The Formation of English Phrasal Comparatives— Study of Lechner's Small Clause Analysis

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Abstract—Lechner (2001) proposes two hypotheses, that is, CR-Hypothesis (Conjunction Reduction (hereafter CR) operations can target comparatives.) and PC-Hypothesis (Phrasal Comparatives (hereafter PCs) derive from clausal comparatives by CR.) In this paper, I discuss the formation of PCs and its relevance to Lechner's two Hypotheses. As to the formation of PCs, based on his two hypotheses, he puts forward small clause analysis. Compared with Direct Analysis and Comparative Ellipsis approach, although small clause analysis is superior to them by his analysis, I will argue that some special PCs can provide evidence that his small clause analysis is untenable, that is, some PCs can't be analyzed by his small clause analysis.

Index Terms—CR-Hypothesis, PC-Hypothesis, gapping, right-node raising, direct analysis, comparative ellipsis approach, small clause analysis

I. INTRODUCTION OF ENGLISH COMPARATIVES

The basic form of English comparatives is *more/as...than/as* X. When X is equal to S, as illustrated below, we call such sentences clausal comparatives:

(1) John bought a more expensive car than Bill did _.

The derivation of comparatives is traditionally claimed to involve an obligatory deletion process called Comparative Deletion (hereafter CD) and also an optional one called Comparative Ellipsis (hereafter CE) within clausal comparatives. Comparative Deletion deletes lexical material in the comparative clause under identity with material in the comparated constituent of the matrix clause (Corver, 1993), as in (2a). The operation that deletes just the amount term (e.g. *x-many*) of the comparative clause, as in (2b) is called Comparative Subdeletion (Corver, 1993). Pinkham (1982, p.92) defines Comparative Ellipsis as an optional operation that elides the verb and all other recoverable constituents from the comparative clause, as in (2c).

(2) a. John met more linguists than I met [[x many] [linguists]].

- \rightarrow John met more linguists than I met _. ----Comparative Deletion
- b. John met more linguists than I met [x many] biologists.

 \rightarrow John met more linguists than I met _ biologists. ---Comparative Subdeletion

c. You can catch more flies with honey than you can eatch [[x many] flies] with vinegar.

 \rightarrow You can catch more flies with honey than _ with vinegar. ---Comparative Ellipsis

Besides Comparative Ellipsis, there are some other ways of reduction in English Comparatives, such as Pseudo-gapping and VP deletion.

- d. John gave many more cookies to Mary than he gave _candies to her.
- \rightarrow John gave many more cookies to Mary than he did candies. ---- Pseudo-gapping
- e. I thought I looked more like a student than he looked like a student ____.

 \rightarrow I thought I looked more like a student than he did _. ----VP deletion

In relation to the theme of this paper, I will focus on the analysis of the formation of PCs. Coming back to the form *more/as...than/as* X, when the element X behind *than/as* is not an S (i.e. X = NP, QP, etc.), such comparatives are called Phrasal Comparatives. For example:

(3) a. John is older than Mary.

b. More men than women attended the meeting.

c. John is taller than six feet.

Compared with clausal comparatives, the surface form of PC (*than/as* +XP) is simpler. However, the proper representation and interpretation of PCs, as well as the relation of PCs to their clausal variants, is still subject to debate. The existing various approaches towards PC-formation roughly divide into two groups--- Direct Analysis(Nappoli1983, Pinkham1982) and Clausal Analysis. The latter includes CE Analysis (Bresnan1973, Pinkham1982) and Small Clause Analysis (Lechner2001). Direct Analysis contradicts Lechner's PC- Hypothesis that PCs derive from clausal comparatives by CR, because Direct Analysis directly generates the structure of *than*-XP in its surface form. Lechner argues against Direct Analysis and endorses Small Clause Analysis instead. I will demonstrate below, however, that

there are sentences that can be generated under Direct Analysis but not Small Clause Analysis.

In the following parts, as I evaluate various aspects of the theories of Bresnan, Pinkham and Lechner, I will cite many actual examples found by searching on Google and BNC in support of my argumentation.

II. LECHNER'S TWO HYPOTHESES

In Lechner (2001), he claims that CE can be dispensed with, namely, than-XP clauses can be interpreted as coordinate structures (and-clauses). Specifically, he proposes CR-Hypothesis and PC Hypothesis. In order to understand and evaluate his theory let us first consider what claims Lechner's two hypotheses make. In order to better understand Lechner's two hypotheses, I look into the basic properties of Conjunction Reduction, Gapping and Right-Node Raising.

A. Conjunction Reduction, Gapping and Right-node Raising

I agree with Hudson's (1976a) view that Conjunction Reduction (CR), Gapping and Right Node Raising (RNR) are separate rules in English, each having its own set of constraints. The three rules are illustrated below:

(4) a. Mary opened the window at 8:00 and _looked out. (CR)

b. Mary cooked the first course and Jane _the second. (Gapping)

c. Mary likes, and Jane would go anywhere to find, antique horse-brasses from the workshop of that genius in metalwork, Sam Small. (RNR)

---Hudson (1976a)

In each of these examples one of the conjoined clauses has something missing from its structure. For example, the second conjoined clause lacks a subject in (4a) and the main verb in (4b), and the first conjoined clause lacks the object in (4c).

It seems clear that some kind of transformational mechanism is needed for explaining these special phenomena, and so far it has been widely assumed that the transformations needed are CR, Gapping and RNR.

For CR, we can't easily judge whether CR has applied, since whether a conjoined clause is incomplete or not depends on how we analyze its surface structure. For example, in *He goes to bed at ten and gets up at eight*, if *at eight* is seen as a daughter of the S node, the second conjunct must be considered an incomplete sentence. On the one hand, if *gets up at eight* forms a VP, there is no need to invoke CR in this sentence. In sentences like *He drinks coffee at breakfast time and tea at other times*, it is easier to see that the second conjunct is incomplete. Though some linguists claim that such sentences can be generated by Gapping, Hudson (1976b) convincingly rejects such a view. The clearest evidence for the necessity of CR comes from sentences like Dougherty (1970)'s *Mary was fun to tease, easy to please, and known to have fleas*, where none of the conjuncts exist as constituents in deep structure I conclude, with Hudson, that CR is necessary.

1. Gapping

Gapping is a rule which deletes strings including a finite verb in the right conjunct of a coordinated structure under identity with the verb(s) in the left conjunct (Corver, 1993), as in (5):

(5) John kissed Mary and Sue, Bill.

Hudson (1976b) points out that the following properties distinguish Gapping from "phrasal conjunction." The following descriptions and examples are quoted from Hudson (1976b):

A. In gapped sentences, the only possible conjunctions are *and*, *or*, and *nor*; however, in sentences with phrasal conjunction, *but* is also possible:

(6) a. John drinks coffee and/or/*but Mary, tea.

b. John drinks coffee and/or/but likes tea.

B. In gapped sentences, only two constituents are possible in the second conjunct, one before the gap and the other after it; in phrasal conjunction sentences, on the other hand, the second conjunct may contain any number of constituents:

(7) a. *John drinks coffee at 11, and Mary, tea at 10:30.

b. John drinks coffee at 11 in his coffee with his colleagues, and eats his lunch at 1 with his friends.

C. In gapped sentences, the order of constituents in the second conjunct is very severely restricted, so that they parallel the order of the corresponding constituents in the first conjunct; but in phrasal conjunction sentences, the order after the conjunction is much freer:

(8) a. * John left at 11 and, at 12, Bill.

b. John left his office at 11, and, at 12, the library.

D. In gapped sentences, the first constituent in the second conjunct must be the subject of the shared verb, but obviously no such restriction applies to phrasal conjunction sentences:

(9) a. *Which book did Mary buy and which record, Bill?

b. John drinks coffee for breakfast and tea in the afternoon.

E. If the first clause of a gapped sentence is negative, the conjunction must be either *nor* or *or* (i.e. not *and*), but *and* is possible after a negative clause in a phrasal conjunction sentence:

(10) a. John didn't see Mary nor/or/*and Bill, Sue.

b. John doesn't drink coffee nor/or/and smoke a pipe.

I agree with Hudson that these properties clearly separate Gapping from CR.

2. Right Node Raising

RNR raises some common element out of two conjuncts and attached it to the right of both of them. Some examples follow:

(11) a. Mary liked _, but John hated, the man with the red beard.

b. John enjoyed _, and my friend liked the play.

Hudson (1976) summarizes the differences between RNR and CR as follows:

(i) CR has the shared items on the left of the coordination, RNR has them on the right.

(ii) CR has no special intonational break between the shared item and the rest of the sentence, but RNR does have such a break, as already noted.

(iii) CR is restricted to coordinations, but RNR isn't.

(iv) CR can delete any number of constituents (by applying recursively to its own output, and deleting one at a time); but RNR can apply to just one constituent, as Postal (1974) notes (125). Thus CR can apply to *Who has been eating my porridge, and who has eaten it all up*? to give *Who has been eating my porridge, and eaten it all up*?, 'deleting' both who and has. With RNR, on the other hand, nothing like this is possible. For example, one cannot apply it to *John gave Mary two pounds and Bill lent Mary two pounds*, deleting both *Mary* and *two pounds* to give *John gave, and Bill lent, Mary two pounds; the best you can do is delete just two pounds, giving John gave Mary, and Bill lent her, two pounds.

(v) In CR, as already noted, any constituent which is 'deleted' must be a daughter –i.e. an immediate constituent—of the conjunct in question. There is no such restriction on RNR; so sentences like *John is a wizard at growing, and Mary has perfected the art of preserving, a very delicate kind of quince which is only known in their part of Worcestershire* are as good as any sentences involving RNR.

According to the above analysis, we can see that there are differences between CR and Gapping or RNR, so we should separate these three phenomena in English.

B. Two Hypotheses

Lechner (2001) proposes two hypotheses, that is, CR-Hypothesis and PC-Hypothesis. Napoli (1983) argues that the two main kinds of comparatives in English should be dealt with separately, since *than* in the clausal comparatives is a coordinator, whereas *than* in the phrasal comparative is a preposition. Lechner claims, however, that *than* is always a coordinator and the complement of *than* behaves as a conjunct. This character of comparative clauses is most clearly reflected in the observation that they may be targeted by Gapping, RNR, and so on, i.e., CR processes which are generally taken to affect coordinate structures only. (In Lecher (2001), he uses "CR" in a board sense, as a general term for operations reducing coordinate structures, including Conjunction Reduction, Gapping, Right Node Raising (RNR), and so on.) For instance, main verb ellipsis can be attributed to Gapping both in the comparatives (12a) and (13a) and in the corresponding coordinate structures in (12b) and (13b) (Napoli 1983, p. 676)

(12) a. John spoke more vehemently against Mary than Tom spoke against Jane.

b. John spoke against Mary and Tom spoke against Jane.

(13) a. Mary loves John more than Helen loves Bill.

b. Mary loves John and Helen loves Bill.

Similarly, the comparative (14a) and the conjunction (14b) can be uniformly analyzed in terms of RNR (from Napoli1983, p.677)

(14) a. I organize more her life than I actually run her life.

b. I organize her life and actually even run her life.

Lechner (2001) thus claims that CR may target comparatives, which he calls the CR-Hypothesis:

(15) The CR-Hypothesis

CR operations can target comparatives.

The CR-Hypothesis also extends to PCs, as illustrated by the derivations in (8). In the partially reduced comparatives in (12a), (13a) and (14a) above, the *than*-XPs contain more than a single remnant, while in (16) there is only one single remnant in the *than*-XP clause.

(16) a. Mary bought more books than Sam bought _. (_ = d-many books)

b. More people bought books than <u>bought</u> magazines. (_ = d-many people)

c. Mary bought books more often than Sam bought books _.

d. Mary bought books more often than <u>Mary bought</u> magazines_. (_=d-often)

---Lechner (2001)

The reduction processes in (16) are paralleled by those in the coordinate correlates in (17).

(17) a. Mary bought books and Sam bought magazines.

b. Many people bought books and Sam bought magazines.

c. Mary bought books on Tuesday and Sam bought books on Friday.

d. Mary bought books on Tuesday and Mary bought magazines on Friday.

On the basis of paradigms like these Lechner (2001) proposes the PC-Hypothesis:

(18) The PC-Hypothesis

PCs derive from clausal comparatives by CR.

In contrast to the CR-Hypothesis, the PC-Hypothesis not only maintains that PCs can *optionally* be parsed as the output of CR, but also strongly claims that *all* PCs derive from an underlying clausal source by application of CR. If these two hypotheses are correct, CE can be dispensed with. I will examine his hypotheses in detail in the following chapters, but before that I will make some notes below about the relationship between comparatives and ordinary coordinate structures.

III. THE FORMATION OF PCs

A. Direct Analysis and Comparative Ellipsis Approach

In the clausal comparatives in (19), CD (Bresnan 1973) has removed the gradable property from inside the comparative complement (*than*-XP). The overall structure of the *than*-XP is left intact-except for the application of CD: (19) a. John is older [than-XP than Mary is _]. (_=x -old)

9) a. John is older [than-XP than Mary is _]. (=x - old)

b. John read more books [than-XP than Mary read _]. (_=x- many books)

c. More people bought books [than-XP than_ bought magazines]. (_=x-many people)

Under the CE analysis of PC, PCs differ from their clausal counterparts in that the comparative complement has undergone further reduction through CE, in addition to CD. By definition, the *than*-XPs of PCs, exemplified by (20), superficially embed a single remnant only:

(20) a. John is older [than Mary].

b. John read more books [than Mary].

c. More people bought books [than magazines].

According to Direct Analysis, PCs don't contain any elliptical structure, and are base-generated as PPs headed by the prepositional comparative marker *than* (Brame 1983, Napoli 1983). Because PP is not a coordinate structure, Direct Analysis is clearly incompatible with Lechner's PC Hypothesis.

Pinkham (1982) argues that Direct Analysis is necessary, pointing out that there are sentences that cannot be explained by CE, as shown in (21):

(21) a. He ran faster than the world record.

Cf. * He ran faster than the world record ran.

b. John jumped higher than the fence.

Cf. *John jumped higher than the fence jumped.

c. Mary is older than **me**.

Cf. *Mary is older than *me am*.

It is obvious that none of the sentences in (21a-c) can be derived from an underlying structure containing a *than*-clause.

Pinkham (1982) also argues for Direct Analysis by pointing out that PCs like (22a) can't be explained by CE, since Comparative Ellipsis applies only "from left to right," i.e., the antecedent more phrase must be to the left of the deleted compared phrase, as evidence by (22b):

(22) a. More men than women applied for the job.

b. * More dresses [than _ by that company] were sold by us.

c. More dresses [than [x many] dresses] were sold by that company] were sold by us.

d. More dresses were sold by us [than (were sold) by that company].

---- Pinkham 1982, p.108

Although most linguists accept Direct Analysis, it also has its own deficiencies. For instance, it can't explain such sentences as (23a, b):

(23) a. *A taller man [than Mary] came in.

b. *a taller woman than my father

Cf. a woman taller than my father

(24) a taller man than my father

Because (24) is grammatical, so far as syntax is concerned, there is nothing that prevents Direct Analysis from generating (23).

As I mentioned above, Direct Analysis clashes with Lechner's (2001) PC- Hypothesis because according to Direct Analysis *than*-XP phrases like [*than the world record*] are PPs and not coordinate structures. Lechner argues against Direct Analysis and claims that it should be abandoned in favor of Small Clause Analysis, to which topic I will turn in the next subsection.

B. Small Clause Analysis

Both Direct Analysis and CE Analysis have their own defects, so it is necessary to find a new ellipsis analysis of PCs. Lechner (2001) adopts a new analysis of the formation of PCs, that is, Small Clause Analysis (first suggested, according to Lechner (2001, p. 731), by Heim (1985)).

Consider the examples in (6), repeated below, again:

(25) a. He ran faster than the world record.

Cf. * He ran faster than the world record ran.

b. John jumped higher than the fence.

Cf. *John jumped higher than the fence jumped.

c. Mary is older than **me**.

Cf. * Mary is older than *me am*.

Small Clause Analysis analyzes the than-phrases in these sentences as small clauses. Thus, the underlying structure of (25a) is as shown in (26):

(26) He ran faster than [the world record [x fast]].

The complement of *than* forms a small clause; [*the world record*] is the subject and the [x fast] is the predicate. [x fast] is deleted by CD. The same applies to (25b, c) as well.

As for the accusative case in (25c), Lechner (2001, p. 728) claims that it fails to count as evidence for Direct Analysis because comparatives are not unique in licensing accusative remnants, they are also attested in conjunctions (27). He says: "Crucially, in both constructions, accusative remnants are limited to contexts involving CR ([Stripping]):" (Lechner calls the rule responsible for the reduction in question Gapping. I use the term "Stripping," instead, which I believe is more appropriate.)

(27) a. Stripping: Mary is eager to meet them, and **me** too.

b. Source: * Mary is eager to meet them and **me** is eager to meet them, too.

Lechner concludes that the morphological alternation of remnants in PCs and coordinate structures is conditioned by identical environments, as predicated by the PC-Hypothesis."

Next, consider (23) and (24), repeated below again in (28) and (29).

(28) a. *A taller man [than Mary] came in.

b. *a taller woman than my father

Cf. a woman taller than my father

(29) a taller man than my father

According to the Small Clause Analysis, the underlying structures of (28a, b) and (29) should be as shown below: (30) a. *A taller man than [Mary [[x-tall] man]] came in.

b. *a taller woman than [my father [[x-tall] woman]]

(31) a taller man than [my father [[x tall] man]]]

Because Mary is a female and a father is a male, both (30a) and (30b) are semantically anomalous, while (16) is fine. Thus, Small Clause Analysis succeeds in explaining the contrast between (30) and (31) and is therefore superior to Direct Analysis.

Suppose we abandon Direct Analysis and adopt Small Clause Analysis. Strictly speaking, I believe, Small Clause Analysis still fails to save the PC Hypothesis. This point is easy to see. Consider (25), repeated below in (32), again.

(32) He ran faster than [the world record [x fast]].

The deletion of [x fast] is due to CD, and CD is not a rule of Coordinate Structure Reduction (hereafter CSR). Hence, as it stands, *He ran faster* [*than* [*the world record*]] still violates the PC Hypothesis. What Lechner intends to say by adopting Small Clause Analysis is probably that (32) should be regarded as not constituting a counterexample to the hypothesis in question, in the same sense that (33) is not a counterexample to it. In both cases, the complement of *than* is clausal (i.e. subject-predicate structure) and only CD applies.

(33) She is taller than Mary is $_$. ($_$ = [x tall])

We could accordingly reformulate the definitions of the relevant notions so that (32) cease to be a counterexample to the PC Hypothesis. But I will not take the trouble to do so, because I will claim that Direct Analysis is necessary and that Small Clause Analysis should be abandoned.

First, consider (22a), repeated below, again.

(34) More men than women applied for the job.

This PC sentence cannot be accounted for by Small Clause Analysis. It is obvious that there is no predicate with which *women* can form a small clause in (34). Lechner simply says in a footnote (p. 685) that he "will ignore subcomparatives throughout." Thus, sentence like (34) remains an important counterexample to the PC Hypothesis.

Second, the explanation of the deviance of (25a, b) offered by Small Clause Analysis is actually of little force, because Small Clause Analysis fails to cover cases likes the following:

(35) a. He ran more quickly than the world record.

b. I flick my eyelids open more *quickly* than the speed of light.

c. Human's faces can appear and dissolve more quickly than the blink of an eye.

The important thing about these examples is that in each, more modifies an *-ly* adverb, not an adverb like *fast* which is homophonic with an adjective. Now, it is obvious that we cannot posit underlying structures containing a small clause for these sentences, because *-ly* adverbs cannot be used predicatively:

(36) *The world record is quickly.

Notice also that these sentences cannot be derived by CD, because there are no appropriate comparative clauses for them at the underlying level: the following sentences do not make sense.

(37) a. *He ran more quickly than the world record ran.

b. *I flick my eyelids open more quickly than the speed of light flicks my eyelids open.

c. *Human's faces can appear and dissolve more quickly than the blink of an eye. can appear and dissolve.

Direct analysis is therefore necessary to produce sentences like those in (35). Note that this means that the anomaly of expressions like (23a, b), repeated below, is not a syntactic problem but a problem to be dealt with by a mechanism for semantic interpretation.

(38) a. *A taller man [than Mary] came in.

b. *a taller woman than my father

In order to make sure that sentences like (35a-c) are indeed grammatical and are not sentences that are actually ungrammatical but happened to be produced by a careless mistake. I searched for more actual examples of the same kind on Google. As shown in (39), I have succeeded in finding many such examples:

(39) a. The laws of physics allow for space itself to expand more quickly than the speed of light.

b. It seems to involve some sort of information which travels more quickly than the speed of lights.

c. Ultimately, the digital domain's boundaries are the theoretical limits of physics: a bit cannot be smaller than individual atoms, and the circuits cannot operate more quickly than the speed of light.

d. Two galaxies can separate more quickly than the speed of light.

e. The computation involved must be done fast, since the mirror has to respond much more quickly than the blink of an eye.

f. This communication process happens far more quickly than the blink of an eye.

g. I inched my way up each continuum more slowly than the lowliest snail's pace.

h. Will the mails cease to move, or move even more slowly than their accustomed snail's pace?

i. She also became slow in picking up cues and our scene together consequently crawled more slowly than the proverbial snail's pace.

j. Time passed more slowly than a snail in a windstorm.

Therefore, I conclude that these sentences are grammatical and that again, Direct Analysis has proved to be necessary. Small Clause Analysis cannot explain the above examples, since adverbs cannot be the predicates of sentences, and the above examples can only be explained by Direct Analysis.

IV. CONCLUSION

In fact there are various arguments about the formation of PCs. The various approaches towards the formation of PCs roughly divide into three groups: Direct Analysis, Comparative Ellipsis analysis and Small Clause analysis. Lechner (2001) claims that Small Clause Analysis is superior to the other two analyses, being free from the deficiencies mentioned above. However, I will argue that there is a type of PC that can be generated by Direct Analysis but not by Small Clause Analysis. If this claim is correct, then Small Clause Analysis is very doubtful because whatever sentence can be generated by the latter can also be generated by the former.

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