Matching and Raising compared

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This paper argues that English clausal comparatives are generated by means of two different syntactic derivations. Comparative deletion structures are given a 'raising analysis' in which the correlate moves into its structural case position and then moves out of the comparative clause to the matrix head position. In comparative subdeletion structures, the correlate and the head are base-generated separately. The analysis invokes remnant movement within the comparative clause to account for certain A-bar properties of comparatives attested by new parasitic gap evidence. Finally, it is shown that raising analyses are less stipulative concerning the semantic properties of comparatives than 'matching' proposals.

1. Introduction

English clausal comparative constructions come in at least two varieties: comparative deletion (CD) exemplified in (1) and comparative subdeletion (CSD) as in (2).

(1) a. Scott is **taller** than Cilene is <~~tall~~>.
b. Bill owns more **DVDs** than Scott owns <~~DVDs~~>.

(2) a. Violet is **wider** than she is **tall**.
b. John reads more **books** than he reads **magazines**.

In CD, the correlate (located inside the *than*-clause) necessarily deletes, while the head (located in the matrix clause next to it or attached to the comparative morphology) does not. In CSD, the head and correlate are distinct lexical items and neither deletes.

This paper has several goals. First, I will claim that English CD and CSD constructions are generated via two different syntactic derivations (Chomsky 1977 basically made this claim). This claim goes against standard analyses of clausal comparatives, which attempt to unify the two constructions by treating CD as a special case of CSD (for instance, Bresnan 1973, 1975; Heim 1985; Kennedy 2002a). I will provide reasons for not reducing CD to a case of CSD in Section 3. In Section 4, I will claim that CD is most aptly accounted for under a raising analysis in which the correlate moves to the head position. CSD, on the other hand, involves base-generation of a separate head and correlate.

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Second, I will propose that CD and CSD both involve overt remnant movement within the than-clause. In CD, the NP must first move out of the Number Phrase (NumP) projection that dominates it to check case followed by movement to the matrix head position.[1] The remnant NumP then moves to Spec CP of the *than*-clause for interpretive purposes. CSD also involves movement out of the NumP to check case, but there is no further movement into the head position. I will present new parasitic gap evidence for this analysis. This will be discussed in Section 5.

Third, in Section 6, I will compare matching to raising theories in order to buttress my claim that CD should not be reduced to a special case of CSD. I will point out that both matching and raising theories invoke non-traditional stipulations. However, matching requires more of these stipulations than the analysis presented in previous sections. I will also argue that CSD constructions do not provide an argument for a unified matching analysis.

In the next section, I will provide a short review of raising, matching and ellipsis accounts of clausal comparatives.

2. Theories of clausal comparatives

Three types of analyses have been offered to account for English style clausal comparatives. I will present a short review of ellipsis, raising and matching analyses in turn.

2.1 Ellipsis theories

Ellipsis accounts treat CD and CSD as a special case of redundancy reduction. Bresnan (1973, 1975) argues for an obligatory unbounded deletion mechanism that deletes the degree element as well as all redundant material (up to recoverability). In CD, the correlate and head match entirely, and hence, the correlate is deleted entirely. But in CSD, only the degree term deletes since the correlate and matrix sortals are different, and hence, deletion of the correlate would not be recoverable.

(3) a. Scott is **taller** than Cilene is ~~***n*-much tall**~~.
b. Bill owns **more DVD's** than Scott owns ~~***n*-many DVD's**~~.

(4) a. Violet is wid**er** than she is ~~***n*-much**~~ tall.
b. John reads **more** books than he reads ~~***n*-many**~~ magazines.

But notice that this looks like a very *ad hoc* system, since the deletion mechanism is a construction specific kind of ellipsis (for instance, it is required whereas ellipsis is generally optional). Furthermore, clausal comparatives have many properties similar to relative clauses (these will be reviewed in the next section). As such, ellipsis accounts have been discarded in favor of theories that have been proposed for relative clauses (RCs) such as raising and matching (see Kennedy 2002a for a review).[2]

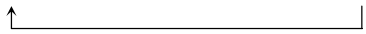
[1] I will only provide an analysis of quantity NP comparatives as in (1b) and (2b) and save extending the analysis to AP comparatives for future research.

[2] For examples of raising and matching theories of relative clauses see Vergnaud (1974), Carlson (1977), Chomsky (1977), Kayne (1994), Sauerland (1998), Bianchi (2000), Aoun and Li (2003).

2.2 Raising theories, or one-sortal theories

One type of RC theory, typically referred to as *raising*, has been applied to CD (Lechner 1999). For CD, raising theories base-generate the correlate and then move it up into the head position.

(5) Scott is [tall]er than Cilene is ~~*n much*~~ *t*



I will often refer to raising theories as *one sortal* theories because only one sortal is base-generated.

(6) *One sortal systems (raising)*: the head and the correlate are related via a movement transformation

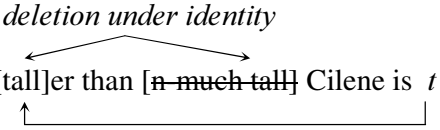
Raising has difficulty providing a unified account of CSD. There obviously could not be movement of the correlate into the head position, since the head and correlate are different lexical items.

2.3 Matching theories, or two-sortal theories

The second type of RC theory that has been applied to clausal comparatives is usually called *matching* (see Kennedy 2002a,b). Matching theories base-generate two sortals, one in the correlate position and one in the head position. In CD, the correlate moves to a position where it can be deleted under identity with the head (in Kennedy 2002a,b this is a CP position).

deletion under identity

(7) Scott is [tall]er than [~~n much tall~~] Cilene is *t*



I will refer to matching theories as two-sortal theories since two sortals are base-generated.

(8) *Two sortal systems (matching)*: the head and correlate are base generated separately (and, if the correlate 'needs' to delete, it moves to a position where it can be deleted under identity with the head)

CSD also has two sortals base-generated, but the correlate sortal does not move and does not delete. Matching theories, at least on the surface, appear to offer an easy unified account of CD and CSD. In effect, CD is treated as a special case of CSD, since CSD obviously has two sortals base-generated. In this respect, matching is very similar to the ellipsis account. I will offer reasons why CSD is not an argument for a matching analysis in Section 6.

2.4 Summary

This short review of ellipsis, raising and matching theories of comparatives was intended to highlight attempts at unification of CD and CSD. Both ellipsis and matching theories treat CD

as a special case of CSD. Raising, on the other hand, does not have an account of CSD. The next section provides arguments against the ellipsis account as well as reasons to believe that CD should be unified with relative clauses, not CSD.

3. CD and relative clauses vs. CSD

In this section, I will review several data points that show that CD and CSD pattern like relative clauses in key respects, but CSD differs from CD and relatives in other ways. This will lay the groundwork for the claim that CD and CSD should not be unified under one matching or raising analysis. The data will also indicate that ellipsis theories are inadequate for CD and CSD.[3]

3.1 The difference: PF deletion

The main difference between CD and relative clauses on the one hand and CSD on the other concerns deletion of the correlate. The correlate must be deleted in CD (9) and relatives (10), but deletion is prohibited in CSD (11).

(9) a. John has more books than Bill has.
b. *John has more books than Bill has books.

(10) a. Kip saw the movie that I saw.
b. *Kip saw the movie that I saw the movie.

(11) a. *John bought more books than Bill bought <~~magazines~~>.
b. John bought more books than Bill bought magazines.

Ellipsis, however, is generally optional. Therefore, ellipsis theories of comparatives must somehow *require* deletion of the correlate. This makes ellipsis theories look rather construction-specific and detracts from their appeal.

The next two data points stem from the required deletion property of CD and relatives. There is a locality restriction on the resolution of CD that is not present in typical ellipsis structures (Kennedy 1997). This is also true of relative clauses (Williams 1977). The examples in (12) are taken from Kennedy (1997).

(12) a. The table is wider than the rug is, but the rug is longer than the desk is.
b. The table is wider than the rug is, but the rug is longer than the desk is <~~long~~>.
c. *The table is wider than the rug is, but the rug is longer than the desk is <~~wide~~>.

(13) a. Kip saw the movie that Marc saw, and Chad has the picture that Anthony saw.
b. Kip saw the movie that Marc saw, and Chad has the picture that Tony saw <~~picture~~>.
c. *Kip saw the movie that Marc saw, and Chad has the picture that Tony saw <~~movie~~>.

[3] Much of this review was taken from Kennedy (2002a) except that Kennedy does not discuss relative clauses in the same way that I will here. Also, I will draw a different conclusion from Kennedy, who provides a unified matching analysis of CD and CSD.

This test doesn't apply to CSD, since its correlate has not deleted. Notice that this data also argues against an ellipsis account. As noted by Williams (1977) and Kennedy (1997), a VP gap can be resolved with a VP that is local or far away (examples taken from Kennedy 1998).

(14) a. Marcus read every book I did and I bought every book Charles did.
b. Marcus read every book I did and I bought every book Charles did <~~buy~~>.
c. Marcus read every book I did and I bought every book Charles did <~~read~~>.

If comparative deletion were really a general form of ellipsis then we would expect it to not have a locality restriction on its resolution.

Lastly, it has been noted that relative clauses behave ambiguously with respect to certain reconstruction properties (Chomsky 1993; Lebeaux 1992; Munn 1994; Sauerland 1998).

(15) a. The relative of John$_i$ that he$_i$ likes lives far away. (Munn 1994)
b. The relative of his$_i$ that everybody$_i$ likes lives far away.

CD displays the same paradox.

(16) a. There were more relatives of John$_i$ at the reunion than he$_i$ wanted there to be.
b. There were more of their$_i$ relatives at the reunion than everybody$_i$ wanted there to be.

CSD, of course, has no reconstruction properties since the correlate is pronounced in its base position. I will ignore why and how this reconstruction data is explained, and instead use it only as support for the claim that CD and RCs are similar. (But see Sauerland 1998 for a discussion and review of the literature concerning this paradox for RCs).

To summarize, CD and RCs pattern alike with respect to required deletion, locality of resolution and reconstruction effects. CSD, on the other hand, does not delete the correlate. Furthermore, ellipsis accounts can only stipulate the required deletion and cannot account for the locality requirement on resolution.

3.2 The similarities: movement

Relatives, CD and CSD behave very similarly with respect to movement diagnostics. First, the deleted correlate in comparatives and relatives cannot be located inside an island. (see Sauerland 1998, ch. 2 and references cited therein). The (a) and (b) examples in (17) – (22) are taken from Kennedy (2002a).[4]

(17) Complex NP islands
a. *Michael has more scoring titles than Dennis is a guy who has.
b. *Michael has more scoring titles than Dennis is a guy who has tattoos.
c. *Michael won the scoring title that Dennis is a guy who wanted.

(18) Wh-islands
a. *The shapes were longer than I wondered whether they would be.
b. * The shapes were longer than I wondered whether they would be thick.
c. *Mary likes the shapes that I wondered whether she would.

[4] Note that Chomsky (1977) argues that island diagnostics cannot be used on CSD.

(19) Adjunct islands
  a. *My sister drives as carefully as I avoid accidents when I drive.
  b. *My sister drives as carefully as I avoid accidents when I drive carelessly.
  c. *My sister drives a car that I avoid accidents when I drive.

(20) Sentential subjects
  a. *There are more stars in the sky than that the eye can see is certain.
  b. *There are more stars than that the eye can see planets is certain.
  c. *There are many stars in the sky that the eye can see is certain.

Second, CD and CSD display weak and strong crossover effects as reported by Kennedy (2002a). His examples are used below. Relatives also display this property.

(21) Weak Crossover:
  a. More Democrats$_i$ voted than their$_{*?i/j}$ friends expected to vote.
  b. More Democrats voted than their$_{*i/j}$ friends expected Republicans$_i$ to vote.
  c. John voted for the Democrats$_i$ who their$_{*i/j}$ friends expected to win

(22) Strong Crossover:
  a. More Democrats$_i$ voted than they$_{*i/j}$ expected to vote.
  b. More Democrats voted than they$_{*i/j}$ expected Republicans$_i$ to vote.
  c. John voted for the Democrats$_i$ who they$_{*i/j}$ expected to win.

Ellipsis theories have no explanation for the results of these movement diagnostics, since ellipsis is does not show movement properties. Therefore, we can conclude that comparatives and relatives are not a matter of a general ellipsis mechanism. Instead, any account of comparatives and relatives must involve movement. Recall that both raising and matching invoke movement.

3.3 Summary

The similarities presented in this section indicate that a movement analysis is preferable over an ellipsis account. Furthermore, the similarities make a unified analysis look very appealing. But the PF differences indicate that CD is very much like relatives, while CSD is somehow different. Herein lies the difficulty: how do we accommodate CSD structures which show island and crossover effects (indicating movement), but don't delete the correlate? The answer I will provide in the next section is that CSD should not be unified with CD. Rather, CD and CSD are generated differently.

3.3.1 One sortal vs. two sortals

While each construction type tests positive for movement, only relatives and CD require deletion of the correlate; CSD cannot delete the correlate. Rather than trying to unify CD and CSD by providing either a one or two sortal system for both of them, I will propose in 4.1 and 4.2 that they are have distinct derivations: CD base-generates one sortal, while CSD base-generates two. That is, CD is a raising construction and CSD is a matching construction under the following definitions of raising and matching.

(23) *Raising*: one sortal is base-generated in the correlate position and then moves to the head position.

(24) *Matching*: one sortal is base-generated in the correlate position and a second sortal is base-generated in the head position.

This will account for the fact that CD constructions require deletion of the correlate. Typically, only one member of a chain can be pronounced. (This is Lechner's 1999 argument for raising in CD). Notice that matching is defined as a derivation *without deletion under identity* (see Kennedy 2000a,b for a typical matching analysis with deletion).

(25)

CD	raising (one sortal)
Relative clauses	raising (one sortal)
CSD	matching (two sortals)

This analysis will allow us to solve a problem for movement theories first brought up by Bresnan (1973). Bresnan's problem only arises when CD and CSD are given a unified two sortal analysis. I will discuss Bresnan's problem and the solution for it in Section 4.3.

4.1 One sortal for CD

In this section, I will present the raising analysis of CD offered by Lechner (1999).[5] This will suffice for the current purpose of explaining the data in the previous section, but I will modify the account in Section 6. The derivation is as follows. First, a NumP is constructed by merging the sortal *books* with an abstract Num^0, which I will assume is the functional head MANY.[6,7] MANY also takes an internal degree argument, which in this case will be the variable *n*. The sortal *books* is inserted with an uninterpretable feature that Lechner calls [–COMP].

(26) $[_{NumP}$ books MANY *n*]
[–COMP]

The comparative clause is constructed without anything interesting happening until the comparative morpheme *more* is inserted. The comparative morpheme has a [+comp] feature that can check the uninterpretable feature on the correlate. Therefore, the correlate moves into the head position where it checks its uninterpretable feature.

[5] Lechner (1999) treats only AP-NP comparatives of the sort *Mary knows younger authors than Peter knows.* I will adjust his basic analysis to account for the quantity comparatives I am analyzing here.

[6] I will assume the NP projects a NumP (the analogue of the AP projection DegP). The degree phrase projection is a typical assumption in comparative analyses; see Kennedy (1997), Lechner (1999), among many others. These assumptions are based on Abney (1987).

[7] MANY is a function that allows degrees to combine with NP sortals compositionally. While there are many different proposals for what MANY is, they all have in common that it relates the cardinality of the set of entities referred to by the NP and a degree term. See Hackl (2000) and references cited therein for a discussion of MANY.

(27) [$_{DP}$ [$_{NumP}$ books$_i$ more [$_{CP}$ than Bill bought [$_{NumP}$ ~~books$_i$~~ MANY *n*]]]]
[–~~COMP~~][+~~COMP~~] [–COMP]

Lechner assumes the NumP raises to insure a proper compositional semantics.[8,9] I will assume that it moves to a CP position.

(28) [$_{DP}$[$_{NumP}$ books$_i$ more [$_{CP}$[$_{NumP}$ ~~books$_i$~~ MANY *n*]$_j$ than Bill bought [$_{NumP}$ ~~books$_i$~~ MANY *n*]$_j$]]

This A-bar movement of the NumP is remnant movement (Müller 1998) done covertly. Finally, in order to get the word order correct, I will assume that *more* raises to a D head position.

Lechner's basic proposal accounts for the data presented in section 2. First, deletion of the correlate is expected in CD since deletion of lower copies in a movement chain is normal. Second, we expect the gap to be resolved with the local head of the comparative, because the gap is just the lower member of the chain that contains the head as its top member. Third, because there is movement, we can explain the island and crossover effects.

4.2 Two sortals for CSD

The task now is to provide an analysis of CSD constructions that is compatible with the raising analysis of CD, but still accounts for the fact that the correlate must delete in CD but not in CSD. This will be accomplished by base-generating two sortals in CSD. The derivation of CSD looks very similar to CD, but in CSD the numeration contains two sortals, which must be merged into the sentence.

First, we merge the correlate into the NumP. This time the correlate is without a [–COMP] feature. The rest of the comparative clause is constructed normally.

(29) [$_{CP}$ than Bill bought [$_{NumP}$ books MANY *n*]]

The derivation continues by merging *more* which possesses the [+COMP] feature. Then, the second sortal is merged into the position where the correlate moved in CD. This time, however, the head has the [–COMP] feature. This feature is deleted on its initial merge with *more*.

[8] See Lechner (1999:50-51). Lechner argues that the gap position is interpreted as a bare plural weak indefinite, denoting an individual property. Therefore, it is of the wrong type to combine with the verb, which needs type <e>. I will assume along with Lechner that QR of the NumP leaves a trace of type <e>, and that the NumP can combine with the lambda-abstract created by the QR. Lechner points out that there are other possible ways to make the compositionality work out correctly, but since I will be offering evidence of overt A-bar movement of the NumP, I will stick to his account. Kennedy (2002a) provides other evidence for A-bar movement of the NumP. This will be discussed in Section 5.

[9] An anonymous reviewer points out that the need for this QR seems weakened by the data in (16) which argues for some type of reconstruction. But the reconstruction effects only require that the sortal NP be reconstructed, not the NumP. Furthermore, it may be a requirement that the NP reconstruct without the entire *wh*-phrase. See Chomsky (1977) and Heim (1987) for discussion of this point.

(30) [$_{NumP}$ magazines more [$_{CP}$ than Bill bought [$_{NumP}$ books MANY *n*]]]
[–~~COMP~~] [+~~COMP~~]

Again, the NumP must A-bar raise to a CP position in order for the compositional semantics to work out (see footnote 8 above). Hence, there is covert movement of the NumP, as in CD, explaining why CSD shows movement properties.

(31) [$_{NumP}$ magazines more [$_{CP}$[$_{NumP}$ books MANY *n*]$_j$ than Bill bought [$_{NumP}$ books MANY *n*]$_j$]]

We can now explain why the movement diagnostics indicate A-bar movement in CSD: there is covert A-bar movement. Also, we expect to pronounce both the head and the correlate since both are base-generated separately.

4.3 A solution to Bresnan's Problem

Bresnan (1973) pointed out a problem for movement theories of comparatives: how can we get movement and deletion when the correlate and the head match (CD), but no movement or deletion when they don't (CSD)?

(32) a. John reads more books than Bill reads.
b. *John reads more books than Bill reads books.

(33) a. John reads more books than Bill reads magazines.
b. *John reads more books than magazines Bill reads <~~magazines~~>.

However, Bresnan's Problem only arises when one tries to unify CD and CSD to either a one or two sortal system. If CD and CSD are treated differently, as they are here, the problem doesn't even arise. The sortal either moves to the head position, requiring deletion of the lower copy, or it doesn't move and hence there is no deletion. However, there is one prediction that this analysis makes which looks like a form of Bresnan's Problem: we should be able to get a CSD construction where the sortals match.

(34) John bought more books than Bill bought books.

It has been noted before (Chomsky 1977; Sag 1976; Kennedy 2002a) that (34) can actually be acceptable under certain circumstances. In the discourse presented in (35), it seems to be acceptable.

(35) A: Did John buy more books than Bill bought magazines?
B: Not only did John buy more books than Bill bought magazines, but he bought more books than Bill bought BOOKS!

So, (30) isn't really a problem: it is just a case of CSD that appears to be the deep structure of CD. This contrasts with relative clauses, which don't allow anything like (30).

(36) A: Did John buy the magazines that Bill bought?
B: #Not only did John buy the magazines that Bill bought, but he bought the books that Bill bought BOOKS!

But that is okay, since relatives don't allow subdeletion structures. Whatever is responsible for disallowing subdeletion (two-sortal structures) in relatives is what is responsible for ruling out (36).

4.4 Summary

There is no need to unify CD and CSD in terms of how many sortals are base generated. A one sortal analysis of CD and a two sortal analysis of CSD can account for the major difference between the two constructions: the correlate deletes in CD because it moves to the head position. And, yet, we can still account for the similarities since both constructions involve A-bar movement. In addition, we don't have to deal with Bresnan's Problem. Kennedy (2002a, b) points out that there are other differences between CD and CSD. The analysis presented above will have to be modified slightly, but the basic claim that CD is a raising construction (one sortal) and CSD is a matching construction (two sortals) will be able to account for these differences.

5. Movement within the comparative clause

The previous section claimed that both CD and CSD involve covert A-bar movement of the correlate for semantic reasons and to account for the weak crossover effects. In this section, I will revise the account so that this A-bar movement is *overt remnant movement* for both constructions in order to account not only for the facts in Section 2, but also some differences between CD and CSD reported by Kennedy (2002a,b) and some new evidence reported here. The only difference between CD and CSD will again be how many sortals are base generated — one or two.

5.1 More differences between CD and CSD

Kennedy (2002a, b) points out three differences between CD and CSD, which he attributes to their behavior at PF. Given that an ellipsis account is inadequate, and that both CD and CSD test positive for movement, he concludes that only CD displays overt A-bar movement of the correlate, while CSD displays covert A-bar movement of the correlate (Kennedy argues for a unified matching account). The data in (37) through (39) is taken from Kennedy (2002a).

First, Kennedy uses languages that prohibit preposition stranding as a test for overt movement. In languages that have this prohibition, CD constructions display preposition stranding effects, while CSD constructions do not, as in the Czech example below. He argues this indicates that CD involves overt movement, but not CSD.

(37) a. *Kterych mestech Vaclav bydlel ve?
which city Vaclav live in
'Which city does Vaclav live in?'
b. *Bydlel jsem ve vice mestech nez ty jsi bydlel v.
lived have in more cities than you have lived in
'I have lived in more cities than you have lived in'
c. Chci bydlet ve vice americkych mestech nez jsem bydlel v
want lived in more American cities than have lived in
europskych mestech.
European cities
'I want to have lived in more American cities than I have lived in European cities'

Second, CD constructions show a *that*-trace effect, while CSD constructions do not. Again, this seems to indicate overt movement for CD but not CSD.

(38) *That*-trace effects:
a. More books were published than editors said (*that) would be.
b. More boys flunked than I predicted (*that) would pass.
c. More books were published than editors said (that) articles would be.
d. More boys flunked than I predicted (that) girls would pass.

Third, contraction is disallowed in English when a trace immediately follows the contracted element. CD constructions disallow contraction of the copula in the comparative clause, while CSD constructions allow contraction. This again seems to indicate that the correlate moves overtly in CD but not in CSD.

(39) Contraction:
a. I thought there was more than there is/*'s.
b. John was more upset than he is/*'s now.
c. There is more meat than there's rice.
d. John was more upset than he's angry now.

To summarize, Kennedy attributes these differences to an overt/covert distinction between CD and CSD. However, there is evidence that this distinction doesn't exist.

5.2 Evidence for overt A-bar movement in comparatives

There are two data points that argue for overt A-bar movement inside the comparative clause in both CD and CSD. The first comes from a dialect of English (that I speak), which allows pronunciation of the NumP in the Spec of CP position in CD and CSD. (Chomsky 1977 notes the acceptability of 40d).

(40) a. John bought more books than how many books Bill bought .
b. John bought more books than how many magazines Bill bought .
c. John bought more books than how many books Bill did.
d. John bought more books than what Bill bought .

I will assume that this dialect of English displays overtly what all other dialects of English do least covertly: move the NumP to the CP position.

The second one uses parasitic gap licensing as a test for overt A-bar movement. Kennedy (2002a) claims that only CD licenses parasitic gaps. His claim rests on the following data:

(41) a. I threw away more books than I kept without reading <pg>.
b. *I threw away more books than I threw away magazines without reading <pg>.
c. *I threw away more books than I did without reading <pg>.

Kennedy concluded from this that CD involves overt A-bar movement, but CSD involves covert A-bar movement. He also concluded that VP ellipsis as in (41c) forces covert A-bar movement in CD constructions. However, (42) indicates that what is wrong with the data in (41b) and (41c) has to do with some kind of parallelism constraint, not with a lack of A-bar movement. When an adjunct parasitic gap is added to the matrix clause, all of the constructions license parasitic gaps including CD with VP ellipsis.

(42) a. I threw away more books without reading than I kept without opening <pg>.
b. I throw away more books without reading than I keep magazines without opening <pg>.

In (42), we can see that CD and CSD each license parasitic gaps inside the comparative clause. Assuming that parasitic gaps are licensed only by overt A-bar movement, then we must conclude that the correlate moves *overtly* to Spec of CP in both CD and CSD, not covertly.

5.3 Revised analysis of comparatives

I will now revise my analysis to accommodate the data presented in Section 5.2 by adding overt A-bar movement. But I will also retain a distinction between the PF properties reviewed in Section 5.1. Notice that each of the PF diagnostics (P-stranding, *that*-trace effect, contraction) test for case positions, not base-generated positions. As such, I will propose that both CD and CSD involve overt A-bar movement, but that this is remnant movement. The sortal will first move out of the NumP and into its case checking position. It is from this position that the sortal will move to the matrix clause in CD, or remain in CSD.

For this analysis to work, I will make several additional assumptions. First, I will assume that NPs carry an uninterpretable case feature that must be checked. Second, I will assume that DP projections may act as a mediary between the case feature on the NP and the case feature on the checking head, but NumPs, DegPs or empty DPs cannot[10]. Therefore, an NP must move out of the NumP in order to get case.

5.3.1. The remnant analysis of CD

There will be several changes to the analysis of CD presented above. First, the sortal in the correlate position will first move through a Case checking position before it moves to the

[10] I see this as something like feature percolation of the NP's uninterpretable Case feature up to the DP level where it can be licensed by a Case checker, but percolation is blocked by null functional heads.

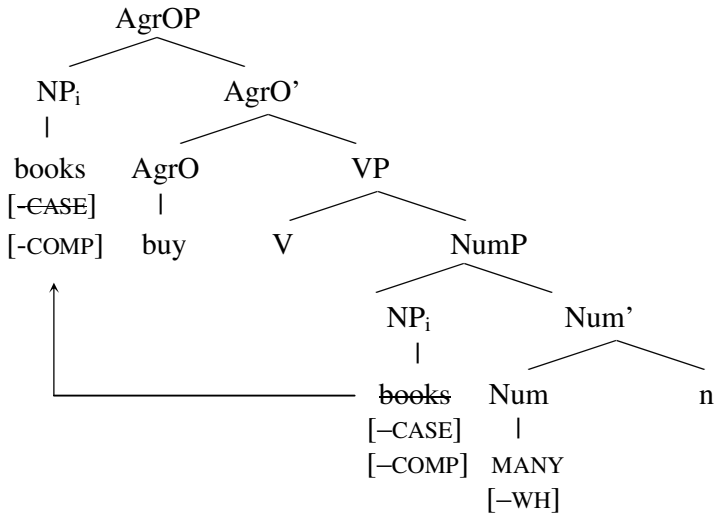
head position. And, second, the NumP remnant moves to A-bar position. Below is the derivation of the CD construction *John bought more books than Bill bought*.

The sortal *books* is introduced with not only an uninterpretable comparative feature, but also an uninterpretable case feature. The NumP phrase is introduced with an uninterpretable [-WH] feature to insure that there is overt A-bar movement.

(43) $[_{NumP}\ [_{NP}$ books] MANY n]
[–CASE] [–WH]
[–COMP]

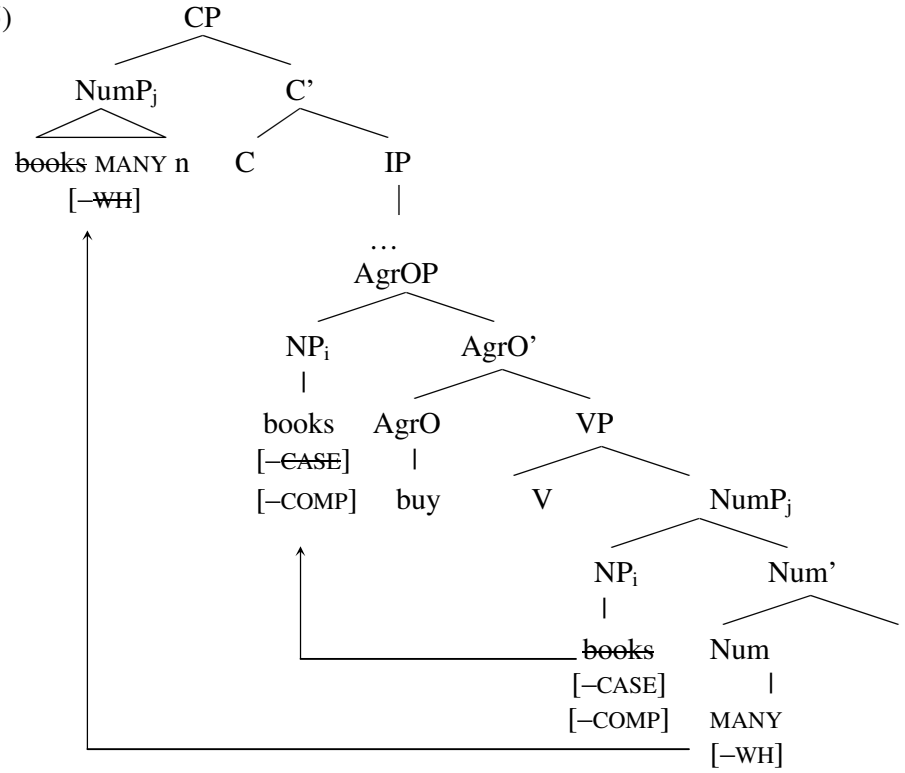
The derivation proceeds by moving the sortal *books* out of the NumP and into its case checking position in Spec of AgrO.

(44)



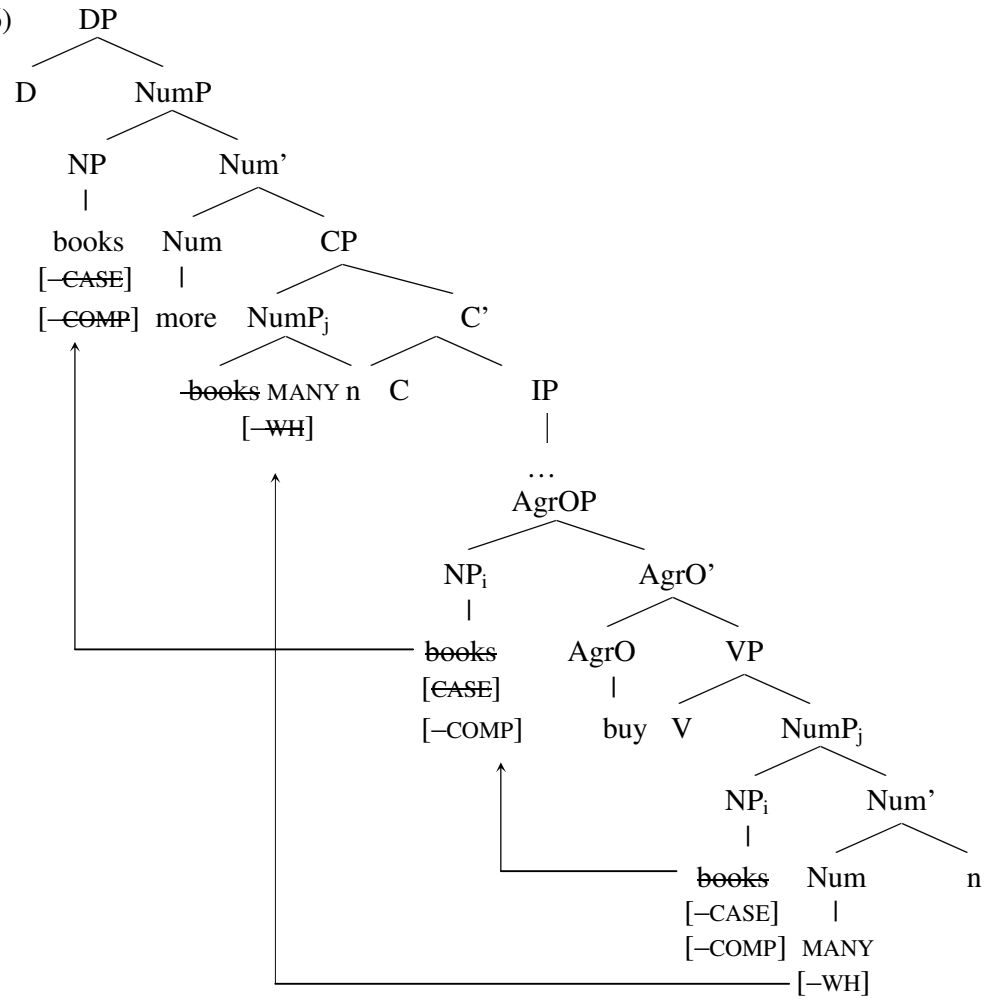
The derivation of the comparative clause continues as expected until merger of the CP projection allows the NumP to check its uninterpretable [–WH] feature. This requires remnant movement of the entire NumP to Spec of CP.

(45)



At this point the comparative morpheme *more* merges with a [+COMP] feature that can check the uninterpretable [–COMP] feature on the correlate. The sortal *books* copies and remerges in the spec of NumP.

(46)



There are two differences between this derivation and Lechner's derivation presented in Section 4.1. First, the correlate moves into a Case checking position before it moves into the head position. And, second, the NumP A-bar moves overtly, rather than covertly.

5.3.2. The remnant analysis of CSD

I will give the derivation of the CSD construction *John bought more magazines than Bill bought books*. To begin, the numeration includes both sortals (*books, magazines*). The *how many* phrase is built in a way similar to the CD derivation, except that this time there is no uninterpretable [–COMP] feature on the sortal.

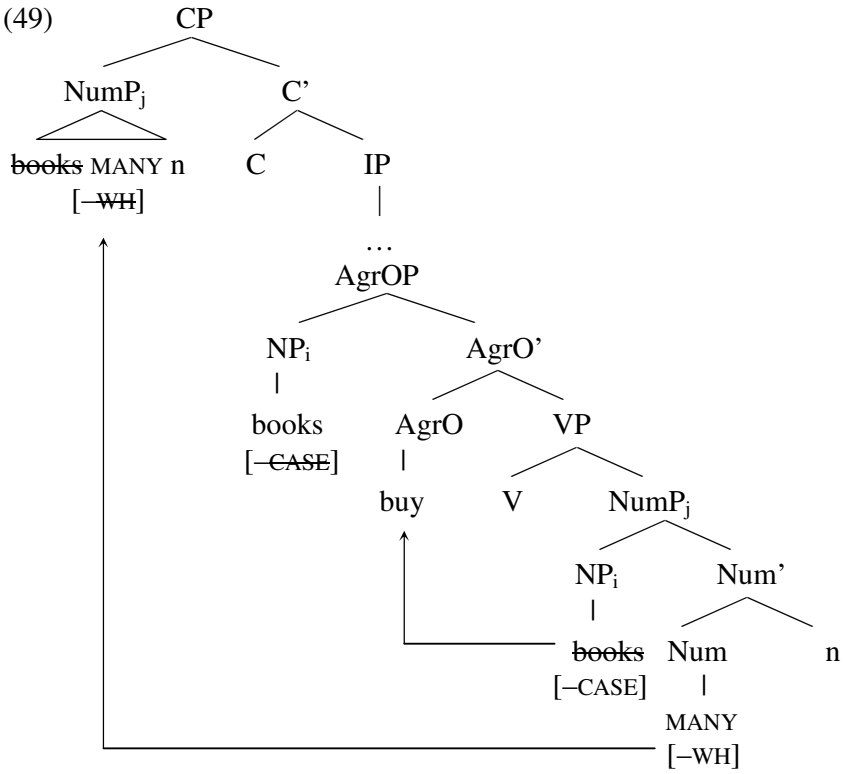
(47) $[_{\text{NumP}}$ books MANY n]
[–CASE] [–WH]

The derivation follows the same initial steps as in CD. The NP must move out of the NumP into the spec of AgrO where it can check its case feature.

(48) [$_{AgrOP}$ books$_i$ buy [$_{VP}$ [$_{NumP}$ ~~books$_i$~~ MANY n]]
[–~~CASE~~] [–CASE] [–WH]

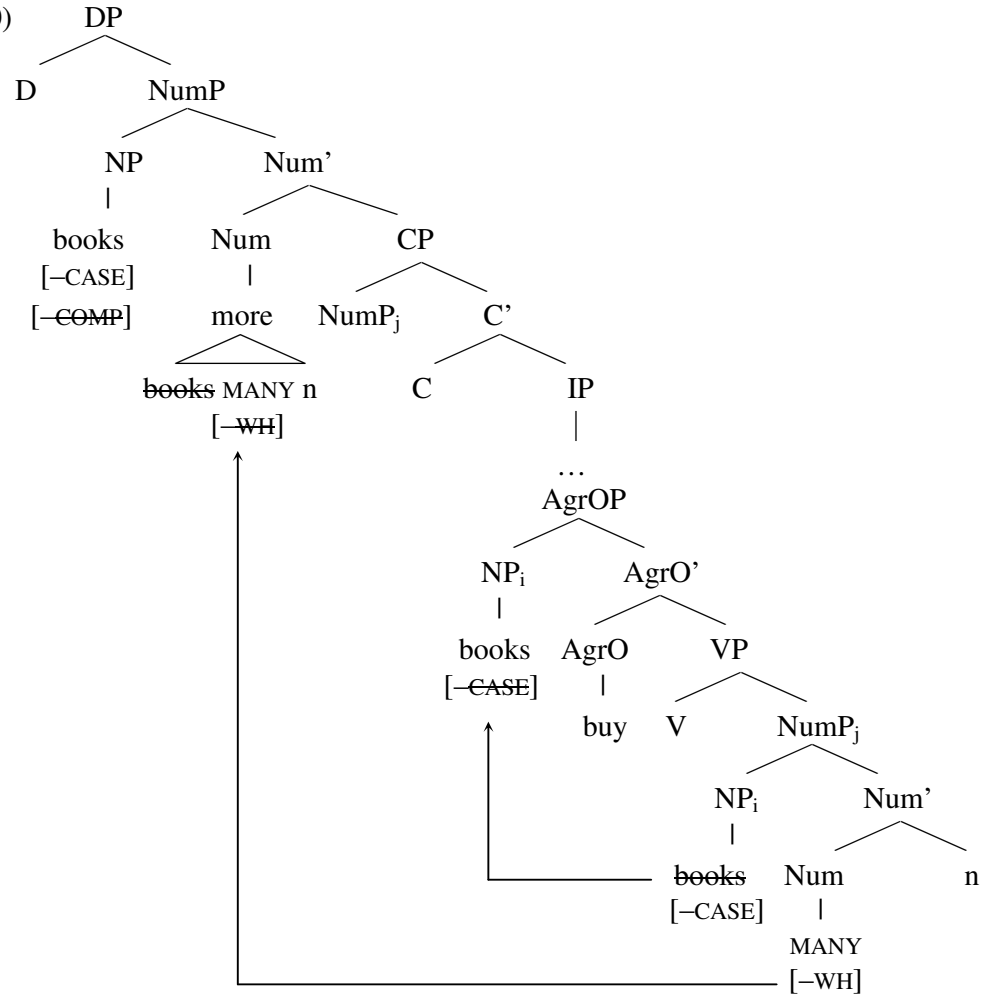
The derivation continues as expected until the CP position, where the entire correlate will A-bar move (remnant move) to CP to check its [-WH] feature. Again, this is the same as the derivation of CD.

(49)



The rest of the derivation follows as in the previous derivation of CSD in Section 4.2. The comparative clause merges with *more* which heads the matrix NumP, followed by the merger of *magazines*. This second sortal possesses the uninterpretable [–COMP] feature, which is checked by *more*.

(50)



The only differences between this derivation and the one given in Section 3.2 is that the correlate moves out of the NumP to check case and the NumP A-bar moves overtly.[11]

5.4 Arguments for a overt/covert distinction revisited

With the remnant analysis of comparatives, we can account for the parasitic gap data presented in Section 5.2. The parasitic gap in the comparative clause is licensed by overt movement of the NumP to spec of CP in *both* CD and CSD.

The difference between CD and CSD in the revised analysis is whether the sortal moves from its Case checking position to the matrix head position or stays put. This difference is what accounts for the gap diagnostics, because the contraction, *that*-trace, and preposition stranding examples all involve testing Case positions for gaps. In CD there is a gap left by the moved correlate, and in CSD there isn't a gap because it hasn't moved.

[11] The anonymous reviewer pointed out to me that the word order of the correlate sortal and verb is wrong. Since I need the sortal to move overtly, I will have to assume that the verb raises further, say to adjoin to a little *v* head position.

Contraction is disallowed in CD because the correlate has moved from its Case checking position up into the head position, leaving a gap next to copula. But contraction is allowed in CSD because the correlate is still in its Case position next to the copula.

(51) a. I thought there was more [meat]$_i$ than there is/*'s [$_{AgrP}$ ~~meat~~$_i$ [$_{NumP}$ ~~meat~~$_j$ MANY *n*]]
b. There is more meat than there's [$_{AgrP}$ rice$_i$ [$_{NumP}$ ~~rice~~$_i$ MANY *n*]]

There is *that*-trace effect in CD because the correlate has moved and left a trace next to the complementizer. In CSD, there is not trace next to the complementizer.

(52) a. More [books]$_i$ were published than editors said (*that) [~~books~~]$_i$ would be [$_{NumP}$ ~~books~~$_i$ MANY *n*] published.
b. More [books] were published than editors said (that) [articles]$_i$ would be [$_{NumP}$ ~~articles~~$_i$ MANY *n*] published.

Prepositions are stranded in CD because the correlate will move to the head position. But they will not be stranded in CSD because the correlate will not move.

(53) a. *Bydlel jsem ve vice
lived have in more
[mestech]$_i$ nez ty jsi bydlel [$_{pP}$ v [$_{AgrPP}$[~~mestech~~]$_i$ [$_{PP}$ [$_{NumP}$ *n* MANY [~~mestech~~]$_i$]].
cities than you have lived in
b. Chci bydlet ve vice [americkych mestech] nez jsem bydlel
want lived in more American cities than have lived
[$_{pP}$ v [$_{AgrPP}$[europskych mestech]$_i$ [$_{PP}$ [$_{NumP}$ *n* MANY [~~europskych mestech~~]$_i$]]
in European cities

6. Responding to several semantic arguments for matching

Let's summarize what we have done so far. First, we reviewed reasons for eliminating ellipsis accounts as possible theories of clausal comparatives. Second, we reviewed arguments for providing a movement analysis for clausal comparatives and relative clauses. Third, we noticed that CD differs from CSD in that CD requires deletion of the correlate. Given this crucial fact, an analysis was proposed that did not reduce CD to a special case of CSD. Rather, CD was given a one-sortal analysis, while CSD was given a two-sortal analysis. This allowed an easy solution to Bresnan's problem, since this problem only arises when CD and CSD are unified as two-sortal constructions. Lastly, the analysis was revised in order to account for Kennedy's data.

So far, we have one reason to choose this analysis over a unified matching analysis. The matching analysis has a difficult time accounting for the necessary deletion of the correlate (i.e. Bresnan's Problem), whereas the raising analysis of CD explains why deletion is obligatory.

In this section, I will present two (related) semantic arguments that have been used to argue for a matching analysis, and I will respond to each in turn.

6.1 Identity of substance

We've already seen that the required deletion of the correlate in CD can be explained in terms of the PF interpretation of chains: we expect only the topmost copy of movement chains to be pronounced. We can make the following descriptive generalization.

(54) The head and the correlate of CD must be members of one chain for the PF component to interpret.

If this is correct, and we accept the raising analysis of CD, then we understand why there is necessary deletion in CD but not in CSD; the head and correlate are not members of the same chain in CSD. (Lechner 1999)

But, there is another requirement, on the LF side, that seems to contradict the PF requirement. When CD constructions are interpreted, the LF component needs the correlate and the head to be members of two different chains. CD patterns like CSD in this respect and not like relatives. Let's start by looking at a typical restrictive relative clause.

(55) Tom has the students that Bill has.

Relative clauses are typically interpreted as intersective with the head noun. That is, in this example the set of students that Tom has must be part of the set of students that Bill has. I will refer to this type of reading as *identity of substance* (IDS). While a sortal that is modified by a relative clause must adhere to IDS, the matrix sortal of a comparative construction does not need to.

(56) Samson eats more doggie-treats than Pauli eats.

Clearly, the doggie-treats that Samson eats are not the same ones that Pauli eats.[12] This fact is generally accounted for by existentially closing off both the comparative and matrix clauses. (57) is the general form of the interpretation of comparatives. (58), however, is disallowed for comparatives.

(57) $\exists X\ [_{\text{Matrix}} \ldots \textit{sortal}\ X \ldots \& \ldots X \ldots] \ \&\ \exists X\ [_{\text{Comparative}} \ldots \textit{sortal}\ X \ldots \& \ldots X \ldots]$

(58) $*\exists X\ [[_{\text{Matrix}} \ldots \textit{sortal}\ X \ldots \& \ldots X \ldots] \ \&\ [_{\text{Comparative}} \ldots \textit{sortal}\ X \ldots \& \ldots X \ldots]]$

This is surprising given that relative clauses do seem to require an IDS reading.[13] Relative clauses do have the general form in (58). We can make the following generalizations.

(59) a. The IDS reading is required for relative clauses
b. The IDS reading is optional in comparatives

[12] There are some comparatives that appear to require an IDS reading (Irene Heim, pc):

(i) Samson eats as many doggie-treats as I give him.

But, notice that both the IDS and the non-IDS readings are actually available in (i). Samson could be eating the doggie treats that my neighbor gives him, but he eats as many of those as what I give him.

[13] Relative clauses also have what are often referred to as 'kind' readings and 'amount' readings. I will discuss amount readings in section 5.2. I won't discuss kind readings in this paper.

DP chains are normally interpreted with one quantification. I will take this to mean that the optional IDS reading is a requirement that there be *two chains* for the LF component to interpret in comparatives.

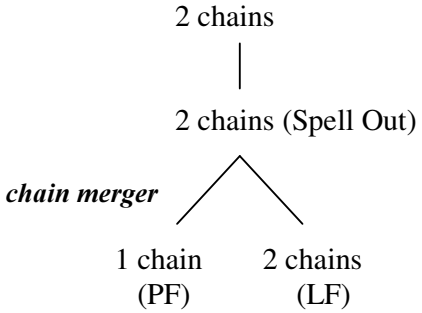
(60) The head and the correlate of a comparative must be members of two separate chains for the LF component to interpret.

This is the opposite of what we concluded from the PF deletion requirement, repeated here.

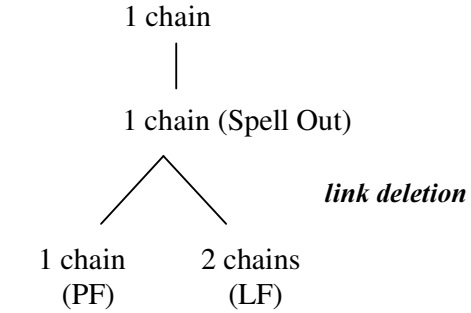
(61) The head and the correlate of a comparative must be members of one chain for the PF component to interpret.

Matching and raising theories are different in their assumptions about what is base generated: one sortal or two. In the end, both theories have to make non-traditional stipulations to satisfy either PF or LF. Matching theories need to invoke a type of chain merger to satisfy the PF requirement, and raising theories need to invoke some type of link deletion to split the one movement chain into two in order to satisfy the LF requirement.

(62) a. Matching



b. Raising



The chain merger and link deletion can be instantiated in different ways. The PF component in Kennedy (2002a) treats the two chains as if they were one, pronouncing only the chain that contains the head. Lechner (1999) uses a syntactic process that explicitly breaks the one chain formed by movement of the correlate to the head position into two chains after the derivation has been spelled out. Rather than argue for independent evidence for one mechanism or the other, I would like to offer a different kind of argument in favor of the raising analysis of CD.

In section 3, it was argued that comparatives bear a striking resemblance to relatives. Let's say that they should therefore be accounted for using the same type of analysis, either matching or raising. If both are raising structures, then we need to employ link deletion in order to get the non-obligatory IDS reading in comparatives. Relatives work out nicely, since we would expect a single movement chain to be interpreted only once. If both are matching structures, however, we have to employ a PF chain merger mechanism in order to insure deletion in both relatives and CD. But, we also need to employ some type of new interpretation mechanism for relatives. If the non-obligatory IDS reading can be used as an argument for matching, then we have to ask why relatives do not also get a non-obligatory IDS reading. A non-obligatory IDS reading for relatives would not be incoherent. In (63), a NP modified by a relative clause such as in (63a) would have the interpretation in (63b).

(63) a. the book that John threw out
b. *the [book(x) & ∃x John threw out [book(x)]]

The relative clause would simply be closed off by an existential operator (which is typically assumed for comparative clauses). So, while a matching theory can handle the LF side of comparatives quite well, it would then have trouble with relative clauses. Accounting for relatives would require some type of stipulation in addition to the PF stipulation that requires deletion of the correlate. The conclusion I want to draw from this discussion is that while a raising theory must employ an *ad hoc* mechanism of interpretation for CD, it is only one *ad hoc* mechanism. Matching, when we use it for both relatives and comparatives, must employ two ad hoc mechanisms.

6.2 Subdeletion is not an argument for matching in CD

Matching theories attempt to reduce CD to CSD in that there are two sortals base-generated for both constructions. Kennedy (2002a,b) argues that this makes sense since the LF requirement of comparatives makes it look as if CD behaves like CSD in that the head and correlate are interpreted separately. In other words, if all comparatives base-generate two sortals, then subdeletion can be thought of as a natural consequence. Kennedy also points out that relative clauses have no construction analogous to subdeletion.

(64) a. *Mr. Salt went down the chute that Veruca went down *shaft*.
b. *John read some books that Tom read *magazines*.

Since the head and correlate of relatives are not interpreted separately, we shouldn't expect them to have subdeletion structures. Kennedy (2002b) then concludes that English relative clauses must be raising structures. CD and CSD are given a unified analysis (matching) while relatives are given an unrelated analysis (raising). I think this argument can be summarized as the following generalization:

(65) Subdeletion Generalization:
a. We get subdeletion in constructions where the head and correlate are interpreted separately (matching).
b. We don't get subdeletion in constructions where the head and correlate are interpreted intersectively (raising).

I have two arguments against this generalization. The first is empirical. Amount relative clauses (Carlson 1977) have a non-IDS reading, just like comparatives, indicating that the relative is not interpreted intersectively with the head. Instead there is existential closure as with comparatives. (Grosu & Landman 1998; von Fintel 1999) Here is an example of an amount relative from Heim (1987).

(66) It will take us the rest of our lives to drink the champagne that they spilled that evening.

The champagne spilled is not the champagne it will take the rest of our lives to drink. Rather, the relative clause seems to denote the *amount* of champagne that was spilled last night, and (66) means something like 'it will take us the rest of our lives to drink as much champagne as they spilled that evening'. But, while the head of the amount relative (the champagne that we drink) is not identical to the correlate (the champagne that they spilled), amount relatives do not allow subdeletion.

(67) *It will take us the rest of our lives to drink the champagne that they spilled beer that evening.

So, interpreting the head and correlate separately may be necessary to license subdeletion, but it is not sufficient.

The second argument is that the reason there is no subdeletion in relative clauses cannot be due to an incoherent meaning. A relative subdeletion structure would have the perfectly coherent logical form in (68b).

(68) a. *… [a person which man is standing in the corner]
b. … [∃X s.t. X is a person & X is a man and X is standing in the corner]

The point here is that subdeletion has nothing to do with whether or not there is predicate modification. Predicate modification structures are just as able to give us a subdeletion meaning as existentially closed structures like comparatives. While the second conjunct of the generalization in (65) is probably descriptively correct, it is not the semantics (as it is currently defined) that is going to account for it.

7. Conclusions

I first argued in this paper that CD and CSD should not be given a unified analysis (where 'unified' means base-generating either one or two sortals for both constructions). CD should be given a one-sortal analysis along with relatives because this explains the deletion of the correlate requirement. This means that CD is a raising structure and the correlate moves into the head position. CSD should be given a two-sortal analysis. The correlate and head are each base-generated separately in CSD.

I then revised the analysis so that the correlate overtly moves out of the NumP to check its Case, followed by overt remnant movement of the NumP to a CP position. The syntactic differences between CD and CSD were explained by whether or not there is movement of the NP correlate from its Case position into the matrix head position or not. In CD the correlate does raise to the head position and in CSD it stays in its Case checking position.

In addition, I argued that not unifying CD and CSD under either a one or two sortal analysis was not a drawback. Instead, I pointed out that a raising theory of CD does unify it with (restrictive) relative clauses, and this is a benefit. While it is true that the raising analysis of CD must employ a stipulative interpretation mechanism, matching theories must employ two stipulative mechanisms, one to require deletion of the correlate and one to interpret relative clauses.

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