Why one head is better than two:
Head-movement and compounding as consequences of Merge in
Bare Phrase Structure
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0 Where we're going

1. Why do we have syntactic head-movement?
>   - it accounts for lots of nifty variation among languages
2. How is it theoretically instantiated?
>   - various ways, none very satisfactory
3. Why does Minimalism reject syntactic head-movement?
>   - because it's incompatible with Bare Phrase Structure
4. How to rehabilitate head-movement within Bare Phrase Structure.
>   - via Hale and Keyser 2002's notion of conflation as "label-copying"
5. Deriving an account of restrictions on English synthetic compounds
>   - allows an account of Selkirk's First Order Projection Condition
6. This is a good first step in getting rid of a generative lexicon, as DM wants to do
>   - although it puts a Late Insertion model like DM in an odd position
>   - and it has some shortcomings

1. Head movement is a good and useful bit of syntactic explanation

→ It accounts for the different positions of finite and non-finite French and Irish verbs in a unified and elegant way, as well as German verb position and the formation of English questions

1.1 V-to-T

1.   French
a)

	V[+fin]	**Adv**		
Jean	embrasse	souvent	Marie	
J.	kisses	often	M.	

"John often kisses Mary"

		Aux[+fin]	**Adv**	V[-fin]	
b)	Jean	a	souvent	embrassé	Marie
	J.	has	often	kissed	M.

"John has often kissed Mary"

2.   Irish
        V[+fin]   **Subject**
a.   Leanann   an t-ainmní   an briathar   i   nGaeilge
        follow.pres   the subject   the verb   in   Irish
        "The subject follows the verb in Irish"

b.   Aux[+fin]   **Subject**   V[-fin]
        Tá   naClingeánaí   ag scaoileadh   na féasar
        be.pres   the Klingons   prog fire   the phasers
        "The Klingons are firing the phasers"   (from Carnie 1995)

→ In both Irish, and French, finite things, be they auxiliaries or verbs, appear in one position, and non-finite verbs appear in another position.
→ An easy way to account for this alternation in verb position is to say that the verb starts out in the verb position and then raises to the finiteness position in Irish and French, when it's finite.

1.2   T-to-C

3.   English
                         Subject   Aux   V
a.   John   has   seen *Bowling for Columbine*.

                 Aux   **Subject**   V
b.   Has   John   seen *Bowling for Columbine?*

c.   Wh   Aux   **Subject**   V
        What   has   John   seen?

→ In English, the finite element moves to the left of the subject in questions, but not in declarative clauses.

1.3   V-to-T-to-C

4.   German
                         V[+fin]   S   O
a.   Schon letztes Jahr   las   ich   diesen Roman
        Already last year   read   I   this book

                         Aux[+fin]   S   O   V[-fin]
b.   Schon letztes Jahr   habe   ich   diesen Roman gelesen
        Already last year   have   I   this book   read

c.   Comp   S   O   V[-fin]   Aux[+fin]
                         …dass   Hans die Aufgaben   lösen   muss
                         …that   Hans the exercises   do   must

2

→ In German, the finite element appears in second position except in embedded clauses
→ If the finite element isn't the verb, the non-finite verb appears last
→ If the clause is embedded beneath a complementizer, the finite element appears last
→ This pattern can be accounted for if finite T moves to C in German, except when C is otherwise occupied, and if finite V moves to T, except when T is otherwise occupied

1.4   If V- to-T, and T-to-C, looks like V-to-C. If lose V-to-T, then lose V-to-C

→ Head-movement allows a parametric account of the change in verb placement in the history of English.

5.   Shakespearean English:

	Aux[+fin]	**S**		**V[-fin]**	**O**	
a.	Wilt	thou		use	thy wit?	(From Radford 1997)
		(Thou	wilt	use	thy wit)	

	V[-+fin]	**S**			**O**
b.	Knows	he	not		thy voice?
		(He	knows not		thy voice)

	V[-+fin]	**S**		**O**
c.	How came	you		hither?
		(You	came	hither by boat)

6.   Modern Eng:

	Aux[+fin]	**S**		**V[-fin]**	
a.	Will	you		use	your brains?
		(You	will	use	your brains)

	Aux[+fin]	**S**		**V[-fin]**	
b.	Doesn't	he		know	your voice?
		(He	doesn't	know	your voice)

	Aux[+fin]	**S**		**V[-fin]**	
c.	How did	you		come	here?
		(You		came	here by boat).

→ In Shakespearean English, question formation involves the auxiliary if there is one, but if there isn't one, the finite main verb moves before the subject.
→ In Modern English, question formation involves the auxiliary if there is one, but if there isn't one, a semantically inert dummy auxiliary *do* is inserted, marked for tense, and moved before the subject.
→ This change in the behavior of main verbs in Modern English can be neatly captured if we simply say that Modern English stopped doing V-to-T movement.

→ This parametric account correctly predicts a temporal correlation between English losing V-to-T movement (change in position of V with respect to negation), and English losing V-to-C movement (change in V-Subj inversion in questions), and the appearance of the dummy auxiliary *do* when no other auxiliary is around (in questions and negation).

1.5   V-to-T correlated with overt syntactic DP movement in Icelandic

→ Head-movement robustly interacts with other kinds of obviously syntactic movement, e.g. Holmberg's generalization

7.   In Icelandic, we see a French-type difference when the verb is finite and non-finite: when it's finite, it appears in a different position than when non-finite.

		V[+fin]	**S**	**Neg**	**O**
a.	Af hverju	lásu	nemendurnir	ekki	bækurnar
	for what	read.fin	the.students	not	the.books

"Why didn't the students read the books?"

		Aux	**S**	**Neg**	**V[-fin]**	**O**
b.	Af hverju	hafa	nemendurnir	ekki	lesi**D**	bækurnar
	for what	have.fin	the.students	not	read	the.books

"Why haven't the students read the books?"

(from Thráinsson 2000)

Interestingly, when the verb is finite, the object may appear to the left of the negative adverb *ekki*

		V[+fin]		**O**	**Neg**
c.	Af hverju	lásu	nemendurnir	bækurnar	**ekki**
	for what	read.fin	the.students	the.books	not

"Why didn't the students read the books?"

But this is not possible when the verb is non-finite:

		Aux	**S**	**O**	**Neg**	**V[-fin]**
d.	*Af hverju	hafa	nemendurnir	bækurnar	ekki	lesi**D**
	for what	have.fin	the.students	the.books	not	read

"Why haven't the students read the books?"

→ So in Icelandic, it looks like we've got a syntactic movement -- Object Shift -- that's dependent on head-movement. This seemed plenty of reason to conclude that head-movement is syntactic.

1.6   Incorporation as head movement

→ Baker used a locality condition on head-movement — reminiscent of well-understood locality conditions on other kinds of syntactic movement — to explain why object Ns

may be incorporated into V in noun-incorporation languages, while subject Ns may not be. (The *Head Movement Constraint*)

8.   *Mohawk: noun-incorporation of objects but not subjects:*

a.   Owira'a   wah-rake'   ne o'wahru
      Baby   Agr-ate   the meat
      "The baby ate the meat"

b.   Owira'a   waha'-wahr-ake'
      Baby   Agr-meat-ate
      "The baby ate meat."

c.   *Waha-wir-ake'   ne o'wahru
      Agr-baby-ate   the meat
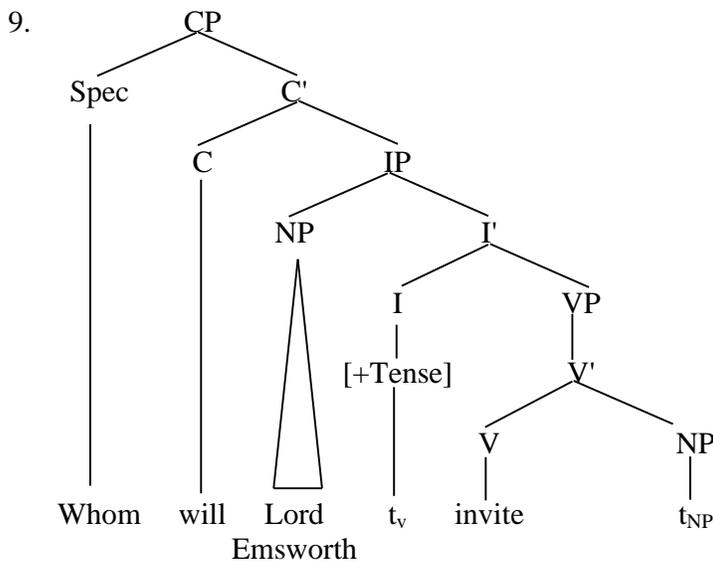   "Baby ate the meat"   Baker 2002

→ Baker's (1988) account in a nutshell: because the verb c-commands the object, but not the subject, incorporation of the object into the verb will leave a well-formed trace (a *properly governed* trace), but incorporation of the subject into the verb will not

→ plus more good payoffs: construct states, N- adjective ordering, Mirror Principle effects…

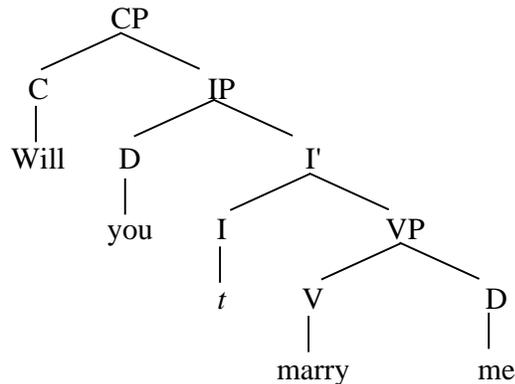**2   The mechanism of head movement**

→ In X-bar theory, head movement was (almost) like any other kind of movement

→ A head simply picked up and moved up to the closest c-commanding head position to sastisfy some requirement. Here's an illustration from Haegeman 1991:338:

9.
```
                     CP
             /               \
        Spec                   C'
          |              /           \
          |            C             IP
          |            |         /        \
          |            |       NP          I'
          |            |        /\       /      \
          |            |       /  \     I        VP
          |            |      /    \    |         |
          |            |     /      \ [+Tense]    V'
          |            |    /        \          /    \
          |            |   /          \        V      NP
          |            |  /            \       |       |
        Whom     will  Lord          t_v    invite   t_NP
                      Emsworth
```

5

→ and here's another one from Radford 1997:220

10.

```
                    CP
              ╱         ╲
            C             IP
            │          ╱      ╲
          Will       D          I'
                     │       ╱     ╲
                    you     I        VP
                            │      ╱    ╲
                            t     V        D
                                  │        │
                                marry      me
```

→In both Radford's and Hageman's illustrations, it looks as though *will* simply changes category mid-move somehow: it starts out as an I, and ends up as a C[1]

2.1 *Adjunction or substitution?*

→ Rizzi, in Relativized Minimality (Rizzi 1990:117 n. 19), says the following about head to head movement:
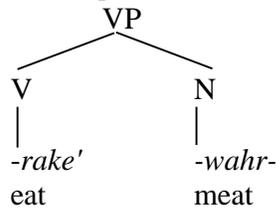
> "If a head can only be moved to another head, as per Chomsky's (1986b) generalized structure-preserving constraint, then perhaps the LF-movement of the tensed verb forming the required A'-chain involves adjunction to Agr°. Following Rizzi and Roberts (1989), I assume that all the familiar cases of syntactic head-to-head incorporation involve substitution, with adjunction possibly restricted to cliticization and, perhaps, to LF movement."

→ Assuming substitution rather than adjunction *might* be a possible approach for examples like (9) and (10) above. (There's still a lack of clarity about what'*s* being substituted for what: the terminal node, or the X° category node? Presumably the latter, although Hageman's illustration shows the former.)
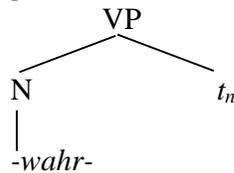
→ But for Mohawk examples like (8b) above, it seems essentially impossible to assume anything but adjunction. Consider: Baker's account is based on the idea that the pre-movement structure is (11a). If we did head-to-head-movement via substitution, either of the category or of the terminal node, we'd end up with (11b) or (11c), not the desired compound form (11d):

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[1] Hageman's illustration seems designed to confuse, in that not only does it dodge the question of what the actual structure of head-to-head movement is, it doesn't actually indicate that it's the whole *phrase* that moves from object to subject position. Rather mysteriously, the word "whom" just shows up in a position labelled "Spec", leaving behind its projection, the NP, to be headed by a trace. A trace of what? This despite the fact that Hageman 's illustration is in the middle of a discussion of how movement is structure-preserving.

11. a. *Before incorporation*   b. *Incorporation as terminal substitution*
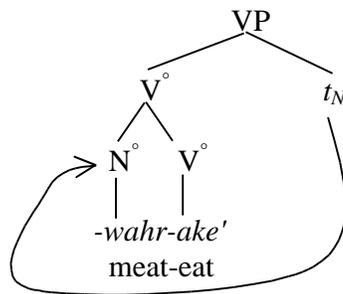
```
          VP                                          VP
         /  \                                        /  \
        V    N                                      V    N
        |    |                                      |    |
     -rake'  -wahr-                              -wahr-  t_N
      eat    meat                                 meat
```

c. *Incorporation as X° substitution*   d. *The desired result of incorporation*

```
          VP                                    -wahr-ake'
         /  \                                    meat-eat
        N    t_n                                  N  -  V
        |
     -wahr-
```
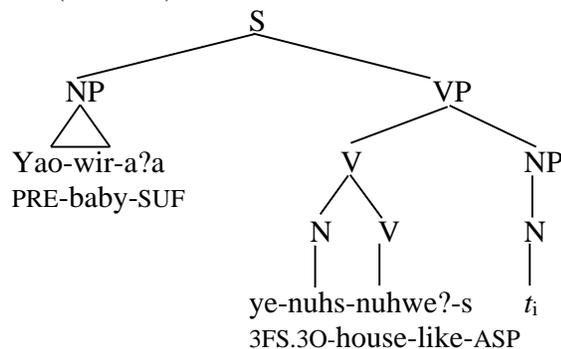
→ What we want is for the final element to end up *being* a verb that *contains* a N

→ adjunction of N to V accomplishes this: the target projects a *segment* of itself, of which the adjoining thing is a daughter.

12.

```
              VP
             /  \
           V°    t_N
          /  \
        N°    V°
        |     |
     -wahr-ake'
      meat-eat
```

→ actually, even in his illustrations of the adjunction structure, Baker temporizes a bit: he indicates the trace as dominated by a N° category node, even though the N° category node dominating the incorporated noun has clearly moved into the V:

13. Baker (1988:97)

```
                    S
                  /   \
               NP      VP
               /\     /  \
              /  \   V    NP
         Yao-wir-a?a  /\    |
         PRE-baby-SUF N  V   N
                      |  |   |
              ye-nuhs-nuhwe?-s   t_i
              3FS.3O-house-like-ASP
```

→ How is the trace of N licensed in this structure? It is subject to the ECP. What lets it be properly governed in this configuration? Baker adopts a version of government that depends on m-command, not c-command (p. 54-55).

2.2   *From central element of syntactic theory to PF-phenomenon*

→ In Relativized Minimality, Rizzi argued that all three types of movement were subject to a single well-formedness condition: each 'jump' has to be to the closest possible spot. So the following are all instances of a violation of the same principle:

14.   a.   Head movement minimality:
                    *Why reading$_i$ he is t_i the book?
              vs.   Why is$_i$ he t_i reading the book?

       b.   A-movement minimality:
                    *[Three men]$_i$ are certain there to seem to be t_i in the room.
              vs.   [There]$_i$ is certain t_i to seem t_i to be three men in the room.

       c.   A-bar movement minimality
                    *What$_i$ do you think who likes t_i ?
              vs.   Who$_i$ do you think t$_i$ likes what$_i$?

→ One way that head-movement was different from NP-movement or wh-movement, though, was that the location to which it was moving *had* to "already" be occupied, in a formal sense.

→ NP-movement and wh-movement took things from lower phrasal positions and put them in *empty* phrasal position (spec of TP or spec of CP).

→ (It was crucial to both kinds of phrasal movement, in fact, that an occupied specifier would *block* even temporary insertion of any other element. Otherwise sentences like [*Three men*]$_i$ *seemed* <u>there</u> *to be likely* t$_i$ *to be in the room* or *What$_i$ did you wonder* <u>how</u> *John fixed* t$_I$ *yesterday* would have been predicted to be grammatical.

→ Head-movement, then, was subject to a special kind of paradox. By virtue of the nature of X-bar theory, every phrase had to be projected by one particular head, and, crucially, a *single head could not project more than one phrase.*

15.   XP → (YP) X'
       X' → X$^{\circ}$ (ZP)   The only things *not* optional here are X' and X$^{\circ}$.

→ Consequently, when a head was moving to another head position, it was moving away from its own phrase, and to a position which crucially *must* already be occupied by a syntactically real object (whether the object has a phonological realization or not). So it's not just that V-to-T movement *sometimes* involves movement to an already-occupied position, it *always* involves such movement.
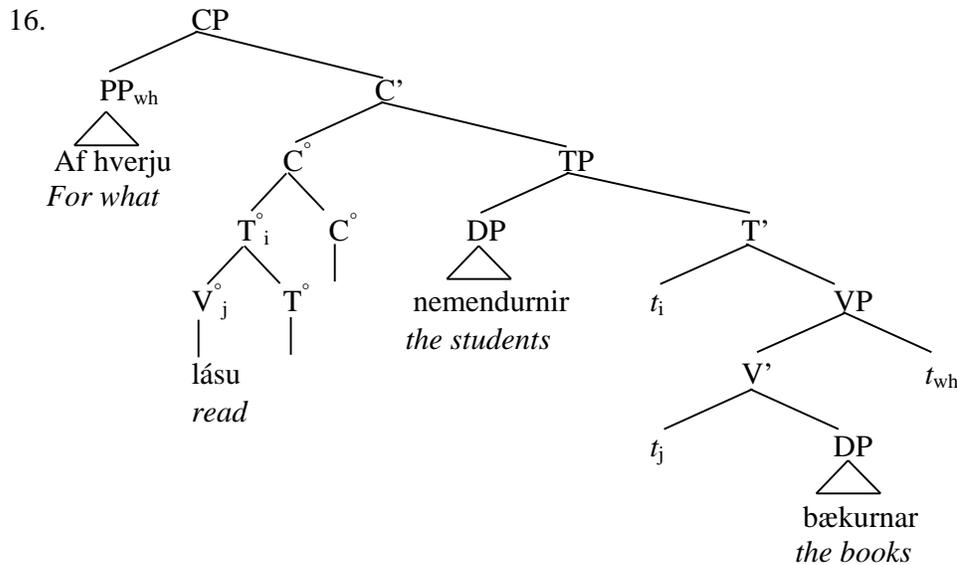
→ As we'll see in more detail in a second, this means that head-movement is necessarily *counter-cyclic,* a Bad Thing. for movement to be.

→ We've seen that the most logical assumption was
  a) the moved head *adjoins* to the target head
  b) the result is *itself* a complex head — an X$^{\circ}$ element with internal structure.

→ As such it was in the domain of morphology, not subject to syntactic rules anymore, just morphological rules (For instance, word-internally, English is right-headed, although syntactic phrases are left-headed). Consequence: a syntactically-constructed complex item which is *not* subject to syntactic rules and which *is* subject to morphological (i.e. lexical) rules.

→ This is a problem, *especially* for Lexicalist theories like GB, in which it was supposed to be a *virtue* that morphological rules applied only in the lexicon, and were totally segregated from the syntax (they were *pre*-syntactic). Embarrassing.

3   Minimalism and Bare Phrase Structure

→ Things get worse before they got better, though (if they do get better)

→ In the first half of *The Minimalist Program,*Chomksy 1995 head-movement takes center stage exactly twice, as the core element in an argument in favor of a derivational vs. a representational approach to syntax (pretty crucial, you would think!). The argument basically goes like this (p. 50-52, and also 223)

  1. It's clear that something like relativized minimality is true.
  2. We could think of this either representationally or derivationally
     a. Representational constraint: "Minimize chain links"
     b. Derivational constraint: "Move the shortest distance possible"
  3. Certain kinds of chains are treated much more nicely by (b) than by (a). In particular, head-movement chains are like this. The final product of V-to T-to-C movement, as in the Icelandic (7a) above, for example, looks like the tree in (16).
  4. To quote Chomsky (with adjustments for example; he didn't use Icelandic):
     "Here we have two chains: ([T V]$_i$, t_i), and (V$_j$, t_j). Each step of chain formation [during the derivation] satisfies the strict locality condition. But the resulting chain headed by V$_j$ does not. In the S-structure, the chain (V$_j$, t_j) violates the HMC, because of the intervening head t_i, a possible [intermediate link] that is 'skipped' by the chain. The form should thus be as deviant as *Read John will* t *the book?* but it is well formed. The locality conditions are satisfied stepwise in the derivation, but are not satisfied by the output chain. Modificiatons required under nonderivational approaches are not entirely straightforward.[2]   (1995:50)

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[2] (Later he reprises the argument (p. 225) and even cites the undesirability of using output conditions in phonological theory, given the need for intermediate levels of derivation. "These seem to be fundamental

16.

A syntax tree with the following structure:

CP branches into PP_wh and C'.

PP_wh: Af hverju / *For what*

C' branches into C° and TP.

C° branches into T°_i and C°.
T°_i branches into V°_j and T°.
V°_j: lásu / *read*

TP branches into DP and T'.
DP: nemendurnir / *the students*
T' branches into t_i and VP.
VP branches into V' and t_{wh}.
V' branches into t_j and DP.
DP: bækurnar / *the books*

"Why did the students read the books?"

→ But by the end of MP, Chomsky has this to say about verb-second, having deduced from fundamental conceptual principles that it shouldn't exist (p. 368):

> "In section 4.9 we noted that the expletive in Multiple Subject Constructions is overt in order to satisfy the V-second property, which may belong to the phonological component. If that is the case, the observed order is formed by phonologic operations that are extraneous to the Numeration → LF computation, and may observe the usual constraints, but need not… We thus take the order to be really (205a), irrespective of what is observed at the PF output.

→ This degree of disdain for the actual facts is unusual even for Chomsky. I think he has an underlying uneasiness about head-movement in general that justifies his feeling that a core case of head-movement like V2 might be purely 'phonologic'.

→ This uneasiness comes from the proposed elimination of the phrase-structure component: the adoption of Bare Phrase Structure

3.1   *Bare Phrase Structure*

→ Chomsky (1995) made a proposal about syntactic structure-building that was very elegant and simple ("virtually conceptually necessary") and did away with X-bar theory, derived phrasal status and c-command, and was generally cool and derivational.

properties of language, which should be captured, not obscured by coding tricks, which are always available." !! ☺

16.   Building a tree using only *Merge* and *Copy*

a)   Select the lexical items you want to use to build your sentence.
      They will be bundles of phonological and syntactic (semantic) features
      (This initial list is called the *Numeration*).

Numeration: { /reviewed/, /*Bowling for Columbine*/, /was/ }

b)   Stick two of them together to create a constituent, an unordered pair.
      (This operation is called *Merge*. You might check some features or
      satisfy some requirement of the two bundles involved when you Merge
      them).

{ /reviewed/, /*Bowling for Columbine*/ }

c)   Give the constituent a label by copying and merging one of the pairs
      of the set with the set itself, to create a new set, consisting of the labelling
      element plus the old set. (This is the operation by which the head
      "projects" a phrase)

{ /reviewed/, {/reviewed/, /*Bowling for Columbine*/}}=

d)   You've now got a complex constituent which is ready to be merged
      with another constituent: either another straightforward bundle you pluck from
      the Numeration, another complex element you've created in another workspace
      (e.g. an adjunct phrase like *by Ebert*), or else by Copying an element you've
      already got in your tree and Merging the copy with its own tree — this'll be
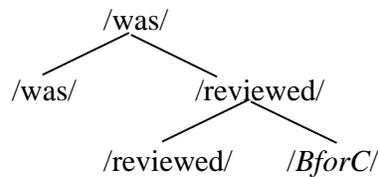   how you do movement.

e)   Let's merge first /was/, and then see where we are:

{ /reviewed/, {/reviewed/, /*Bowling for Columbine*/}} + {/was/ } =
{ /was/ , { /reviewed/, {/reviewed/, /*Bowling for Columbine*/}}}
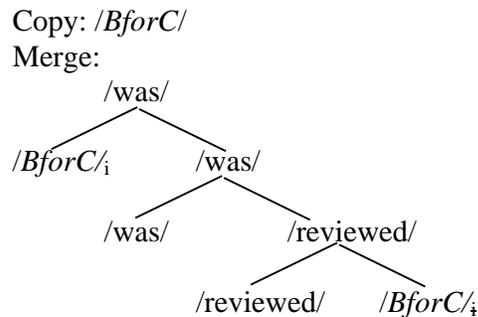
and then we label this set with whichever constituent we want to project,
      in this case {was}:

{ /was/, { /was/ , { /reviewed/, {/reviewed/, /*Bowling for Columbine*/}}}}

equivalent to

f) Now, /*BforC*/ has some Case features, being a DP, which need to get checked. /reviewed/ can't check them, because it's a participle. However, /was/ has got nominative case features to check. If we make a copy of /*BforC*/ and Merge it with its own tree, then it'll be able to check its Case features against the features of /was/:
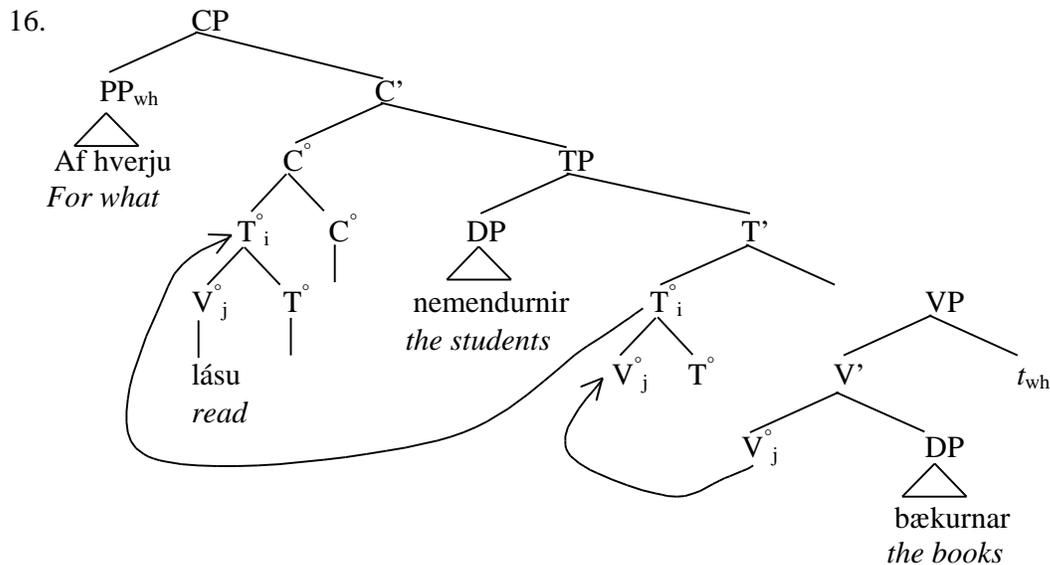
Copy: /*BforC*/
Merge:

```
                    /was/
              _____|_____
             |             |
        /BforC/ᵢ         /was/
                    _____|_____
                   |             |
                 /was/       /reviewed/
                         _____|_____
                        |             |
                   /reviewed/     /BforC/ᵢ
```

17. <u>Nice Consequences of BPS:</u>

   a. No need for PS-rules, even ones as abstract as an X-bar schema
   b. **Crucially,** Phrase vs. head status of a given element is determined by the derivation:
      - a phrase is any element that is not dominated by a copy of itself
      - a head is any element that does not dominate a copy of itself
   c. Something like /*BforC*/, as I've represented it here, will be both a phrase and a head
   d. C-command can be treated derivationally: it's the relationship between an element and whatever it's Merged with.
   e. The requirement that 'moved' elements c-command/govern their traces need not be stated independently: if Move is Copy plus Merge, and if c-command is just Merge, then the 'base' position of a Moved element *has* to be c-commanded by the Moved position; it couldn't be any other way.
   f. **Crucially**, movement must obey cyclicity. That is, you can't Merge inside anything you've already built. Merge is just concatenation plus projection. Take X, stick it onto Y, label it with Y or X. Not "Take X, and use it to modify Y into Y' by adding X to any subset of Y".

All of that's good. (In particular, understanding *why* traces have to be c-commanded by their antecedents, rather than just stipulating that they do, is good). But it creates a huge problem for head-movement. Chomsky sums it up, p. 321:

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

→ This is what will happen in cases like (16) above, repeated below:

16.
```
                          CP
                _____
              PPwh                      C'
             /\                _____
           Af hverju          C°                         TP
           For what       _____          _____
                         T°i      C°          DP                   T'
                       _____       |         /\            _____
                     V°j   T°   nemendurnir T°i            VP
                      |     |   the students _____     _____
                    lásu          V°j   T°   V'        twh
                    read                  _____
                                        V°j    DP
                                              /\
                                           bækurnar
                                           the books
```

→ In BPS, two things are wrong with the movements that create the complex $T^°$ and $C^°$ heads:

(i) they violate structure preservation (as Chomsky outlined above: V^* starts out as nonmaximal, i.e. as a head (in the VP), since it's dominated by a copy of itself, but it ends up as maximal, i.e. as a phrase, since in its position adjoined to T it is *not* dominated by a copy of itself.

(ii) they violate cyclicity, in that they do not constitute Merge of two elements. Rather, the Copy of the head that is being Merged appears to reach *inside* the thing it's being Merged with to form a new subset (with label) inside an already formed set.

→ So no wonder Chomsky doesn't want head-movement to be syntactic.
→ Note: there is one reason to think this is right: I don't *think* anyone has ever shown that V-movement has semantic or scope consequences.[3] That is, there's no difference in the relationship between V and negation in *Jean ne parle pas en français*, 'John isn't speaking in French', and *Jean n'as pas parlé en français* 'John didn't speak in French'.

4   Rehabilitating head-movement

→ The fundamental insight regarding 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

---

[3] …that are independent of the difference in the features of the target that trigger the V-raising the first place.

"T-to-C movement is blocked in German embedded clauses because C is filled"…
where the only serious notion of 'filled' that might be relevant is morphophonological.
(Remember, *syntactically* the head C would have to be there in order for T to move to
it at all, phonologically filled or not, since C *must* exist in order for CP to exist).

→ The move proposed by Hale is simply to allow "head-movement" to be something that
happens at Merge, motivated by the affixal nature of the target.

→ How does this work?

18.   In Chapter 7 of their 2001 book manuscript, H&K first propose a new conflation
mechanism, but then end up concluding that conflation doesn't really exist after all. Let's have
a look at their initial thoughts on the mechanism of conflation[4]:

> 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.

•   Associating conflation with Merge gets their desired result, which is that only sisters can
    conflate.

19.   *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, which H&K call the 'p-sig' of the
          head.

   b.   <u>Conflation occurs when a constituent   is merged with a sister head   whose p-
          sig is 'defective'. The p-sig of   is merged into the defective p-sig of   .</u>

   c.   For Economy reasons, the copied p-sig is only pronounced once, in its
          uppermost position, as the v *saddle*.
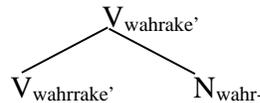
20.   Consider what will happen in the derivation of the Mohawk example (8b) above,
        repeated here:

   b.   Owira'a   waha'-wahr-ake'
          Baby   Agr-meat-ate
          "The baby ate meat."

---

[4] I think this is an idea of Ken's that Jay resisted, because Ken actually uses it to do interesting things with
Navajo in Hale 2001 Hale forthcoming).

→ you'll start with the roots, /wahr-/ and /-rake'/
→ Assume /-rake/ has a 'defective' p-sig

21. a. /wahr-/ merges with /-rake'/
    b. Because /-rake/ has a 'defective' p-sig (you could think of this as a phonological template), the p-sig of /wahr-/ copies into the p-sig of /-rake'/
    c. the head, now /wahrake'/, projects
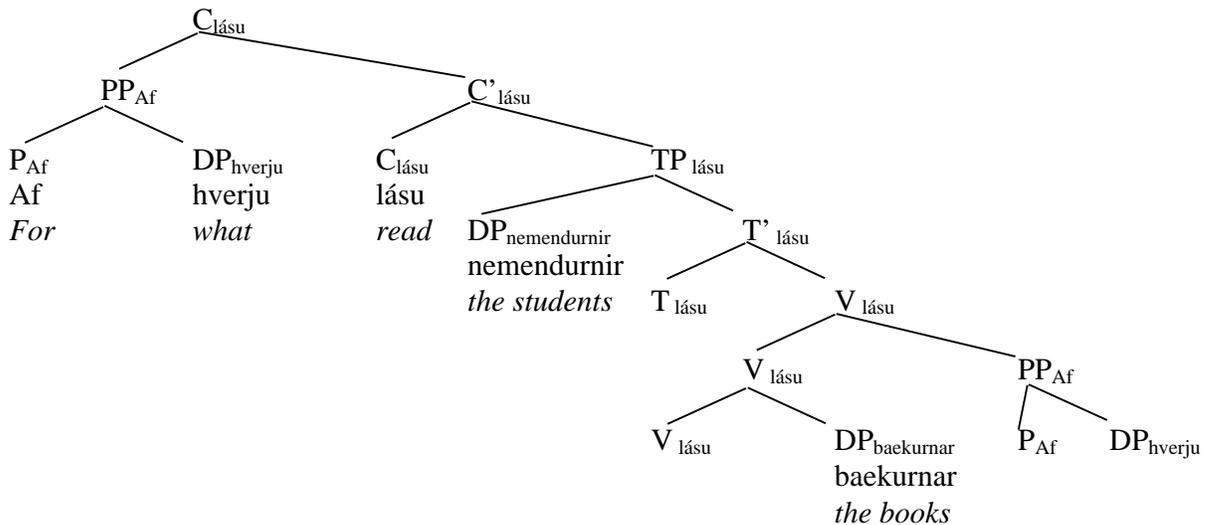
    d. /rake'/ + /wahr/   →

        $V_{wahrake'}$
        ╱   ╲
    $V_{wahrrake'}$ N_{wahr-}

→ Big deal! I hear you saying. That looks just like Hageman was doing! and essentially it is. Except – and this is the cool part – that locality for head-movement falls out automatically. It's not subject to any kind of relativized minimality constraint; because it happens with Merge, it has to happen between sisters or not at all.

→ the insight: in the theory of Bare Phrase Structure, the p-sigs of two items that are Merging are sisters because the label of the whole constituent is just a copy of its head.

→ let's do an instance of V-to-T-to-C movement, as in Icelandic, above:

22. a. Af hverju   lásu   nemendurnir   bækurnar
       for what   read.fin   the.students   the.books
       "Why did the students read the books?"

23. a. The verb *lásu* 'read' merges with the (independently constructed) DP
       baekurnar 'the books'. Neither P-sig is defective, and no copying
       occurs. The whole constituent is labelled with the p-sig of its head, *lásu*

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b.	The verb phrase labelled *lásu* merges with the adjunct PP *af hverju*, 'for what'. Neither of the p-sigs of the labels of these constituents is defective, so no copying occurs. The whole constituent is labelled with the p-sig of its head, *lásu*.

c.	The verb phrase labelled *lásu* merges with an element from the numeration, a [+finite] T element. *This* element's p-sig *is* defective. Consequently, the p-sig of the verb phrase — *lásu* — is copied into the defective p-sig of the T element. Then, the whole constituent — a projection of T — is labelled with the p-sig of its head, *lásu*.

d.	The TP labelled *lásu* merges with the subject DP, *nemendurnir*, 'the students'. (Note: this could be a copy of *nemendurnir* from down in the VP, if we're assuming the VP-internal subject hypothesis). Neither p-sig is defective, so no copying occurs. The whole constituent — a projection of T — is labelled with the p-sig of its head, *lásu*.

e.	The TP labelled *lásu* is merged with a [+wh] C element, whose p-sig, again, is defective. Consequently, the p-sig of the TP, *lásu*, is copied into the defective P-sig of C. Then the whole constituent, a projection of C, is labelled with the P-sig of its head.

f.	Finally, the [+wh] PP *af hverju*, 'of what', is copied from its position inside the VP and Merged with the [+wh] CP, checking its [+wh] feature. No defective p-sig is present, so no copying occurs; the whole CP is labelled with the p-sig of its head, *lásu*.

→ Notice: on the copy theory of movement, you only pronounce one of the copies of any given item, usually the highest one.

→ This mechanism essentially lets us retain the idea that head-movement is 'phonological', while ensuring that it is *local,* and only triggered by appropriate items higher in the tree (i.e. it's an instance of Enlightened Self-Interest, violating Greed).

Locality:	Notice that this mechaism will ensure the Head Movement Constraint is respected: only the p-sigs of the label may be copied during merge of a [+affix] head; the label is crucially a copy of the *head* of the larger constituent. Any p-sigs within that constituent that are not in its head will not make it into the label.

Example: if a [-affix] head like an auxiliary Merged in between a verb root and Tense in a normally verb-raising language — i.e. in a language where Tense only has [+affix] realizations — the result will be that the verb root's P-sig does not get copied into the head of the phrase projected by the auxiliary. When that auxiliary-projected phrase merges with Tense, only the p-sig of the auxiliary will be copied into the p-sig of Tense. If no [-affix] element is Merged between the verb root and Tense, however, the verb's p-sig will make it all the way up the tree to be copied into the p-sig of Tense, giving the effect of verb-raising. No adjunction is necessary, and no head/phrase conundrum is created, since all that is at issue is PF well-formedness.[5]

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[5] Many discussions of the HMC and triggers for head-movement have made an appeal to something like a [±affix] feature (see, e.g., Carnie 2000) as a trigger for movement. As far as I know, though, H&K's proposal is

5   Conflating Synthetic Compounds

- I propose to represent the notion of a 'defective' p-sig by a feature ± affix, freely generated on any head.
- A +affix feature will trigger the p-sig copying operation from its sister's label at Merge.
- If appropriately affixal Vocabulary Items are available at Vocbulary Insertion to realize the heads that have been generated with a +affix feature, the derivation will converge. Otherwise those heads will not receive a PF interpretation, and the derivation will crash.
- The inventory of Vocabulary Items in different languages will differ, resulting in the appearance of different conflation structures.

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.

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24.   *English incorporation in nominalizations*

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

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

25.   Nominalizations, not gerunds

- Just in case it seems like the examples in 31b might be gerunds rather than nominalizations, try the adjectival/adverbial modification test developed by Lees 1970. Gerunds can be adverbially modified (*Thoroughly mixing the flour and eggs is a bad idea*), while nominalizations must be adjectivally modified (*Thorough mixing of the flour and eggs can cause problems; *Thoroughly mixing of the flour and eggs can cause problems*). All the *-ing* forms in 31b must be adjectivally modified:
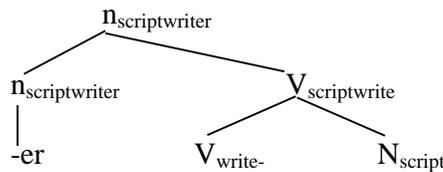
*good housekeeping, *well housekeeping*, *fast truck-driving, *quickly truck-driving, skillful scriptwriting, *skillfully scriptwriting…*

---

the only one that does not involve any actual *movement* at all, making use of the P-label-merging device outlined here.

- This is the case with nonce compounds of this type as well: *quick letter-typing, *quickly letter-typing, thorough typo-checking, *thoroughly typo-checking,* etc.

- The other clue, of course, is that they're (mostly) not wellformed verbs: *John fact-found, *Mary truck-drove, *Bill page-turned.* (Some have been back-formed, of course, so *to housekeep* doesn't sound so bad to me, nor does *to scriptwrite* or *to mind-read*.) The crucial thing for this argument is that nonce incorporations of this type should all be nouns.

26. *Deriving these incorporations through conflation* (I'm abstracting away from Late Insertion here for ease of exposition; I can explain how it really works with abstract heads and Vocabulary Items later, if you want):

    a. Select *write* with +affix features in the numeration.
    b. Merge *write* and *script*. Copy the p-sig of *script* into *write* during Merge (by Conflation Economy).
    c. Project the head (i.e. label the whole thing with the head's features)
    d. Merge [scriptwrite] with *-er* (also selected with a +affix feature). Copy the p-sig of *scriptwrite* into that of *-er* during Merge (again by CE)
    e. Project the head.
    f. Pronounce entire structure as *scriptwriter*
    g.

$$n_{scriptwriter}$$

$n_{scriptwriter}$ $V_{scriptwrite}$

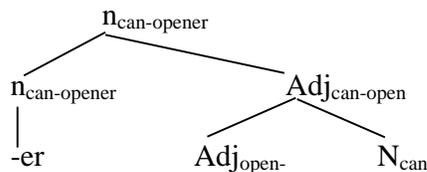|
-er V_{write-} N_{script}

27. Contrast that with a derivation where *write* starts with a -affix feature:

    a. Merge *write* and *scripts*.
    b. Project the head (*write*), i.e. label the whole structure with *write's* features.
    c. Merge [write scripts] with *-er*. Copy the p-sig of *write* into *-er*
    d. (Insert genitive *of* for free to case-mark argument of *write*)
    e. Pronounce entire structure as *writer of scripts*.
    h.

$$n_{writer}$$

n_{writer} V_{write}

|
-er V_{write} (of) $N_{scripts}$

28. *This will work the same with adjectival roots — no problem that it's an* 'inner subject':

$$n_{can-opener}$$

$n_{can-opener}$ $Adj_{can-open}$

|
-er Adj_{open-} N_{can}

29. *The payoff*: deriving Selkirk's 1982:37 First Order Projection Condition, Roeper and Siegel 1978:208 First Sister Principle

• By Conflation Economy, +affix heads *must* get a p-sig from their sister at Merge
• This means that *no conflation can 'wait'*. If you want to incorporate a 'specifier', *you must also incorporate the whole predicate that is its complement*. That is, in a PP or adjectival small clause, you can't incorporate the inner subject without the 'inner object'.

a. Consider the following: *drug-pusher, errand-runner, truck-driving, horse-jumping*

b. These are all formed from verbs which have good argument structures with a Goal PP: *push drugs to children, run an errand to the store, drive trucks across the country, jump the horse over the fence.*

c. Their nominalizations, however, do NOT allow the goal PP to be included: **drug-pusher to children, *errand-runner to the store, *truck-driving across the country, *horse-jumping over fences* (cf. Selkirk 1982:37)

d. Similarly for resultative constructions: *washing dishes clean* & *dishwasher* are fine but **dishwashing clean*; *painting houses red* & *house-painting* but **housepainting red…*

e. However, if the object is *not* incorporated, modification of the nominalization by a result or goal secondary predicate is ok (at least, better): *painting of houses red, washer of dishes clean, running of errands to the store, driving of trucks across the country.*

→ The impossibility of secondary predication in these incorporation structures follows from Conflation Economy, because 'inner subjects' (specifiers) can't incorporate by themselves. Here's why:
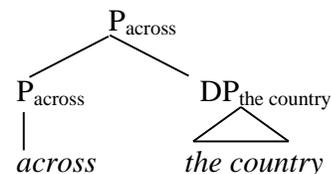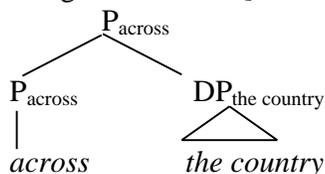
30. Compare the derivation of **truck-driving across the country* and *driving of trucks across the country*: Let's try to derive them by generating *drive* with a +affix feature in the first case and not in the second:
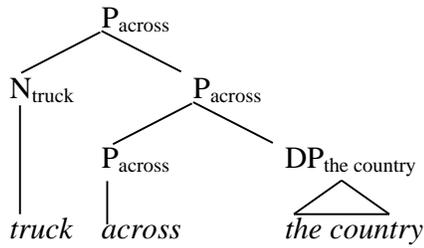
a. Numerations

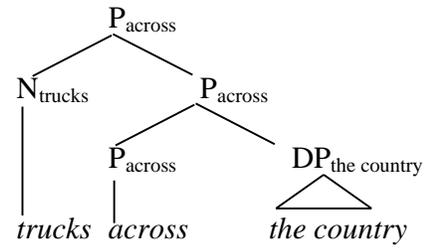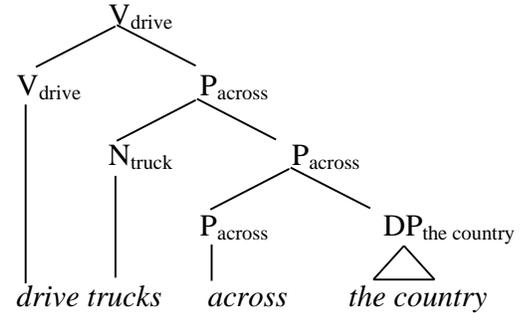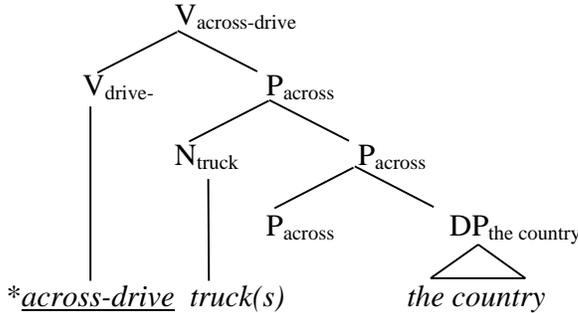| [+affix] 'drive'		[-affix] 'drive'
{drive-, [DP the country], across, truck, -ing}	vs.	{drive, trucks, across, [DP the country], -ing}

b. Merge: *across* and *[the country]*

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c.   Merge: *truck* and [*across the country*][6]   N.B. the P is the head of the result!!

P_{across}
N_{truck} P_{across}
                P_{across} $DP_{the\ country}$
truck   *across*   *the country*

P_{across}
N_{trucks} P_{across}
                P_{across} $DP_{the\ country}$
trucks   *across*   *the country*

d.   Merge: *drive-* or *drive* and [*truck across the country*]

$V_{across\text{-}drive}$
$V_{drive\text{-}}$ P_{across}
                N_{truck} P_{across}
                        P_{across} $DP_{the\ country}$
*across-drive *truck(s)*   *the country*

V_{drive}
V_{drive} P_{across}
                N_{truck} P_{across}
                        P_{across} $DP_{the\ country}$
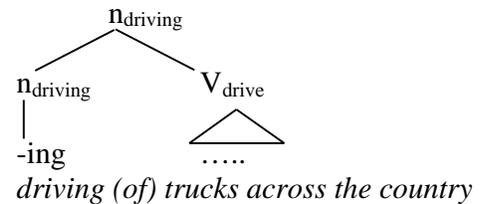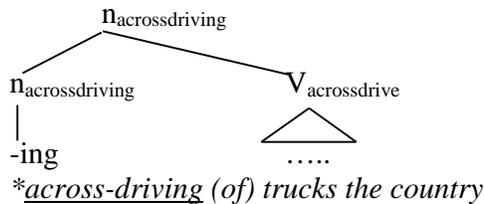*drive trucks*   *across*   *the country*

NOT   *truck-drive across the country*

e.   Merge *-ing* with [acrossdrive truck the country] or [drive trucks across the country]

$n_{acrossdriving}$
$n_{acrossdriving}$ $V_{acrossdrive}$
-ing   …..
*across-driving (of) trucks the country

$n_{driving}$
$n_{driving}$ V_{drive}
-ing   …..
driving (of) trucks across the country

31.   *What's wrong with* acrossdriving of trucks the country*?*

       2 possibilities:
       a) English doesn't have any appropriate conjunct-form vocabulary item for *across*, so the
            derivation fails when Late Insertion fails to realize that node.
       b) Somehow, case-checking of *the country* is tied to the phonological realization of the P
            that it is the complement of (not unreasonable since it has long been hypothesized
            that case-checking is necessary to license the realization of DPs phonologically).

→ Conflation Economy ensures that incorporation of internal subjects can happen in cases
    where the complement predicate incorporates, but not otherwise.

→ The good thing, of course, is that this structure explains why the N is interpreted as the
        object of the V in these compounds., with no recourse to a 'lexical' derivation: the V

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

and its sister are in the same relationship in this structure that they are in when they're in a VP.

6　Extensions, problems, conclusions

6.1　*Non-argument first sisters*

→ The whole question of interpretation is a tricky one. If Roeper and Siegel were right, it's not just verbs and their objects: it's verbs and *any* word that could be a "First Sister" of the verb in the syntax.

→ This could be construed as support for Bare Phrase Structure, since in BPS there's no principled distinction, phrase-structure-position-wise, between a modifier of an intransitive verb phrase and an object of a transitive verb phrase.

33.　work hard　　　　→　　hardworking
　　　look good　　　　→　　good-looking
　　　step lightly　　　→　　light-stepping
　　　bloom late　　　　→　　late-bloomer

→ crucially, in order for an adverbial, as above, to be incorporated, the verb has to be intransitive (because otherwise the *object* would be the First Sister):

34.　fast-moving　　　but not　　　fast-finding
　　　grim-acting　　　but not　　　grim-wanting
　　　girlish-sounding　but not　　　girlish-making

→ weirdly, there are a number of *locative* ones that R&S also include:

35.　go (to) sea　　　　　→　　sea-going
　　　dwell (in) a cave　　→　　cave-dweller
　　　live (in) an apartment →　　apartment-living
　　　go (to) church　　　 →　　church-goer

→ In order for me to make these work in the syntax, I have to postulate null prepositions with defective P-sigs in English

→ luckily, I've already postulated a heck of a lot of these, for independent reasons. It may take some selling to the world at large, though.

6.2　*Idioms in compounds?*

→ The beauty of this system is that the same interpretive principles that operate in the syntax explain the meanings of synthetic compounds and the meanings of verb phrases

→ Shouldn't idioms that we see in verb phrases, <u>as long as they can have an appropriately habitual meaning</u>, appear in synthetic compounds, too?

→ this is true for some idioms, but not others. And for some I can't tell if the idiom's not available, or it's just the novelty of the compound that's sounding odd:

35.   *Idiom preserved*
      X breaks the ice   →   X is an icebreaker
      X drops the penny   →   X is a penny-dropper
      X squeezes the Charmin'   →   X is a Charmin'-squeezer
      X broke (my) balls   →   X is a ballbreaker

36.   *Idiom not preserved*
      X flew the coop   →   X is a coop-flyer
      X saw the light   →   a light-seeing X
      X ate crow   →   X is a crow-eater

37.   *Hmmm?*
      The cadet made the grade   →   a grade-making cadet?
      The dean touched wood   →   a wood-touching dean?
      That story takes the cake   →   a cake-taking story?   etc.

6.3   LF "Incorporation" and the FOPC

→ Interesting thing: some non-specific object constructions in languages like Persian have been treated as "LF-incorporation" constructions. In support of that idea, it seems that in Persian, these objects are subject to the First Order Projection Condition!

(thanks to Simin Karimi for this data and discussion. I didn't have time before the talk to correct the ASCII-data below; these Persian words are missing all their diacritics. My apologies!)

38.   a.   *Nonspecific object* (without *–ro* marker)
           *Mary daasht gaari   hol   mi-daad
            Mary prog   cart   push   prog-gave.3sg
           "Mary was pushing (some) cart /Mary was cart-pushing"

      b.   *With Goal phrase, nonspecific object impossible:*
           *Mary daasht be taraf-e NY gaari   hol   mi-daad
           Mary prog   towards NY   cart   push   prog-gave.3sg
           "Mary was pushing (some) cart to NY/ Mary was cart-pushing to NY"

      c.   *Specific object well-formed, of course*
           Mary daasht   ye gaari-ro   be taraf-e NY hol mi-daad
            Mary prog   a cart-raa   towards NY   push prog-gave.3sg
           "Mary was pushing a cart to NY"

→ So either Persian non-specific objects are a lexical operation, or we have to figure out a way to cause this to fall out in the syntax. Guess which solution I prefer.

→ And if we can get *this* to fall out in the syntax, then it seems entirely reasonable to think that the same operation is at work in English compounds, producing the effect of the FOPC; i.e. it seems reasonable to think that compounds are syntactically formed too
→ And if *compounds* are syntactic, why then, heck! Why do any word-formation in the lexicon at all?

32. *Questions for further research*

→ How can this be parameterized? That is, for instance, why is this process not productive in English verbal constructions, as well as nominalized constructions — and why is it productive in Mohawk verbal constructions?
→ Hypothesis: something to do with case-checking. No v in nominalizations, as argued in Harley and Noyer 1998; Harley and Noyer 2000. If agentive v in English must contain a [+ACC] feature, à la Burzio's generalization, then if the verb is generated as +affix and the object's p-sig is copied, no phrase will be available to check the case-feature of the verb (again assuming that case-checking has to do with licensing of phonological features). Problem: unergative verbs have an agentive little v, by hypothesis. What happens to its [+ACC] feature?

→ Another question: It's still not obvious how to bring Holmberg's generalization back into the fold, given this approach to head-movement. Thoughts?

→ Other questions: cognate objects, modifer stranding, cf. 26i above, Goal incorporation., KP, DP and N-movement, the vocabularies of N-classifier languages vs. mass/count langauges and NumP, LF-incorporation and non-specific readings, why is a CP clause nearly always a boundary for head-to-head movement… and…

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