The case for extraposition as movement

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Drummond (2009) argues that all instances of extraposition are derived by A′-movement. In the first part of this talk, I will review the evidence for this claim in light of some recent arguments against movement analyses (principally Sheehan (2010)). I conclude that the A′-movement analysis offers a more promising account of

(i) freezing effects,
(ii) the interaction of adjunct and complement extraposition, and
(iii) the apparent ability of complement extraposition to feed ACD.

In the second part of the talk I will examine some long-standing problems for movement-based analyses of extraposition. The key problems are

(i) the Right Roof constraint,
(ii) the feeding relation between complement extraposition and Condition C, and
(iii) the extraposability of non-*wh*-movable adjuncts.

I will tentatively explore some possible solutions to these problems based on a reinterpretation of den Dikken (1995), Kayne (2005b) in terms of sideward movement (Nunes 1995, Hornstein 2001).

1. Arguments for a movement analysis

▶ Together, the arguments in the following subsections build a cumulative case that all forms of extraposition in English are derived by A′-movement.

▷ Some of the arguments are positive arguments ***for*** an A′-movement analysis.

▷ Others are arguments ***against*** "stranding" analyses of complement extraposition, and analyses of adjunct extraposition in terms non-movement operations such as Parallel Construal (Koster 2000).

▷ I will use "stranding" as a cover term for Kayne-style and Sheehan-style analyses of complement extraposition (den Dikken 1995, Kayne 2000, 2005a, Brooke 2008, Sheehan 2010):[1]

[1] To make it easier to see what is pronounced and what is not, I have modified Kayne's derivation slightly by having *of* move to K, rather than introducing a null K-*of* head below *of*.

(1) a. KAYNE-STYLE STRANDING

saw John a picture
John of saw t_{John} a picture
K-of John t_{of} saw t_{John} a picture
yesterday K-of John t_{of} saw t_{John} a picture
$[_{\text{VP}}$ saw t_{John} a picture] yesterday K-of John t_{of}
I $[_{\text{VP}}$ saw t_{John} a picture] yesterday K-of John t_{of}

b. SHEEHAN-STYLE STRANDING (VIA PARTIAL DELETION)

I saw [a picture ~~[of John]~~] yesterday [~~a picture~~ [of John]]

▷ I will assume that PF-movement analyses of extraposition are not viable (Drummond 2009).

1.1. The argument from free ordering

Extraposed adjuncts and complements are freely ordered. This shows that it is not possible to maintain a mixed analysis of adjunct/complement extraposition according to which the former is derived via. rightward displacement and the latter via stranding (Sheehan 2010).

▶ If an adjunct and complement are extraposed from within the same DP, their respective order is free:

(2) a. I tried [to give [pictures t_1 t_2] to John [that he would like]$_2$] yesterday [of his dog]$_1$.
b. I tried [to give [pictures t_1 t_2] to John [of his dog]$_1$] yesterday [that he would like]$_2$.

▷ This observation appears to rule out "mixed" strading/movement analyses of adjunct/complement extraposition (Sheehan 2010).

▷ To explain the free ordering in (2), we must hold either that both adjunct and complement extraposition are the result of rightward displacement, or (perhaps) that both are the result of stranding.

▷ We can therefore argue as follows:

(i) Either adjunct extraposition is stranding and complement extraposition is stranding, or adjunct extraposition is rightward displacement and complement extraposition is rightward displacement.

(ii) Adjunct extraposition is clearly not stranding.

(iii) From (i) and (ii): Both adjunct and complement extraposition are rightward displacement.

▷ This argument rules out one prima facie plausible non-movement analysis of complement extraposition. It leaves open the possibility that rightward displacement is effected via (e.g.) parallel construal (Koster 2000) rather than movement.

1.2. The argument from islandhood and freezing

Extraction out of an extraposed phrase typically has the status of a weak island violation. This is expected if extraposed phrases are in adjoined positions, but unexpected on a stranding analysis. Freezing effects (Wexler and Culicover 1980) show the pattern that is expected if extraposition is an A′-movement that is blocked by *wh*-islands. If we assume that *wh*-movement blocks extraposition (rather than vice versa), freezing shows the same argument/adjunct asymmetries as other instances of A′-movement.

▶ Extraction out of extraposed argument/complement PPs and DPs is mildly degraded:[2]

(3) a. ?Who did you give a picture to Bill of?
b. ?Who did you talk in front of Mary to?
c. ?Who did you see yesterday a very good friend of?

▷ The weak islandhood of extraposed complements is unexpected on stranding analyses.

▶ "Freezing" effects are exemplified in (4). The application of extraposition within a VP tends to disrupt *wh*-movement out of that VP. This is illustrated for Heavy DP Shift in (4c):

(4) a. Who did you send a rough draft of your dissertation to?
b. I sent t_1 to my supervisor [a rough draft of my dissertation]$_1$.
c. *Who$_2$ did you send t_1 to t_2 [a rough draft of your dissertation]$_1$?

[2]Since extraction out of noun complement clauses, relative clauses and adjunct PPs is bad anyway, it is difficult to test whether is any additional degradation in the extraposed cases. Extraction out of verbal argument clauses is completely fine (*Who did you say yesterday that John likes?*). Drummond (2009) proposes that these extrapose to a higher position, so that *wh*-movement can occur prior to extraposition.

[3]All of the (ii) examples in (5b)–(5e) sound a bit better than (4c). I think this may be because in these instances it is possible to interpret the adjunct as an "afterthought." In principle we could remove the possibility of an afterthought interpretation by using DPs headed by strong quantifiers. However, extraposition out of such DPs tends to be degraded anyway. Another trick is to embed the DP under a negation: *The man who you didn't present any proof (*to) that 3 is prime (to)?* Freezing effects also tend to become a little stronger with *tough* movement: *John is difficult to present proofs (*to) that 3 is prime (to).* The freezing effect in (5e) is weaker than the others; this may be attributable to the ease of reanalyzing the *to* PP as a base-generated adjunct.

[4]Rochemont and Culicover (1997) further propose that PPs/DPs are not interveners for each other. This is taken to explain the absence of freezing effects in e.g. *For whom did you buy the picture that's now hanging on the wall?*, as compared to its unacceptable counterpart with P-stranding. I made use of R&C's insight in Drummond (2009), but now suspect that the argument/adjunct distinction is more relevant than the PP/DP distinction.

▷ Most other forms of extraposition also trigger freezing:[3]

(5) a. extraposition of a verbal complement clause
i. I suggested t_1 to Mary [that we should leave]$_1$.
ii. ??Who$_2$ did you suggest t_1 to t_2 [that we should leave]$_1$?

b. extraposition of a noun complement clause
i. I presented [proofs t_1] to John [that 3 is prime]$_1$.
ii. ??Who$_2$ did you present [proofs t_1] to t_2 [that 3 is prime]$_1$?

c. extraposition of a relative clause
i. I told [a rumor t_1] to John [that I heard yesterday]$_1$.
ii. ??Who$_2$ did you tell [a rumor t_1] to t_2 [that I heard yesterday]$_1$?

d. extraposition of a noun complement PP
i. I gave a picture t_1 to Mary [of John]$_1$.
ii. ??Who$_2$ did you give [a picture t_1] to t_2 [of John]$_1$?

e. extraposition of a verbal argument PP
i. I talked t_1 about John [to Mary]$_1$.
ii. ?Who$_2$ did you talk t_1 about t_2 [to Mary]$_1$?

▷ Culicover and Rochemont (1990) propose that freezing effects are intervention effects. The extraposed phrase moves to a right-adjoined position and acts as an intervener for subsequent *wh*-movement.[4]

▷ Further support for this analysis comes from the observation that even *wh*-in-situ appears to give rise to freezing effects (Drummond 2009):

(6) a. Who gave the book that you bought yesterday to whom?
b. ??Who gave t_1 to whom [the book that you bought yesterday]$_1$?

▷ This suggests that freezing effects don't result from a relatively surfacey constraint on gaps within VP:

▶ Question: does *wh*-movement block extraposition or vice versa? (C&R assume the latter.)

▷ Argument/adjunct asymmetries may provide a clue to the correct answer. Extraction of arguments over adjuncts is easier than extraction of arguments over arguments — (7) — and extraction of adjuncts over arguments and adjuncts is horrible in both cases — (8):

(7) a. ??What$_1$ do you know who$_2$ t_2 fixed t_1?
b. ?What$_1$ do you know how$_2$ John fixed t_1 t_2?

(8) a. *How$_1$ did you ask who$_2$ t_2 fixed the car t_1?
b. *How$_1$ did you ask why$_2$ John fixed the cart_1 t_2?

▷ Both adjuncts and arguments can extrapose, so in principle we should be able to construct a similar paradigm for extraposition and compare judgments.

▷ A couple of interfering factors, however:

— Noun complement PPs show mixed argument/adjunct behavior[5] in terms of the acceptability of extraction, as shown in (9).

— Complement clauses are un-A′-extractable, as shown in (10).

(9) a. [Of whom]$_1$ did you see [a picture t_1]?
b. *[Which man]$_1$ did you ask [of whom]$_2$ John gave [a picture t_2] to t_1?
c. ??[Of whom]$_1$ did you ask why$_2$ John took [a picture t_1] t_2?
d. ??Who$_1$ did you ask why$_2$ John took [a picture of t_1] t_2?

(10) [That John is an idiot]$_1$ I would never (*make a) claim t_1.

▷ One further issue. Freezing effects tend to be triggered only when the extraposed phrase crosses over the extraction site. Possibly, in cases where it does not, it can attach below the extraction site so that the two movements do not interfere with each other:

(11) a. What$_1$ did you send t_1 to Mary yesterday?
b. What$_1$ did you send [t_1 [t_2 yesterday [to Mary]$_2$]]?

▶ The 2×2 paradigm for extraposition of an complement/adjunct over a complement/adjunct *wh*-phrase is as follows:[6]

Verbal argument DPs:

(12) a. *Wh* = complement, E = complement [c over c]
*Who$_1$ did you give t_2 to t_1 [the perfect gift]$_1$?
b. *Wh* = adjunct, E = complement [c over aj]
[How often]$_1$ did you give t_2 to Mary t_1 [the perfect gift]$_2$?

Nominal argument vs. adjunct PPs:[7]

(13) a. *Wh* = complement, E = adjunct [aj over c]
*Who$_1$ did you tell [a story t_2] to t_1 [by John]$_2$?
b. *Wh* = complement, E = complement [c over c]
?Who$_1$ did you tell [a story t_2] to t_1 [about John]$_2$?
c. *Wh* = adjunct, E = adjunct [aj over aj]
?[How often]$_1$ did you tell [a story t_2] to Mary t_1 [by John]$_2$?
d. *Wh* = adjunct, E = complement [c over aj]
[How often]$_1$ did you tell [a story t_2] to Mary t_1 [about John]$_2$?

[5] That is, noun complements behave like adjuncts in that they don't like to be moved over arguments, but like arguments in that they block movement of other arguments.

[6] It is very hard to tell if a VP adjunct has extraposed, and as observed in note 3 in connection with (5e), extraposition of argument PPs gives rise only to very weak freezing effects. The relevant examples are therefore not given here.

[7] Kyle Johnson, in comments on the talk, notes that the examples with adjunct *wh* are not obviously informative, since the adjunct *wh* may have a higher initial position than indicated (so that extraposition would not cross over any position occupied by it). This possibility can perhaps be excluded given the Condition C reconstruction effect seen in examples such as the following: **How much more often than Mary$_1$'s mother did you tell a story to her$_1$ about John*. Similarly, the adjunct *wh* can contain a pronoun bound by the indirect object: *How much more often than her$_1$ friends did you tell a story to every girl$_1$ about John?* These data suggest that the adjunct *wh* starts out below the *to* PP, as indicated in the examples in (13)–(14).

Relative vs. complement clauses:

(14) a. *Wh* = complement, E = adjunct [aj over c]
*Who$_1$ did you show [a proof t_2] to t_1 [that had already been discovered]$_2$?
b. *Wh* = complement, E = complement [c over c]
?Who$_1$ did you show [a proof t_2] to t_1 [that 3 is prime]$_2$?
c. *Wh* = adjunct, E = adjunct [aj over aj]
?[How often]$_1$ have you shown [a proof t_2] to John t_1 [that had already been discovered]$_2$?
d. *Wh* = adjunct, E = complement [c over aj]
[How often]$_1$ have you shown [a proof t_2] to John t_1 [that 3 is prime]$_2$?

▶ Very messy data, but overall indications are that *wh*-movement blocks extraposition rather than vice versa. Adjunct *wh*-movement never triggers a strong freezing effect.

▷ If extraposition is triggered by a head, this suggests that the head in question must be above the initial target of *wh*-movement (outer Spec,vP?).

▷ This is consistent with ability of extraposition to feed vP/VP ellipsis (section 1.5).

▷ What remains puzzling is that there is typically no strong freezing effect with an adjunct *wh*-phrase and an extraposed NP adjunct (compare e.g. (14c) and (14d)).

▷ This would however be expected on Fox and Nissenbaum's (1999) account, according to which adjunct extraposition is effected via movement of an argument.

▶ A further problem for stranding analyses is the ability of complement PPs and CPs to extrapose out of an embedded non-finite clause over a matrix adjunct:

(15) a. I requested reviews to be written yesterday of all submitted articles.
b. I tried to develop a proof yesterday that 3 is prime.

▷ In and of themselves, the data in (15) themselves are not strictly incompatible with stranding analyses. It could be that the embedded clause starts out to the right of the matrix adjunct and then moves to the left.

▷ What is not expected on a stranding analysis is that the form of the embedded clause should influence the acceptability of extraposition out of it:

(16) HEAVY DP SHIFT

a. I tried to show John t_1 yesterday [my proposal for a new office layout]$_1$.
b. ??I wondered how to show John t_1 yesterday [my proposal for a new office layout]$_1$.
c. *I wondered who to show t_1 yesterday [my proposal for a new office layout]$_1$.

(17) VERBAL COMPLEMENT CLAUSES

a. I tried [to persuade the prof. t_1] yesterday [that 3 is prime]$_1$.
b. ??I wondered [how$_2$ to persuade the prof. t_1 t_2] yesterday [that 3 is prime]$_1$.
c. *I wondered [who$_2$ to persuade t_2 t_1] yesterday [that 3 is prime]$_1$.

(18) NOUN COMPLEMENT CLAUSES

a. I wanted [to give a proof to the prof. t_1] yesterday [that 3 is prime]$_1$.
b. ??I wondered [how$_2$ to give a proof t_1 to the prof. t_2] yesterday [that 3 is prime]$_1$.
c. *I wondered [who$_2$ to give a proof t_1 to t_2] yesterday [that 3 is prime]$_1$.

(19) VERBAL COMPLEMENT PPS

a. I asked [to speak to John t_1] yesterday [about the office reorganization]$_1$.
b. ?I asked [how$_2$ to speak to John t_1 t_2] yesterday [about the office reorganization]$_1$.
c. ??I asked [who$_2$ to speak to t_2 t_1] yesterday [about the office reorganization]$_1$.

(20) NOUN COMPLEMENT PPS

a. I asked [to send reviews t_1 to the editor] yesterday [of all submitted articles]$_1$.
b. ??I asked [how$_2$ to send reviews t_1 to the ed. t_2] yesterday [of all submitted articles]$_1$.
c. *I asked [who$_2$ to send reviews t_1 to t_2] yesterday [of all submitted articles]$_1$.

▶ Again, we see the pattern expected if extraposition is an A′-movement which can be blocked by another A′-movement. The intervention of an adjunct *wh*-phrase leads to moderate degradation while the intervention of an argument *wh*-phrase leads to severe degradation.

1.3. The argument from QR and ACD

Extraposition of both adjunct and complement PPs can feed ACD in certain instances. This is unsurprising if extraposed phrases move to a higher position, but more difficult to explain if extraposed phrases are "stranded" in low positions.

▶ Quantifiers can scope out of noun complement PPs, albeit somewhat awkwardly — (21a) vs. (21b).

▷ Wide scope becomes significantly more difficult if the containing NP is not peripheral — (21c).

▷ Similar judgments obtain for ACD — (22):[8]

(21) a. An editor read every article. ($\forall \succ \exists$)
b. An editor read a review of every article. (?$\forall \succ \exists$)
c. An editor gave a review of every article to Mary. (??$\forall \succ \exists$)

(22) a. I read every paper that John did.
b. ?I read a review of every paper that John did.
c. ??I gave a review of every paper that John did to Mary.

▷ If the complement PP extraposes in (21c)/(22c), ACD becomes perfect:

(23) I gave a review to Mary of every paper that John did.

▷ This is naturally explained if extraposition can feed ACD. When QR takes place, the erstwhile noun complement PP is an adjunct in the main spine of the clause.[9]

▶ Some people don't get much of a contrast between (22c) and (23).

▷ For these people, we can construct some more complex examples to illustrate the same point.

▷ ACD out of non-peripheral noun complement PPs seems to be blocked by the intervention of a scopally commutative quantifier:

(24) a. ??I gave a review of every paper that John did to Mary.
b. *I gave every review of every paper that John did to Mary.

▷ However, if the lowest quantifier first hops over the intervening one via extraposition, ACD improves:[10]

(25) I gave every review to Mary of every paper that John did.

▷ Again, all of this is unsurprising if extraposed complements move to a higher position, but somewhat unexpected if they remain low.

▶ If Fox and Nissenbaum (1999) are right, we should ***not*** see a similar improvement in the acceptability of ACD following extraposition of adjunct PPs,[11] since in these instances it is the DP containing the PP which moves. Judgments are tricky but this seems to be right:

(26) a. ?I sent a book by every author that John did to Mary.
b. ?I sent book to Mary by every author that John did.

(27) a. *I sent every book by every author that John did to Mary.
b. *I sent every book to Mary by every author that John did.

[8] Rajesh Bhatt, in comments on the talk, points out that on F&N's analysis it is unexpected that ACD should be possible out of a non-peripheral relative clause. As a matter of fact, ACD out of non-peripheral relatives is uncontroversially recognized to be possible (*I gave every book that Mary did to John*; see Fox (2002) for discussion of such examples). Thus, the unacceptability of (22c) cannot be put down simply to the non-peripherality of the relative. Since the argument in this section does not depend on F&N's analysis of QR being correct, I leave open the problem raised by the acceptability of ACD within non-peripheral relatives. However, the solution to this problem proposed in Fox (2002) is congenial to the present point, since it also depends on a kind of interaction between QR and (complement) extraposition which would not be expected on stranding analyses of the latter.

[9] ACD out of base-generated adjunct PPs is perfect: *I recited my lines in the same way that Bill did.*

[10] You will likely find (25) quite bad if you're already down on (22c). The claim is that for people who find (22c) pretty much fine, there should be a contrast between (24b) on the one hand and (25) on the other.

[11] It is far from clear that the *of* PP is a true complement in *picture of John*. For present purposes the crucial division is between PPs that are *wh*-extractable (*Of whom did you see a picture?*) and those which are not (**By whom did you buy a book?*). I will refer to the former as complements. Section 3.1 of Sheehan (2010) has a good discussion of this issue.

Interim summary: QR out of a DP is in general possible but often noticeably degraded (especially if a scopally commutative quantifier intervenes). If a phrase containing the QP is first extraposed out of the DP, then QR improves. This is expected if extraposition is an A′-movement in the main syntactic cycle.

▶ Sheehan (2010) has some discussion of cases where extraposition appears to force narrow scope:

(28) a. A better/#certain book has never been printed about sheep shearing.
b. A better/certain book about sheep sheering has never been printed.

▷ Sheehan takes (28) to show that "complement extraposition triggers obligatory scope reconstruction."

▷ However, some instances of non-*wh* A′-movement show the same kind of reconstruction effect:[12]

(29) a. About sheep sheering, a better/#certain book has never been printed.
b. A better/#certain way of buttering toast, I doubt he will ever discover.

▷ Thus, it is not clear whether (28) can choose between the stranding analysis and the A′-movement analysis.

▷ Also worth noting that Guéron (1980) claims that extraposed PPs sometimes have obligatory wide scope:

(30) The owner will be fined of every car on the block. (∀>∃,*∃>∀)

[12] *Wh*-movement is however fine: *About which disgusting practice did John write a certain/better book?*

1.4. Arguments from the double object construction

The first object in the double object construction is frozen for A′-movement. It is also unable to undergo Heavy DP Shift. These facts follow immediately if Heavy DP Shift is derived via A′-movement. The (apparent) ability of HDPS and complement clause extraposition to license parasitic gaps is also explained.

Examples based on Chomsky (1982), Engdahl (1983), Rochemont and Culicover (1997), Postal (1994), Authier (1990):

(31) a. John gave Bill books.
b. %Who did John give books?
c. *John is difficult to give books.

(32) *I gave t_1 books [every student in my class]$_1$.

(33) I offended t_1 by not recognizing e_1 [my favorite uncle from Cleveland]$_1$.

(34) a. [That the ruble is worthless]$_1$ he asserted t_1 without verifying e_1.
b. I revealed t_1 by attempting to deny e_1 [that I loved Mary]$_1$.
c. We suggest t_1 to our employees without actually requiring e_1 of them [that they wear a tie]$_1$.

▶ Postal (1994) argues that none of (34a)–(34c) are true parasitic gap constructions. He gives two main arguments. First, the insensitivity of the relevant operation to islands:

(35) a. John offended by not recognizing (the people who were supporting at the time) his favorite uncle from Cleveland.
b. Who did John offend by not recognizing (*the people who were supporting)?

Second, the ability of this operation to strand prepositions:

(36) He looked for in the closet without knowing there were on the table the kind of magazines you were told to hide.

▷ Judgments are not very robust. Remains rather unclear whether or not (34b) and (34c) show parasitic gaps licensed by extraposition.

1.5. Implications of stranding under VP ellipsis

▶ Sheehan (2010) makes the following assumptions regarding extraposition of arguments/adjuncts in relation to VP ellipsis:

(i) Adjuncts extrapose via Parallel Construal (Koster 2000); argument extrapose via stranding.

(ii) Adjuncts which extrapose from within VP do not escape VP; phrases which extrapose from within subjects may escape VP (Baltin 1983).

(iii) Hence, adjuncts which extrapose from subjects may be stranded under VP ellipsis but complements may not — (37).

▷ The conclusion (iii) is supported by the contrast in (37):

(37) a. Although no solution has been found that you would accept, one has that I would accept.
b. *Although no good solution has been found to our problem, a bad one has to your problem.

▷ However, extraposition of complement PPs and CPs can escape predicate ellipsis from both subject and non-subject DPs:[13]

(38) a. Although no picture has been taken of Mary, several have of Jane.
b. After John told a story about Mary, I did about Jane.
c. Although it isn't obvious that John is an idiot, it is that he is a fool.

▷ Moreover, the behavior of adjunct PPs is the opposite of what Sheehan's account would lead us to expect. In configurations in which complement PPs can extrapose to escape VP ellipsis, adjunct PPs cannot:

(39) a. *Although I haven't seen a man with a red hat, I have with a green hat.
b. *Although I haven't read a book by Fodor, I have by Chomsky.

▶ The data in (39) may however be misleading. On the F&N account, the unacceptability of (39a)–(39b) might be put down to a lack of any motivation for 'long' QR of the relevant DP. If we force long QR, then stranding of adjunct PPs and relative clauses under VP ellipsis becomes noticeably better:

(40) a. *I treated many patients with serious injuries and you did with trivial ones.
b. I treated as many patients with serious injuries as you did with trivial ones.

(41) a. *I treated many patients who had serious injuries and you did who had trivial ones.
b. ?I treated as many patients who had serious injuries as you did who had trivial ones.

▷ The only kinds of extraposed phrase which absolutely can't escape the VP are shifted argument DPs and extraposed noun complement clauses:[14]

(42) a. *Although I didn't books, I did buy yesterday a number of boring magazines.
b. *Although I didn't that Bill is an idiot, I did make the claim that he is a fool.

[13] Psuedogapping is not permitted when the antecedent is in a preposed *although* adjunct (**Although John ate peas, Mary didn't beans*), so we can be reasonably sure that it is extraposition, not some other movement, which extracts the PP from the ellipsis site in (38).

[14] Or maybe even these can? It depends what we make of examples like *I claimed that Bill is an idiot but I didn't that he is a fool*. I suspect that these involve extraction from the ellipsis site via whatever mechanism is involved in pseudogapping (and are therefore irrelevant), but it's hard to be sure.

▶ This basically leaves us with the same mess as Drummond (2009) (with the addition of the data in (40)–(41)). It's far from clear what determines whether or not extraposition can escape VP ellipsis in any given case, but it seems fairly clear that complement extraposition can sometimes do so.

▶ So much the worse for stranding analyses of complement extraposition.

1.6. Brooke's 2008 stranding analysis of Heavy DP Shift

▶ It has occasionally been proposed that Heavy DP Shift derives from failure of the DP to undergo a leftward movement operation which it would typically undergo (Brooke 2008).

▷ On Brooke's analysis, Heavy DP Shift occurs when a heavy DP fails to move to Spec,AgrOP:

(43) I saw (the man with the red hat) on Tuesday (the man …)
a. I $[_{vP}$ saw $[_{AgrOP}$ [the man …$]_1$ $[_{VP}$ [on Tuesday] $[_{VP}$ t_V $t_1]]]]$.
b. I $[_{vP}$ saw $[_{AgrOP}$ $[_{VP}$ [on Tuesday] $[_{VP}$ t_V [the man …$]_1]]]]$.

▷ This analysis does not appear to account for the possibility of extraposing ECM subjects:

(44) I consider t_1 to be late [any homework received after 5pm$]_1$.

Conclusion to part 1

▶ Is extraposition of complements stranding? No:

— Doesn't explain the mild degradation of *wh*-movement out of (most) extraposed complements.

— Doesn't explain freezing effects.

— Doesn't explain intervention effects in cases of extraposition out of embedded clauses.

— [Noun complements only]
Doesn't explain ability of extraposition to feed ACD.

— [HDPS only]
Can't explain HDPS of ECM subjects.

— [HDPS only]
Doesn't account for pgaps licensed by HDPS (***if*** these are real pgaps).

▶ Is extraposition of complements movement? Probably.

— It is difficult to conclusively rule out the possibility that the extraposed phrase is displaced by some operation other than movement. However, the adjunct/argument asymmetries seen in freezing effects are suggestive.

▶ Is extraposition of adjuncts movement? Maybe.

— Evidence that adjunct extraposition is movement is harder to come by. Apart from freezing effects, nothing we have seen above is really incompatible with an analysis in terms of (e.g.) Parallel Construal (Koster 2000). Another possibility is that the extraposed adjunct is base-generated in its surface position and the semantics does the heavy lifting.

▶ Now let's turn to some outstanding problems for movement analyses.

2. Problems for movement analyses

2.1. The Right Roof Constraint

Some strategies for dealing with the Right Roof Constraint:

▷ Processing.

— Maybe? You tell me!

▷ Extraposition is stranding, and you can't be stranded lower than your initial θ-position.[15]

— Very unlikely that ***all*** extraposition is stranding.

▷ Extraposition is, or is closely tied to, A-movement. A-movement is typically finite clause bound. (Is this what Kayne (2005b) has in mind?)

— Adjuncts don't undergo A-movement, so this can't account for the RRC on extraposition of adjuncts.[16]

— We have seen evidence that argument/complement extraposition is A′-movement.

▷ Drummond, Hornstein, and Lasnik (2010). The proposed analysis de-

[15] Or, in the case of adjuncts, lower than the position of the phrase you modify.

[16] It might account for the RRC on extraposition of DP adjuncts if combined with some variation on Fox and Nissenbaum (1999), but this would leave out adjuncts to VP.

rives a very strict version of the RRC — no rightward movement across a strong phase boundary.

— If PP is a strong phase, as DH&L assume, then nothing should be able to extrapose out of a PP.

— But only HDPS out of PP is blocked (all others forms of extraposition are fine).

2.2. The RRC and extraposed non-wh-movable adjuncts

DP-internal adjunct PPs which can't undergo *wh*-movement can nonetheless extrapose (Culicover and Rochemont 1990). This is problematic for A′-movement analyses of adjunct extraposition (with the exception of F&N). However, if we reinterpret a Kayne-style remnant-movement analysis in terms of sideward movement, Hornstein's (2001) explanation for why control into adjuncts is possible carries over. We may also have the beginnings of an explanation for the RRC. However, this raises the question of whether we still want to maintain F&N's analysis of the extraposition of DP-internal adjunct PPs.

▶ Shortly following Kayne (1994), a number of people (including Kayne himself) hit on the idea of deriving apparent rightward movement of α via two leftward movements:

(45) $[_{XP} \ldots \alpha \ldots]$

Leftward movement of α to Spec,YP:

$[_{YP}\ \alpha\ Y \ldots [_{XP} \ldots t_{\alpha} \ldots]]$

Leftward movement of the remnant XP to Spec,ZP:

$[_{ZP}\ [_{XP} \ldots t_{\alpha} \ldots]\ Z \ldots [_{YP}\ \alpha\ Y \ldots t_{XP}]]]$

▷ Sideward movement offers a different way of sneaking in rightward displacement:[17]

(46)

workspace 1	workspace 2
$[_{XP} \ldots \alpha \ldots]$	Y

Sideward movement of α from w1 to w2:

$[_{XP} \ldots t_{\alpha} \ldots]$ $\qquad$ $[_{Y'}\ Y\ \alpha]$

Sideward movement of XP from w1 to Spec,YP in w2:

t_{XP} $\qquad$ $[_{YP}\ [_{XP} \ldots t_{\alpha} \ldots]\ [_{Y'}\ Y\ \alpha]]$

[17] In this instance only one head (Y) drives both movements, as compared to two (Y and Z) in (45). This is possible due to the availability of sideward movement into complement positions. A derivation more closely parallel to (45) could also be given where α moves sideward to the specifier of Y and XP then moves sideward to the specifier of a head above Y. However, if α moves to a specifier position, this raises the question of why (or if) this movement must always be sideward. If upward movement is available then we lose the account of the RRC sketched in this subsection.

▷ If we go with (46) instead of (45) we have the beginnings of an explanation of the RRC.

▷ The key observation is that if the remnant moves sideward there is no possibility of its moving successive-cyclically, given the following reasonable assumption:

(47) Assumption:
Successive-cyclic movement of α to a position P via a position P′ is possible only if P (eventually) c-commands P′.

▷ Given (47), Minimality will impose an upper bound on the size of the remnant (and hence on how far α can be displaced to the right). In particular, if Y's specifier must be filled by a phrase with a feature f, then it must be filled by the ***first*** f-specified phrase that comes along.

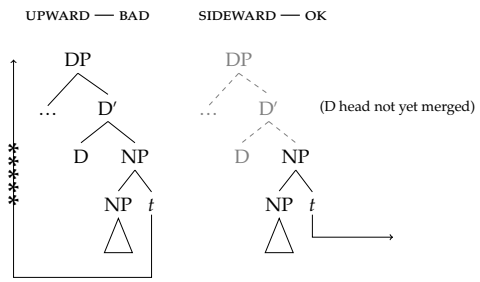
▷ If f is the category feature 'C' then something close to the traditional RRC is imposed.[18]

▶ Another interesting property of the derivation in (46) is that it offers an explanation of why DP adjuncts can extrapose even though they can't undergo *wh*-movement.

▷ Hornstein (2001) argues that sideward movement can be used to obviate the adjunct island constraint: α can sideward move out of a phrase which later becomes an adjunct before it is adjoined.

▷ Suppose that DP-internal adjunct PPs are adjuncts to NP. Then we can hypothesize that what is illicit is movement of the PP over the DP above it. If the PP moves sideward immediately following its adjunction to NP, and before the D head is merged, then there will be no violation.

(48)



[18] Why must it be a phrase containing t_α which moves to Spec,YP? I hope that this constraint will follow from a general constraint on the minimization of simultaneous workspaces. In general, however, a maximum of three simultaneous workspaces are required to derive arbitrary binary-branching trees. It is therefore not immediately clear that we can rule out the possibility of a phrase from a third workspace moving into Spec,YP. The derivation in (58) makes use of three workspaces.

▶ Question: What about the analysis of freezing effects in section 1.2? Hornstein (2009) defines Minimality so that when α moves from w1 into w2 it "moves over" everything that c-commands α in w1. But couldn't sideward movement of α occur immediately after α is merged (and hence way before merger of the remnant in Spec,XP)? If so, couldn't early movement of α be used to sneak around Minimality? This would in effect permit α to move over an intervening A′-position in its home workspace.

▶ Answer: This is basically a broader problem within the theory of sideward movement. There are a number of possible solutions to this problem (ask me!) For present purposes, the key point is that we ***never*** want to permit sideward movement to sneak around Minimality in this way. I.e., there are no analyses which exploit the assumption that early sideward movement can be used to do this. Any satisfactory theory of sideward movement must ensure that the following generalization holds:

(49) *[[… β … t_α …] … […α …]]
if β is an intervener for α.

▶ So, however we fix up the theory of sideward movement, this fix will apply to the present analysis.

2.3. Extraposition and Condition C

Extraposition sometimes feeds and sometimes bleeds Condition C. Judgments are sufficiently delicate to permit multiple interpretations, but one reasonable way to carve up the data is as follows: adjunct extraposition bleeds Condition C whereas complement extraposition feeds it.

Adjunct extraposition bleeds Condition C

(50) a. i. *I sent him the books that John's mother likes.
ii. I sent him yesterday the books that John's mother likes.

b. i. *I sent him a template for John's assistant to copy.
ii. I sent him a template yesterday for John's secretary to copy.

c. i. *I gave him an iPad with John's name engraved on it.
ii. I gave him an iPad for his birthday with John's name engraved on it.

d. i. *I talked to him regarding John's future with the company.
ii. I talked to him at the party regarding John's future with the company.

Adjunct extraposition **fails** to feed Condition C

Note: the (ii) cases should be compared to the "good" (ii) cases in (50).

(51) a. i. I gave the books that John likes to him.
ii. I gave to him the books that John likes.

b. i. I gave the template for John's assistant to copy to him.
ii. I gave the template to him for John's assistant to copy.

c. i. I gave an iPad with John's name engraved on it to him.
ii. I gave an iPad to him with John's name engraved on it.

d. i. I gave my review of John's time at the company to him.
ii. I gave my review to him of John's time at the company.

Complement extraposition **fails** to bleed Condition C

(52) a. i. *I told him the rumor that John's mother denied.
ii. *I told him the rumor yesterday that John's mother denied.

b. i. *I gave him a picture of John's mother.
ii. *I gave him a picture yesterday of John's mother.

c. i. *I gave him John's favorite book.
ii. *I gave him yesterday John's favorite book.

Complement extraposition feeds Condition C[19]

(53) a. i. I told the rumor that John is an idiot to him.
ii. *I told to him the rumor that John is an idiot.

b. i. I gave a picture of John's mother to him.
ii. *I gave a picture to him of John's mother.

c. i. I gave John's favorite picture to him.
ii. *I gave to him John's favorite picture.

▷ Roughly similar judgments for NPI licensing, e.g. (Guéron 1980):

(54) a. *The names of any of those composers weren't called out yet.
b. The names weren't called out yet of any of those composers.

▶ Culicover and Rochemont (1990) note that (if Condition C is any guide) *wh*-movement can feed extraposition:[20]

(55) a. *He$_1$ said he invited several girls to the party that John$_1$ dated in high school.
b. How many girls did he$_1$ say he invited to the party that John$_1$ dated in high school?

[19] Guéron (1980) notes this for the case of PP extraposition.

[20] (55) is C&R's example.

▷ Puzzlingly (and, from my point of view, frustratingly!), this pattern stubbornly fails to extend to complement extraposition:

(56) a. *He$_1$ said that he took a number of pictures of John$_1$'s mother.
b. *How many pictures did he$_1$ say that he took of John$_1$'s mother.

(57) a. *He$_1$ said he denied a number of rumors that John$_1$ is having an affair.
b. *How many rumors did he$_1$ say he$_1$ denied that John$_1$ is having an affair.

▷ The data in (55)–(57) would seem to support stranding analyses of complement extraposition quite strongly.

2.4. An alternative sideward movement derivation

▶ The sideward movement derivation for extraposition in (46) makes use of remnant movement to derive the correct word order.

▷ Another option is to assume that the YP attaches to the main clause as a right adjunct.

▷ This would be consistent with the extension to antisymmetry proposed by Takano (2003), which permits base-generated right adjuncts.

▷ If YP adjoins, then it is possible to fake "downward" movement using sideward movement:

(58) workspace 1 workspace 2 workspace 3

$[_{XP} \ldots \alpha \ \ldots]$ Y

Sideward movement of α from w1 to w2:

$[_{XP} \ldots t_{\alpha} \ldots]$ $[_{YP}\ Y\ \alpha]$

Construction of main clause begins in w3:

$[_{XP} \ldots t_{\alpha} \ldots]$ $[_{YP}\ Y\ \alpha]$ $[_{ZP} \ldots]$

YP right-adjoins in main clause:

$[_{XP} \ldots t_{\alpha} \ldots]$ $[_{ZP}\ [_{ZP} \ldots]\ [_{YP}\ Y\ \alpha]]$

Construction of main clause continues; XP eventually merges:

$[_{WP}\ [_{XP} \ldots t_{\alpha}] \ldots [_{ZP}\ [_{ZP} \ldots]\ [_{YP}\ Y\ \alpha]]]$

▶ The question is now: why must YP adjoin low when the extraposed phrase is an argument?

▷ I have no answer to this question at present.

▷ I suspect that we should instead reconsider the role of c-command in stating Condition C — subsection 2.6.

2.5. Extraposition and Condition A

▶ Culicover and Jackendoff (2005) claim that HDPS can feed anaphoric binding:

(59) a. *I showed herself as a young child to Mary.
b. I showed to Mary herself as a young child.

▷ Yikes! Possibly logophors?

(60) John$_1$ showed to Mary$_2$ themselves$_{\{1,2\}}$ as young children.

2.6. Theoretical note

▶ A lot of the angst caused by the data in this section derives from a commitment to strict c-command as the structural relation relevant to Conditions A and C.

▷ If we follow Barss and Lasnik (1986)'s suggestion that these conditions are actually defined in terms of 'm-command plus precedence' (MCPP), the data no longer seem so paradoxical.

▷ Sketch of a not crazy analysis:

— Adjuncts extrapose to a position above vP, and hence are not m-commanded and preceded by vP-internal material to their left.

— Arguments extrapose to a position within vP and hence are.

▶ Given that the empirical arguments favoring c-command over MCPP are weak to non-existent, it is difficult to build a strong empirical case for stranding analyses on the basis of the Condition C facts.

▶ Moreover, it is notable that Condition C effects within the VP are weaker than Condition C effects triggered by subjects, and do not apply at all with epithets:[21]

(61) a. *He thinks that John is intelligent.
b. ??I persuaded him that John was intelligent.
c. I persuaded the President that the experienced politician would have to resign.

[21] Though see Dubinsky and Hamilton (1998), Schlenker (2004), Johnson (2012).

3. Some loose ends

3.1. Heaviness and the ban on P-stranding

▶ One puzzle for a unified analysis of extraposition is the impossibility of Heavy DP Shift out of PP, given that extraposition of a PP out of a PP is fine:[22]

(62) a. I saw yesterday a large gathering of people.
b. *I looked at yesterday a large gathering of people.
c. I looked at a picture yesterday of Bill.

▷ My own suggested explanation for why (62b) is bad (Drummond, Hornstein, and Lasnik 2010) predicts on the face of it that (62c) should also be bad.

[22] Extraposition of relative and complement clauses out of PPs also seems to be possible in general, although judgments are very variable.

3.2. Why can't subjects of finite clauses extrapose?

(63) a. I consider t_1 to be late [all assignments handed in after 5pm]$_1$.
b. *t_1 arrived [several men who John knew already]$_1$.

3.3. Cross-linguistic variation

On the present analysis, difficult to see how a syntactic story could be told about cross-linguistic variation in the availability of extraposition.

Conclusions

▶ There is good evidence that all instances of extraposition involve displacement of the extraposed phrase.

▶ There is reasonably good evidence that this displacement is effected via A′-movement, either of the extraposed phrase itself or (possibly, in some instances) a phrase containing it.

▶ Sideward movement offers some promising lines of attack on two puzzles:

— The Right Roof Constraint

— The extraposability of non-*wh*-movable NP adjuncts (possible alternative to F&N?).

▶ Feeding relations between complement extraposition and Condition C remain puzzling.

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