're sisters], with α raising to target K, which projects, forming L – $\{<H(K), H(K)>, \{\alpha, K\}\}$. Since K projects, α is maximal. Thus, α is both maximal and minimal.

* I would like to thank the audience at NELS as well as audiences at Arizona and Maryland for their helpful comments. Thanks also to Andrew Carnie, Terry Langendoen, Julie Legate and Idan Landau for discussion and suggestions, and to a NELS abstract reviewer for extensive comments.

If that is true of *t* as well (e.g. in the case of clitic raising), then CH[ain] satisfies the uniformity condition. But suppose *t* is nonmaximal, as is common in the case of V-raising to I or to V. Then, under a natural interpretation, [chain uniformity] is violated; CH is not a legitimate object at LF, and the derivation crashes.”)

These difficulties, as well as the fact that he can't get V2 order to work out correctly given other assumptions (1995:368), lead Chomsky to conclude that head-movement is essentially phonological — not part of the syntactic component at all. He provides no suggestions as to how this conclusion can be implemented in such a way as to retain the empirical generalizations and locality effects that made a syntactic treatment of head movement so attractive in the first place.

Since 1995, head-movement has been something of a no-fly zone within Principles and Parameters theory. Some attempts have been made to capture its effects within a general Minimalist picture. Brody 2000 proposes that the general properties of head movement, as well as of Baker's 1985 Mirror Principle, arise because syntax is projected from pre-built morphological structure; Mahajan 2000, following ideas of Kayne 1994 et seq, proposes that apparent head-movement is in fact the result of massive movement of remnant XPs in an antisymmetric model. Both approaches require substantial revision of fundamental assumptions of the MP, however, and no solution has emerged that both captures the central properties of head-movement as understood from previous study and implements Chomsky's proposal that it is 'phonological' in nature.

In this paper, I observe that the Conflation mechanism proposed in Hale and Keyser 2002 has the right characteristics to be such a solution within more conventional MP assumptions, and apply it to the problem of synthetic compounds in English.

2. Making sense of head-movement as 'phonological': Conflation

One commonly-expressed intuition behind head-movement seems to be that it's triggered by "affixal" properties of one or the other of the heads involved. People say things like "...the complementizer position must be filled in Dutch and German" (Hageman 1990: 530), where the only serious notion of 'filled' that might be relevant is morphophonological.¹ This comports well with Chomsky's intuition that head-movement is 'phonological'. Its crucially local nature, however, makes it seem more like a syntactic phenomenon. Hale and Keyser 2002: 60-88 propose (then retract) an implementation of a mechanism they call Conflation for their lexical syntactic derivations that is a natural candidate for a Minimalist, phonological head-movement mechanism. It operates in tandem with the syntactic operation Merge. They say

"We would like to take seriously the idea that Conflation is a concomitant of Merge, the operation which is fundamental in defining the projection of syntax from the lexicon (Chomsky, 1995). [...] To say that Conflation is a concomitant of Merge is to say that it is in some intimate manner bound up with Merge, that it is a part of Merge in some sense." (pp. 60-61)

H&K's Conflation is an operation that occurs when a head X merges with a maximal constituent YP whose label is H(Y). The label of Y, by assumption, contains all the

¹ ...since even a null ('unfilled') C must be syntactically & featurally completely robust

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features of Y° , including a copy of its phonological features—a *p-sig*. If X 's *p-sig* is defective, Y 's *p-sig* is conflated into X 's when X and Y Merge, meaning that X is now pronounced with Y 's phonological features. When X projects, the label of the whole constituent, $H(X)$, will now contain Y° 's phonological features.

- (1) Key assumptions for H&K 2002 Conflation:
 - a. The label of any constituent has ALL the features of the head, including some representation of a phonological matrix, (the 'p-sig' of the head).²
 - b. Conflation occurs when a constituent α is merged with a sister head β whose *p-sig* is 'defective'. The *p-sig* of α is merged into the *p-sig* of β .³
 - c. For Economy reasons, the conflated *p-sig* is only pronounced once, in its uppermost position.

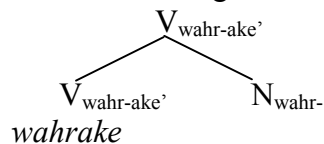
Consider what will happen in the derivation of this Mohawk incorporation example:

- (2)

	Owira'a	waha'-wahr-ake'	(Baker 1988)
	Baby	Agr-meat-ate	
	"The baby ate meat."		

In the numeration relevant to the VP we start with the roots, [_N wahr-], 'meat' ($N_{\text{wahr-}}$) and [_V -rake'], 'eat' ($V_{\text{-rake}}$).⁴ To trigger Conflation, we assume $V_{\text{-rake}}$ has a 'defective' *p-sig*. The steps of the derivation of the VP are listed in (3):

- (3)
 - a. $N_{\text{wahr-}}$ merges with $V_{\text{-rake}}$
 - b. Because $V_{\text{-rake}}$ has a 'defective' *p-sig*, the *p-sig* of $N_{\text{wahr-}}$ conflates into the *p-sig* of $V_{\text{-rake}}$
 - c. The head, now with the *p-sig* $V_{\text{wahrake'}}$, projects (i.e. is used to form a label) giving the set $\{ V_{\text{wahrake'}}$, $\{ V_{\text{wahrake'}}$, $N_{\text{wahr-}} \} \}$, which can be represented as the following tree:



- d. For economy reasons (because $V_{\text{wahrake'}}$ is pronounced), $N_{\text{wahr-}}$ is not.

(The tree in (3) is a VP. Remember that in Bare Phrase Structure, an X undominated by a copy of itself is an XP, also called an X_{max} ; an X dominating no copy of itself is an X^0 s,

² Because this approach depends crucially on labels, it's incompatible with Collins 2002.

³ This is like foot-feature passing in GPSG and later models. It violates Brody 1998's 'Uniqueness' principle, although only for phonological material; I assume Uniqueness holds for active syntactic features.

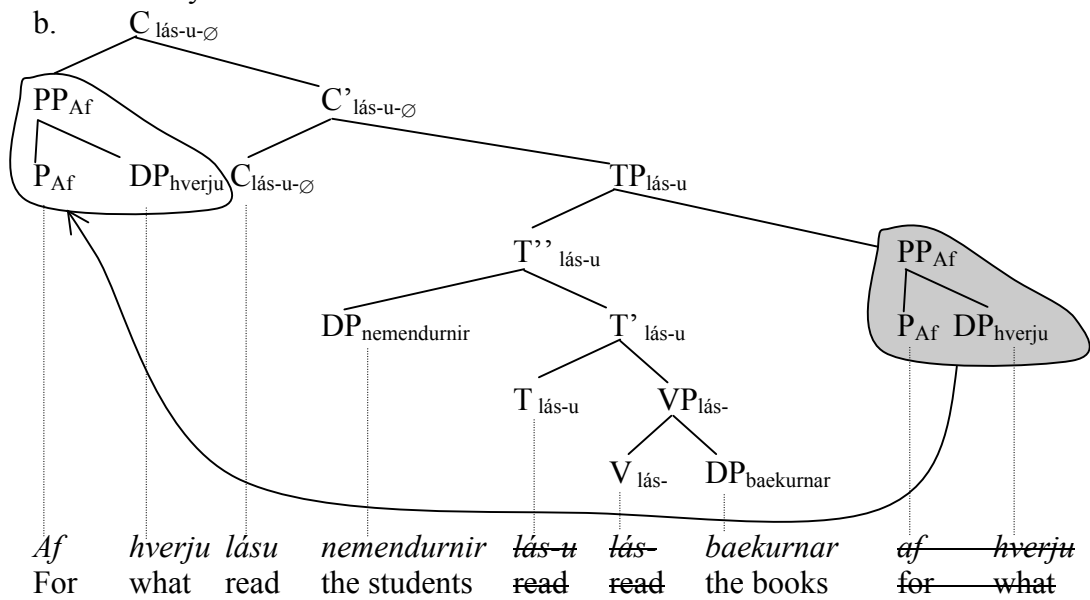
⁴ I will represent heads as a syntactic category label, subscripted with their phonological realization intended to represent the *p-sig* of the head. Since I believe in the 'interpretive' morphology of the Distributed Morphology theory, with Late Insertion, this isn't really what I think is happening. I think of 'p-sigs' as just positions-of-exponence, waiting for Vocabulary Insertion to fill them in; conflation makes a copy of a p.o.e. and puts it next to the 'defective' p.o.e. of another head.

also called an X_{min} . For the rest of the paper, I'll use conventional bar-notation to indicate the levels of projection, but of course in BPS the bar-notation has no theoretical status.)

The extension to the standard cases of head movement is straightforward. The central insight is that within Bare Phrase Structure, the p-sig of the head Y in a complex constituent YP is present in the label of YP , because the label of YP contains a copy of all the features of its head Y . Consequently, if X has a defective p-sig, at Merge it will acquire the p-sig of its sister by Conflation—and the p-sig of its sister YP is the same as the p-sig of Y° , the closest c-commanded head.

Let's consider a standard case of V2 in a wh-question in Icelandic. Unpronounced elements are represented using strikethrough notation, as usual. Phrasal movement of the Wh-element is indicated with shading and arrows; the vP structure and subject-movement to TP have been silently suppressed for simplicity. The steps relevant to deriving the tree in (4) are detailed in (5):

- (4) a. Af hverju lásu nemendurnir bækurnar
 for what read.fin the.students the.books
 "Why did the students read the books?"



- (5) a. The verb *lás-* ‘read’ merges with the (independently constructed) DP *bækurnar* ‘the books’. Neither P-sig is defective, and no conflation occurs. The VP is labeled with the p-sig of its head, *lás-*.
- b. The VP labelled *lás-* merges with an element from the numeration, a [+finite] T element, *-u*. This element’s p-sig is defective, and conflation occurs. The p-sig of the VP, *lás-*, is copied into the defective p-sig of T, giving *lás-u*. Then, the whole constituent, a projection of T, is labeled with the p-sig of its head, *lásu*.
- c. The TP labelled *lásu* merges with the subject DP, *nemendurnir*, ‘the students’. (Note: this is a copy of *nemendurnir* from down in spec-vP, not shown). Neither p-sig is defective, so no copying occurs. The whole constituent is labeled with the p-sig of its head T, *lásu*.

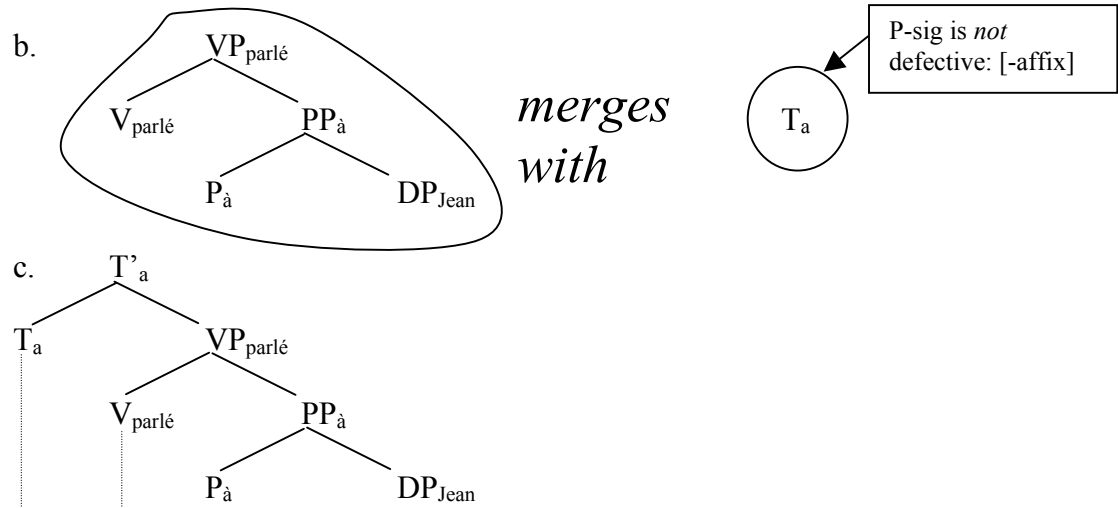
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- d. The T projection is merged with the adjunct PP *af hverju*, ‘for what’. Neither P-sig is defective, and no conflation occurs.
- e. The TP labeled *lásu* is merged with a [+wh] C element, whose p-sig, \emptyset , is defective. Consequently, the p-sig of the TP, *lásu*, is copied into the defective P-sig of C, giving *lás-u- \emptyset* . Then the whole constituent, a projection of C, is labeled with the P-sig of its head.
- f. Finally, the [+wh] PP *af hverju*, ‘of what’, is copied from its base position and Merged with the [+wh] CP, checking its [+wh] feature and satisfying V2. No defective p-sig is present, so no copying occurs; the whole CP is labeled with the p-sig of its head, *lásu*.

I will call heads with ‘defective’ p-sigs [+affix] heads; this is just for convenience. As we’ll see, I’m not suggesting that such heads are necessarily morphophonologically affixal, though in canonical cases they are.⁵

H&K’s Conflation mechanism lets us implement the idea that head-movement is ‘phonological’, while simultaneously ensuring that it is *local*. Conflation derives the Head Movement Constraint, in a syntax-dependent way—but under this mechanism, it turns out the HMC has nothing to do with the Minimal Link Condition. Locality is ensured because only the p-sig of the label of its sister may be conflated during merge of a [+affix] head. The p-sig in the label of the sister is a copy of the p-sig of the *head* of the sister. Any p-sigs *within* that constituent will not be eligible for conflation, unless they have previously been conflated into the label of the head of the sister. To see how this works, consider the derivation of the French *passé-composé* clause in (6) below, at the point where the VP (labeled with the verb’s p-sig) merges with the auxiliary in T⁶:

- (6) a. Marie a parlé à Jean
 Mary has spoken to John.



⁵ Many discussions of the HMC and triggers for head-movement have made an appeal to something like a [\pm affix] feature (see, e.g., Carnie 2000) as a trigger for movement. As far as I know, though, H&K’s proposal is the only one that does not involve any actual *movement* at all, making use of the P-label-merging device outlined here.

⁶ Or Asp or another v or whatever your favorite category for the *avoir* auxiliary is.

a *parlé à* *Jean*

When the T *a*, ‘has’, merges with VP, there is no conflation of the VP’s p-sig into the p-sig of T because T’s p-sig is not defective. V’s p-sig is now ‘locked’ downstairs, not visible in any label dominating VP. Consequently, head-‘movement’ *must* be to an immediately c-commanding head—the HMC is derived.

Another desirable consequence of the conflation mechanism include a ban on excorporation. Because there’s no provision for ‘partial’ conflation of a p-sig, there can be no excorporation without special effort.

One consequence of the analysis that may or may not be desirable is that head movement could never have any semantic consequences; this follows because it truly realizes Chomsky’s assertion that head-movement is phonological, only involving transmission of phonological features. On this view, since HM is only transfer of phonological material, it could never, for instance, change scope relations. This seems provisionally correct, in that there’s no V>Neg/Neg>V effect in the classic verb-raising-past-negation cases:

- | | | | | |
|-----|----|--|----|---|
| (7) | a. | Jean ne parlait pas français.
J. speak.IMP not French
‘John didn’t speak French’ | b. | Jean n’as pas parlé français.
J. has not spoken French.
‘John hasn’t spoken French’ |
|-----|----|--|----|---|

Other cases are not so clear, as in negation pied-piping with auxiliary head-movement in English: *Didn’t every key work?* doesn’t seem to exhibit the same relationship between the subject quantifier and negation as *Did every key not work?* or *Every key didn’t work.* I will not attempt an investigation of this issue here; for some discussion, see Lopez 1994, Kim and Sag 2002.

One final note on the basic mechanism: Conflation as understood here has a lot in common with Agree, as it may only be triggered by Merging an appropriate item high in the tree. Since it is motivated to satisfy the needs of the triggering item, rather than the target, it’s an instance of Lasnik 1995’s Enlightened Self-Interest principle, and violates Chomsky 1993’s Greed.

3. Deriving the First Sister Principle: Conflation and Compounding

The conflation mechanism of H&K 2002, then, can do essentially everything that classical head-movement can do and nothing that it can’t. It affects only the phonological material in labels, not syntactic or semantic features, and is consequently ‘phonological’ in Chomsky 1995’s sense. Adopting it allows us to retain essentially unchanged the central idea behind the head-movement accounts of verb-second and other phenomena. In this section, I wish to suggest that not only does it capture all the above effects, but that it also can derive Roeper and Siegel’s 1978 First Sister Principle for English synthetic compounds in a natural way, if we assume that compounding of this type is a syntactic process. All we need in addition is the notion that conflation can’t Procrastinate.

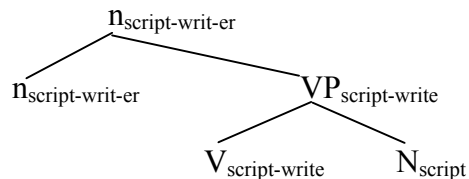
It’s well-known that English has a very productive object-incorporation process in *-er* and *-ing* nominalizations (‘synthetic compounds’) (Roeper and Siegel 1978; Selkirk 1982)

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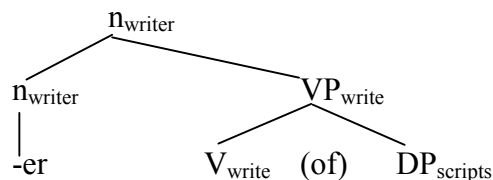
- (8) a. *-er* nominalizations
paper-cutter, can-opener, door-stopper, housekeeper, page-turner, truck-driver, scriptwriter, tiebreaker, mind-reader, homemaker, name-caller, storyteller, noisemaker, blood donor
- b. *-ing* nominalizations
paper-cutting, can-opening, housekeeping, page-turning, truck-driving, script-writing, tiebreaking, mind-reading, name-calling, storytelling, noisemaking, fact-checking, fact-finding

Assuming that the *-er* and *-ing* morphemes represent nominalizing syntactic heads, it is clear that we can derive such incorporations through conflation of the object with its sister V, just as we did for the object-incorporating verb in Mohawk, above. In order for V to trigger incorporation of its object, we have to assume that it can be assigned a [+affix] feature as it enters the numeration. I will assume that this is generally possible for lexical categories (more correctly, roots) in English, though not for functional categories. In (9), I illustrate the derivation of *scriptwriter*, and contrast it with the derivation of *writer of scripts* in (10).

- (9) a. Select *write* with a [+affix] feature in the numeration.
 b. Merge *write* and *script*. Conflate the p-sig of *script* into *write*.
 c. Project the head (i.e. label the whole constituent with the head's features)
 d. Merge $VP_{\text{scriptwrite}}$ with *-er* (which has a +affix feature). Conflate the p-sig of the VP into that of *-er* during Merge.
 e. Project the head.
 f. Pronounce entire structure as *scriptwriter*
 g.



- (10) a. Select *write* with a [-affix] feature in the numeration.
 b. Merge *write* and *scripts*. (No conflation because no defective p-sigs)
 c. Project the head (i.e. label the whole constituent with the head's features)
 d. Merge VP_{write} with *-er*. Conflate the p-sig of *write* into *-er*
 e. Project the head.
 f. (Insert genitive *of* for free to case-mark argument of *write*)
 g. Pronounce entire structure as *writer of scripts*.
 h.



Why would we want to allow the syntax to form compounds in this way? The payoff is that, with the addition of just one extra assumption, this approach derives Roeper and Siegel's 1978:208 First Sister Principle⁷. Given certain syntactic assumptions, conflation can predict the ungrammaticality of otherwise perplexing cases.

R&S 1978 show that synthetic compounds can occur between a verb and any first sister, not just between verbs and objects. As long as a verb doesn't have an object, adverb-verb synthetic adjectival compounds are possible (examples from R&S 1978):

- (11) a. quick-acting baking powder (It acts quick(ly))
 b. fast-falling snow (It falls fast)
 c. snappy-looking suit (It looks snappy)
 d. light-stepping horse (It steps lightly)
 e. odd-seeming sentence (It seems odd)
 ...and many more.

When a complement object is included in the source VP, as in (12)a, the compound of verb+adverb is ill-formed, as shown in (12)c. R&S rule this out with their First Sister Principle: the compound can only be formed when the adverb is the verb's First Sister, as in (12)e-f, which it is not when there is an object in the source VP.

- (12) a. The farmer grows wheat quickly.
 b. a wheat-growing farmer.
 c. *a quick-growing farmer
 (bad where it's the things he's growing that grow quickly)
 e. The wheat grows quickly
 f. quick-growing wheat.

Conflation can also derive this result, given one additional assumption. On a conflation account, adjectives like *wheat-growing* or *quick-growing* would be formed when a [+affix] verb *grow* was merged with whatever its First Sister is—object N for *wheat-growing*, with transitive *grow*, and adverb *quick* for *quick-growing*, with intransitive *grow*. As long as conflation must apply as early as it can, the First Sister principle falls out. In essence, we have to stipulate that conflation may not Procrastinate. If conflation could 'wait', and apply later in the derivation, one could get an adjective like **a quick-growing (of) wheat farmer*, where [+affix] *grow* merged with *wheat*, but put off conflating with a helper p-sig until the V', when it is merged with *quick*. Since such adjectives are ungrammatical, we can rule out Procrastinate for conflation; I'll call this 'conflation economy':

- (13) **Conflation Economy:** *Conflation must occur as early as possible.* That is, a [+affix] p-sig *must* copy the p-sig of its sister during Merge; it cannot 'wait' to copy some later available p-sig in a later Merge.

⁷ Selkirk's 1982:37 version of this is the First Order Projection Condition, but in fact I think the First Sister principle captures the facts in a more principled way, given BPS.

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By Conflation Economy, [+affix] heads *must* get a p-sig from their sister at Merge. This means that no conflation can 'wait'. If the numeration contains a [+affix] V, the p-sig of the first thing it merges with must conflate into V's p-sig.⁸

The Conflation Economy incarnation of the First Sister Principle can also account for the data illustrated in (14), given certain syntactic assumptions. In nominal synthetic compounds, only true direct objects may incorporate with their verbs. Direct objects that co-occur with a Goal PP, a resultative predicate or V-particle verbs may not, even if the incorporation is fine without the extra predicate present.

(14) First Sister Principle, nominal compounds:

<i>VP</i>	<i>nominalization</i> <i>n</i>	<i>Resultative VP</i>	<i>*nominalization</i>
push drugs	drug-pusher	push drugs to children	*drug-pusher to children
drive trucks	truck-driving	drive trucks across the country	*truck-driving across the country
run an errand	errand-running	run an errand to the store	*errand-running to the store
wash dishes	dishwashing	wash dishes clean	*dishwashing clean
eat apples	apple-eating	eat apples up	*apple-eating up

However, if the object is *not* incorporated, the nominalization may include a result or goal secondary predicate: *painting of houses red*, *washer of dishes clean*, *running of errands to the store*, *driving of trucks across the country*.

Recall from above that R&S's central observation was that the verb may only form a synthetic compound with something if it is the First Sister of the verb. In a Small Clause analysis of these resultative and V-prt constructions, like that of Hoekstra and Mulder 1990, the examples with goal PPs, resultative phrases and particles are cases where the First Sister of the object is not the verb, but the Small Clause predicate.

The impossibility of secondary predication in these incorporation structures then follows from Conflation Economy, because 'inner subjects' (objects that are subjects of small clause predication) aren't the first sister of their V. Their first sister is their small clause predicate. If such objects are going to incorporate into their V, they can only do it if the secondary small clause predicate is itself [+affix], triggering conflation of the inner subject, and the small clause is then merged with a [+affix] verb.

Compare the derivation of **truck-driving across the country* and *driving of trucks across the country*: Let's try to derive them by generating *drive* with a +affix feature in the first case and not in the second:

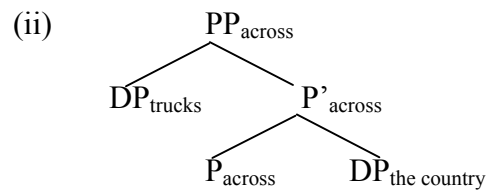
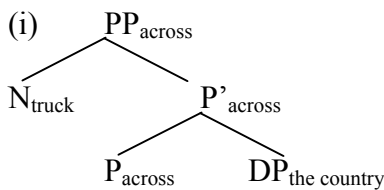
⁸ Conflation Economy also has the desirable consequence of deriving a ban on head-lowering—a [+affix] V couldn't remain defective all the way through the derivation until it got to T, and then copy T's P-sig into *its* label when they Merged.

(15) a. Numerations (assuming DPs already formed independently)

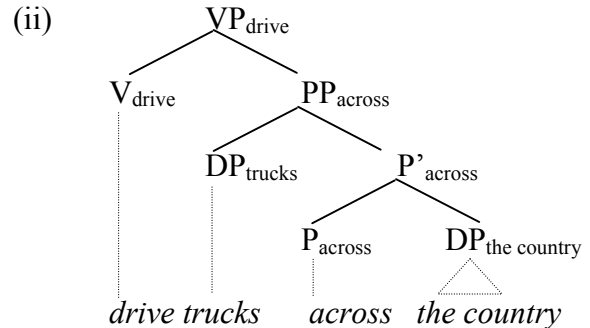
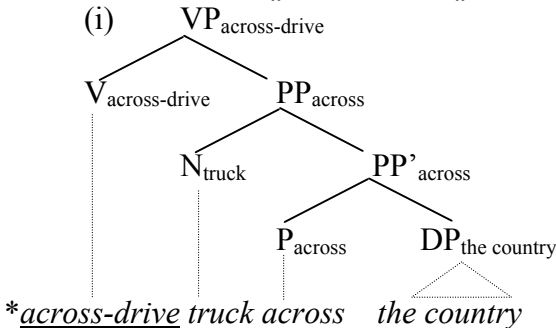
(i) [+affix] 'drive'		(ii) [-affix] 'drive'
drive-		drive
[_{DP} the country]	vs.	[_{DP} the country]
across		across
truck		[_{DP} trucks]
-ing		-ing

b. (i) and (ii): Make a P' by Merging *across* and [*the country*]

c. (i) and (ii) Merge: *truck* and [*across the country*]⁹
 (Note that the P is the head of the resulting small clause).



d. Merge: *drive*_{+aff} (i) or *drive*_{-aff} (ii) and [_{PP} *truck across the country*]



Note that at this point in derivation (i), the [+affix] feature on *drive* will trigger conflation of *across*, not of *truck*. No further Merging of nominalizing *-ing* or anything else will give *truck-driving across the country*. In the derivation (i), the result after *-ing* is Merged will be **acrossdriving (of) trucks the country*; in the derivation in (ii), the result will be the well-formed *driving of trucks across the country*. Any derivation with a secondary predicate will work in a similar way, whether it is a resultative or a verb-particle construction.

Leaving things as they stand, conflation does allow the generation of **acrossdriving of trucks the country*, and nothing we have said so far will rule this out. There are at least two possible independent reasons why this might be ungrammatical. First, case-assignment between a P and its object may depend on phonological adjacency in English, in line with Stowell 1981's Adjacency Condition. If that's the problem, the

⁹ Also note: if we'd tried to do this derivation with a [+aff] feature on *truck*, we'd get *truck-across* at this point.

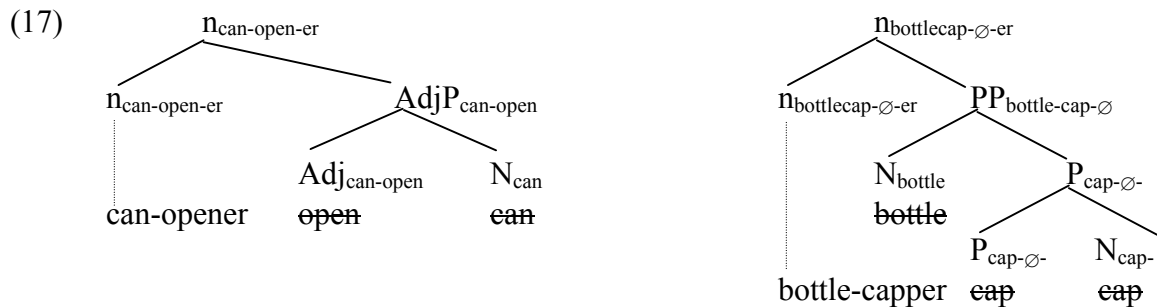
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ungrammaticality of *acrossdriving of trucks the county* is similar to the ungrammaticality of **across completely the country*, or **John drove quickly trucks*.

A second possibility is that morphemes may be independently specified as free or bound, morphologically. That is, *across* may have a morphological subcategorization requirement that prevents it from appearing in Conflations. This is in line with the hypothesis sketched earlier that only true lexical categories — Roots — may vary in their [\pm affix] specification. Deterministically inserted morphemes, termed *f-morphemes* in Harley and Noyer 2000, may not vary. I will adopt this latter account as having a more general application, and make a principle of it, couching it in Distributed Morphology terms:

- (16) **Affixal Determinism:** At least functional vocabulary items (f-morphemes; the VIs that realize T, D, C, v, P) are specified as morphophonologically bound or free or both; if conflation applies to a item that can only be realized as a free morpheme, vocabulary insertion fails.¹⁰

As noted above, Conflation Economy ensures that incorporation of internal subjects can happen in cases where the complement of the predicate incorporates, but not otherwise. In (17), we see the derivation of synthetic compounds from a deadjectival resultative verb *open* and a H&K ‘locatum’ denominal verb, *cap*. The inner subject of the predicate can conflate in both cases, because the predicate itself completely conflates:¹¹



The conflation approach to these cases also gives the right result for double-object constructions. On a Larsonian analysis of double object constructions, the impossibility of incorporating the dative indirect object follows because the first sister of the verb is the object at the bottom of the VP shell, *not* the indirect object: consequently, *gift-giving* is well-formed but **child-giving* is not (where *child* is intended as the Goal argument, as in *give a child a gift*.) Dative objects can't form synthetic compounds; their V has a first-sister Theme.¹²

¹⁰ It may be that roots are variable in their affixal properties, or that they're always bound. See below.

¹¹ In (17), we will have to assume that *cap* too is generated with a [$+$ affix] feature, or else further conflation of *bottle* will not be needed at the P' level.

¹² Idan Landau (p.c) points out that Object Experiencer verbs may not form synthetic compounds with their apparent direct object, suggesting perhaps that the relevant restriction is semantic or case-related, rather than syntactic:

(i) T.V. frightened/amused the child. *A child-frightener/child-amuser

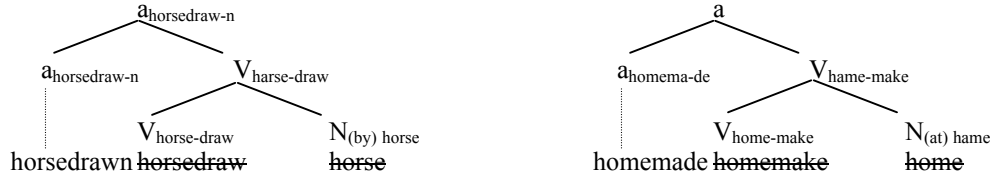
Taking these results as evidence for the approach, we are led to a couple of interesting conclusions about the structure of adjectival passives and the nature of certain P elements in English. Adjectival passives can form synthetic compounds with VP adverbials headed by prepositions, as well as regular adverbs:

- (18) a. *well-drawn, clearly-written, widely-circulated, brightly-colored*
- b. *starstruck, wolf-reared, horse-drawn, expert-tested, frost-bitten*
- c. *homemade, panfried, land-based, jungle-trained, California-grown*

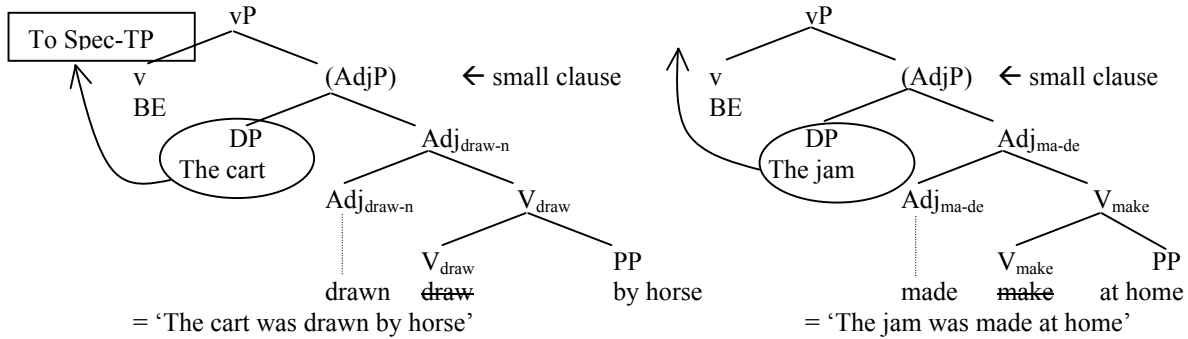
The (18)a cases are like the adverbials incorporated into *-ing* adjectives above. In (18)b, however, the incorporated noun would have been included in the source VP with a *by*-phrase (*reared by wolves*, etc), and in (18)c, various prepositions would have been necessary—*made at home, based on land, trained in the jungle*. These cases, therefore, lead us to conclude that either P-deletion is possible here or else the P is present in the verbal equivalents only for Case purposes, and is unnecessary in the incorporated form.

The second conclusion is that these adjectives must be formed from VP structures where what would have been the internal argument of the active verb is actually the ‘inner subject’ of a (resultative) adjectival small clause. If these were formed from structures where the verb’s internal argument was the sister of the verb root, they should be as bad as **quickly-growing farmer*. Their predicative counterparts, therefore, must have the structures in (20).

(19) Synthetic compound with adjectival passive:



(20) Corresponding verbal structures:



For more discussion of resultative adjectives in English within the DM framework, see Embick 2003.

To my ear, adjectival versions of these are not as bad: *A child-frightening ride, the child-amusing clown*—but clearly some account must be provided of the nominal cases. I leave these for future work.

4. The \$64,000 question

Why can (certain) *a* and *n* heads in English accommodate a conflated object or adjunct but *v* heads can't? That is, why is true incorporation possible with Mohawk verbs, but not with English verbs? It's not because English verbs can't be affixal—the treatment of *scriptwriter* outlined above makes it clear that it's necessary to be able to have [+affix] *write* in English. And conflation can operate on elements like *cap* or *saddle* in Locatum structures to produce verbs like *to cap* or *to bottle*. Although I have no definitive answer, it seems clear that the problem must lie in restrictions imposed by the *v* head in English that are not imposed by the *v* head in Mohawk, or by the *a* and *n* heads in English. Essentially, there must be a constraint on English *v* such that it cannot contain more than one root. It's possible that English *v* has a prosodic template associated with it that rules out certain types of stress pattern, resulting in a prohibition on verbal compounds. (While such an approach is fairly ad-hoc at this level of development, it is similar in spirit to Hale 2001's account of Navajo verbal morphology. A strict CVCCVC template is imposed on Navajo verbs, and the various morphemes in the extended projection of V are inserted in turn, or discarded as necessary, until the template is filled.) In any case, it's clear that the final analysis will have to state somehow that object incorporation is illegitimate with English *v*, while fine with *a* and *n*; such a statement has to occur in any account of these phenomena in English, so the current one is not at a disadvantage with respect to competitors in this regard.¹³

5. Re-affixation

One final extension of the analysis: Keyser and Roeper 1992 propose an account of *re*-affixation that also deals with many of the compounding facts treated by Roeper and Siegel 1978. Here, I will just sketch a discussion of *re* within the conflation framework that suggests that if we treat *re*-affixation as adverbial modification of the predicate part of a small clause structure, the conflation framework can also predict most of the blocked cases of *re*-affixation discussed in Keyser and Roeper 1992.

- (21) Keyser & Roeper's observation:
- a. *Good re-affixations*: retied the shoe, regrouped the troops, restarted the car
 - b. *Bad re-affixations*: *regave the money, *releft a note, *rethrew the ball

K&R note that the bad cases in (21) have appropriate (telic) semantics, so a semantic explanation for their infelicity is out. What they observe is that the verbs in the bad cases, without *re*, have potential double-object dative structures (*throw him the ball*, *leave her a note*); the verbs in the good cases (21) don't (**tie him his shoes*, **group him his troops*.)

When K&R consider a few more cases, the parallel with synthetic compounds becomes even clearer. Bad *re*-affixation targets include verbs which allow a benefactive

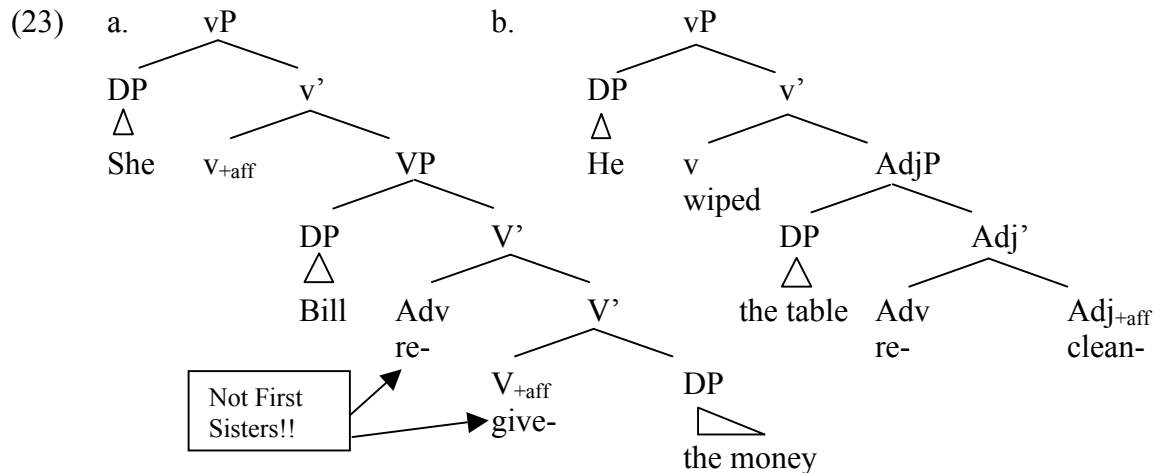
¹³ Note that although it's tempting to ascribe this prohibition to a Case problem, in the form of a statement that "if object incorporates, derivation crashes because *v* won't be able to assign its [+acc] case," such an account isn't feasible; it would leave unergatives and unaccusative verbs' failure to incorporate adverbs in verbal form unexplained — **The snow fast-fell*, despite *fast-falling snow*.

structure (22)a, verbs with particles (22)b, resultative predicates (22)c and Goal PPs (22)d. Good *re*-affixation targets don't involve any such structures (22)a', b':

- (22) a. *refound an island (*find her an island*), *rebought a car (*buy him a car*),
*reshowed his paintings (*show him his paintings*)
a'. rediscovered an island (**discover her an island*), repurchased a car
(**purchase him a car*), reexhibited his paintings (**exhibit him his...*)
b. *resold his friend out, reopened the door up, rewrote the idea down
b'. resold the car, reopened the door, rewrote the idea
c. *redrive someone crazy, *remake someone sick, *rewipe something clean
d. *rejump over the fence, rerun to the store

In the present framework, the generalization seems to be that *re*-modification is only good with change-of-state Vs where *the V itself encodes the change-of-state* — in other words, where conflation of the result predicate to *v* is complete. No 'remnant' of the small clause can be left downstairs — no Theme in a double-object construction, no particle, no resultative predicate.¹⁴

Assume that *re-* is generated as the modifying sister of a [+aff] resultative complement to *v*, and becomes affixed to *v* via conflation with the [+aff] resultative complement and subsequent conflation with [+aff] *v*. By the same logic as for synthetic compounds, above, *re*-affixation to the verb should be blocked when the predicative complement fails to conflate, as when there is a separate resultative predicate, or a particle. To see this, consider the trees in (23) below:



The derivation in (23)a will produce something like **She re(the)moneygave Bill*, not **She regave Bill the money* — the affixal nature of the predicate *give* will force

¹⁴ K&R consider a version of this hypothesis, put forward by Kayne 1985, but dismiss it based on examples like *wall-repapering* (vs. **chess-replaying*). You can repaper walls to your heart's content, they note, but you can't *replay chess*—you have to *replay a game of chess*. It seems likely to me that semantics may be at fault here, specifically the atelic bare interpretation of the incorporated noun *chess*. In any case, the proposal here is not that *re-* *is* a small clause predicate, just that it has to modify (and affix to) one.

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conflation of its Theme object, by Conflation Economy, before it gets to *re*. Similarly, (23)b will produce **He wiped the table reclean*, rather than **He rewiped the table clean*.

The ungrammaticality of true verbal incorporation like *She remoneygave Bill* was discussed above, but so far we have seen no reason why the output of (23)b, **He wiped the table reclean*, should be bad; or why similar examples with particles are also bad **He wrote the idea reup*. One would think that conflation of *re* should satisfy the [+affix] nature of *clean*, and because *v* is filled by the Manner component *wipe*, further conflation does not need to occur to satisfy *v*. Why not **He wiped the table reclean*? The only account I can offer at the moment is stipulative: *re-* has a morphological subcategorization for a +*v* environment. Nonetheless, any account of *re*-affixation would have to include such information as well, so if its entire distribution falls out from that stipulation plus Conflation Economy, the current viewpoint seems worth pursuing further.

In any case, I hope to have shown that head-movement can be brought back within the fold of Minimalist assumptions using H&K's 2002 Conflation mechanism, with little or no alteration to the fundamental operations made available in the theory.

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