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Ā-MOVEMENT AND DELETION IN COMPARATIVE CLAUSES*

1 INTRODUCTION

Many articles have discussed the comparative degree of adjectives, but little attention has been given to deletion in the clauses introduced by *as* or *than*. This paper is intended as an investigation of deletion of comparative terms, the Comparative Deletion (CD) and Comparative Subdeletion (CSD).

(1) CD
  a. The galaxy contains more stars than the eye can see.
  b. At that time, sea level was not as high as it later became.
  c. My sister drives as carefully as I drive.

(2) CSD
  a. Michael Jordan has more scoring titles than Dennis Rodman has tattoos.
  b. The shapes seem to be longer than they are thick.
  c. My sister drives as carefully as I drive carelessly. (Kennedy 2002: 553-554)

CD construction is the expression in which an adjectival, adverbial, or nominal constituent is eliminated from the surface representation of the complement of *than* or *as* (henceforth the comparative clause) as seen in the sentences in (1). *Stars*, *high*, and *carefully* are deleted in (1a), (1b), and (1c) respectively. On the other hand CSD construction has a complete sentence in the complement of *than* or *as* as seen in (2). I will concentrate on the comparative (sub)deletion sentences which include nominal constituents with attributive adjectives such as (a)-sentences and examine how CD and CSD constructions are generated −− why in CD construction the comparative clauses lack some elements, and why in CSD it appears that the clauses need not delete any elements.

The next section introduces previous studies, and discusses problems which are not solved. In section three I would like to deal with the problems and give an alternative analysis, which claims that it is plausible not to separate CD and CSD, but to identify CD

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with CSD. This paper suggests that both of them undergo the operator movement in overt syntax, arguing against Kennedy's (2002) assumption that CD involves overt movement while CSD does covert movement. And comparing CD/CSD in English with Japanese and Bulgarian, I will suggest that English has 'exceptional' CSD sentences, and they are generated in a different way from CD or 'standard' CSD sentences. Such CD sentences do not exist in Japanese. These facts will support our claim that in CD/CSD the operator moves overtly and that English has an exceptional way of moving the operator that causes 'exceptional' CSD sentences. Finally the fourth section summarizes the main points of the derivation of CD/CSD construction.

2 Previous Analyses And Problems

In this section I will investigate several theories on CD and CSD. They mainly discuss the relation between CD/CSD and *wh*-movement. Some papers claim that CD and CSD constructions undergo Ā-movement like *wh*-movement. Other papers claim that CSD constructions are not subjected to movement operation. Let us begin with Bresnan's (1975) analysis, which finds similarity between CD/CSD and *wh*-movement.

2.1 Parallelism between CD/CSD and Wh-*Questions*

Bresnan (1975) claims that CD/CSD sentences are similar to *wh*-questions with respect to applicability of various constraints on transformations.[1] First CD and CSD obey the cross-over-like condition. The original Cross Over Condition proposed by Postal (1971), which prohibits elements from being coindexed with the crossed constituents, explains the following facts:

(3) a. The students who$_i$ ___ thought they$_i$ would flunk didn't flunk.
b. * The students who$_i$ they$_i$ thought ___ would flunk didn't flunk.

In (3a-b) the pronoun *they*$_i$ and *who*$_i$ are coindexed. In (3b) *they*$_i$ is crossed by the co-referential constituent *who*$_i$, which violates the Cross Over Condition, but in (3a) *who*$_i$ does not cross *they*$_i$, so no Cross Over Condition violation occurs. This condition appears to be applied to CD in (4) and CSD in (5).

(4) a. More students flunked than ___$_i$ thought they$_i$ would (flunk).
b. * More students flunked than they$_i$ thought ___$_i$ would (flunk).

(Bresnan 1975: 29)

[1] However Bresnan (1975) insists that no Ā-movement occurs in the comparative clauses. Although CD and CSD behave like a movement rule with respect to applicability of constraints on transformations, they are analyzed as a rule which deletes a constituent 'across a variable,' according to Bresnan (1975).

(5) a. As many new students flunked as ___ old students$_i$ imagined they$_i$ would (flunk).
b. *As many new students flunked as they$_i$ imagined ___ old students$_i$ would (flunk).

(Bresnan 1975: 57)

(4) and (5) are exactly parallel to (3). In (4a), the pronoun *they* can refer to the removed constituent (or *x many students* according to Bresnan's (1973) analysis) but in (4b) it can not be co-referential with *x many students*. Similarly in (5a) *they* is allowed to co-refer with *x many old students*, and in (5b) *they* is not allowed to. So we can say that the removed constituents in (4) and (5) behave like the traces in (3).

Next Bresnan (1975) observes Ross's Constraints on Variables, e.g. the Complex NP Constraint, the Coordinte Structure Constraint, and the Sentential Subject Constraint. Firstly the Complex NP Constraint (stated in (6)) prohibits extraction from a complex NP with a lexical noun head as seen in (7).

(6) The Complex NP Constraint
No element contained in a sentence dominated by a noun phrase with a lexical head noun may be moved out of that noun phrase by a transformation.
(7) a. *How hard did you believe the claim that these problems would be?
b. How hard did you believe that these problems would be?

CD and CSD can also be applied to this constraint.

(8) a. *Wilt is taller than he believes the claim that he is ___.
b. Wilt is taller than he believes that he is ___.

(ibid.: 35)

(9) a. *We ended up buying as many oranges as we had discussed a plan to buy ___ apples.
b. We ended up buying as many oranges as we had planned to buy ___ apples.

(ibid.: 56)

The ungrammatical sentences in (8) and (9) have gaps in the complex NPs. They will become grammatical when the gaps do not appear in complex NPs. These facts indicate that CD and CSD sentences obey the Complex NP Constraint.

Secondly the same discussion can also be given in the Coordinate Structure Constraint. This constraint, illustrated in (10), is applied to (11a).

(10) No conjunct in a coordinate structure may be moved, nor may any element in a conjunct be moved.
(11) a. *How hard do you consider these problems onerous and ___?
b. How onerous and hard do you consider these problems ___?

Ross claims that (11a) is ungrammatical because one conjunct 'how hard' is extracted from coordinate structure and the other conjunct 'onerous' remains, although (11b) is grammatical

because the entire coordinate structure is extracted. The similar phenomenon is seen in the examples of CD and CSD too.

(12) a. *Wilt is taller than Bill is strong and ___.
b. *Wilt is taller than Bill is so strong and __ wide. (Bresnan 1975: 35)
c. *Dean drank more booze than Frank ate a lot of Wheaties and Sammy drank ___ milk. (ibid.: 56)

Let us compare (12) with the following examples. If the rule of 'across the board' is applied, they will be well-formed.

(13) a. Wilt is taller than Bill is ___ strong.
b. Wilt is taller than Bill is ___ strong and ___ wide.
c. Dean drank more booze than Frank ate ___ Wheaties and Sammy drank ___ milk.

Thirdly the Sentential Subject Constraint in (14) prohibits extraction from the sentential subject, which explains the following grammaticality.

(14) No element may be extracted from the sentential subject of a sentence.
(15) a. *How hard is [that they will be ___] likely?
b. How hard is it likely that they will be___?

(15b) is grammatical because *how hard* is extracted from the complement position. On the other hand (15a) is ungrammatical since it is moved out of the subject position. CD and CSD obey a constraint like this as follows.

(16) a. *Wilt is taller than [that he is ___] is generally believed.
b. Wilt is taller than it is generally believed [that he is ___]. (ibid.: 35)
(17) a. *You have as many reasons for leaving him as [that he has ___ for leaving you] is likely.
b. You have as many reasons for leaving him as it's likely [that he has ___ for leaving you]. (ibid.: 56)

The (a)-sentences are ungrammatical since the gaps are in the sentential subject of comparative clause, while the (b)-sentences are licensed since the gaps are in the complement position.

From these observations Bresnan (1975) concludes that there is a parallelism between CD/CSD and *wh*-movement. But there are some problems in this analysis, according to Grimshaw (1987), Corver (1993), and Kennedy (2002). CD and CSD sometimes behave differently. In the first place CSD constructions (the (a)-sentences below) do not obey *that*-trace effect, although CD constructions (the (b)-sentences below) do.

(18) a. Even fewer books were published than we expected (*that) would be.
b. Even fewer books were published than we expected (that) magazines would be. (Grimshaw 1987: 665)

(19) a. More boys flunked than I predicted (*that) would pass.
b. More boys flunked than I predicted (that) girls would pass.
(Kennedy 2002: 561-562)

In the second place CSD construction does not allow parasitic gaps while CD sentences license them. Compare (20a) with (20b) and (21).

(20) a. I threw away more books than I kept without reading *e*.
b. *I threw away more books than I kept magazines without reading e.
(ibid.: 561)

(21) *I throw away more books than I file papers without reading *e*.
(Grimshaw 1987: 665)

Finally according to Corver (1993) *multiply-headed comparatives* are acceptable as seen in English CSD sentences in (22a). Multiply-headed comparatives are expressions in which there are more than one pair of compared constituents, e.g. the pair of *girls* and *boys* in addition to that of *dolls* and *pencils* in (22a). We can say that there is an asymmetry between CSD and *wh*-movement because extraction of more than one *wh*-element is actually forbidden in English as in (22b).

(22) a. John gave [more girls] [more dolls] than he had given [__ boys] [__ pencils]
b. *I don't know [$_{CP}$ who$_i$ where$_j$ [$_{IP}$ John will meet t_i t_j]].
c. I don't know who John will meet where. (Corver 1993: 776)

Such a difference is true of Dutch. Dutch licenses multiply-headed comparatives but does not multiple *wh*-questions as illustrated in (23).

(23) a. Jan heeft [meer meisjes] [meer peren] gegeven
John has [more girls] [more pears] given
dan Marie [__ jongens] [__ appels] heeft verkocht.
than Mary [__ boys] [__ apples] has sold
'John gave more girls more pears than Mary sold boys apples.'
b. Ik weet niet [$_{CP}$ wie$_i$ waar$_j$ [$_{IP}$ Jan t_j t_i zal ontmoeten]].
I know not [$_{CP}$ who$_i$ where$_j$ [$_{IP}$ John t_j t_i will meet]]
'* I don't know [$_{CP}$ who$_i$ where$_j$ [$_{IP}$ John will meet t_i t_j]].'
(ibid.: 775)

Considering these problems, it may be concluded that while CD construction is similar to *wh*-movement, CSD construction is not.[2]

2.2 No Extraction in CSD

[2] However I will argue that CSD should not be separated from CD later. The asymmetry seen in CD and CSD will be reanalyzed in 3.7.

Grimshaw (1987) and Corver (1993) claim that an operation like *wh*-movement occurs in CD but it does not in CSD. Grimshaw (1987) analyzes that Subdeletion should be separated from Comparative Deletion in that Subdeletion involves no extraction, since several facts make the movement analysis suspicious: e.g. application of the ECP effects, parasitic gap licensing, and so on. As for ECP effects, although Bresnan (1975) argues that *that*-trace effect is found in CSD, the presence or absence of this effect certainly has much less effect than in CD (as we have just seen in 2.1). With regard to parasitic gaps CD can license them but CSD cannot. (See (20)-(21).) These facts are repeated below:

(24) *that*-trace effect
  a. Even fewer books were published than we expected (*that) would be. (=18a)
  b. Even fewer books were published than we expected (that) magazines would be. (=18b)

(25) parasitic gap
  a. I threw away more books than I kept without reading *e*. (=20a)
  b. *I threw away more books than I kept magazines without reading *e*. (=20b)

So Grimshaw (1987) concludes that there is no QP extraction[3] in CSD, but does not examine in detail how CSD construction is actually generated.

On the other hand, Corver (1993) claims that there is a coordinate-like structure in CSD construction, and that *than* or *as* functions as a coordinator. For example, the sentence (26a) has the structure like (26b), according to Corver.

(26) a. [$_{IP}$ Mary bought more cookies than Pete had sold [*e* candies]]
  b. more x_i $\left[\begin{array}{l}[_{IP}\text{ Mary bought }[x_i\text{ cookies}]]\\ [_{IP}\text{ Pete had sold }[x_i\text{ candies}]]\end{array}\right]$ than

(Corver 1993: 779)

Corver (1993) proposes that the antecedent clause (or the first IP) and the subcomparative clause (or the second IP) enter into a coordinating relation, and that the empty category is construed as a variable being locally Ā-bound by the raised quantifier in the antecedent clause, *more*, in an across-the-board fashion at LF.

Some facts are raised to prove that CSD has a coordinate-like structure. First it allows gapping as illustrated in (27a) and (27b) for English and Dutch, respectively. Second, CSD sentences exhibit right-node-effects (see (28)). Third, across-the-board syntactic movement occurs in CSD constructions, as seen in (29a), where the *wh*-phrase *which actress* has been moved in an ATB fashion to Spec CP. (29b) involves a movement which appears to violate the Coordinate Structure Constraint.

(27) a. John knows more Romance languages than Pete Germanic languages.
  b. Jan kent meer Romaanse talen dan Piet Germaanse talen.

(28) As many women like, as men hate [the man with the red beard].

(29) a. Which actress$_i$ do as many women hate t_i as men like t_i?
  b. *Which actress$_i$ do as many women hate t_i as men like Sue?

[3] The QP is a null degree term, for example, null form of *x-many* or *that many* in DP.

(Corver 1993: 777)

These are characteristics of coordinate structures, and lead to the assumption that subcomparative clauses are coordinated with their antecedent clauses.

Furthermore the following parallelism effect in CSD indicates that they involve ATB-like movement.

(30) a. John killed [more Englishmen] than the Inquisition burned [___ Frenchmen].
b. *John killed [more Englishmen] than [___ Frenchmen] fought the Inquisition.
(31) a. [More Frenchmen] revered John than [___ Englishmen] adored Sir Thomas.
b. *[More Frenchmen] revered John than Sir Thomas converted [___ Englishmen]. (ibid.: 777-778)

In (30a) the two compared NPs are direct objects, and in (31a) they are subjects. In the ill-formed (b)-sentences the compared NPs are not in parallel positions, that is to say, in (30b) the first NP is in Comp-VP and the second one is in Spec-VP, and in (31b) the first one is in Spec-VP and the second one is in Comp-VP.

From these facts Corver (1993) claims that the first IP and the second IP are in a coordinating relation. The quantifier *more* is raised out of the NP in the antecedent clause, and consequently the gap within the comparative clause, which is construed as variables, can be Ā-bound in ATB fashion by the raised quantifier 'more'.

However there is a problem in Corver's analysis. Certainly it is assumed that *than*/*as* in English and *dan*/*als* in Dutch might function as coordinators from (27)-(31). But the Hebrew words corresponding to *than*/*as* do not behave like coordinators (Hazout (1995)), which is shown in (32).

(32) a. yeS anaSim Se Dan ohev afilu yoter mi-aSer et Dina
there.are people that Dan loves even more than ACC Dina
'There are people that Dan loves even more than Dina.'
b. ma Dan sone yoter mi-aSer la-lexet le beyt sefer
what Dan hates more than to.go to school
'What does Dan hate more than going to school?' (Hazout 1995: 30)

Supposing the word *mi-aSer* coordinates the antecedent and comparative clause, then the extraction seen in (32) should lead to a violation of ATB rule because one only conjunct is extracted out of the coordinate structure. Thus we can say that it is untenable to claim that the antecedent clause and comparative clause are in a coordinating relation.

2.3 Overt Movement in CD and Covert Movement in CSD

Kennedy (2002) insists that Ā-movement occurs both in CD and in CSD but it occurs overtly in CD while covertly in CSD. I would like to investigate his analysis, classifying the following three points: (i) Both CD and CSD involve Ā-movement, (ii) CD undergoes overt movement and CSD does covert movement, and (iii) what is moved is the entire DP (the

compared constituent). He gives some evidence for his claim as follows.

Firstly the island condition and the Cross Over Condition are taken as the evidence for the claim that Ā-movement occurs in CD and CSD. As for island conditions we have checked them in the examples (6) – (17). Kennedy gives other examples to show the island effect.

(33) *Complex NP Constraint*
  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.
(34) Wh-*Island*
  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.
(35) *Adjunct Condition*
  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.
(36) *Sentential Subject Condition*
  a. *There are more stars in the sky than that the eye can see is certain.
  b. *There are more stars in the sky than that the eye can see planets is certain.
(Kennedy 2002: 558)

Both CD and CSD obey such constraints as are applied to the trace of *wh*-element.

Furthermore we saw the examples (4) and (5), which seem to obey the constraint like Cross-Over Condition in section 2.1. Another two pairs of examples are given in Kennedy (2002) as follows.

(37) a. More Democrats$_i$ voted than they$_{*i/j}$ expected to vote.
  b. More Democrats$_i$ voted than their$_{?*i/j}$ friends expected to vote.
(38) a. More Democrats voted than they$_{*i/j}$ expected Republicans$_i$ to vote.
  b. More Democrats voted than their$_{*}$i/j friends expected Republicans$_i$ to vote.
(ibid.: 559)

(37) demonstrates that CD shows both strong and weak Cross Over effects, and (38) makes the same point for CSD.

Secondly the claim that the level where movement occurs is different between CD and CSD is supported by *that*-trace effect, contraction, multiply-headed comparatives and parasitic gap. The asymmetry seen in *that*-trace effect was pointed out in section 2.1.

(39) a. More books were published than the editor said (*that) would be.
  b. More books were published than the editor said (that) articles would be.
(ibid.: 561)

In CD construction the gap cannot immediately follow *that*, although in CSD construction the gap can. Hence we can say that CD construction shows *that*-trace effect but CSD construction does not. Here Kennedy (2002) claims that *that*-trace effect does not apply to covert movement, providing evidence as seen in (40).

(40) a. Which student made sure that which speaker got home safely?
b. Some student made sure that each speaker got home safely.

(40) indicates *that* can be followed by the trace which results from covert movement. If the effect does not work at LF, then we can say that the movement of CSD occurs at LF since CSD does not obey the effect either.

Next let us consider the following examples of compatibility with the contracted copula *be*.

(41) a. I thought there was more meat than there is/*'s.
b. John was more upset then than he is/*'s now.
(42) a. There's more meat than there's rice.
b. John was more upset then than he's angry now. (Kennedy 2002: 561)

When there is a gap just behind the copula, the copula cannot be contracted (Bresnan (1973)).[4] As is seen in (41), in CD construction the gap does not allow contracted *be*. Here the parallelism can also be seen between CD and overt *wh*-movement. And in CSD construction the gap allows contracted *be* as in (42). Now contraction is possible before an in situ *wh*-phrase as illustrated in (43).

(43) a. Who said there's how much rice?
b. Which team's how likely to win?

There is a parallelism between CSD and covert *wh*-movement.[5] Again he insists that if CSD involves covert movement, then it should have properties similar to in-situ *wh*-phrases.

As third evidence for the different level of Ā-movement between CD and CSD, he takes examples of multiply-headed comparatives like the sentences in (44).

(44) a. *Christmas makes as many children as happy as birthdays make.
b. Christmas makes as many children as happy as it makes adults unhappy.
(Kennedy 2002: 562)

CD sentences do not allow multiply-headed comparatives while CSD sentences allow it as

[4] Bresnan (1975) provides evidence for this claim as follows:

(i) a. Mary's happy about her work, and John's happy about his children.
b. * Mary's happy about her work, and John's _____ about his children.
c. Mary's happy about her work, and John is ____ about his children.

Contraction of the tensed auxiliary is inhibited directly in front of a removal site. (ib) is not grammatical because contraction of *is* is prohibited directly in front of the place from which *happy* has been deleted.

[5] However there are some counterexamples to Kennedy's claim. Bresnan (1973) pointed out that contraction is not licensed in CSD too.

(i) a. * The table is longer than the door's wide.
b. * I'm sadder than I'm angry.

The judgment on license of contraction seems to vary. Hence the argument given in (41)-(43) may not make sense.

above. Such contrast appears in *wh*-questions too. In English more than one *wh*-element can not move overtly but can move covertly as is well known. So he insists that CD sentences correspond to the sentences including overt *wh*-movement and CSD sentences correspond to the examples of covert *wh*-movement.

Furthermore he argues that parasitic gaps also indicate the parallelism between overt/covert *wh*-movement and CD/CSD constructions respectively. We saw the examples of parasitic gap in (20), whose PF representation is presented below.

(45) a. I threw away more books than [$_{CP}$ [$_{DP}$ books]$_i$ I kept [$_{DP}$ books]$_i$ without reading e_i]
b. *I threw away more books than [$_{CP}$ I kept [$_{DP}$ papers]$_i$ without reading e_i]

Here parasitic gaps are licensed by the trace which is produced by Ā-movement. They are licensed when the Ā-movement occurs overtly but not when it occurs covertly. Such difference is illustrated in the following examples.

(46) a. [$_{CP}$ [$_{DP}$ How many books]$_i$ did you keep [$_{DP}$ how many books]$_i$ without reading e_i]
b. *[$_{CP}$ Who kept [$_{DP}$ how many papers]$_i$ without reading e_i]

Again CD behaves like overt *wh*-movement and CSD does like covert *wh*-movement. So he claims that the CD sentence (45a) has undergone overt movement but the ungrammatical sentence of CSD (45b) has not. From the discussion so far Kennedy (2002) concludes that CD sentences involve overt Ā-movement while CSD sentences involve covert Ā-movement.

Thirdly he claims that the moved element in CD and CSD sentences is 'entire compared constituent.' If this claim is correct, we can avoid violation of the Left Branch Condition (henceforth LBC) because we do not assume the movement of degree term, the left branch of DP. LBC, which is defined in (47), explains the ungrammatical examples in (48).

(47) No noun phrase on the left branch of another noun phrase may be extracted from that noun phrase.
(48) a. *How many does Dennis have tattoos?
b. *How (much) are your feet long?
(49) a. How many tattoos does Dennis have?
b. How long are your feet?

LBC prohibits the movement of the left-branch degree term out of DP as seen in (48). But moving the entire DP makes the examples grammatical as in (49).

Turning to CD/CSD sentences like (50a) and (50b), his analysis avoids the problem with the LBC since the moved element is considered as the entire DP. Let us consider the following examples.

(50) a. Michael has more scoring titles than Dennis has.
b. Michael has more scoring titles than Dennis has tattoos. (=2a)

In Kennedy's analyses, neither CD nor CSD involve movement out of a left branch, but movement targets the entire compared constituent (e.g. [$_{DP}$ *Op* scoring titles] in (50a)). So the representation (51) is incorrect according to Kennedy:

(51) Michael has more scoring titles than [$_{CP}$ *Op* Dennis has [$_{DP}$ *Op* scoring titles]]

Instead it is claimed that (52a) is the plausible LF representation of the CD sentence (50a) and (52b) is that of the CSD sentence (50b).

(52) a. Michael has more scoring titles than [$_{CP}$ [$_{DP}$ D^0_C scoring titles] Dennis has [$_{DP}$ D^0_C scoring titles]]
b. Michael has more scoring titles than [$_{CP}$ [$_{DP}$ D^0_C tattoos] Dennis has [$_{DP}$ D^0_C tattoos]]

Thus Kennedy insists we need not to assume violation of LBC in grammatical examples like (50a) and (50b) if we claim that in both CD and CSD sentences what moves is not the left branch of DP, but the entire DP.

To sum up, Kennedy (2002) argues that all clausal comparatives in English involve Ā-movement of the compared constituent to the specifier of clausal complement of *than*, but that the two constructions differ in the level where this movement applies. The crucial points are summarized in (53).

(53) English Comparative Formation
i. CD involves overt movement of the compared constituent to the specifier of a clausal complement of *than*/*as*, plus deletion under identity with the head of the comparative.
ii. CSD involves covert movement of the compared constituent to the specifier of a clausal complement of *than*/*as*.

Moreover this leads to the following two predictions:

(54) i. CD and CSD should behave the same regarding constraints on LFs.
ii. All syntactic differences between the two types of comparatives should be localized to PF.

However there are some problems with this claim. In the first place it is unclear why the deletion of the second DP (i.e. DP in the comparative clause) is needed in CD constructions. When it is not deleted, the sentence will be ungrammatical as illustrated in (55) and (56). (55) is an English example, and (56) is Japanese one. The DPs *stars* and *ronbun* remain in *than*-clause in (55b) and (56b) respectively, which makes the examples ill-formed. They will be grammatical if the DPs are deleted as in (55a) and (56a).

(55) a. The galaxy contains more stars than the eye can see.
b. *The galaxy contains more stars than the eye can see stars.

(56) a.	Taro-wa	Hanako-ga	kaita-yori-mo	nagai	ronbun-o	kaita.
	Taro-TOP	Hanako-NOM	wrote+than	long	paper-ACC	wrote

'Taro wrote a longer paper than Hanako wrote.'

b. *Taro-wa Hanako-ga ronbun-o kaita-yori-mo nagai ronbun-o
Taro-TOP Hanako-NOM paper-ACC wrote+than long paper-ACC
kaita.
wrote
'Taro wrote a longer paper than Hanako wrote a long paper.'

In the second place we can not explain why the CSD sentences like (57a-d) are ill-formed.

(57) a. *Pico wrote a more interesting novel than Brio wrote a ___ play.
b. *Erik drives a more expensive car than Polly drives a ___ motorcycle.
c. *Jones produced as successful a film as Smith produced a ___ play.
d. *The Cubs started a more talented infield than the Sox started an ___ outfield.
(Kennedy and Merchant 2000: 92)

If DP or VP is deleted in the comparative clause, they will be grammatical.

(58) a. Pico wrote a more interesting novel than Brio {wrote, did, expected, Φ} ___ .
b. Erik drives a more expensive car than Polly {drives, does, said, Φ} ___.
c. Jones produced as successful a film as Smith {produced, did, had hoped, Φ} ___.
d. The Cubs started a more talented infield than the Sox {do, started, think, Φ} ___. (ibid.: 94)

We cannot account for the necessity of deletion as seen in (58). For another they are ameliorated when the VPs have pseudogap too.

(59) a. Pico wrote a more interesting novel than Brio did a ___ play.
b. Erik drives a more expensive car than Polly does a ___ motorcycle.
c. Jones produced as successful a film as Smith did a ___ play.
d. The Cubs started a more talented infield than the Sox did an ___ outfield.
(ibid.: 98)

It is not clear why some CSD sentences are licensed without applying deletion as we saw in (50b) while other CSD sentences cannot be licensed without deletion as illustrated in (58)-(59). We will consider how the pseudogapping and DP or VP deletion improves the ungrammatical CSD in section three.

Finally in Japanese and Bulgarian CSD sentences are prohibited while the CD ones are allowed.

(60) Bulgarian CD

a. Az imam po-golijam apartamen otkolkoto ti imaš.
I have bigger apartment than+how.much you have
'I have a bigger apartment than you have.'

b. Ivan napisa po-dobar roman otkolkoto Saša.
Ivan wrote better novel than+how.much Sasha
'Ivan wrote a more successful novel than Sasha (did).'
(Kennedy and Merchant 2000: 109)

(61) Bulgarian CSD

a. *Az imam po-golijam apartamen otkolkoto ti imaš kušta.
I have bigger apartment than+how.much you have house
'I have a bigger apartment than you have a house.'

b. *Ivan napisa po-dobar roman otkolkoto Saša napisa drama.
Ivan wrote better novel than+how.much Sasha wrote play
'Ivan wrote a more successful novel than Sasha wrote a play.'
(ibid.: 107-108)

(62) Japanese CD

a. Taro-wa Hanako-ga kaita yori(mo) nagai ronbun-o kaita.
Taro-TOP Hanako-NOM wrote than long paper-ACC wrote
'Taro wrote a longer paper than Hanako wrote.'

b. Taro-wa Hanako-ga katta yori(mo) takai kuruma-o katta.
Taro-TOP Hanako-NOM bought than expensive car-ACC bought
'Taro bought a more expensive car than Hanako bought.'

(63) Japanese CSD

a. *Taro-wa Hanako-ga syosetu-o kaita yori(mo)
Taro-TOP Hanako-NOM novel-ACC wrote than
nagai ronbun-o kaita.
long paper-ACC wrote
'Taro wrote a longer paper than Hanako wrote a novel.'

b. *Taro-wa Hanako-ga ie-o katta yori(mo)
Taro-TOP Hanako-NOM house-ACC bought than
takai kuruma-o katta.
expensive car-ACC bought
'Taro bought a more expensive car than Hanako bought a house.'

If Japanese licenses covert *wh*-movement, it cannot be explained why Japanese does not allow CSD sentences, which are analyzed as involving covert Ā-movement in Kennedy (2002). Furthermore we cannot explain clearly why Bulgarian cases also prohibit CSD sentences.

In the next section we will solve the problems which have been given so far and will present an alternative analysis of derivation of the CD/CSD sentences.

3 PROPOSAL

3.1 Movement Analysis for CD/CSD

First of all I agree with Kennedy (2002) in thinking that CD/CSD sentences undergo Ā-movement. The English examples applied to island effect or Cross Over Condition support this claim, and some Japanese sentences can also be given as the evidence for this analysis. The following examples are Japanese CD sentences. They have the canonical properties of *wh*-movement.

(64) a. [John-ga *e* yonda to] Tom-ga uwasasiteiru yori(mo)] Mary-wa
John-NOM read C^0 Tom-NOM rumor than Mary-TOP
takusan-no hon-o yonde-ita.
many-GEN book-ACC read-had
'Mary had read more books than Tom rumors that John read.'

b. *[Paul-ga [e_i e_j yonda hitoi]-ni atta yori(mo)$_j$] John-ga
Paul-NOM read person-to met than John-NOM
takusan-no hon-o yonda.
many-GEN book-ACC read
'John read more books than Paul met a man who read.'

c. *[Minna-ga [naze Paul-ga *e* yonda-ka] siritagatteiru yori(mo)]
everyone-NOM why Paul-NOM read-Q know-want than
John-ga takusan-no hon-o yonda.
John-NOM many-GEN book-ACC read
'John read more books than everyone wants to know why Paul read.'

(Watanabe 2003: 526)

(65) a. *Zibun-tati-ga rakudaisita koto-ga *e* odorokasita yorimo
self-PL-NOM flunked fact-NOM *e* surprised than
harukani takusan-no gakusei-o Bill-ga rakudaisita
far many-GEN students-ACC Bill-NOM flunked
koto-ga odorokasita
fact-NOM surprised
'The fact that Bill flunked surprised far more students than the fact that they$_i$ flunked surprised e_i.'

b. Ronbun-nituite ieba Bill-wa John-ga London-de pg_i kaita
article-about say Bill-TOP John-NOM London-at pg_i wrote
ato Paris-de e_i happyousita yorimo ooku-no ronbun-o
after Paris-at e_i published than many-GEN article-ACC
America-de kaite-ita.
America-at write-had
'As for the articles, Bill wrote more articles in America than John had published e_i in Paris after he wrote pg_i in London.'

(Kennedy 2002: 610)

(64a) indicates that in Japanese CD sentences the empty category is allowed to be in the embedded clause [*John-ga* e *yonda to*], but (64b) and (64c) show that it cannot be within the complex NP or *wh*-island. And (65a-b) shows that Japanese CD sentences obey Cross Over Condition and license parasitic gaps. So, here in Japanese again, the empty category

considered to be in the comparative clause behaves like the trace of Ā-movement.

Furthermore Japanese allows multiply-headed comparatives in CD construction as follows. There is parallelism between CD and *wh*-movement in that both of them are able to operate on more than one element in Japanese.

(66) a. Taro-wa Hanako-ga teishutusita yori(mo) motto nagai
Taro-TOP Hanako-NOM submitted than more long
ronbun-o motto ooku-no gakkai-ni teisyutusita.
paper-ACC more many-GEN society-to submitted
'Taro submitted a longer paper to more societies than Hanako did.'

b. Taro-wa Hanako-ga utta yori(mo) motto ooku-no hito-ni
Taro-TOP Hanako-NOM sold than more many-GEN person-to
motto ooku-no hon-o utta.
more many-GEN book-ACC sold
'Taro sold more people more books than Hanako sold.'

We will investigate the multiply-headed comparatives further in section 3.6.1.

What we have seen so far makes it clear that CD and CSD sentences involve the Ā-movement. However, I find it dubious that the level where movement occurs is different between CD and CSD sentences. I think it more plausible to claim that the Ā-movement occurs in overt syntax in both CD and CSD constructions, considering the facts which were pointed out at the end of the previous section.

In the following section, I would like to analyze when the movement occurs, what is moved, why the movement must occur and why some elements must be deleted. All the problems considered, it is quite likely that only the operators (the degree terms such as the null form of *more*) are moved in the overt syntax in both CD and CSD sentences.

3.2 The Problems We Need to Solve

I would like to check the problems again before we move on to the proposal. A few matters are raised about Kennedy's (2002) claim that in CD the entire DP (the compared constituent) moves overtly and in CSD the entire DP moves covertly. The problems are as follows: (i) It is unclear why CD must undergo deletion because if what is moved is the entire DP, the violation of LBC does not occur and there is nothing that forces deletion. (67) illustrates the problem.[6]

(67) a. The galaxy contains more stars than the eye can see. (=55a)
b. *The galaxy contains more stars than the eye can see stars. (=55b)

(ii) It is not also apparent why CSD must involve deletion as shown in the contrast between

[6] More examples have been given in (56).

(68a) and (68b)[7] or as illustrated in the examples of pseudogapping (68c).[8]

(68) a. *Pico wrote a more interesting novel than Brio wrote a ___ play. (=57a)
b. Pico wrote a more interesting novel than Brio. (=58a)
c. Pico wrote a more interesting novel than Brio did a ___ play. (=59a)

(iii) Kennedy (2002) cannot explain why the level of movement differs between CD and in CSD. It is strange to predict that in the process of derivation some element must be moved covertly only because the comparative clause has a complete sentence, or that the element must be moved overtly only because the comparative clause has an incomplete sentence.

(iv) If the entire DP moves, then we must assume pied-piping of the null operator and lexical constituent, which is regarded as inappropriate operation as seen in the following examples of *wh*-movement.

(69) a. the editor [to whom he gave his novel]
b. *the editor [to (that) he gave his novel]
(70) a. the editor [whose books he admires]
b. *the editor [Ns books (that) he admires]

(v) We cannot clarify what prohibits Japanese or Bulgarian from generating CSD sentences. Let us repeat the examples (60)-(63) below.

(71) Bulgarian CD/CSD
a. Az imam po-golijam apartamen otkolkoto t_i imaš.
I have bigger apartment than+how.much you have
'I have a bigger apartment than you have. (=60a)
b. *Az imam po-golijam apartamen otkolkoto t_i imaš kušta.
I have bigger apartment than+how.much you have house
'I have a bigger apartment than you have a house.' (=61a)

(72) Japanese CD/CSD
a. Taro-wa Hanako-ga kaita yori(mo) nagai ronbun-o kaita.
Taro-TOP Hanako-NOM wrote than long paper-ACC wrote
'Taro wrote a longer paper than Hanako wrote.' (=62a)
b. *Taro-wa Hanako-ga syosetu-o kaita yori(mo)
Taro-TOP Hanako-NOM novel-ACC wrote than
nagai ronbun-o kaita.
long paper-ACC wrote
'Taro wrote a longer paper than Hanako wrote a novel.' (=63a)

Taking the problems above into consideration, I would like to propose that CD and CSD are not basically considered as different, that is, in both cases only the operator moves in overt syntax. Section 3.3 discusses the problem (iii) and (iv) and then 3.4 deals with the problem (i) and (ii). In section 3.5 I would like to discuss the motivation of Ā-movement in CD/CSD. 3.6 summarizes our claim and shows how our analysis solves the problems (i)-(iv),

[7] See (57) and (58) for more examples.
[8] This paper considers pseudogapping as deletion operation including movement of VP complement according to Johnson (2001). It will be examined further in section 3.4.2.

and 3.7 will discuss CSD sentences and multiply-headed comparatives further. Finally section 3.8 will focus on the problem (v) concerning Japanese examples of CD/CSD and will show that they support our claim.

3.3 Overt Movement of the Degree Term

Here I will take up the problem (iii) and (iv) raised in the previous section, that is, problems for the claim that the time movement occurs is different between CD and CSD, and that the entire DP moves with pied-piping null element and lexical element. To avoid these problems I assume that *both* CD and CSD sentences involve *overt* movement of the operator (the degree term in the comparative clause). Let us take some examples to see how to derive CD and CSD.

(73) a. Michael Jordan has more scoring titles than Dennis Rodman has.
b. Michael Jordan has more scoring titles than Dennis Rodman has tattoos.

Suppose these examples in (73) have the following LF representations.

(74) a. Michael Jordan has more scoring titles [$_{CP}$ *Op*$_i$ than [$_{IP}$ Dennis Rodman has [$_{DP}$ *e*$_i$ scoring titles]]]
b. Michael Jordan has more scoring titles [$_{CP}$ *Op*$_i$ than [$_{IP}$ Dennis Rodman has [$_{DP}$ *e*$_i$ tattoos]]]

Both in (74a) and (74b) the operator moves from DP to the Spec CP overtly. The difference between them is only in their DPs: (74a) has the same DP in the comparative clause as the DP in the antecedent clause (‘scoring titles’); on the other hand, *than*-clause of (74b) has the DP *tattoos*, which is different from the DP in the antecedent clause.

Our proposal does not provoke the problems raised above, but there appears another problem; if the left node of entire DP alone is moved, the LBC will be violated. This matter will be considered in the following section.

3.4 Why CD and CSD must Undergo Deletion

This section deals with the problem (i) and (ii); why do CD and CSD have to delete DPs or VPs in comparative clauses?

3.4.1 On Comparative Deletion

(75) a. The galaxy contains more stars than the eye can see.
b. *The galaxy contains more stars than the eye can see stars.

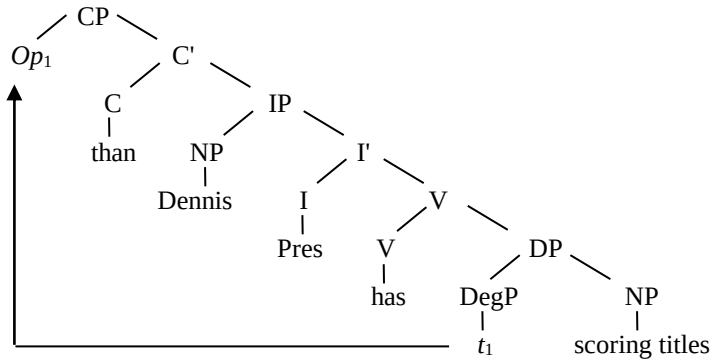
(76) a. Michael Jordan has more scoring titles than Dennis Rodman has.
b. *Michael Jordan has more scoring titles than Dennis Rodman has scoring titles.

If the entire DP ([$_{DP}$ *Op* stars] in (75a) and [$_{DP}$ *Op* scoring titles] in (76a)) moves, we cannot explain why the deletion of the DP is needed. On the other hand if the operator alone moves, then it can be said that it is because the LBC is violated that the DP must be deleted. The LBC is a PF condition, so the violation is avoided if elements are deleted including the left branch which has undergone violable movement, according to Merchant (2001) etc.

Thus our analysis can account for the necessity of deletion. (75b) and (76b) are ungrammatical because deletion of [$_{DP}$ *e* stars] and [$_{DP}$ *e* scoring titles] does not occur after the movement from left branch of DP, while (75a) and (76a) are grammatical due to the deletion of the DP. (78) shows how to derive the comparative clause of (77):

(77) Michael Jordan has more scoring titles than Dennis Rodman has. (=76a)

(78)



The Operator in DegP (the left branch of DP) is moved to Spec-CP, and then the DP (or the VP[9]) is deleted. The violable movement becomes invisible to LBC at PF owing to the deletion of DP (or VP).

3.4.2 On Comparative Subdeletion Next let us consider the following ungrammatical CSD sentences.

(79) a. *Pico wrote a more interesting novel than Brio wrote a ___ play.
b. *Erik drives a more expensive car than Polly drives a ___ motorcycle.
c. *Jones produced as successful a film as Smith produced a ___ play.
d. *The Cubs started a more talented infield than the Sox started an ___ outfield. (=57)

(80) indicates that such ungrammatical CSD sentences will ameliorate if they undergo the deletion of DP (or VP).

[9] Of course it is all right to delete VP instead of DP, which leads to the following sentence.

(i) Michael Jordan has more scoring titles than Dennis Rodman.

(80) a. Pico wrote a more interesting novel than Brio (wrote).
b. Erik drives a more expensive car than Polly (drives).
c. Jones produced as successful a film as Smith (produced).
d. The Cubs started a more talented infield than the Sox (started). (=58)

Here again in CSD, the deletion makes inappropriate movement invisible. Furthermore pseudogapping which targets VP will also make the ungrammatical CSD acceptable.

(81) a. Pico wrote a more interesting novel than Brio did a ___ play.
b. *Erik drives a more expensive car than Polly does a ___ motorcycle.
c. *Jones produced as successful a film as Smith did a ___ play.
d. *The Cubs started a more talented infield than the Sox did an ___ outfield. (=59)

Now I leave comparative (sub)deletion, turning to pseudogapping. Several studies have made on pseudogapping since it was introduced in Levin (1986). Let us take some examples for pseudogapping below.

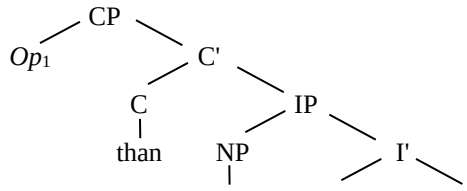
(82) a. While O. J. Berman read Fred, he didn't *e* Dickens.
b. Sally suspected Joe, but he didn't *e* Holly. (Johnson 2001: 459)

As shown in (82), something less than an entire VP is missing in the second clause. According to Johnson (2001), the *remnant*, the element left over from the VP (e.g. *Dickens* in (82a) and *Holly* in (82b)), is scrambled to the right node of VP, and then the VP is elided. What is important is that VP is elided, although there is little agreement on the operation before elimination of VP among various researchers.[10]

Let us now return to the examples of CSD in (81), in which the violation of LBC is avoided through the operation of pseudogapping (Kennedy and Merchant (2000)).[11] The remnant (e.g. *a play* in (81a) or *a motorcycle* in (81b)) is scrambled to the right node of VP and then the VP is elided, which makes (79) acceptable as in (81). (84) is the structure of *than*-clause in (83).

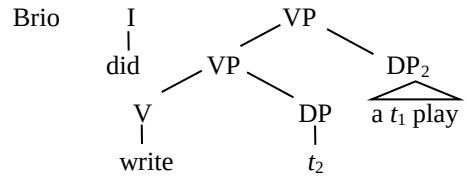
(83) Pico wrote a more interesting novel than Brio did a ___ play. (=81a)

(84)



[10] For example, Kuno (1981) proposes that the remnant is derived by Heavy NP Shift and Lasnik (1995) claims that it is the target of Object Shift. Johnson (2001) argues that it is the result of Dutch's scrambling, demonstrating that there is parallelism between the remnant and the scrambled element in Dutch.

[11] According to Kennedy and Merchant (2000) whether the violation of LBC occurs depends on the uninterpretable feature [+WH] on the F^0 which is considered to be within VP. If this feature remains in VP, it makes the sentences unacceptable, and if the feature is elided by deleting VP, it makes them acceptable.

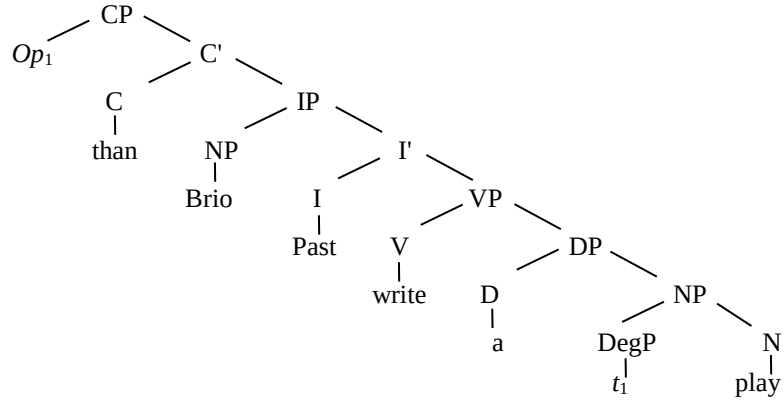


Following Johnson (2001), we assume that the entire DP [$_{DP2}$ a t_i play] is scrambled to the right node of VP and then the VP is elided. The deletion of VP makes the violable movement of Op_1 invisible to LBC, so (83) becomes acceptable.

Likewise, in (80a) deleting VP saves the ungrammatical sentences in (79a) from the violation of LBC and makes them grammatical. (86) shows the derivation of compared clause's in (80a).

(85) Pico wrote a more interesting novel than Brio (wrote). (=80a)

(86)



From what has been discussed in section 3.3 and 3.4, we can conclude that the degree term alone is overtly moved in CSD and deletion is needed to avoid the violation of LBC. If the entire DP is moved, or if the element is moved covertly, then it cannot be accounted for the necessity of deletion.

Now why does the operator have to be moved? In the following section we would like to consider what induces movement of the degree term.

3.5 What Motivates Movement

Chomsky (1995) claims that whenever a strong feature [F] is introduced into the derivation, it must be immediately checked off by Move. What undergoes movement is, strictly speaking, not a constituent but a feature. At LF features can move freely, but prior to Spell-Out movement of features produces Pied Piping for reasons of convergence at PF. Following this formulation, it is presumed that movement in CD/CSD construction is brought about in order to check the feature [+DEG] which exists in C^0. The feature [+DEG] in the operator agrees

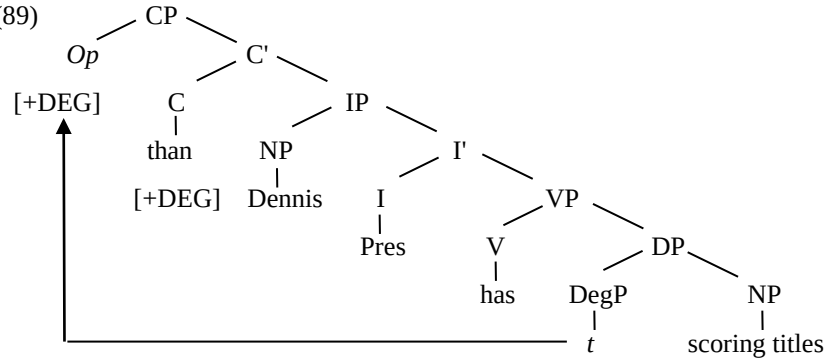
with the feature [+DEG] in C^0 in Spec-head relation so that the uninterpretable feature is erased.

And then VP or DP is elided to avoid the violation of LBC as has been noted in the previous section. If VP is deleted, only the subject NP will remain in the comparative clause, and if DP is deleted, the clause will include subject NP and V^0. To adduce an actual example, CD sentence in (87) is derived as illustrated in the structure (88) and (89).

(87) Michael has more scoring titles than Dennis has. (=76a)

(88) Michael has more scoring titles [$_{CP}$ *Op*$_{i[DEG]}$ than$_{[DEG]}$ [$_{IP}$ Dennis has t_i scoring titles]]

(89)

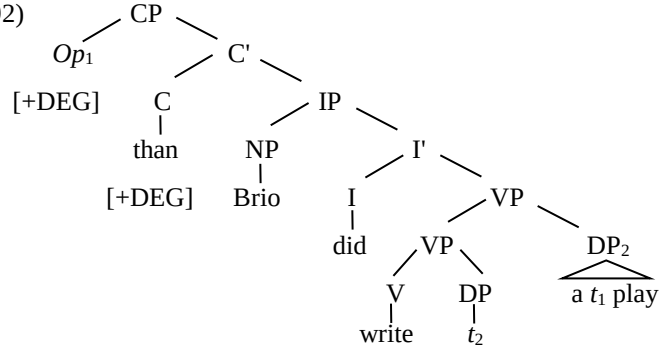


The operator moves in overt syntax to check the feature [+DEG] in C^0 so that the two [+DEG] features can agree in the Spec-head relation, and then DP is deleted as seen in (88) and (89). Similarly, in CSD like (90), the operator moves to check the feature [+DEG] in C^0 as illustrated in the structure in (90), (91) and (92).

(90) Pico wrote a more interesting novel than Brio did a ___ play. (=83)

(91) Pico wrote a more interesting novel [$_{CP}$ *Op*$_{i[DEG]}$ than$_{[DEG]}$ Brio [$_{VP}$ [$_{VP}$ did] [$_{DP}$ a ___ play]]]

(92)



In this manner, we can explain the reason movement must occur in the comparative clause, assuming the existence of [+DEG].

3.6 Problems Solved

Now let us consider how our analysis solves the problems (i)-(iv) raised in 3.1. First of all our analysis is summarized as follows:

(93) *Operator*, the degree term in (sub)comparative clause, moves *overtly* to the Spec-CP in order to check the uninterpretable feature [+DEG] in C^0.

This rule is applied to both CD and CSD. We consider they are not basically different, contrary to Kennedy's (2002) claim.

Our claim solves all the problems (i)-(iv):
(i) As for the requirement for deletion in CD, overt movement of the operator violates LBC, which forces deletion of DP or VP. (ii) The need for deletion in CSD is induced by the same operation. We can also account for the effect of pseudogapping on subcomparative clauses. (iii) With regard to the level of movement in CD and CSD, we assume the overt movement in both types, so the problem of the level should not arise. (iv) We can evade the problem of pied-piping of null elements and lexical ones, supposing that what is moved is only the operator.

The remaining problem (v) will be dealt with later. The next section will re-examine the evidence which was given in previous analyses to show that CD and CSD should be distinguished. We will show that our analysis can give another explanation for their evidence.

3.7 Further Consideration of Other Types of Comparative (Sub)deletion

3.7.1 Exceptional CSD So far we have considered why CD/CSD sentences which have not undergone deletion like (94a) and (94b) are ungrammatical.

(94) a. *Pico wrote a more interesting novel than Brio wrote a play. (=57a)
b. *Erik drives a more expensive car than Polly drives a motorcycle. (=57b)

But certain type of CSD sentences remains to be examined in detail. Some CSD sentences are grammatical even if they have not involved deletion. Now I will concentrate on the characteristics of such CSD sentences and how to derive them. Let us give their examples again in (95).

(95) a. Michael Jordan has more scoring titles than Dennis Rodman has tattoos. (=2a)
b. Mary brought more cookies than Pete had sold candies. (=26a)

As discussed in the previous section, such CSD sentences do not show *that*-trace effect, which is indicated in (96).

(96) a. Even fewer books were published than we expected (that) magazines would be. (=18b)

b. More boys flunked than I predicted (that) girls would pass. (=19b)
c. More books were published than the editor said (that) articles would be. (=39b)

And they do not allow parasitic gaps as seen in (97).

(97) a. *I threw away more books than I kept without reading *e*. (=20a)
b. *I threw away more books than I kept magazines without reading *e*. (=20b)

Now why do these examples show such special properties? Given that in such CSD sentences Ā-movement occurs, the phenomena shown in (96) and (97) can not be explained; in (96) the trace of the operator exists after *that*, which should violate *that*-trace effect; and in (97b) the parasitic gap should be licensed given that the trace is produced through overt Ā-movement.

Then I assume that QR occurs exceptionally in such examples as in (95). There are two reasons for this claim. Firstly the semantic difference is found between the special type of CSD we are considering now as in (95) and the 'standard' CSD we have considered in section 3.4.2 like (79)-(81). In the former case the moved operator has the meaning of 'a larger number of' while in the latter case the moved operator has the property of pure 'degree'. In other words, the former *more* is the comparative of *many* and the latter *more* is that of *much*. In fact *more* of pure 'degree' term does not allow CSD without deletion of DP or VP while *more* of 'a larger number of' does allow it. Compare the following (a)-sentences with (b)-sentences.

(98) a. *Michael has a more (= *er-much*) expensive bag than Dennis has a car.
b. Michael has more (= *er-many*) bags than Dennis has cars.
(99) a. *I bought more (= *er-much*) expensive shoes than I did that suit.
b. I bought more (= *er-many*) shoes than I did suits.

Secondly *more* of *er-many* is like a quantifier phrase. Actually following examples indicate that *more* as the comparative of *many* is quantificational.[12]

(100) a. Next year, as many women will be admitted as ___ men will be (admitted).
b. *Next year, as many women will be admitted as {most/many/enough/16/a few} men will be (admitted). (Bresnan 1975: 47)
(101) a. I have written a more successful play than I have a ___ novel.
b. *I have written a more successful play than I have ___ 10 novels.
(102) a. Dennis bought more new ties than he bought new shirts.
b. *Dennis bought more new ties than he bought some new shirts. (Kennedy and Merchant 2000: 140)
(103) Michael has more scoring titles than Dennis has (*two/*many) tattoos. (Kennedy 2002: 554)
(104) a. Mary bought more cookies than Pete had sold candies.
b. *Mary bought more cookies than Pete had sold three candies.

[12] This claim is based upon Bresnan (1973, 1975).

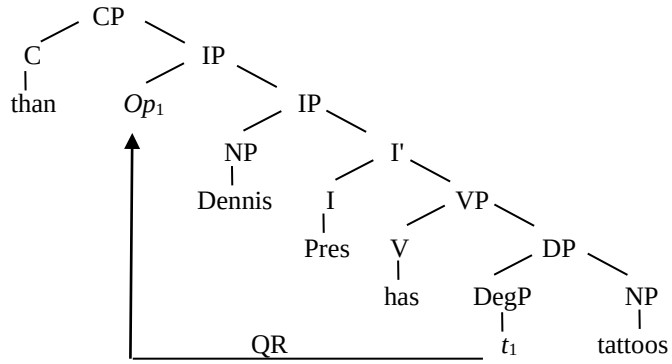
(105) a. Marie kocht meer koekjes dan Piet snoepjes had verkocht.
Mary bought more cookies than Pete candies had sold
b. *Marie kocht meer koekjes dan Piet drie snoepjes had verkocht.
Mary bought more cookies than Pete three candies had sold
(Corver 1993:773)

As indicated in (100)-(105) no quantifier phrase can appear at the site of Subdeletion. We assume this is because the operator is quantificational and another quantifier cannot be inserted any longer. Bresnan (1973, 1975) claims that a partitive 'QP,' which may be thought of as 'x many' or 'that many,' exists in the comparative clause.

Consequently we may claim that sentences in (95) undergo QR of the degree phrase under the condition that it has the sense of *er-many*. To put it specifically the derivation of (95a) is like (107).

(106) Michael Jordan has more scoring titles than Dennis Rodman has tattoos. (=95a)

(107)



Op in DegP is raised to IP at LF as shown in (107). In this way 'exceptional' CSD such as (106) is derived. Supposing QR occurs in 'exceptional' CSD sentences, we can explain their special properties as we have seen in (96) and (97): the trace produced by QR does not show *that*-trace effect and it does not license parasitic gaps.

Hence our analysis makes it possible to explain the asymmetry between 'standard' CSD and 'exceptional' CSD, i.e. the asymmetry between CSD which cannot be allowed unless deletion occurs and CSD which can be allowed even if deletion does not occur. Our claim can be applied to Japanese CD/CSD, which we will discuss in section 3.8.

3.7.2 On Multiply-Headed Comparatives Examples of 'multiply-headed comparatives' we have already seen are repeated below. Kennedy (2002) and Corver (1993) argue that multiply-headed comparative is licensed in CSD but it is not allowed in CD, comparing (108) with (109).

(108) a. Christmas makes as many children as happy as it makes adults unhappy.

b. Max persuaded more people to buy more cars than you persuaded women to buy trucks. (Kennedy 2002: 562)
c. John gave more girls more dolls than he had given boys pencils. (=22a)

(109) a. *Christmas makes as many children as happy as birthdays make.
b. *Max persuaded more people to buy more cars than you persuaded to buy. (ibid.: 563)
c. *John gave more girls more dolls than he had given. (=22b)

On the other hand, multiple *wh*-questions undergo covert *wh*-movement in English because English prohibits more than one *wh*-element from moving overtly. According to Kennedy (2002), there is a parallelism between multiple-headed *comparative* deletion and multiple *overt wh*-movement or between multiple-headed *subcomparative* deletion and multiple *covert wh*-movement, which proves that *CD* sentences involve *overt* movement while *CSD* ones do *covert* movement. To put it specifically, the sentences in (109) are ungrammatical because more than one element are overtly moved, but the sentences in (108) are grammatical because covert movement can occur multiply.

His claim is supported by Japanese multiply-headed comparatives as seen in (110).

(110) a. Taro-wa Hanako-ga teishutusita yori(mo) motto nagai
Taro-TOP Hanako-NOM submitted than more long
ronbun-o motto ooku-no gakkai-ni teisyutusita
paper-ACC more many-GEN society-to submitted
'Taro submitted a longer paper to more societies than Hanako did.'
b. Taro-wa Hanako-ga miseta yori(mo) motto takai kuruma-o
Taro-TOP Hanako-NOM showed than more expensive car-ACC
motto takusan-no hito-ni miseta
more many-GEN person-to showed
'Taro showed more people a more expensive car than Hanako did.'

In Japanese more than one *wh*-element can move *overtly* as indicated in (111).

(111) a. Dare-ni nani-o Taro-wa Hanako-ga katta to itta no?
who-to what-ACC Taro-TOP Hanako-NOM bought C said Q
'Who did Taro tell that Hanako bought what?'
b. Dare-ga dare-ni itsu atta no?
who-NOM who-to when met Q
'Who met whom when?'

According to Kennedy (2002) the grammaticality of (110) is parallel to the grammaticality of (111). He claims that the languages which allow multiple *wh*-movement in overt form (like Japanese) license multiply-headed CD while the languages which do not allow multiple *wh*-movement in overt form (like English) do not license multiply-headed CD but license multiply-headed CSD.

However there are some examples in English that appear to allow multiply-headed CD, contrary to his claim.

(112) a. Christmas makes as many children as happy as birthdays do.
b. Max persuaded more people to buy more cars than you did.
(Kennedy 2002: 605)

Such examples clearly indicate that English also allows more than one element to move *overtly* in comparative clauses.[13]

Here we assume the reason why the sentences in (109) are ungrammatical is that what is deleted in comparative clause does not make a constituent. For example, in (109b) [$_{DP}$ ___ children] and [$_{AP}$ ___ happy] are deleted together, which do not make one constituent. On the other hand in (112b) entire VP, [$_{VP}$ make [$_{DP}$ ___ children] [$_{AP}$ ___ happy]], is deleted, so this is grammatical. In other words, what makes (109) ungrammatical is not the way of moving operator but the inappropriate way of deleting elements.

Thus (109) does not imply that CD/CSD corresponds to overt/covert *wh*-movement respectively. Certainly Japanese multiply-headed CD works as evidence for the claim that in Japanese CD sentences multiply Ā-movement can occur overtly as well as in Japanese multiple *wh*-questions. However English multiply-headed CD/CSD sentences cannot work as evidence for the claim that there is an asymmetry between them, and that covert movement occurs in CSD sentences. We assume that both in CD and in CSD the operator moves overtly because there is not enough evidence proving that they should be completely separated.

3.8 Japanese CD and CSD

In this section we investigate the language which behaves differently from English in generating CD/CSD sentences, turning to the problem (v) raised in 3.2; why does Japanese prohibit CSD sentences? In Japanese CD is allowed as seen in (113) but CSD is not as illustrated in (114).

(113) a. Taro-wa Hanako-ga kaita yori(mo) nagai ronbun-o kaita
Taro-TOP Hanako-NOM wrote than long paper-ACC wrote
'Taro wrote a longer paper than Hanako wrote.'

b. Taro-wa Hanako-ga katta yori(mo) takai kuruma-o katta
Taro-TOP Hanako-NOM bought than expensive car-ACC bought
'Taro bought a more expensive car than Hanako bought.' (=62)

(114) a. *Taro-wa Hanako-ga syosetu-o kaita yori(mo)
Taro-TOP Hanako-NOM novel-ACC wrote than
nagai ronbun-o kaita
long paper-ACC wrote
'Taro wrote a longer paper than Hanako wrote a novel.'

[13] Kennedy (2002) claims that these facts follow if VP-deletion forces a hidden subdeletion structure in CD. The PF representations assigned to these examples are as shown in (i).

(i) a. Christmas doesn't make as many children as happy as birthdays do [$_{VP}$ ~~make [$_{DP}$ children]~~][$_{DegP}$ ~~happy]~~].
b. Max persuaded more people to buy more cars than you did [$_{VP}$ ~~persuade [$_{DP}$ people] to buy [$_{DP}$ cars]~~].

However it seems that our analysis can explain the asymmetrical examples as in (109) and (112) more clearly.

b. *Taro-wa Hanako-ga ie-o katta yori(mo)
Taro-TOP Hanako-NOM house-ACC bought than
takai kuruma-o katta
expensive car-ACC bought
'Taro bought a more expensive car than Hanako bought a house.' (=63)

Firstly, investigating the CD sentences, they involve Ā-movement in the same way as in English. We have already seen the fact that Japanese CD sentences are similar to *wh*-questions. The evidence for this claim is given again:

(115) a. Complex NP Constraint
*[Paul-ga [t_i t_j yonda hitoi]-ni atta yori(mo) $_j$] John-ga
Paul-NOM read person-to met than John-NOM
takusan-no hon-o yonda.
many-GEN book-ACC read
'John read more books than Paul met a man who read.' (=64b)

b. *Wh*-Island
*[Minna-ga [naze Paul-ga *t* yonda-ka] siritagatteiru yori(mo)]
everyone-NOM why Paul-NOM read-Q know-want than
John-ga takusan-no hon-o yonda.
John-NOM many-GEN book-ACC read
'John read more books than everyone wants to know why Paul read.' (=64c)

c. Cross Over Condition
*Zibun-tati-ga rakudaisita koto-ga *t* odorokasita yorimo
self-PL-NOM flunked fact-NOM *t* surprised than
harukani takusanno gakusei-o Bill-ga rakudaisita
far many students-ACC Bill-NOM flunked
koto-ga odorokasita.
fact-NOM surprised
'The fact that Bill flunked surprised far more students than the fact that they$_i$ flunked surprised t_i.' (=65a)

d. Parasitic Gap
Ronbun-nituite ieba Bill-wa John-ga London-de e_i kaita
article-about say Bill-TOP John-NOM London-at e_i wrote
ato Paris-de t_i happyousita yorimo ookuno ronbun-o
after Paris-at t_i published than many article-ACC
America-de kaite-ita.
America-at write-had
'As for the articles, Bill wrote more articles in America than John had published t_i in Paris after he wrote e_i in London. (=65b)

These examples indicate that the gaps in comparative clauses behave like the traces of Ā-movement as is shown by English CD sentences.

Next CSD sentences like (114a) and (114b) are prohibited because they violate the LBC, we assume. Japanese obeys the LBC, as well as English.

(116) a. Donokurai takai kuruma-o Taro-wa katta no?
how expensive car-ACC Taro-TOP bought Q
'How expensive a car did Taro buy?'
b. *Donokurai takai Taro-wa kuruma-o katta no?
how expensive Taro-TOP car-ACC bought Q

(117) a. Dono hon-o Taro-wa katta no?
which book-ACC Taro-TOP bought Q
'Which book did Taro buy?'
b. *Dono Taro-wa hon-o katta no?
which Taro-TOP book-ACC bought Q

The CSD sentences in (114) involve Ā-movement of the degree term, so unless VP or DP is deleted in the comparative clause, they remain ungrammatical; if the deletion occurs, they are to be allowed (as in (113)). These facts show again that CD and CSD involve overt movement of the operator. If CSD sentences involve covert movement, nothing prohibits Japanese CSD sentences without deletion.

So far we have given the same discussion as in English cases, but Japanese CSD sentences are different from English ones in that English has 'exceptional' CSD while Japanese does not.

Here Bulgarian is similar to Japanese: it allows CD sentences but does not CSD ones as follows:

(118) a. Az imam po-golijam apartamen otkolkoto ti imaš.
I have bigger apartment than+how.much you have
'I have a bigger apartment than you have.'
b. Ivan napisa po-dobar roman otkolkoto Saša.
Ivan wrote better novel than+how.much Sasha
'Ivan wrote a more successful novel than Sasha (did).' (=60)

(119) a. *Az imam po-golijam apartamen otkolkoto ti maš kušta.
I have bigger apartment than+how.much you have house
'I have a bigger apartment than you have a house.'
b. *Ivan napisa po-dobar roman otkolkoto Saša napisa drama.
Ivan wrote better novel than+how.much Sasha wrote play
'Ivan wrote a more successful novel than Sasha wrote a play.' (=61)

The CSD sentences will ameliorate if pseudogapping is applied.

(120) Ivan napisa po-dobar roman otkolkoto Saša drama.
Ivan wrote better novel than+how.much Sasha play
'Ivan wrote a more successful novel than Sasha (did) a play.'
(Kennedy and Merchant 2000: 109)

Bulgarian also needs to delete DP or VP. This is because, I assume, Bulgarian obeys the LBC, too.

(121) a. Kolko skipa kola kupi Ivan?
how expensive car bought Ivan

'How expensive a car did Ivan buy'

b. *Kolko skipa kupi Ivan kola?
how expensive bought Ivan car
'* How did Ivan buy an expensive car?'

(Kennedy and Merchant 2000: 107)

Bulgarian must delete DP or VP in order to avoid the violation of LBC in the same way as English and Japanese CD/CSD. For example, if the DP is deleted in (119a), the grammatical sentence (118a) is generated, and if the pseudogapping targets the VP, the well-formed (120) arises. Again if our claim is correct, the reason can be explained for which the Bulgarian sentences in (119) are ungrammatical.

Now turning to the 'exceptional' CSD, we must examine why CSD sentences are not licensed in Japanese.[14] Recall our earlier discussion of 'exceptional' CSD in English. I have claimed that QR occurs in case the operator in (sub)comparative clause is interpreted as 'a larger number of', that is to say, in case the operator 'more' functions as 'er-many'. Here it is predicted that if a language does not have this option, it does not produce the 'exceptional' CSD sentences. And actually this prediction is correct: Japanese does not have a word corresponding to *er-many* in English. Japanese 'yori ooku-no' means 'more' in English, but it is a compound word, so we may suppose that the word cannot be raised as a quantifier. And Japanese does not have a form of pseudogapping. So it must delete the entire DP or VP after moving the operator in comparative clause.

Therefore, we can explain why the CSD sentences which are licensed in English are not allowed in Japanese: the option of quantifier-raising does not exist in Japanese CSD sentences, so the operator is moved overtly in any case and deletion of some elements is needed in order to avoid the violence of LBC. Our analysis for derivation of the 'exceptional' CSD sentences is supported by the fact that no 'exceptional' CSD exists in Japanese.

4 Conclusion

In this paper we have considered the deletion in *than*-clauses. Some research shows that the gaps in CD and CSD sentences behave like the traces in *wh*-questions. Some studies claim that CD and CSD should be separated and CSD has involved no movement. Other analyses suggest that CD undergoes overt Ā-movement, and CSD does covert Ā-movement. We agree with the claim that CD and CSD sentences involve Ā-movement since they are similar to *wh*-questions with regard to the obedience to island effects and Cross-Over Condition or the license to parasitic gaps.

However we argue against the analysis which separates CSD from CD. Both CD and CSD basically need deletion of DP or VP in (sub)comparative clauses, so we assume that CD and CSD involve the same operation −− *overt* Ā-movement. Furthermore we claim that the movement is brought about by the requirement of checking uninterpretable feature [+DEG] and the need for deletion is due to violation of the Left Branch Condition. And we suggest that what is moved in CD and CSD sentences is the operator, that is, the null degree term

[14] As for Bulgarian CSD, it calls for further research.

more in the left branch of DP. Our analysis gives a reason for which the deletion must occur in CSD sentences, which cannot be explained if CSD involves *covert* movement or if what is moved is the entire DP in (sub)comparative clauses.

Next we investigated 'exceptional' CSD, which is licensed even when deletion does not occur. This kind of CSD sentence does not appear in Japanese. And it has some peculiarities in the operator's sense: the operator such as *more* means 'er-many' not 'er-much', and moreover, it can be regarded as a quantifier-like element. From these facts we assume this kind of CSD sentence undergoes QR 'exceptionally', and that is why such CSD sentences do not obey *that*-trace effect and the Left Branch Condition, or do not license parasitic gaps. This hypothesis can explain that the lack of the 'exceptional' CSD in Japanese is caused by the lack of the option of QR in Japanese CD/CSD sentences.

From what has been discussed, we conclude:

(122) Operator, the degree term in (sub)comparative clause moves overtly to the Spec-CP in order to agree with the uninterpretable feature [+DEG] in C^0.

(123) On condition that quantifier raising occurs in the (sub)comparative clause, deletion does not have to appear.

Let me summarize the main points of our analysis in the following table:

	CD	CSD	'exceptional' CSD
Does it involve the movement?	yes	yes	yes
The kind of movement	overt Ā-movement	overt Ā-movement	QR
The moved element	Operator	Operator	Operator
Does it appear in Japanese (and Bulgarian)?	yes	no	no

Our analysis can solve all the problems which we have seen in section 3.2. So it is plausible to argue as shown in (122) and (123), but there is room for reconsidering further whether it is true that Japanese 'yori ooku-no' (which means *more* in English) does not receive benefit from the option of QR.

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