Today

§1 An overview of the origins and development of head movement.

§2 Chomsky, and head movement a 'phonological' operation

§3 Some more alleged empirical properties of head movement.

§4 An aside on some phenomena we won't be talking about.

1 Origins

Head movement has been around in some form since the mid to late 1970s. Generally speaking, it has been used to derive the positions of verbs cross-linguistically.

1.1 Emonds

- The earliest citations for something like head movement are usually to work by Joe Emonds; Emonds 1978 is fairly representative, proposing V°-to-T° movement.

- Building on work by Kayne (1975), Emonds is particularly interested in understanding the status of French auxiliaries and the structures in which they occur.

  Nowadays, Kayne's observations are perhaps more commonly associated with Pollock (1989).

- In particular, Kayne observes various adverbs must precede infinitives, but follow tensed verbs. Emonds notes this is true of negation, as well.

  (1)   Jean (n') *aime* pas Marie.
          John *ne*   likes NEG Mary

  (2)   Ne {pas} *posseder* {*pas} de voiture en banlieue rend   la   vie difficile.
          ne NEG own.INF   of car   in suburbs makes the life difficult

  Data from Pollock 1989: (2), (16c,d). There are very few examples in Emonds 1978.

- Emonds proposes that finite verbs undergo movement to tense (X being an adverb or negation in the transformation below):
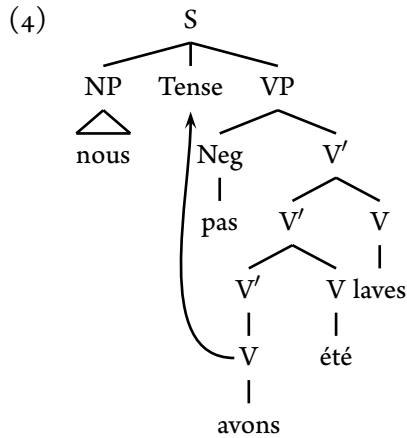
  (3)   *Finite Verb Raising*:
          NP – Tense – X – V – Y $\Rightarrow$ 1 – 4 + 2 – 3 – $\emptyset$ – 5
          Conditions: X doesn't contain NP or V; obligatory application

  Emonds 1978:165, (17)

  Den Besten (1977) suggests a similar rule for Dutch and German root clauses. His *verb preposing* rule moves verbs from sentence-final position to Comp. This work is based heavily on Emonds's.

- Emonds proposes this rule in the context of a particular view of auxiliary verb structure, which he argues to be left-branching (exploiting the then-burgeoning X′-theory). It is actually a part of an argument about the correct placement of tense at deep structure.

- Like many transformations of the time, this rule affects a *linear order*. The leftmost verb (term 4 above) will be the one to undergo movement to tense (term 2).

  Emonds says nothing about the particle *ne*.

(4)

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                    S
          ┌─────────┼─────────┐
         NP       Tense       VP
          △         │      ┌───┴───┐
        nous       Neg    ...      V′
                    │      ┌────────┴───┐
                   pas    V′            V
                         ┌─┴──┐         │
                        V′    V laves  laves
                        │     │
                        V    été
                        │
                      avons
```

- This is not really head movement in the sense that we recognize it today. The terms of the transformation don't distinguish between heads and phrases, we can move anything anywhere as long as it is a constituent, and it relies on linear order to get the correct verb to move.

- The novel theoretical insight of this rule is that it resolves an apparent problem of word order by proposing that tense is external to the VP and that *verbs move to tense* in French.

As best as I can tell from the discussion, AFFIX HOPPING was the only other comparable way of uniting tense with a verb.

1.2 Travis

- An important development in head movement came in Lisa Travis's (1984) dissertation. In Chapter 3, Travis's main goal is understanding various differences between the word orders of German, Dutch, and Yiddish. Much of this discussion centers on the idea that IPs in German and Dutch are left-headed.

- The problem she faces is that verbs in German seem to appear in three different places: In Comp, in Infl (between subjects and objects), and in VP.

Others, including den Besten (1977) and Vikner (1995) argue that verbs always move to Comp/C° in V2 clauses.

- A key part of understanding this comes in the from of the HEAD MOVEMENT CONSTRAINT (HMC):

(5)   HEAD MOVEMENT CONSTRAINT:
       An X° may only move into the Y° which properly governs it.

Travis 1984:129, (55)

- This has the effect of linking head positions together. Verbs move to I°, and then to Comp – there is a feeding relationship between these positions.

- Thus in a series of verbs, only the highest verb will move to Infl (6). The inflected verb (the one that moves to I°) will be the only one available to move to Comp (7).

In den Besten (1977), the final verb moves directly to Comp. There is no feeding relationship between these.
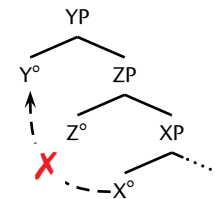
(6)
```
            I′
          /    \
        I        VP
        |       /   \
  hat_i+present VP    t_i
             /    \
           NP      V
          /  \     |
         A    N   gelesen
         |    |
       viele Bücher
```

(7)
```
              Comp′
            /       \
          Comp        I′
         /    \      /  |  \
       X″  [V_i+I]_j NP t_j  VP
                          /    \
                        VP      t_i
                       /  \
                     VP    V
                    /  \
                  NP    V
```
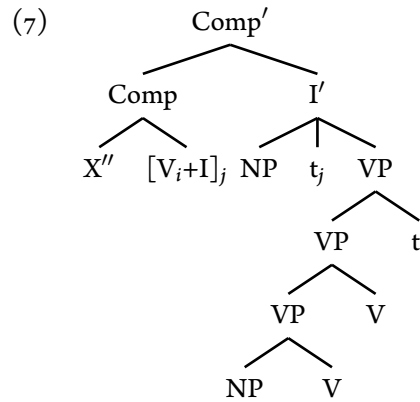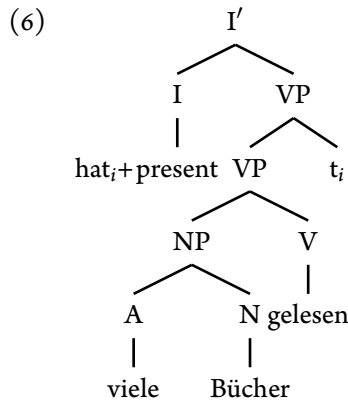
- The HMC is a notable move toward generalization: We are no longer just talking about verb movement, but movement of syntactic elements in particular syntactic positions.

- The HMC remains a central empirical observation to this day. Roberts (2011) recasts this in more modern terms:

  (8) HEAD MOVEMENT CONSTRAINT (HMC):
       Head movement of X to Y cannot skip an "intervening" head Z.

       (Z intervenes between Y and X iff Y asymmetrically c-commands both X and Z, while Z asymmetrically c-commands X)

- Exactly why the HMC should hold, however, is an open and problematic question (as we will see).

- Rizzi (1990) has argued that the HMC is a special case of Relativized Minimality, suggesting that it may fall out from more general syntactic locality principles.

1.3 Head movement in GB

- In Government and Binding theory, head movement can be summarized as:

  (9) Head movement is the case of Move-α where α is X°.

- Head movement, being a reflex of Merge-α, was therefore a core syntactic operation.

- As such, it was thought to be constrained by general constraints on movement:

  a. *Structure preservation*:
     In traditional $\overline{\text{X}}$-theory, this meant that only heads could move to head positions and only phrases could move to specifiers. This basically required head-to-head adjunction.

  b. *Locality*:
     The locality condition on head movement was the HMC (8). The HMC, as mentioned above, forces head movement to be cyclic, since a moving head must pass through each head position on the way to its target.

```
        YP
       /   \
     Y°     ZP
      ↑    /   \
      ¦   Z°    XP
      ✗    \    /  \
       `–X°      ....
```

Y is in a Minimal Configuration (MC) with X iff there is no Z such that

  (i) Z is of the same structural type as X, and
  (ii) Z intervenes between X and Y   (Rizzi 2003)

Roberts 2011:196

Now known as the CHAIN UNIFORMITY CONDITION.

c. *Well-formedness of conditions on traces*:
   This, of course, means the Empty Category Principle (ECP). This meant that head movement had to proceed out of complements, and that 'downward' head movement was not allowed.

- The GB view of head movement survived into early versions of Minimalism, and is probably the formulation that most non-specialists are familiar with.

2   Chomsky on head movement

- As with so many other things, the view of head movement began to shift after the adoption of the Minimalist Program.

  An early sign of this shift: Chomsky (1995:368) suggests that v2 in Germanic languages (T°-to-C° movement) might be phonological.

- Chomsky (2001:37) suggests 'the possibility that V-raising is […] not part of the narrow-syntactic computation but an operation of the phonological component'. He goes on to claim that '[t]here are some reasons to suspect that a substantial core of head raising processes, excluding incorporation in the sense of Baker (1988), may fall within the phonological component'. He enumerates the following reasons:

(i) *Interpretation of raised verbs*:
    Verbs that undergo movement to T° or to C° receive the same (LF) interpretation as those verbs which remain *in situ*.

(ii) *The motivation for movement*:
    It is frequently assumed that a strong $[v]$ feature on T° drives V°-to-T° movement, but this cannot be satisfied by VP movement to SpecTP. The theoretical apparatus driving movement, however, cannot distinguish between head and phrasal movement, so both should be possible. The 'phonetically affixal character of the inflectional categories' suggests head movement is a PF process.

    However, there have been attempts to derive this from, *e.g.*, anti-locality effects (Pesetsky and Torrego 2001).

(iii) *Differences between head movement and phrasal movement*:
    a. It is an adjunction rule.
    b. It is countercyclic.
    c. A moved head does not c-command its trace.
    d. It is problematic in ways similar to feature movement.
    e. It observes different locality conditions.
   f. It is not successive cyclic.

    That head movement results in adjunction structures is the standard assumption, but Rizzi and Roberts (1989) claim it might actually be substitution in some cases.

2.1 The empirical claim: Interpretive effects

- Notice that only point (i) is a properly empirical claim; the rest are theory-internal concerns. As a consequence, probably, point (i) is the most contentious claim in modern theorizing on head-movement.

- If head movement feeds an interpretive difference, then the simplest conclusion is that head movement is a narrow syntactic operation.

  The other logical possibility is that there are independent PF and LF head movements that, on occasion, happen at the same time. This is generally ruled out as being less parsimonious than narrow-syntactic head movement.

- If head movement can be shown to have interpretive effects, we can be relatively confident that head movement is part of the narrow syntax. Then the theory of movement would need to be adjusted to accommodate the issues raised in points (ii) and (iii).

- Note, however, that *a lack of interpretive effects is not evidence that head movement is a PF operation*; it is merely evidence consistent with that view.

- Syntactic movements often lack interpretive effects for a host of reasons, and there are arguably reasons that head movement might lack them. This is why the theory-internal concerns in (ii) and (iii) are of importance.

2.2 Motivation: Feature driven movement

- Agree is a central theoretical mechanism in Chomsky 2001, so making it function consistently is a key motivation for Chomsky here.

- The typical Minimalist assumption, given Bare Phrase Structure, is that the a head projects the same label as the phrase it forms. The feature make-up of a phrase is the same as the head of the phrase – there is no way to distinguish between a head and the phrase that projects from it.

- Consequently, there is no way for Agree distinguish between phrases and heads using features.

- If all syntactic movement is feature-driven, and V°-to-T° movement is driven by a strong [v] feature on T° (Pollock 1989), VP movement as in (11) should be just as acceptable as V°-to-T° movement, as in (10), since both should check the [v] feature.

(10)   /   (11)
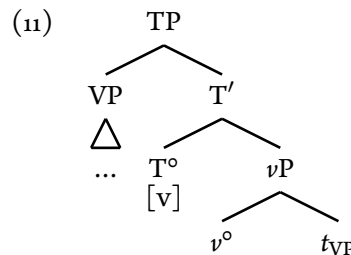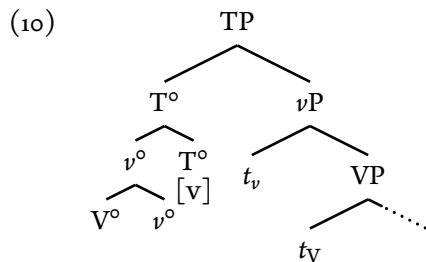
- If head movement is not (feature-driven) movement, then these derivations are no longer in competition.

2.3 The theory of movement: The extension condition

- The list of issues in (iii) are several issues that violate contemporary views of movement in Minimalism.

- Several of the points in (iii) are related to the Extension Condition of Chomsky (1995), namely:

    a. It is an adjunction rule.

    b. It is countercyclic.

    c. A moved head does not c-command its trace.

- The Extension Condition requires that Merge (and therefore, Move) apply at the topmost node of the tree:

There is a one-way implication: If there are semantic effects, then hed movement is syntactic.

Matushansky (2006) points out that the average verb doesn't have a semantic type that would show scopal interactions (they are predicates, not quantifiers). So Chomsky's argument from verb movement is not, of itself, a particularly strong one, anyway.

See Chomsky 2001:5.

As Preminger (2016) points out, this would seem to suggest that head movement should not even be possible. Locality conditions on Agree mean that VP is a nearer goal for the probe on T° than V°, so VP movement should be preferred to V movement. Only (11) should be possible.

(12) *Extension Condition*:
      Merge should be effected at the root.

– In order for a head X° to adjoin to another head Y°, Y° must already have merged, and so X° cannot adjoin at the root.

– The Extension Condition is rules out countercyclic movement, which head-to-head adjunction would be a case of.

– The Extension Condition also derives the fact that a moved phrase c-commands its trace, since it will always be a sister to the constituent out of which it moves.

Adjunction itself is not a problem (moving-and-adjoining phrasal elements at the root does not violate the Extension Condition). Rather, it is the fact that one head must adjoin to another.

- The point about the locality conditions (iii-e) is more equivocal, since the HMC can be explained as a special case of Relativized Minimality.

- The fact that it is not successive cyclic is related to the fact that it is impossible to extract from a complex head (as I discuss below).

2.4 Discussion

The real issue with points (ii) and (iii) is that they are completely theory-internal.

- If we construct Agree differently, or if we reconceptualize how features are projected from heads to phrases, point (ii) might be avoided. If we reject the Extension Condition, then many of the issues in point (iii) might dissolve.

- **Question:** These theoretical mechanisms were not necessarily made with head movement in mind. Should they have been?

  – Imagine if Chomsky came to this problem with the intent of keeping head movement as part of the narrow syntax. Could there have been a way to build the theory to meet that end?

  – Here we have a theory that was designed to handle phrasal movement. Head movement is thought to behave differently from phrasal movement. Is the fact, then, that it does not fit well with a theory meant to describe phrasal movement sufficient grounds for excluding it from the narrow syntax?

  – This is why point (i) is such a contentious issue – the empirical evidence supporting this move is actually fairly thin.

What if head movement is evidence that the Extension Condition is wrong? Chomsky (2000:137), in fact, suggests that the Extension Condition should be weakened due to the head movement facts.

- There's also a big gap left in the theory if head movement is not syntactic.

  – Heads are syntactic objects. How do we account for the fact that head movement appears to target the head position in a syntactic structure? What role should the syntax play?

  – The HMC looks a lot like a syntactic constraint (especially given its outward resemblance to Relativized Minimality). Any non-syntactic account of head movement must reckon with the fact that head movement takes place between adjacent heads and that any intervening non-head material (adjuncts, specifiers) can be skipped.

Put another way, punting to the 'phonological component' doesn't immediately explain why the syntactic structure apparently matters.

– If there is 'phonological' head movement, we should wonder whether and why head movement is not available in the syntax. Merge must to be able to take bare heads as its terms (since the contents of a numeration is a collection of lexical items). Internal Merge should also be able to do so in principle.

- I raise these questions because I think a healthy dose of skepticism is warranted here. The empirical evidence here is not particularly strong; in general, more evidence should be brought to bear on these issues.

3 Additional properties of head movement

- There are several other ways in which head movement is reported to differ from phrasal movement.

- The following list, which overlaps with Chomsky's (2001) in several places, is from Platzack (2013), who identifies several additional properties we have not seen yet.

a. *Violation of the extension condition*
   HM does not extend the root when moved, contrary to phrasal movement.

   I discuss this in Section 2.3

b. *Locality*
   HM is restricted to occur within a single extended projection [of the verb –NL]. Phrasal movement is not restricted in such a way.

c. *Relativized minimality*
   HM but not phrasal movement is blocked by an intervening head.

   This is the Head Movement Constraint; see Section 1.2.

d. *No extraction*
   If a head β moves to α, then $\{\alpha + \beta\}$ acts as one constituent. A moved phrase may display a similar "freezing" effect.

   Usually referred to as the ban on EXCORPORATION.

e. *The higher the bigger*
   If $\{\alpha + \beta\}$ is the result of HM of β to α, then the features of β are a proper subset of those of α. There is no similar effect of phrasal movement.

f. *Mirror Principle*
   HM obeys the Mirror principle, saying that the order of affixes attached to a head is a mirror image of the order of functional heads corresponding to these affixes. There is no mirror principle in connection with phrasal movement.

g. *No semantic effects*
   HM seems to lack semantic effects, whereas phrasal movement may have such effects.

   I discuss this in Section 2.1.

- Of these, only b, d, e, and f are completely novel, so I will discuss them below.

3.1 Locality (b)

- Platzack claims that 'a head cannot head move out of its maximal functional projection, hence V cannot head move out of CP', contrasting verb movement with topicalization:

(13)   This book, John thinks that Eva read last summer.

(14)   a.   * Has Mary said that John stolen the book?

        b.   Has Mary said that John stole the book?

- I'm not totally sure what this is meant to show.

    1. If this is meant to show that head movement head movement cannot be triggered long-distance, than this is already covered by the HMC.

    2. If this is meant to show that heads cannot undergo topicalization (in English), then this is not really head movement in the strict sense.

    See Matushansky (2006) on the possibility of moving heads to specifier positions.

- The way he puts it, though, would seem to suggest that head movement is clause-bounded. If this is right, then there shouldn't be anything like like C°-to-V° movement. I've never seen this claimed anywhere, and also I don't know of any clear evidence that this *does* happen.
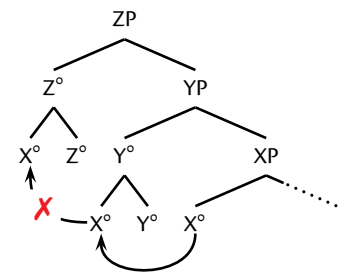
3.2 No extraction (d)

- Sometimes referred to as the ban on EXCORPORATION, it is thought that it is impossible to move out of a complex head.

- The result, then, is that if one wants to move a head X° to Z° across an intervening head Y°, then one must also move Y° to Z°.

    – The HMC precludes straight-out skipping over Y°, so X° must move to Y° first.

    – It seems, though, that subsequent movement of X° requires movement of Y° as well. It is not possible to move X° without Y°.

- Roberts (2003, 2011) points out that nothing in the GB conception of head movement explains the ban on excorporation; Platzack (2013) notes that it remains a stipulation.

3.3 The higher, the bigger (e)

- A consequence of the inability to extract from a complex head is that the iterated application of head movement results in progressively larger *syntactic* elements. Phrasal movement does not really do this.

- A related observation, though, is that this generalization is not necessarily diagnostic of head movement having occurred, due to confounds like AFFIX HOPPING.

    Affix hopping is going to haunt us a lot this semester, I suspect. With luck, we will have some time to look at it in comparison to head movement.

    – Verbs are not typically reckoned to move past $v°$ in English. Despite this, they appear with tense and aspect affixes associated with a higher head.

    – Moreover, T°-to-C° movement in most cases does not result in increased morphological complexity. Thus, 'bigger' can, at best, only mean syntactically bigger.

3.4 The mirror principle (f)

- The Mirror Principle of Baker (1985)

  (15) *The Mirror Principle*:
  Morphological derivations must directly reflect syntactic derivations (and *vice versa*).

  Baker 1985:375, (4)

- In morpho-syntactic theories where word-building is the result of syntactic operations (read: head movement), the morphological structure of the word will reflect the syntactic structure.

  See Embick and Noyer 2007:302–304

- For instance, if a verb acquires affixes by moving through various functional heads, the order of the heads will reflect the order of the functional heads through which it moved.

  If you are a fan of non-concatenative morphology, then you may have opinions about this.
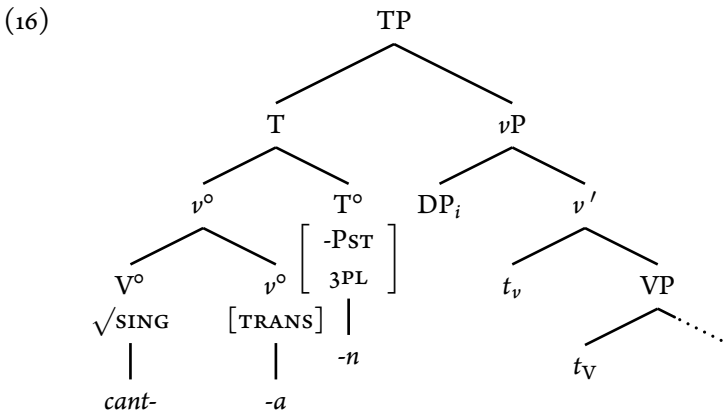
  A tree for the Spanish verb *cantan*, 'sing (PRES, 3PL)', based on Oltra-Massuet and Arregi 2005

  (16)

```
                          TP
                      ┌────┴────┐
                      T         vP
                   ┌──┴──┐    ┌──┴──┐
                  v°    T°   DPᵢ   v′
               ┌───┴─┐  ┌─────┐  ┌─┴──┐
              V°    v° │-Pst │  tᵥ   VP
              │    │   │ 3PL │       ┌─┴·····
            √SING [TRANS] └──┬┘      tᵥ
              │     │       -n
            cant-  -a
```

- This should fall out from the HMC and the ban on excorporation.

4 Important things we are not talking about extensively

4.1 Incorporation

- INCORPORATION (Baker 1988) is a rich and complicated topic. Very broadly speaking, incorporation occurs when the complement of a verb appears as a proper morphological subpart of that verb.

  See Roberts 2003:115–119 for a brief summary.

  (17) Incorporation in Onondaga (Iroquoian).

  Baker 1988:76–77, (1a) and (3a)

  a. Pet waʔ-ha-htu-ʔt-aʔ   neʔe o-<u>hwist</u>-.
      Pat PAST-3MS-lost-CAUS-ASP the   PRE-<u>money</u>-SUF
      'Pat lost money.'
  b. Pet waʔ-ha-<u>hwist</u>-ahtu-ʔt-aʔ.
      Pat PAST-3MS-<u>money</u>-lost-CAUS-ASP
      'Pat lost money.'

- The traditional view of this is that this is derived via head movement.

(18)

```
              S
         ┌────┴────┐
        NP         VP
         │      ┌───┴───┐
        Pat     V       NP
             ┌──┴──┐     │
             N     V     N
             │     │     │
          moneyᵢ -lose   tᵢ
```

- Historically, incorporation has played a central role in the theory of head movement. Reading Travis (1984), for instance, one gets the sense that there was no meaningful distinction between the two.

- However, it has taken a backseat in recent discussions on the nature of head movement, quite possibly because Chomsky (2001) himself brackets it.

- This is certainly a mistake, and one that I am unfortunately propagating here.

4.2 Clitics

Clitics, in some cases, look a lot like individual heads

- For example, Uriagereka (1995) argues that Galician object clitics are heads that adjoin to a functional position to which the verb also moves.

- These clitics originate in argument positions. While the verb movement to F° follows the HMC, movement of the clitic to F° does not.

(19)   Dixen   que este concerto, ouvin-o   eu.
        said.1SG that this concert,   heard.1SG-it$_{cl}$ I

        'I said that this concert I heard it.'

(20)

- Clitics are fascinating, but well beyond the purview of what we are talking about here.

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