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The probe-goal turn

Superiority in wh-movement

- While our focus here is ϕ-labeled features —
  - the probe-goal model is at the center of ϕ-feature syntax originates in the treatment of movement — and, in particular, wh-movement

- The basic empirical observation was this:

Superiority effects in multiple-wh questions are inelegant for “foot-driven” theories of movement.

Superiority in wh-movement

- To see why, consider:

  1. a. Who did Morty think built what?
     b. *What did Morty think who built?
  2. a. Who did Morty think t built what?
     b. *What did Morty think who built t?

  ➢ Crucially, we can’t just say that what in (1–2) is not a potential mover:

  3. What did Morty think Rick built t?

  ⇒ In a “foot-driven” model of movement —

  (where movement is driven by the wh-phrases)

  — the different wh-phrases would have to “consult” one another to determine which one moves
### Superiority in wh-movement

(2) a. Who did Morty think they built **what**?
b. *What* did Morty think **who** built **t**?

(3) What did Morty think Rick built **t**?

- In particular, **what** would have to “check” if there’s another potential mover higher up in the tree
  (like **who** in (2a–b), but not **Rick** in (3))
  — before deciding whether it could, itself, move.

- And, crucially, we can create examples where **what** is unboundedly far away from the other phrase
  · the phrase it has to “check” with

(4) *Did* you think **who**/Rick claims Beth knows […] Jerry broke **what**?

### Solution: the probe-goal model

- Chomsky (in his 1989 class notes on Rizzi’s 1990 *Relativized Minimality*, which was circulating as a manuscript at the time) —
  - we can solve this problem by assuming that wh-phrase move not because of their **own** needs;
  - but because of the needs of an element at (or near) the **landing site**

- Assume that interrogative **C** is a **probe** — which means:
  - it has a featural need;
  - in this case, to seek and find a phrase bearing [wh]-features
    - a.k.a., a **goal**

### Solution: the probe-goal model

- **One more ingredient:** Iterative Downward Search
  (a.k.a., “minimal search”)
  - I’ll give a formal definition in a moment;
  - but the intuition is:
    - starting from the probe, and searching downward
    - so that **closer** potential goals will be encountered earlier than **farther** potential goals
      · where ‘closer’ and ‘farther’ are defined structurally
      · i.e., in terms of (asymmetric) c-command
Solution: the probe-goal model

⇒ Looking once again at our paradigm:

(2) a. Who did Morty think [t] built [what]?
   b. *What did Morty think who built [t]?

(3) What did Morty think Rick built [t]?

➢ the different wh-phrases no longer have to “consult” with one another:

(5)

\[ \text{CP} \quad \cdots \quad \cdots \quad \cdots \quad \cdots \quad \text{what} \]
\[ \text{who / Rick} \quad \cdots \quad \cdots \]

\[ \text{\textit{C}}^0 \quad \text{\textit{wh}} \quad \text{\textit{goal}} \]

Solution: the probe-goal model

- Instead, \( \text{C}^0 \) simply scans the tree for the closest bearer of [\textit{wh}]-features it can find

(6)

\[ \text{CP} \quad \cdots \quad \cdots \quad \cdots \quad \cdots \quad \text{what} \]
\[ \text{\textit{C}}^0 \quad \text{\textit{wh}} \quad \text{\textit{goal}} \]
\[ \text{\textit{probe}} \quad \text{\textit{Rick}} \quad \cdots \quad \cdots \]

- here, \( \text{C}^0 \) acts as the \textbf{probe};
- and the closest \textit{wh}-phrases acts as the \textbf{goal}. 
Solution: the probe-goal model

- And, of course, if the closer noun phrase is already a bearer of [\textit{wh}]-features:

\[(7)\]

\[
\begin{array}{c}
\text{CP} \\
\text{probe} \\
\text{who} \\
\text{goal} \\
\text{what}
\end{array}
\]

- In interrogative constructions of this sort:
  - the goal is then moved to (=remerged at) the [Spec,CP] position

\[(8)\]

\[
\begin{array}{c}
\text{CP} \\
\text{who} \\
\text{C'} \\
\text{t}_{\text{who}} \\
\text{who} \\
\text{C}^0 \\
\text{[wh]}_{\text{wh}}
\end{array}
\]

Probe-goal: summary

- What we have seen so far:
  - superiority in multiple-\textit{wh} questions
    - inelegant for “foot-driven” models of movement
  \[\Rightarrow\] SOLUTION: the \textit{probe-goal} model of movement.
The empirical question: Is the model suitable for $\varphi$-features?

- Before turning to “how the probe-goal model works with $\varphi$-features” —
  - we should first ask: Is the probe-goal model well suited, empirically, as a model of $\varphi$-feature interactions?

  ➢ You already know the answer is “yes”…
  (otherwise why am I telling you all this)
- But let’s see why.

The empirical question: Is the model suitable for $\varphi$-features?

- The probe-goal model takes it as a given that:
  1. the element with the featural need—the “probe”—is a head ($X_0$)
  2. the “probe” c-commands the element that may satisfy that featural need (the “goal”)

- Reminder:

$\varphi$-features

The set of syntactic features that, at the LF interface, trigger interpretations that are exclusively related to PERSON, NUMBER, and GENDER(/NOUN-CLASS).

The empirical question: Is the model suitable for $\varphi$-features?

⇒ When it comes to $\varphi$-features:
  - what would be an “element with a featural need”?
  - and what would be an “element that may satisfy that need”?

  ➢ Chomsky (1995:277–278) provides the following suggestion:
  - features like PERSON, NUMBER, and GENDER are meaningful on the DPs where they occur
    - with some well-known exceptions in each class
    - e.g. politeness marking, pluralia tantum, and grammatical gender, respectively
  - but they are meaningless when they occur on a verb or a TAM(=Tense/Aspect/Mood) marker
    - e.g. “build.1sg” and “build.2sg” have no meaning difference beyond the difference already encoded on the argument
The empirical question: Is the model suitable for $\varphi$-features?

⇒ Chomsky’s (1995:277–278) suggestion:
   - $\varphi$-features get copied from nominals (where they “belong”) to verbs / TAM markers
     - to satisfy a featural need that verbs / TAM markers have
   - Crucially, verbs & TAM markers are heads
     - in accordance with tenet (i) of the probe-goal model, repeated here:
       (i) the element with the featural need—the “probe”—is a head ($=X_0$)

The empirical question: Is the model suitable for $\varphi$-features?

- This brings us to the second tenet, repeated here:
  (ii) the “probe” c-commands the element that may satisfy that featural need (the “goal”)

➢ Does this hold for $\varphi$-feature dependencies in syntax?

  local, clause-internal dependencies are not where one goes to investigate these matters!
  - that’s because the directionality (who c-commands who) of local relationships can be easily reversed
  - e.g. by positing various hard-to-detect movement operations that reverse the relevant structural relations
    - cf. agreement with English subjects — is it before or after the subject moves to [Spec,TP]…?

The empirical question: Is the model suitable for $\varphi$-features?

- Instead, we should look at cross-clausal agreement relations

➢ Polinsky & Potsdam (2001) provide the paradigm case
  - based on Long-Distance Agreement (LDA) in Tsez, a Nakh-Daghestanian spoken in the northeast Caucasus
The empirical question: Is the model suitable for \( \varphi \)-features?

- Some basic facts about Tsez:

\[(9)\]

\[\begin{align*}
a. & \text{ ziya} \quad \text{b-ik'i-s} \\
& \text{cow.} \quad \text{III-go-PAST.EVID} \\
& \text{The cow left.}'
\end{align*}\]

\[\begin{align*}
b. & \text{ eniy-ā ziya} \quad \text{b-išer-si} \\
& \text{mother-ERG} \quad \text{cow.} \quad \text{III-feed-PAST.EVID} \\
& \text{The mother fed the cow.}'
\end{align*}\]

- ergative-absolutive language
- agreement in NOUN-CLASS(=GEN) only
  - and with absolutive argument only
- movement in Tsez is only possible within a single clause; there is no cross-clausal movement of any kind (Polinsky & Potsdam 2001:590, 602–604)

The empirical question: Is the model suitable for \( \varphi \)-features?

- Now here’s the crucial data point:

\[(10)\]

\[\begin{align*}
a. & \text{ Eni-r} \quad [ \text{ uži } \quad \text{φ-āy-ru-li } ] \quad \text{φ-iy-xo.} \\
& \text{mother-DAT} \quad \text{boy.} \quad \text{I-arrive-PAST.PRT-NMZ} \quad \text{I-know-PRES} \\
& \text{The mother knows that as for the boy, he arrived.}'
\end{align*}\]

\[\begin{align*}
b. & \text{ Eni-r} \quad [ \text{ už-ā magalu } \quad \text{b-āc'-ru-li } ] \quad \text{b-ly-xo.} \\
& \text{mother-DAT} \quad \text{boy-ERG} \quad \text{bread.} \quad \text{III-eat-PAST.PRT-NMZ} \quad \text{III-know-PRES} \\
& \text{The mother knows that as for the bread, the boy ate it.}'
\end{align*}\]

➢ verbs in Tsez show \( \varphi \)-feature agreement with nominals located inside an embedded clause
  (and recall: there is no cross-clausal movement in Tsez)

➢ and since these clauses are complements of the matrix verbs —
  ⇒ the nominal, the source of GENDER features, is c-command by the verb

The empirical question: Is the model suitable for \( \varphi \)-features?

➢ In other words, the behavior of \( \varphi \)-features in syntax accords with tenet (ii) of the probe-goal model, as well:

(ii) the “probe” c-commands the element that may satisfy that featural need (the “goal”)

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Valuation

- Okay, so: suppose a $\varphi$-feature probe, e.g. $T^0$ (a.k.a., $I^0$ or Infl$^0$) has located a nominal goal

(11)

➢ What happens then? Valuation.

- We know what valuation amounts to empirically —
  - the features of the nominal end up on $T^0$

Valuation

- But note that there are several possibilities for what this means, grammatically speaking —
  - traditionally, valuation was taken to be a copy-and-overwrite process:
    - $T^0$ starts out with placeholders for PERSON, NUMBER, and GENDER

(12)

```
\[
\begin{array}{c}
\text{PERSON:} \\
\text{NUMBER:} \\
\text{GENDER:}
\end{array}
\Rightarrow
\begin{array}{c}
\text{PERSON: 1} \\
\text{NUMBER: pl} \\
\text{GENDER: fem}
\end{array}
\]
```

- we can call these placeholders ‘unvalued features’, or ‘uninterpretable features’, or whatever

- and valuation consists of the relevant feature values being copied from the nominal goal onto $T^0$
- and replacing these placeholders
Valuation

- another possible implementation of valuation is feature sharing
  
  
  – on this view, valuation amounts to taking the goal’s features —
    ➢ and associating them with both the goal and the probe

(13) probe goal probe goal

⇒ consequently, any subsequent modification to this feature bundle will affect both the goal and the probe

Valuation

- in the extreme, the goal and the probe can enter into feature sharing while both are still unvalued
  
  – acquiring actual values only later in the derivation

Valuation

- here is an example of that — not from ϕ-features, but from case:

(14) emmenomen hois₁ ho:mologe:samen t₁ dikaiois ousz, e: ou?

we.abide.by which.DAT we.have.agreed just.DAT being.DAT or not

‘Do we abide by those things which we consider just, or not?’

[Ancient Greek; Andrews 1971:138]

– in (14), the predicate “being just” enters into feature sharing with the wh-phrase while neither has case yet

– only later does the predicate “abide” assign the value ‘dative’ (DAT) to this feature bundle
  ➢ yielding dative morphology on both the wh-phrase and the stranded predicate

Valuation

- and there is yet another, third possible implementation of valuation, which we will not discuss until later in the course —
  
  – feature-geometric valuation

  ➢ but before we can discuss that, we have to acquaint ourselves with the notion of a ϕ-feature geometry . . . stay tuned!
References


