Too tough to see: null operator constructions and hidden movement chains*

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1 Introduction

This talk concerns two movement constructions, tough-constructions (TCs, 1) and gapped degree phrases (GDPs, 2).

(1) Ian is tough for Anneke to talk to 
(2) Ian is too shy for Anneke to talk to 

The proposed relationship (broadly):

- GDPs and TCs are both improper movement constructions (A movement precedes A movement)
  - TCs contain an element (an overt DP) that undergoes improper movement from the embedded clause to the matrix clause
  - GDPs contain an element (a null operator) that undergoes improper movement within the embedded clause

Motivations for this relationship:

- Section 3: tests for A-movement steps in GDPs and TCs
- Section 4: tests for A movement steps in GDPs and TCs
  - Hartman (2012) gives tests for A movement step in TCs
  - I show that Hartman’s tests can be extended to GPDs
- Section 5: tests to show what moves in TCs (overt DP) vs. GDPs (null operator, following Nissenbaum and Schwarz, N&S 2011)

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1 I assume the embedded clause of a GDP includes the DegP layer directly above CP, in addition to the CP layer itself.
2 GDPs and spec-DegP

Recall the structure proposed for GDPs (also proposed as an LF in N&S), repeated below:

(5) Ian is too shy OP for Anneke to talk to $t_{op}$.

- specifics of movement chain left unspecified for the moment
- final landing site of the NOP (proposed here and in N&S) is the highest spec-DegP position
  - this movement step is semantically necessary: without this movement step, the NOP can’t be linked to its matrix antecedent
  - Section 4: This movement can be syntactically motivated, too!
- other processes extrapose CP standard; time permitting, I’ll address word-order at the end²

3 ᾳ movement steps in TCs & GDPs

DISCLAIMER: This talk assumes a theory of grammar where (a) improper movement is not always outlawed and (b) TCs are improper movement constructions³.

3.1 ᾳ movement in TCs

SCHEMATIC:

(6) $-$ is tough $[\text{CP Ian C}]_{[\text{TP for Anneke to [vP talk to <Ian>]]}}$

TCs are ᾳ movement constructions. Support for this comes from:

- the fact that they show hallmarks of ᾳ movement, in the sense of Chomsky (1977)
  - behaves like movement that takes advantage of spec-CP and is not $\phi$-feature motivated
  - tough-movement can occur “across” an embedded subject without causing a minimality violation
(7) a. ✓ $-$ is tough $[\text{CP Ian C}]_{[\text{TP for Anneke to talk to <Ian>}] }$ (ᾳ)
    b. * $-$ is tough $[\text{CP Ian C}]_{[\text{TP for Anneke to talk to <Ian>}] }$ (A)

- the TC gap can be separated from it’s filler by a clause boundary (8a), but not an island boundary (8b)

(8) a. Ian is tough $[\text{CP for Anneke to say [CP that she has talked to } ]$
    b. *Ian is tough $[\text{CP for Anneke to talk about [DP the book written by } ]$

- tough-movement also mirrors other ᾳ constructions in a number of ways
  - TCs license parasitic gaps (9) Engdahl (1983)

(9) a. That candidate was easy to hire $t$ [without interviewing pg].
    b. Which candidate did you hire $t$ [without interviewing pg]?

- tough-movement from the higher DOC position is impossible ( Lasnik and Fiengo 1974)

²This is the correct word-order for enough-type GDPs, and there’s some evidence that too, but not enough, might move into the AP, cf. “Enough to see again, that’s how good the movie was” vs. “Too to see again, that’s how boring the movie was.” Additionally, obligatory extraposition theories of comparatives would negative word-order concerns, regardless of whether or not too moves.

³An alternative approach is often assumed in the literature, ranging from Chomsky (1977) to Fleisher (2013). For an intermediate theory see Hicks (2009).
(10)  
   a. *Ian was tough to give t this book. (DOC tough-extraction)  
   b. *Who did you give t this book? (DOC wh movement)  

   - TCs have a “natural analogue” that looks like wh-movement (12) (Chomksy 1977)

(11)  
   a. a tough chair on which to sit
   b. an easy violin on which to play sonatas

3.2  \(\bar{A}\) movement in GDPs

Main Claim: GDPs contain an \(\bar{A}\) step analogous to that found in TCs, as in (12)

(12)  
   Ian is [\(AP\) shy [\(DegP\) too [\(CP\) OP [\(TP\) for Anneke to [\(vP\) t\(_{op}\) talk to t\(_{op}\)]]]]]

GDPs behave identically to TCs with respect to \(\bar{A}\) movement tests:

- GDPs allow movement past the embedded subject (13)

(13)  
   a. ✓ ... [\(AP\) shy [\(DegP\) too [\(CP\) OP [\(TP\) for Anneke to talk to t\(_{op}\)]]]] (\(\bar{A}\))
   b. *... [\(AP\) shy [\(DegP\) too [\(CP\) OP [\(TP\) for Anneke to talk to <t\(_{op}\)]]]] (A)

- gap site can be separated from its filler by a clause boundary (14a), but not an island (14b)

(14)  
   a. Ian is too reclusive [\(CP\) for Anneke to say [\(CP\) that she has talked to _]]. (clause)
   b. *Ian is too reclusive [\(CP\) for Anneke to talk about [\(DP\) the book written by _]]. (island)

- GDPs license parasitic gaps (15)

(15)  
   Ian is too shy for Anneke to talk to t [without getting to know pg]

- GDPs show DOC extraction restrictions

(16)  
   *Ian is too dumb to give _ this book. (DOC extraction)

   - GDPs have an “overt analogue” with a wh-word (18)

(17)  
   a. She thinks 35 miles/week is too small a training base on \textit{which} to run a marathon.
   b. I don’t believe this is a big enough hook on \textit{which} to hang a coat.

3.3 Where are we now?

- TCs and GDPs both have (at least) an \(\bar{A}\) movement step in their derivations
- because (\(\bar{A}\)) movement over embedded subject DPs is possible, this \(\bar{A}\) step targets (at least) the embedded spec-CP

4 A movement

Main Claim both GDPs and TCs contain an A movement step in their derivations, as schematized in (18)-(19):

(18)  
   Tough (improper) movement:
   Ian is tough [\(CP\) t\(_I\) for Anneke to [\(vP\) talk to t\(_I\)]]

(19)  
   Gapped degree phrase movement:
   Ian is shy [\(DegP\) OP too [\(CP\) t\(_{op}\) [\(TP\) for Anneke to [\(vP\) talk to t\(_{op}\)]]]]

- evidence for this comes from defective intervention facts
  - TCs and GDPs can both license an oblique argument, above the embedded CP
  - arguments of the embedded clause cannot move across these oblique arguments

4.1 What is defective intervention?

- defective intervention is a minimality condition (Rizzi 1990) that prevents arguments from A moving “over” each other
- defective intervention is a hallmark of \(\phi\)-feature driven movement
  - A movement (and crucially not \(\bar{A}\) movement) is assumed to be \(\phi\)-driven\(^4\)
  - T Probes for the closest argument with \(\phi\)-features; only that argument can Move
  - a lower argument with \(\phi\)-features cannot (A!) move across another \(\phi\)-feature bearing argument

\(^4\)Though, of course, there are different kinds of A and \(\bar{A}\) movements, and within these subgroups, movement varieties are not necessarily identical.
4.2 Defective intervention effects in English

- English is a language that is sensitive to defective intervention effects
  - defective intervention effects in (at least!) ECM verbs (NOTE: this theory assumes ECM constructions involve A movement)

  (20) Defective intervention effects in ECM verbs
  a. The prosecutor proved [PP to the jury] [CP that the defendant was guilty]
  b. The prosecutor proved the defendant [TP t to be guilty]
  c. *The prosecutor proved the defendant [PP to the jury] [TP t to be guilty]

- defective intervention effects can be obviated in at least two ways
  - put the oblique argument at the left-edge of the matrix clause
  - replace the oblique argument with an adjunct that does not have \( \phi \)-features (and so cannot be Probed for by T)

  (21) Defective intervention obviation
  a. To the jury, the prosecutor proved the defendant [TP t to be guilty]
  b. The prosecutor proved the defendant [Adj over the course of the trial] [TP t to be guilty]

4.3 TCs are sensitive to defective intervention effects

- Hartman (2009, 2012): TCs can optionally license an oblique experiencer
  - tough-movement cannot proceed “across” this oblique argument
  - when the argument is absent, tough-movement proceeds as usual

  (22) a. It was entertaining [PP for John] [CP for his daughter to eat strawberries]
  b. *Strawberries were entertaining [PP for John] [CP for his daughter to eat t]
  c. Strawberries were entertaining [CP for John to eat t]

- TC defective intervention effects can be obviated in the usual ways
  - the oblique argument goes in a non-intervention position
  - a \( \phi \)-feature-free adjunct appears in the argument’s place

  (23) a. For John, strawberries were entertaining [CP for his daughter to eat t]
  b. Strawberries were entertaining [PP during the blizzard] [CP for John to eat t]

- these contrasts are mysterious if TC subjects are base-generated in the matrix subject position or only involve \( \bar{A} \) movement
  - recall: \( \bar{A} \) movement is not defective intervention movement
  - these contrasts are easily explained if tough-movement contains an \( \bar{A} \) step (one that crucially follows the \( \bar{A} \) movement step)

4.3.1 How do we know experiencers are arguments?

- not all experiencers are introduced by the preposition for
  - when tough-movement occurs, only the for argument remains

  (24) a. It was hard [PP on Mary] [CP for her boyfriend to give up sugar]
  b. It is enjoyable [PP to John] [CP for his daughter to eat strawberries]

  (25) a. Sugar was hard for/*on Mary to give up t.
  b. Strawberries are enjoyable for/*to John to eat t.

- experiencers can be \( wh \)-extracted

  (26) Who was it hard [PP on t] for Mary to give up sugar?

- evidence from partial control
  - partial control is \( \checkmark \) in unmoved TCs with an experiencer, but impossible in unmoved TCs
  - this follows if the experiencer is the controller, which is obligatorily absent when tough-movement occurs

  (27) a. It’s tough [PP for Mary] [CP PRO to meet on the bridge]
  b. *The bridge is tough [CP for Mary to meet on t]

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5 I remain agnostic as to whether the oblique argument is base-generated or moved to this position.

6 See Bruening (2012) for an alternative account.

7 Thanks to David Pesetsky, p.c., for bringing these facts to my attention.
4.4 GDPs are sensitive to defective intervention effects

4.4.1 Evaluators
- GDPs optionally license an oblique (evaluator) argument (28)
  - evaluators evaluate the standard, relative to their belief worlds

(28) CONTEXT: Chris needs his advisor’s approval to run an experiment that will only succeed if performed in dry weather.
  a. It’s too humid [PP for his adviser] [CP for Chris to run the experiment]

- the distribution of evaluators is limited
- evaluators can co-occur with degree phrases with no movement (expletive matrix subjects, gapless degree phrases) (29)

(29) a. It is too awkward [PP for Olivia] [CP for Anneke to talk to Ian]
  b. Ian is too shy [PP for the director] [CP for the company to hire anyone he recommends]

- evaluators cannot co-occur with GDPs (which involve movement) (30)

(30) *Ian is too shy [PP for Olivia] [CP for Anneke to talk to t]
- defective intervention obiviation strategies hold for GDPs

(31) a. Ian is too shy [CP for Anneke to talk to t].
  b. [PP For Olivia], Ian is too shy [CP for Anneke to talk to t].
  c. Ian was too shy [PP last year] [CP for Anneke to talk to t].

4.4.2 What does this data tell us?
- the judgement contrast in (29) & (30) reduces to whether or not movement occurs
- this contrast is straightforwardly explained by a defective intervention analysis
- a defective intervention analysis would also capture the judgements in (31)
- two key parts:
  - where the evaluator is introduced: evaluator must be introduced internal to the DegP, below the highest specifier of Deg (the landing site for null operator movement)
  - the type of movement: the null operator must $A$-move (not $\bar{A}$) across the evaluator; otherwise we don’t predict a contrast

  - this is illustrated in (32)

(32)

\[
\begin{array}{c}
\text{PredP} \\
\text{DP} \\
\text{This} \\
\text{experiment} \\
\text{Pred} \\
\text{is} \\
\text{AP} \\
\text{A} \\
\text{simple} \\
\text{DegP} \\
\text{OP} \\
*\text{PP} \\
\text{for Bob} \\
\text{ Deg} \\
\text{too} \\
\text{CP} \\
t_{\text{top}} \text{ for Chris to run } t_{\text{op}}
\end{array}
\]

Why is (32) not mysterious?
- N&S 2011: null operator must move to the highest specifier of DegP
- arguments cannot (A) move over other argument (like for Bob)
- predicts that GDPs cannot co-occur with overt evaluators

4.4.3 How do we know evaluators are arguments?
- evaluators can be $wh$-extracted

(33) Who is it too awkward [PP for t] [CP for Anneke to talk to Ian]?

- the partial control facts shown for TCs are mirrored with GDPs

(34) a. It’s too cold [PP for Mary] [CP PRO to meet on the bridge]
  b. *The bridge is too cold [CP for Mary to meet on t]

4.5 What does all this mean?
- the defective intervention evidence in this section, coupled with the $\bar{A}$ movement evidence in Section 3, suggest that both TCs and GDPs are improper movement constructions
- in TCs, the movement step from the embedded spec-CP to matrix spec-TP is $A$ movement
spec-TP is often assumed to be an A position

- in GDPS, the movement step form embedded spec-CP to spec-DegP is A movement
  - previously, we didn’t know a lot about spec-DegP
  - N&S 2011: null operator movement to spec-DegP is semantically necessary
  - defective intervention tests suggest spec-DegP is an A position
- in GDPS, Deg appears to be playing the role of the tough-adjective

5 What moves in TCs & GDPS?

The claim so far:

- though they are both improper movement constructions, a different element undergoes movement in TCs and GDPS
  - in TCs, an overt DP moves
  - in GDPS, a null operator moves

This predicts a couple things:

- a Θ-role asymmetry between TCs & GDPS
  - GDPS should have an additional Θ-role (assigned to the matrix subject) that TCs lack

(35)  
  a. It’s tough for Ian to talk to Anneke. (TC)
  b. *It’s too shy for Ian to talk to Anneke. (GDP)

(36)  
  a. *Olivia is tough for Ian to talk to Anneke. (TC)
  b. Olivia is too smart for Ian to reject her. (GDP)

- a split-antecedent asymmetry
  - because they do not involve movement into the matrix clause, GDPS are predicted to be grammatical with split-antecedents
  - because they do involve movement into the matrix clause, TCs are predicted to be ungrammatical with split-antecedents (binding theory violation)

(37)  
  a. Lars is friendly enough and Chris is compassionate enough (for me) to introduce to each other. (GDP)
  b. *Lars is easy and Chris is tough (for me) to introduce to each other. (TC)

6 Conclusions

A structural recap\(^8\) (repeated from Section 1):

(38)  
\begin{align*}
\text{Tough construction} \\
\text{PredP} \\
\text{DP} \\
\text{Ian} \quad \text{Pred} \quad \text{is} \\
\text{AP} \\
\text{A} \quad \text{tough} \\
\text{CP} \\
\end{align*}

(39)  
\begin{align*}
\text{Gapped degree phrase} \\
\text{PredP} \\
\text{DP} \\
\text{Ian} \quad \text{Pred} \quad \text{is} \\
\text{AP} \\
\text{A} \quad \text{shy} \\
\text{DegP} \\
\text{OP} \\
\text{for} \\
\text{Deg} \quad \text{enough} \\
\text{CP} \\
\text{for} \quad \text{Anneke} \quad \text{to talk} \quad \text{to} \quad \text{<Ian>} \\
\text{<OP>} \quad \text{for} \quad \text{Anneke} \quad \text{to talk} \quad \text{to} \quad \text{<OP>} \\
\end{align*}

\(^8\)abstracting away from successive-cyclic movement through vP.
A prose recap:

- TCs and GDPs are both improper movement constructions
- in TCs, an overt DP moves; GDPs are null operator constructions
- the movement chain in TCs spans the entire clause; the movement chain in GDPs is DegP-internal
  - thus, GDPs are structurally “larger” than TCs
- GDPs can be described as containing a TC “core,” with Deg playing the role of the tough-adjective

6.1 What this means for improper movement

- improper movement might not be so improper
  - advocates for a theory of grammar that sometimes allows improper movement constructions
  - adds GDPs to the slowly growing roster of improper movement constructions (TCs, Icelandic “Fate Accusatives” cf. Wood 2013, certain constructions in the Bantu language Kilega Obata and Epstein 2011).
- the problem now is determining when improper movement can(not) be licensed (and why)

References

Bruening, B. (2012). No such thing as “Defective Intervention”. Manuscript, available online: