The Unity of Extraposition and the A/A′ Distinction *

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1   Overview

I will make the following claims:

1. Extraposition is rightward movement to a right-adjoined position (as argued, for example, by Stowell 1981).

2. Extraposition is not PF movement (Ross (1967), Chomsky (1981, 18,70), Chomsky (1986, 40-41), Rochemont (1985)).

3. Extraposition does not check any features (except perhaps an EPP feature) and as a consequence is underspecified w.r.t. its A/A′ status.

4. Due to its ambiguous A/A′ status, extraposition is subject to intervention effects in both the A and A′ domains.

5. The vP/VP is essentially right-branching. Left-branching structures are derived (at least for the most part) via extraposition.

1.1 Scope of the analysis

I will cover Heavy NP Shift, PP extraposition, and extraposition of finite clauses:

(1)   a I gave t to Bill [a book that he bought two weeks ago].

        b I gave a book t yesterday [to the man I met two weeks ago].

        c I said t yesterday [that John is intelligent].

If correct, the analysis here should extend to extraposition of relative clauses, extraposition of both finite and non-finite complement clauses. However, these raise too many issues to go into here. It may be the case that extraposition of adjuncts is not effected via the same mechanism as extraposition of complements/arguments. A proposal along these lines is made in Fox and Nissenbaum (1999) (see §8).

2 Evidence for Narrow-Syntactic Movement

Extraposition has interpretative effects not reducible to prosody:[1]

(2)   a.   The picture of John was accidentally taken at his birthday party on Tuesday.

        b.   The picture t was accidentally taken [of John] at his birthday party on Tuesday.
               (Can mean "A picture was deliberately taken in which John was accidentally included.")

(2b) has a reading under which a picture was deliberately taken in which John was accidentally included; this reading is not available for (2a). If extraposition of the *of* PP occured at PF, it would not be expected to have interpretative effects of this sort.

    Extraposition is sensitive to definiteness effects (noted by Fox and Nissenbaum 1999):

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[1] Caveat: Example (2), though it argues against a PF-movement approach, does not exclude the possibility that *of* PP extraposition is a "rule of construal", distinct from movement, that applies in the LF component (Chomsky 1981, pp. 80-81). However, some of the other examples in this section cast doubt on this possibility.

(3)   a.   Where did you see a picture on Friday of John?

      b.   ? Where did you see the picture on Friday of John?

It seems unlikely that the definite/non-definite distinction should be visible at PF.

There are also effects on binding (again, noted by F&N):

(4)   a.   I gave a picture of $John_1$ as a small child to him_1.

      b.   ?? I gave t to him_1 [a picture of $John_1$ as a small child].

Moreover, "Freezing effects" (Wexler and Culicover 1980) – which crucially are found both for overt wh-movement and wh-in-situ – suggest that extraposition interacts with other A' movements:

(5)   a. Who_1 did you give the picture that you bought in Italy to t_1?

      b.   * Who_1 did you give t_2 to t_1 [the picture that you bought in Italy]$_2$.

      c.   Who gave the picture that you bought in Italy to whom?

      d.   * Who gave t to whom [the picture that you bought in Italy]$_1$?

Extraposition is sensitive to subject islands:[2]

(6)   a.   I saw a picture of John yesterday.

      b.   I saw [a picture t] yesterday [of John].

      c.   Pictures of John frighten people.

      d.   * [Pictures t] frighten people [of John].

But these islands can be obviated if the surface subject begins lower than [Spec,vP] (allowing extraposition to occur before the containing constituent is in [Spec,TP], see Johnson (1985) for related observations):

(7)   a.   [Three pictures t] are discovered [of John] every day.

      b.   ?? [Three pictures t] are undiscovered [of John] to this day.

      c.   There are [pictures t] discovered [of John] every day.

      d.   ?? There are [pictures t] undiscovered [of John] to this day.

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[2] The sensitivity of extraposition to subject islands may be compatible with a PF-movement approach under certain assumptions about cyclicity and Spellout (see for example Uriagereka 1999).

3   Minimality, Adjunction Height and Freezing

The following definitions/assumptions specify Minimality in a way that causes extraposition to be subject to intervention effects in both the A and A′ domains. There are many technical details left out here; the intent is just to give a sufficiently clear set of assumptions to deal with the cases at hand.

A/A′ status of formal features
Formal features (e.g. wh, Case, θ, ϕ) are specified either as A or A′ features. EPP features, if they exist, are underspecified with respect to their A/A′ status.

A/A′ status of positions in a tree
For $\alpha \in \{A, A'\}$, a position is an α-position if the (re)merge operation which created it checked an α-feature.

Minimality (approximate definition)
α-movement cannot cross an intervening α-position of the same category (where categories are D, P, C, etc.)

Underspecification
As extraposition checks neither A nor A′ features, it is underspecified with respect to its A′ status. Thus, it behaves as both an A and an A′ movement. (This of course is not logically necessary, but it is hypothesized here.)

Consequences
Extraposition (which checks at most an EPP feature) cannot cross either an A or an A′ position. Other A/A′ movements cannot cross an extraposed phrase.

3.1   Minimality in the A′-Domain: Freezing Effects

There are essentially two kinds of freezing effect: the prohibition on A′ movement out of a vP within which extraposition has occured, and the prohibition on A′ movement from within the extraposed element itself.

3.1.1   The Prohibition on A′ Movement Out of a vP Within Which Extraposition Has Occured

Given the definitions in §3, we predict that *wh*-phrases cannot move over extraposed elements of a like category. Thus, DP *wh*-phrases cannot cross an extraposed DP:

(8)   a.   Who$_1$ did you give the picture that you bought in Italy to t_1?

   b.   * Who$_1$ did you give t_2 to t_1 [the picture that you bought in Italy]$_2$.

But PPs can cross DPs (Wexler and Culicover 1980):

(9)   a.   * Who$_1$ did you buy t_2 for t_1 [the picture that's not hanging on the wall]$_2$?

   b.   For whom$_1$ did you buy t_2 on Tuesday t_1 [the picture that's now hanging on the wall]$_2$?

And DPs can cross PPs:

(10)   a.   What$_1$ did you give t_1 t_2 on Tuesday [to John]$_2$?

The status of examples where a *wh* PP is moved over an extraposed PP are rather unclear:

(11)   a.   About whom did John talk to Bill on Sunday?

   b.   ? About whom did John talk on Sunday to Bill?

It is possible that PPs with different heads are sufficiently different that they do not block each other under Minimality. The facts regarding extraposed clauses are also a little murky. PP *wh*-phrases can easily extract over extraposed clauses:

(12)   [To whom]$_1$ did you suggest t_2 t_1 on Tuesday [that John should leave]$_2$?

But DP *wh*-phrases find it rather more difficult:

(13)   a.   Who$_1$ did you suggest that John should leave to t_1?

   b.   ?? Who$_1$ did you suggest t_2 to t_1 [that John should leave]$_2$?

Though I have no good explanation for (13b), it seems likely that the close connection between CPs and DPs may have something to do with it. For some reason, extraposed noun complement clauses seem to have a weaker blocking effect, leading to only a slight degradation in acceptability in (14b):

(14)   a.   Who did you make the claim that John was an idiot to?

      b.   ? Who did you make the claim to that John was an idiot?

### 3.1.2   The Prohibition on A′ Movement from Within the Extraposed Element

Assumptions:

- Adjunction is cyclic (contra Chomsky 1993, Lebeaux 1988).

- Extraction out of an adjoined position is degraded.

- A′ movement out of vP must proceed via the left edge of vP.

In §3.2, I will argue that Minimality forces extraposed DPs to adjoin lower than extraposed phrases of other categories. Bearing this in mind, suppose that we want to extrapose a DP containing a *wh*-phrase. If prior to extraposition, the *wh*-phrase moves to the edge of vP, then cyclic adjunction of DP will be impossible, since the DP must adjoin lower than vP. Other extraposed constituents can adjoin higher than vP, so they can extrapose cyclicly following *wh*-movement to the edge of vP.

Prediction: extraction out of extraposed DPs is bad, extraction out of extraposed phrases of other categories (PP,CP) is good.

(15)   a.

        GOOD

b.
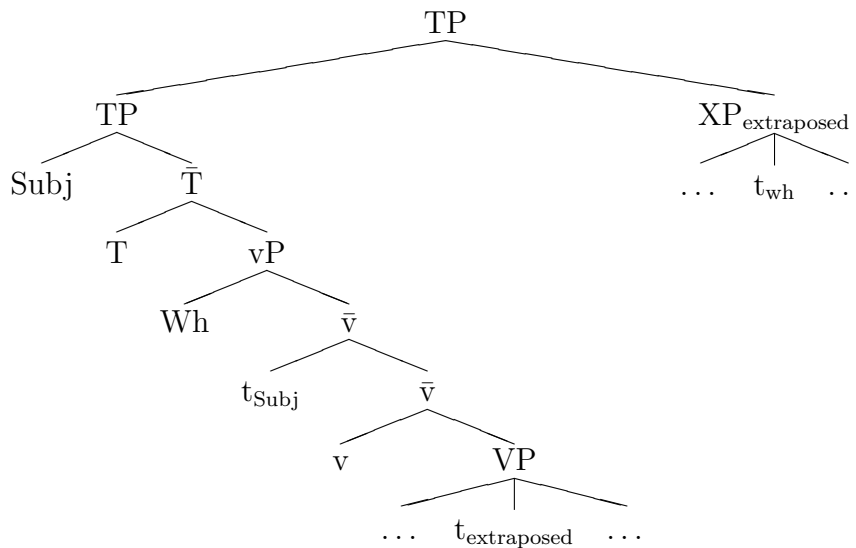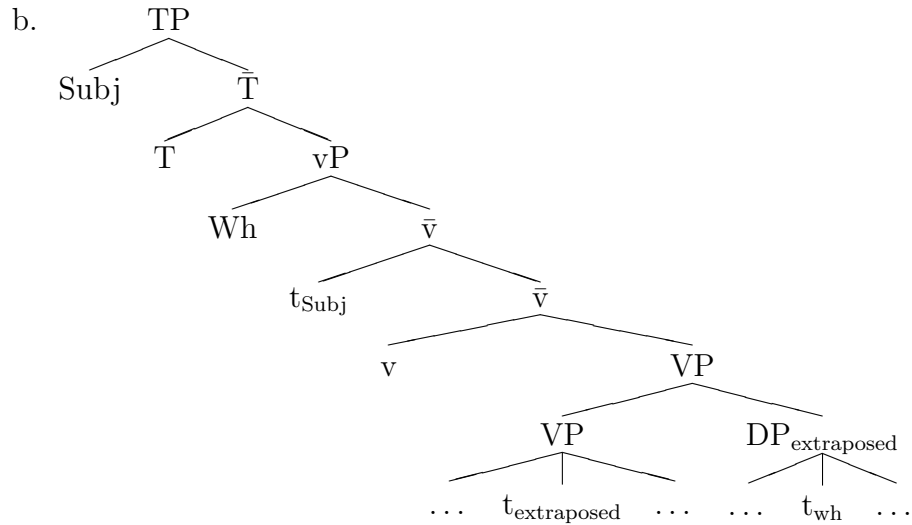
> **COUNTERCYCLIC MOVEMENT** (shown in diagram)
> *or*
> **ADJUNCT ISLAND VIOLATION**

The prediction is confirmed for DPs:

(16)   a.   Who did you take a picture of yesterday?
          b.   * Who did you take yesterday a picture of?

and CPs:

(17)   a.   Who did you suggest that Bill should marry yesterday?
          b.   Who did you suggest yesterday that Bill should marry?

But not for PPs:

(18)   a.   Who did you talk about yesterday?
          b.   ?* Who did you talk yesterday about?
          c.   Who did you talk to yesterday?
          d.   ?* Who did you talk yesterday to?

The data in (18 may have an independent explanation connected to that for the similarly unacceptable passive in (19b):

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(19) a. John was (much) talked about yesterday.

   b. * John was (much) talked yesterday about.

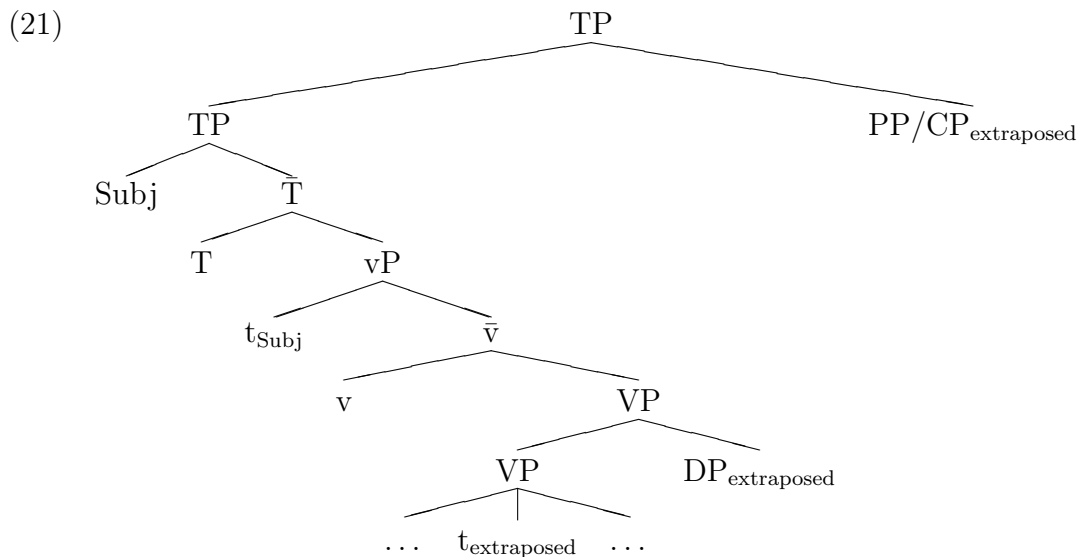When an additional PP is added, extraction from the second PP is relatively acceptable:

(20) a. * John was (much) talked to Bill about.

   b. Who did John talk to Bill about yesterday.

   c. ? Who did John talk to Bill yesterday about?

It may be that "reanalysis" (Hornstein and Weinberg 1981) is required prior to *wh*-movement as well as A-movement, and it is reanalysis which allows preposition stranding. Only one preposition can be reanalyzed (the one closest to the verb), which is why (20d) is better than (18b/d). Alternatively, it may be that the reanalysis analysis of pseudopassives is just wrong (see Baltin and Postal (1996) for arguments to this effect) and some other explanation is required for (18), (19) and (20).

 Either way, what is relevant here is that there are probably independent constraints which rule out (18b/d), so the theory of extraposition need not itself block these sentences.

3.2 Minimality in the A-Domain: Adjunction Height Restrictions

Prediction: DPs cannot extrapose past the vP-internal subject (i.e. they cannot adjoin higher than VP). PPs can extrapose further.

(21)

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                                TP
                   ┌─────────────┴──────────────┐
                  TP                      PP/CP_extraposed
            ┌──────┴──────┐
          Subj            T̄
                   ┌──────┴──────┐
                   T            vP
                          ┌──────┴──────┐
                        t_Subj          v̄
                                ┌───────┴────────┐
                                v               VP
                                         ┌───────┴────────┐
                                        VP          DP_extraposed
                                  ┌──────┼──────┐
                                 ...  t_extraposed  ...
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vP (or VP?) ellipsis can strand the extraposed constituent only if it adjoins higher than vP/VP, implying that extraposed DPs can't be stranded by vP/VP ellipsis:[3]

(22) a. I haven't talked as of yet to the President, but I might to the Vice President.

b. I haven't painted pictures yet of celebrities, but I might of politicians.

c. I haven't said officially that I will resign, but I might that I'm planning on it.

d. ?* John hasn't kissed as of yet the girl in his class, but he might the girl who he met in a book store.

(22d), if possible at all, is pseudogapping. For most speakers, (22d) is pretty bad because pseudogapping happens to be quite bad with *have/might* pairs:[4]

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[3] As an anonymous reviewer notes, examples such as (22d) can be improved for some speakers by stressing *did* or the heavy DP. However, this sort of adjustment is not necessary for (22a-c). This is a somewhat mysterious fact for which I have no explanation.

[4] Pseudogapping is generally considered marginal in English, which is why (23b) has a single question mark, despite being the "acceptable" one of the pair.

(23)   a. ?* John has tried peas and Mary might beans.

   b.   ? John tried peas and Mary did beans.

It's also quite difficult when the remnant is in a preposed adjunct (Sag 1976):

(24)   a.   John eats peas but he doesn't beans.

   b.   * Although John doesn't peas, he does eat beans.

Recasting (22) in this form seems to give the right results:

(25)   a.   Although John hasn't to the President, he might talk to the Vice President.

   b.   Although John hasn't very often of celebrities, he might paint pictures of politicians.

   c.   ? Although John hasn't that he's going to resign, he might deny that he's going to do it soon.

   d. ?* Although John hasn't the girls on his course, he might kiss the girls he meets in book stores.

4 The Constituent Structure of vP/VP

- vP is fundamentally right-branching.

- vP/VP adjuncts are either right-adjoined to projections relatively low in the vP (e.g. AgrOP, if it exists) or are perhaps merged into a Larsonian shell structure (Larson 1988).

- Left-branching vP structures arise from extraposition (except perhaps in the case of certain base-generated adjuncts).

This gives us a good shot at the vP constituency paradox illustrated in (26):[5]

(26)   a.   John said would bake a cake, and bake it he did on Thursday.

   b.   John gave the boys cakes on each other's birthdays.

Partial vP-fronting possibilities seem to correspond to extraposition possibilities (except in the case of CP arguments):

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[5] See Barss and Lasnik (1986), Pesetsky (1995) and Phillips (1996).

(27)   a.   * John said he would kiss someone, and kiss he did the first woman to walk into the room.
(DPs cannot be extraposed high enough.)

b.   * John said he would give someone a book, and give a book he did John.
(The first object in a double object construction can't be extraposed at all.)

c.   ? John said he would give Bill something, and give Bill he did a book.
(The second object in a DO construction may well be a null-headed PP, allowing it to extrapose high enough.)

d.   ? John said he would talk to someone, and talk he did to the first woman to walk into the room.
(PPs can extrapose high enough.)

e.   ? John said he would take pictures of someone, and take pictures he did of Bill.
(Ditto.)

f.   ?* John said he would announce something, and announce he did that Bill was getting married.
(Unexpected exception – the CP should be able to extrapose high enough.)

Regarding (27f), much depends on the status of (25c). If (22c) is in fact ungrammatical, it may simply be that CPs behave exactly as DPs (perhaps because clauses are in some sense underlyingly nominal, or are doubled with a nominal).

5   Conclusion

Extraposition appears to be a syntactic (as opposed to PF) movement which shares properties of A and A′ movements. The height of an extraposed phrase is determined by its category. Extraposition may be largely responsible for left-branching vP structures.

6   Appendix A: Heaviness

The heaviness requirement applies only to DP extraposition:

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(28)　a.　?* I met on Tuesday a man.

　　　b.　　I met on Tuesday a man who would later become my arch nemesis.

　　　c.　　I talked on Tuesday to a man.

　　　d.　　I said on Tuesday that he did.

　　　e.　　I took a picture yesterday of John.

This may be because PPs and CPs are prosodic units of some sort (Idsardi 1989, Neeleman and Reinhart 1998) but DP objects aren't (since the verb and the object together form a prosodic unit). There is plausibly a greater cost incurred at the PF interface by moving a non-prosodic-unit, and in the case of Heavy NP shift, this cost has to be counterbalanced by a correspondingly large improvement.

6.1　Heavy NP Shift out of PPs

The preceding considerations suggest that PP extraposition ought to be preferred to DP extraposition when both operations give more-or-less equivalent results at PF. This may explain why (29b) is better than (29a):

(29)　a.　* I talked to t on Tuesday [the man who I met last week].

　　　b.　　I talked t on Tuesday [to the man who I met last week].

As expected under this hypothesis, it seems that it is possible to extrapose non-DPs out of PPs:

(30)　a.　　I talked yesterday to a friend of John's.

　　　b.　　I talked to a friend yesterday of John's.

　　　c.　　I talked yesterday to a man who I've known for ten years.

　　　d.　　I talked to a man yesterday who I've known for ten years.

An alternative: A different approach to ruling out (29a) is outlined in Hornstein, Lasnik, and Drummond (2009), based on the theory of cyclic linearization in Fox and Pesetsky (2004). HLD note that the derivation of (29a) may plausibly be taken to create an ordering paradox given F&P's system, on the assumption that *wh*-movement out of PPs must precede via [Spec,PP] (which is obligatorily on the left edge of PP). In order to "escape" a PP, a DP must move via the escape hatch. However, as PP is a phase, this will generate a linearization in which P follows the DP. This will then prevent

any operation that subsequently moves the DP to the left in another phase as this would generate an inconsistent set of linearization statements.

On the face of it, the HLD approach would predict the examples in (30) to be unacceptable (if these do indeed involve rightward A′ movement)

7   Appendix B: The Right Roof Constraint

Things to be explained (for English):

- Extraposition is always to the right.

- Extraposition is clause-bounded (with marginally some exceptions[6]).

Possible (though far from fully satisfactory) explanations given the theory above:

- Adjoined positions in English are always on the right (see Saito and Fukui (1998) for an interesting proposal with this consequence).

- "Escape hatches" are always on the left (perhaps because specifiers are always on the left). Cyclic extraposition would involve movement from the base position, through one or more specifiers, and then onto an adjoined position. This is arguably a form of improper movement. Alternatively, it may be that movement to a series of left escape hatches followed by movement to the right creates an ordering paradox within the framework of Fox and Pesetsky (2004).

To my knowledge, the Right Roof Constraint remains somewhat mysterious for all theories of extraposition except that of Larson (1988), which only ap-

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[6] Kayne (2000, p. 251) gives this example, which his theory of HNPS predicts to be grammatical:

(i)   ? She has been requesting that he return ever since last Tuesday the book that John borrowed from her last year.

Howard Lasnik (2007 course handout) gives the following example:

(ii)   ? Mary wanted to go until yesterday to the public lecture.

and the following contrast:

(iii)   The absent minded professor$_1$ will say that **he**$_1$/***Lucy** is working, if you press him, on a new molecular compound for flubber."
        (attributed to Jason Merchant).

I have nothing to say about (i), other than that its level of acceptability – which perhaps merits more than one question mark – seems consistent both with grammaticality and ungrammaticality (we are entitled to "let the theory decide," as Newmeyer puts it). Regarding (ii), it may be that it is only to finite clauses that the right roof constraint applies in full force. Moving on to (iii), it is not clear that extraposition is involved at all in these appositional constructions. The following example is relevant:

(iv)   The absent minded professor$_1$ will say that Lucy, if she is to be believed, is working on a new compound for flubber.

The [is working...] constituent presumably cannot have been extraposed, suggesting that extraposition may not be crucially involved in (iii).

plies to Heavy NP Shift and has a number of other problems. (This includes antisymmetric proposals of Kayne (2005), Kayne (2000), and den Dikken (1995)).

8 Appendix C: A Brief Note on the Fox/Nissenbaum Analysis of Extraposition

The analysis given here is largely compatible with the theory of extraposition in Fox and Nissenbaum (1999). F&N propose that extraposition of complements is derived by ordinary rightward movement, whereas extraposition of adjuncts to DP is derived via adjunction to the (covert) QR'd DP. All of the cases considered here are plausibly taken to be cases of complement extraposition (though in the case of *of* PPs, it seems likely that these are at least optionally adjuncts).

    The F&N analysis, together with the analysis given here, predicts that (apparently) extraposed adjunct clauses ought to adjoin at the same height as extraposed DPs (since the movement operation involved is QR of a DP). This prediction may in fact be correct:

(31)   a.   ? Although John didn't that he was intelligent, he did make
                 claims that he was successful.
        b.   * Although John didn't that Bill had already made, he did make
                 claims that JOHN had already made.

Similarly, *wh*-movement of DPs is subject to rather more robust freezing effects for extraposition of adjunct clauses than for extraposition of complement clauses:

(32)   a.   ? Who did you make the claim t to on Thursday [that John is
                 an idiot]?
        b.   * Who did you make the claim t to on Thursday [that John had
                 already made]?

9 Appendix D: Condition C or Weak Crossover?

The contrast between (33a) and (33b) may appear to be a Condition C violation:

(33)   a.   I gave a picture of John$_1$ as a small child to him$_1$.

      b.   ?? I gave t to him$_1$ [a picture of John$_1$ as a small child].

But if the extraposed *of* PP adjoins to TP, it should not be c-commanded by *him*. Note that an analysis of extraposition in which the extraposed phrase has in fact remained "stranded" in a low position, though it would account for (33b), would be unable to explain the contrast in (34), which is easily accounted for under the assumption that the extraposed phrase has moved to a higher position but can still reconstruct to its base position:

(34)   a.   * I gave its$_1$ author every book$_1$ that I bought in the sale.

      b.   I gave t to its$_1$ author every book$_1$ that I bought in the sale.

A possible analysis of (33b), which I will not attempt to justify here, is that it involves a Weak Crossover violation rather than a Condition C effect. The extraposed DP is analogous to a *wh*-phrase which "crosses over" a pronoun. This analysis explains the rather weak character of the (apparent) Condition C violation in (33b). With the antecedent more deeply embedded in the extraposed DP, this becomes more apparent:

(35)   ? I gave t to him$_1$ [the picture that Mary said John liked the best].

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