

A Solution to the Subcomparative Paradox

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1 Subcomparatives Compared to Other Types of Comparative Constructions

The sentences in (1) illustrate the comparative construction in English. In each case an implicit element in the lower clause is interpreted as being compared with a constituent in the higher clause.

- (1) a. John has more *books* than Bill has *e*.
b. Ann is less *happy* now than she was *e* before.

In (1) the compared constituent in the main clause is italicized and the place of the interpreted but non-overt element in the embedded clause is marked by a gap, *e*. The category of the gap is identical to that of the compared constituent in the matrix clause. Sentence (1a), for instance, means *The number of books that John has is larger than the number of books that Bill has*.

The examples in (2) differ minimally from those in (1) in that only a subpart of the second compared constituent is non-overt. Thus in (2a) the number of books owned by John is compared to the number of magazines (not books as in (1a)) owned by Bill.

- (2) a. John has more *books* than Bill has *e magazines*.
b. Ann is less *happy* now than she was *e sad* before.

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Sentences like those in (2) have been named SUBCOMPARATIVES.

The gap in (2) marks the presence of an “understood” quantifier (Bresnan 1975), modifying the compared element in the second clause. The ungrammaticality of overt determiners in the position of the gap has been taken as evidence that there is indeed an empty quantifier in the subcomparative clause:

- (3) a. John has more books than Bill has (**many/*the*) magazines.
b. Ann is less happy now than she was (**very/*that*) sad before.

Another type of a comparative construction (sometimes classified with ‘ordinary’ comparatives as in (1) and sometimes with subcomparatives) is illustrated in (4):

- (4) We own more of the books than we own *e* of the magazines.

Since Grimshaw (1987) sentences like (4) have been known in the literature as *of*-COMPARATIVES.

Despite the similarity between subcomparatives and the other types of comparative constructions, their syntax is currently considered to be very different. ‘Ordinary’ comparatives like the ones in (1) are typically analyzed as involving *wh*-movement in the comparative clause (e.g. Chomsky 1977, den Besten 1978, Taraldsen 1978, Grimshaw 1987, Larson 1988, Corver 1990, 1993, Moltman 1992, among others). The structure of (1a) is thus taken to be the following:

- (5) John has more books than [[\emptyset *x many books*]_{*i*} Bill has *t_i*].

That is, a non-overt constituent (marked with \emptyset) is moved to (the highest) Spec, CP in the clausal complement of *than*. This analysis is motivated by the fact that ‘ordinary’ comparative clauses exhibit the configuration of properties characteristic of *wh*-movement: they have a gap, they are sensitive to islands, and they allow for long-distance dependency when embedded under bridge verbs.¹

Of-comparatives are similarly analyzed as involving *wh*-movement. The account offered in Taraldsen (1978) and Grimshaw (1987) is that the PP headed by *of* is first extraposed out of the second compared constituent and then the remaining (non-overt) amount phrase undergoes *wh*-movement. An example derivation is given in (6):

¹Bresnan (1973, 1975) proposes that ‘ordinary’ comparatives involve deletion under identity and no movement. The assumption shared since Chomsky (1977) is that an additional rule of the grammar, governed by the same constraints as *wh*-movement, is superfluous.

- (6) a. ...than we own [_{NP} [_∅ *x many*] [_{PP} of the magazines]]
 b. ...than we own [_{NP} [_∅ *x many*] *t_i*] [_{PP} of the magazines]_{*i*}
 c. ...than [_{NP} [_∅ *x many*] *t_i*]_{*j*} we own *t_j* [_{PP} of the magazines]_{*i*}

Originally, subcomparatives were not considered to be radically different in their derivation and structure from the other types of comparatives. Thus for Bresnan (1973, 1975) the phenomenon exemplified by the sentences in (2) is just a proper subset of the comparative construction in (1). She proposes that the rule of Subdeletion, the operation responsible for the derivation of subcomparatives, is a case of Comparative Deletion operating on a smaller constituent. A QP modifier *x many* or *that many* (or *x much/that much*, correspondingly) is deleted in (2) whereas the entire compared constituent (here NP or AdjP, respectively) is removed in (1).

Similarly, Chomsky (1977) and den Besten (1978) suggest that the *wh*-movement analysis can be extended to subcomparatives, but in this case the moved phrase will be a subpart of the compared constituent, namely Bresnan's null modifier.

The more recent accounts, however, treat subcomparatives differently from the other types of comparatives. For Grimshaw (1987) subcomparatives involve no extraction at all. Corver (1990, 1993) proposes that subcomparatives are derived through LF-raising of the comparative quantifier in the antecedent clause which then binds in an across-the-board fashion both its trace and a variable (the gap) in the subcomparative clause.

It is the purpose of this paper to propose a new analysis of the subcomparative construction that allows for a uniform treatment of subcomparatives and the other types of comparatives. Assuming the by now standard analysis of 'ordinary' and *of*-comparatives (though a slightly different proposal will be made for 'ordinary' comparatives in the last section), I argue that subcomparatives also involve *wh*-movement, though of a different constituent than the one proposed by Chomsky (1977) and den Besten (1978). The next section presents the main problem that the original *wh*-movement analysis faces; a solution to this problem is offered in section 3.

2 The Subcomparative Paradox

2.1 Subcomparatives Obey Islands

It was first noted by Bresnan (1975) that subcomparatives exhibit island effects. As evident from (7), the subcomparative construction is subject to the Complex NP Constraint; (8) shows that the subcomparative clause cannot be inside a sentential subject, and (9) illustrates the effect of a violation of the Coordinate Structure Constraint.² Additional island violations not discussed by Bresnan are shown in (10), (11), and (12):

²All these examples are taken from Bresnan with some modification.

COMPLEX NPS:

- (7) a. *We ended up buying more oranges than we had discussed a plan to buy apples.
b. We ended up buying more oranges than we had planned to buy apples.

SENTENTIAL SUBJECTS:

- (8) a. *You have more friends than that he has enemies is likely.
b. You have more friends than it's likely that he has enemies.

COORDINATE STRUCTURES:

- (9) a. *Dean drank more booze than Frank drank a lot of milk and Martha drank Postum.
b. Dean drank more booze than Frank drank milk and Martha drank Postum.

WH-ISLANDS:

- (10) a. *We bought more apples than we wondered whether to buy oranges.
b. We bought more apples than we wanted to buy oranges.

NEGATIVE ISLANDS:

- (11) a. *The door is higher than the window is not wide.
b. The door is higher than the window is wide.

ADJUNCTS:

- (12) a. *John read more magazines than he was seen reading books.
b. John read more magazines than he was told to read books.

The island facts point to *wh*-movement as a possible way of deriving subcomparatives. Indeed, further embedding does not affect acceptability:³

³Chomsky (1977) notes that deeper embedding results in greater decrease of acceptability for subcomparatives than for the corresponding comparatives. The claim is that a sentence like (i) is less acceptable than (ii) (though apparently not so much as to deserve a * or a ?):

- (i) The desk is higher than they believe that Bill thinks that it is wide.
(ii) The desk is higher than they believe that Bill thinks that it is.

First, it has to be noted that not all native speakers agree with this judgement. Furthermore, both Chomsky (1977) and Bresnan (1975) acknowledge that since subcomparatives involve comparison of contrastively focused constituents, their interpretative complexity is greater. Thus the distinction between (i) and (ii), if significant, could be attributed to the fact that deeper embedding interferes with the processing of the contrastively focused compared constituents.

- (13) a. John has more books than we think that Bill has magazines.
 b. Ann is less happy now than John told us that she was sad before.

The sensitivity to islands and the possibility of further embedding is something subcomparatives have in common with ‘ordinary’ and *of*-comparatives. Thus a *wh*-movement account of all types of comparatives is empirically motivated in addition to being theoretically desirable. However, as will become clear in the next subsection, there are reasons for why the *wh*-movement analysis of subcomparatives has not been uncontroversially accepted.

2.2 Left-Branch Extraction is Prohibited

A *wh*-movement account of subcomparatives is problematic because *wh*-movement in many languages including English is not able to front pre-head modifiers:

- (14) a. *How many do we have books?
 b. *How (much) was she sad before?
- (15) a. *Many we have books.
 b. *Very she was sad before.

The ungrammaticality of the left-branch extractions in (14) and (15) suggests that the gap in the subcomparatives in (2) cannot be a trace of *wh*-movement the same way as the gap in (1) is claimed to be.⁴ Therefore, we end up with a puzzle: on the one hand, subcomparative clauses exhibit sensitivity to islands, which is typical of constructions involving movement; on the other hand, extraction of pre-head modifiers is prohibited in English (and many other languages). This state of affairs, which I call the SUBCOMPARATIVE PARADOX, has been the main reason for the interest shown in the construction, and it has made the analysis of subcomparatives nontrivial and quite controversial.

It is clear at this point that an analysis like that of Chomsky (1977) and den Besten (1978), though attractive because of its uniform treatment of subcomparatives and ‘other’ comparatives, runs into problems in violating the left-branch condition.⁵ The analyses of Grimshaw (1987) and Corver (1990, 1993) do not posit movement in the subcomparative clause and thus evade the problem of left-branch extraction. These accounts however do not address the existence of the island effects described in (7) to (12).⁶

⁴For languages like Russian or Serbo-Croatian that allow the fronting of pre-head modifiers the issue of left-branch extraction violations in subcomparatives does not arise.

⁵Chomsky suggests that the quantifier extracted in subcomparatives is an exception to the left-branch condition because it can never be phonologically realized (in English). I take it to be desirable that both overt and null elements be treated the same with respect to extraction possibilities.

⁶An account of subcomparatives that captures the island effects without positing left-branch extraction is that of Kuno (1981). Instead of movement of a null phrase into the Spec, CP of

3 The Proposal

3.1 *Wh*-Movement in the Subcomparative Clause

I propose that there is *wh*-movement in the subcomparative clause; however, it extracts not a pre-head modifier, but a (phonologically non-overt) degree/amount phrase from an adjoined position. The derivation of the subcomparative clause is illustrated in (16):

- (16) a. ...than [\emptyset *in what quantity*]_{*i*} we have magazines *t_i*.
b. ...than [\emptyset *to what extent/degree*]_{*i*} she was sad *t_i* before.

In other words, the claim is that the gap in the subcomparative clause is a *wh*-trace, not a base-generated variable, and furthermore, it is not in the position indicated in (2). Ever since Bresnan's proposal authors have assumed the null-modifier status of the gap in subcomparatives (cf. Chomsky 1977, den Besten 1978, Corver 1990, 1993, Moltmann 1992, and others) and have sought a resolution of the resulting problem with left-branch extraction. The only account, as far as I know, that does not adopt Bresnan's null-modifier proposal is that of Grimshaw (1987). She proposes that subcomparative clauses have a non-overt adverbial phrase "something like *to a certain/great extent*" (p. 668) (attributing this idea to Roger Higgins). Grimshaw, however, explicitly argues against *wh*-movement in subcomparatives.

Adopting the idea of a null adverbial phrase gives us a way to solve the Subcomparative Paradox: *wh*-movement of the degree/amount-denoting adverbial is the reason for the island effects; this movement, however, does not involve left-branch extraction. Note that the extraction of such adverbial phrases is acceptable:

- (17) a. To what extent was John surprised?
b. To such a great extent was John overwhelmed with joy that he didn't even notice Mary crying.
- (18) a. In what quantity did Mary eat apples?
b. We know in what quantities Mary used to drink wine.

The original argument for the existence of a null modifier in subcomparatives relied on the ungrammaticality of overt quantificational determiners in this position (cf. (3)). However, the unacceptability of overt modifiers

the subcomparative clause, he argues for a rightward movement of the compared constituent and subsequent deletion of its modifier. For reasons of space I cannot present here the details of Kuno's analysis. The problem with his account is that he considers the movement in the subcomparative clause to be optional: "...a transformation that applies obligatorily when applicable, but that does not result in unacceptability when it is not applicable..." (p. 152). Yet it can be demonstrated (see Izvorski 1995) that the sentences which he claims are not derived through movement still show sensitivity to islands.

in the compared constituent is equally compatible with the idea of an adverbial trace in the subcomparative clause. Note that when the adverbial is expressed overtly, pre-head degree/amount modifiers are prohibited (an observation made in Grimshaw 1987):

- (19) a. We read (*five) magazines in a certain quantity.
b. She is (*very) sad to a great extent.

How do we account for the data in (19)? I assume, following von Stechow (1984) and Larson (1988), among others, that scalar adjectives have a degree variable: that is, they are interpreted as relations between entities and degrees (scalar adverbs are also taken to have a degree variable). Similarly mass and plural count nouns can be assumed to have an amount variable.⁷ The degree/amount variable can be bound by only one quantificational element; this is why the presence of the adverbial phrase in (19) precludes the quantificational modifiers. For the same reason pre-head determiners in subcomparatives are disallowed (cf. (3)).⁸

A prediction of the present proposal is that subcomparison will not be possible within left-branch modifiers. Indeed, while predicative adjectives can be the compared element in a subcomparative clause, attributive adjectives cannot. Note the contrast between (20a) and (20b):⁹

- (20) a. Bill is more successful than he is talented.
b. *Bill is a more successful actor than he is a talented director.

In both (20a) and (20b) the null adverbial is adjoined to the AP *talented*. Nothing blocks extraction when the AP is used as a predicate and this is why (20a) is grammatical. When the AP is a modifier to an NP though, as in (20b), extraction of the null adverbial results in a violation of the left-branch condition; therefore subcomparison in this case is precluded.

In 'ordinary' comparatives too the gap cannot be an NP-modifier, as shown in the following sentences:

- (21) a. *John makes better cakes than he can make cookies.
b. John makes better cakes now than he could make before.

⁷Such an assumption was made in Izvorski (1994) for an independent reason.

⁸In sentences like *We read magazines* and *She was sad* where no overt quantificational element is present, the variable could be assumed to be bound by the *pos* operator (for 'positively') of von Stechow (1984).

⁹This observation is made in Grimshaw (1987). She argues however that the same facts obtain in what she takes to be *phrasal* comparatives:

- (i) *Bill is a more successful actor than a talented director.

Grimshaw's assumption is that the complement of *than* in (i) is not a clausal projection; therefore, the ungrammaticality of the sentence cannot be attributed to illicit *wh*-movement. See the arguments of Hankamer (1973) that sentences like (i) are in fact reduced *clausal* comparatives; that is, the complement of *than* is a clause that involves ellipsis.

Under the existing approaches to subcomparative formation the contrast between (20a) and (20b) is unexplained (just as the island facts in (7)-(12) remain unaccounted for). Positing *wh*-movement in subcomparatives captures uniformly the facts of both (20) and (21).¹⁰

3.2 Why *Wh*-Movement?

The *wh*-movement in the subcomparative clause is part of the formation of a free relative. It can be seen overtly in some languages. Example (22) is from Bulgarian and here the fronted relative *wh*-pronoun is obligatory. The same relative pronoun appears in ‘ordinary’ clausal comparatives and in *of*-comparatives, as illustrated in (23) and (24).^{11, 12}

- (22) Ivan izpi poveče vino ot-kolkoto Maria bira.
 Ivan drank more wine from-how-much-REL Maria beer
 ‘Ivan drank more wine than Maria drank beer.’
- (23) Ivan izpi poveče vino ot-kolkoto bjahme kupili.
 Ivan drank more wine from-how-much-REL were-1pl bought
 ‘Ivan drank more wine than we had bought.’
- (24) Ivan izpi poveče ot vinoto ot-kolkoto Maria ot
 Ivan drank more from the-wine from-how-much-REL Maria from
 birata.
 the-beer
 ‘Ivan drank more of the wine than Maria drank of the beer.’

Some dialects of English also have an overt *wh*-word in the subcomparative clause, exactly as in ‘ordinary’ and *of*-comparatives:

¹⁰*Wh*-movement of a null adverbial has also been employed in Larson’s (1990) analysis of *before/after*-constructions. He proposes that in clausal complements of prepositions like *before* and *after*, a covert adverbial with the meaning of *when* is extracted to Spec, CP. This account captures the fact that embedding in the complement of *before/after* results in ambiguity and that the available interpretations are sensitive to islands. Given the affinity between comparatives and *before/after*-constructions, it is not surprising that they should be given similar analyses.

¹¹Bulgarian does not permit left-branch extraction, as evident from the contrast between (ia) and (ib):

- (i) a. *Kolkoto izpi Maria bira?
 how-much drank Maria beer
- b. Kolkoto bira izpi Maria?
 how-much beer drank Maria
 ‘How much beer did Maria drink?’

¹²Greek, which also does not allow left-branch extraction, uses the relative pronouns *oso* ‘how-many’ or *oti* ‘what’ in subcomparatives and ‘ordinary’ comparatives alike (Spyridoula Varlokosta, p.c.).

- (25) a. We own more books than *what* we own magazines.
 b. She is more happy now than *what* she was sad before.
- (26) We own more books than *what* they do.
- (27) We own more of the books than *what* we own of the magazines.

The same facts obtain for Afrikaans. Example (28) shows the presence of the relative pronoun *wat* in a subcomparative; the same relative pronoun appears in ‘ordinary’ comparatives, as seen in (29) (examples from den Besten 1978, fn 13):

- (28) Jan koop meer boeke as *wat* Piet plate koop.
 John buys more books than *what* Pete records buys.
- (29) Jan het meer boeke gekoop as *wat* Piet gekoop het.
 John has more books bought than *what* Pete bought has

Uncontroversially, examples like these involve free relatives.

Further support for the claim that the subcomparative clause is a free relative comes from the fact that in Hindi subcomparatives (just like the other types of comparatives) are formed as correlatives.¹³ The correlative construction involves a left-dislocated free relative clause, coindexed with a proform, usually a demonstrative, in the matrix sentence (Andrews 1985, Srivastav 1991).

- (30) [Sita-ne *jit-ne* seb kharide]_i; Ram-ne us-se_i jyada
 Sita-ERG *how-many* apples bought Ram-ERG DEM-ABL more
 aam khaye.
 mangos ate
 ‘Ram ate more mangos than Sita bought apples.’

It is clear at this point that crosslinguistically subcomparatives behave like *wh*-constructions and more specifically like free relatives. This is already a different account from the current analyses of subcomparatives (cf. Grimshaw 1987, Corver 1990, 1993). The claim that subcomparative clauses are free relatives, however, does not immediately and uncontroversially answer the question of what their internal syntax is. Note that the original proposal by Bresnan and Grimshaw (1978) is that free relatives involve no *wh*-movement; for them the *wh*-word is base-generated as the head of the construction and a deletion rule is responsible for the gap in the free relative. Since Bresnan and Grimshaw’s proposal a number of accounts have offered an alternative analysis according to which free relatives involve movement of the *wh*-constituent to Comp (cf. Groos and van Riemsdijk 1979, Hirschbühler and Rivero 1983,

¹³Thanks to Rajesh Bhatt for the data.

Jacobson 1993, among others). As is well known, free relatives are sensitive to islands so the same issue arises with them as with comparatives: should another rule be added to the grammar if *wh*-movement can account for the data. Given the claim made here that (sub)comparatives are free relatives, it is not surprising that both constructions have been the subject of the same controversy.

3.3 The Semantics of (Sub)comparatives

The purpose of this subsection is to provide semantic argumentation in support of the *wh*-movement account of subcomparatives. It will be shown that subcomparatives are not interpreted very differently from the other comparatives and that comparatives and subcomparatives alike have common properties with other *wh*-constructions.

Semantically, all comparative clauses are analyzed as involving binding of a degree or amount variable by an operator.¹⁴ As has often been pointed out (see Heim 1985, Rullmann 1995), subcomparatives are simpler to analyze than ‘ordinary’ comparatives because the syntactic gap in subcomparatives is of a degree/amount expression just like the semantic variable. The *wh*-movement analysis of subcomparatives allows for a compositional semantics of the construction, as the *wh*-element and its trace correspond directly to the operator and the semantic variable.¹⁵ Thus the syntactic expression in (31a) has the semantic representation in (31b):¹⁶

- (31) a. The table is higher than [*wh*_{*i*} [the desk is wide (to) *t*_{*i*}]].
 b. The table is higher than $\max(\lambda d$ (the desk is wide (to) *d*)).

In *of*-comparatives the syntactic category of the gap also corresponds to the amount interpretation of the semantic variable. In ‘ordinary’ comparatives, however, the gap can be an NP, AP, or an AdvP, but semantically they still are degree/amount descriptions. In other words, the structure in (32a) is interpreted as in (32b):

¹⁴The details of the different semantic accounts are not immediately relevant for the particular issue at hand: whether or not there is syntactic movement in the subcomparative clause. What is important is that all analyses involve an operator-variable chain of some sort for both subcomparatives and ‘ordinary’ comparatives.

¹⁵Both Heim and Rullmann assume the left-branch extraction account of Chomsky (1977) and den Besten (1978), but it is obvious that the compositionality argument holds for the present proposal as well.

¹⁶The representation in (31b) and (32b) follows the proposal of von Stechow (1984) and Rullmann (1995) that comparative clauses denote maximal degrees. This view goes back to the original Russellian analysis of comparative clauses as definite degree descriptions (see also Heim 1985). The definition of the *max* operator is as in (i):

(1) The Maximality Operator *max*:
 Let DEG be a set of degrees ordered by the relation \leq , then
 $\max(\text{DEG})=\iota d [d \in \text{DEG} \wedge \forall d' \in \text{DEG}[d' \leq d]]$

- (32) a. The table is higher than [*wh_i* [the desk is *t_i*]].
 b. The table is higher than *max*(λd (the desk is high (to) *d*)).

Note that at the level of interpretation, the ‘ordinary’ comparative in (32a) is treated as a subcomparative. This is achieved through copying of the adjective (without the degree expression) into its original position.

There are more reasons to prefer the *wh*-movement approach to subcomparatives than just the semantic compositionality argument. It can be shown that subcomparatives behave like other *wh*-constructions with respect to sensitivity to negative islands and interaction with certain quantifiers.

As illustrated earlier in (11), subcomparatives obey negative islands. It is well known that negation and downward entailing quantifiers interfere with the extraction of certain *wh*-phrases: measure NP’s like *how many feet* and *how much money*; degree adjectival and adverbial phrases like *how tall* and *how quickly*.¹⁷ That free relatives and questions are sensitive to negative islands is illustrated in (33):

- (33) a. Mary will be however tall her mother is (*not).
 b. I wonder how quickly every student/*few students can swim.

While negative island effects are usually accounted for in terms of syntactic violations (see Rizzi 1990, among others), there have also been proposals for a semantic explanation (e.g. Kroch 1989, Rullmann 1995, among others). Concerning the *wh*-movement approach to the formation of subcomparatives advocated here, it is important to note that subcomparatives behave like other *wh*-constructions with respect to negative islands.

Scope ambiguities in the presence of certain quantifiers is another property (sub)comparatives share with other *wh*-constructions. Upward entailing quantifiers in subject position can get scope outside of the comparative clause (von Stechow 1984, Larson 1988, Moltmann 1992). The same holds for subcomparatives. Consider example (34):

- (34) The door is higher than every window is wide.

This sentence is ambiguous: when the universal has narrow scope all windows are of equal width. That the universal can take scope outside the subcomparative clause is evident from the fact that the sentence can also receive an interpretation under which the windows are not necessarily of equal width.

The same phenomenon is found in free relatives and in *wh*-questions. The sentences in (35) are ambiguous: they have a meaning where all students wrote the same thing and Ann read/knew it, but they can also mean that for every student Ann read/knew what that student wrote. The former interpretation

¹⁷The interpretation of amount quantified NPs like *how many books* is also affected by negative islands (the non-referential interpretation is lost and only the set interpretation survives) as originally discussed in Kroch (1989).

corresponds to a narrow scope of the universally quantified NP with respect to the *wh*-operator; the latter reading is the result of the universal quantifier receiving scope outside of the *wh*-clause.

- (35) a. Ann read what every student wrote.
 b. Ann knows what every student wrote.

I am not going to discuss how the negative island effects and the interaction with increasing quantifiers are to be accounted for. My purpose is to show that subcomparatives pattern with other *wh*-constructions with respect to these phenomena.

Let us briefly see how the syntax of subcomparatives determines their interpretation. I assume, following Jacobson (1993) that the common meaning of all *wh*-constructions is that of a λ -expression. Further operations on this expression determine the exact meaning of the different *wh*-constructions. Free relatives end up being interpreted just like definite NP's, and when the *wh*-operator is a degree/amount phrase, they denote the highest degree or amount of the set characterized by the predicate.¹⁸ To illustrate with an example: the free relative *how(ever) much John earns* starts out as a predicate denoting the set of maximal amounts such that John earns that amount. Type-shifting to an NP denotation results in the free relative being interpreted as denoting the maximal amount that John earns.

How does this work in the case of subcomparatives? The subcomparative clause as a *wh*-expression initially denotes a predicate. In the case of (36a), the denotation of the *wh*-expression is the set of maximal degrees to which Ann was sad before, clearly a singleton. After type-shifting, the interpretation of the subcomparative clause is as in (36b): it denotes the highest degree to which Ann was sad before.

- (36) a. ...than [_{FR} [_{\emptyset} *to what degree*]_{*i*} Ann was sad *t_i* before].
 b. ...than [_{NP} the degree, to which Ann was sad before].

Clearly this is the desired interpretation of the subcomparative clause. Moreover, the same mechanism that is responsible for establishing the denotation of free relatives applies here as well to derive (the rather informally represented) meaning in (36b) from the syntactic structure in (36a).

¹⁸Jacobson discusses only count free relatives which end up denoting a maximal plural entity (the unique entity with a given property that is the sum of all other entities with that property). Her proposal is that the free relative starts out as a predicative expression denoting a set of maximal plural entities (necessarily a singleton). This expression then type-shifts to a maximal plural entity. The type-lowering is accomplished using Partee's (1986) *t*-type shifting rule, an operation that is defined just in case the set characterized by the predicative expression is a singleton, and that maps the property to the unique individual characterized by that property.

4 The Arguments Against *Wh*-Movement

The main argument against *wh*-movement in subcomparatives has always been the problem with left-branch extraction (since it was assumed that *wh*-movement would involve a modifier to the compared constituent). Here I offered a solution that avoids this problem so the Subcomparative Paradox no longer arises. But before reaching a convincing conclusion, it is necessary to examine the other arguments that have been presented in the literature against *wh*-movement in the derivation of subcomparatives and see whether they are true counterexamples to the account proposed here.

4.1 *That*-Trace Effects

Grimshaw (1987) notes that the presence of a complementizer has much less effect in subcomparatives than in ‘ordinary’ comparatives with a subject gap:

- (37) a. Even fewer books were published than we expected that magazines would be.
b. Even fewer books were published than we expected (*that) would be.

Both Grimshaw (1987) and Corver (1990) consider the absence of *that*-trace effects in (37a) evidence that no *wh*-movement has occurred in its subcomparative clause.

Given the analysis proposed here a *that*-trace effect is not to be expected in subcomparatives. It is well known that the presence of overt complementizers does not have an effect on adjunct extraction (see Lasnik and Saito 1984, Rizzi 1990).

4.2 Multiple Subcomparatives

What appears at first problematic for any *wh*-movement account is the existence of MULTIPLE SUBCOMPARATIVES: constructions having more than one subcompared constituent in a single clause. Some examples are given in (38):

- (38) a. Mary sent more papers to more journals than John sent abstracts to conferences.
b. More men attended more morning talks than women attended evening talks.

In each of these examples two constituents in the subcomparative clause are being compared to respective phrases in the main clause. According to the interpretation given for multiple subcomparatives in von Stechow (1984), sentence (38a), for example, compares the number of papers that Mary sent to journals to the number of abstracts that John sent to conferences and the number of journals to which Mary sent papers to the number of conferences to which John sent abstracts.

Corver (1990, 1993) argues that if the derivation of subcomparatives involves *wh*-movement then multiple subcomparatives would have to involve multiple *wh*-movement, which is not possible in English.¹⁹ Therefore, he concludes that subcomparatives are not formed via extraction of a *wh*-element. The prediction of his argument is that multiple comparison should be precluded in ‘ordinary’ comparatives as well and he claims that this is indeed the case. However, multiple comparatives are acceptable; the following examples are taken from Andrews (1985) (his 88a,b):²⁰

- (39) a. People do crazier things at higher speeds on the McGrath Highway than they do other places.
b. Marcille gave a longer talk at a better attended session than did her husband.

Furthermore, the examples of multiple comparatives considered by Corver become fully acceptable with VP-ellipsis. Compare the following (the judgements on the (a) examples are as indicated by Corver):

- (40) a. *John has given as many boys as many parcels as I’ve sent.
b. John has given as many boys as many parcels as I have.
(41) a. *I consider as many boys as intelligent as you consider.
b. I consider as many boys as intelligent as you do.

I will not offer here an analysis of multiple subcomparison. Both the syntax and semantics of the construction are quite complicated, surrounded by important questions that have not yet been settled. These include even the basic questions of grammaticality and interpretation: some speakers find multiple subcomparatives unacceptable and many are not sure what these sentences actually mean. Recently, Hendriks (1994) has argued against von Stechow’s (1984) claim that the multiple instances of comparison are independent of each other. He shows for example that when the comparative operators are not identical, multiple subcomparatives are not well formed.

4.3 Subcomparison and Ellipsis

Another argument given by Corver (1990, 1993) against the *wh*-movement approach to the formation of subcomparatives is the grammaticality of sentences like (42):

¹⁹Note that in a multiple-*wh*-fronting language such as Bulgarian multiple subcomparatives have only one overt *wh*-element.

²⁰Similarly, multiple result clauses are also possible:

- (i) John hit his car so hard so many times with such a big hammer that it finally started. (from Liberman 1974)

(42) Destroyed as many cities as built castles the Romans certainly have.

Corver's claim is that the two compared constituents are within conjoined VPs. As the domain of subcomparison is smaller than a CP, *wh*-movement cannot be involved.

An alternative explanation for (42) is available, however. It is possible to analyze the domain of subcomparative formation as not a VP but a whole clause involving ellipsis (see Hankamer 1973). Note the grammaticality of (43):

(43) Destroyed as many cities as they have built castles the Romans certainly have.

The subcomparative clause provides the necessary landing site for *wh*-movement. Ellipsis, however, conceals the clausal structure of subcomparatives in examples like (42).

We see that no real counterexamples are found to the account proposed here. And since it does not give rise to the Subcomparative Paradox it is to be preferred to analyses that do not treat subcomparatives and the other comparative constructions uniformly.

5 Conclusions

The aim of this paper was to show that subcomparatives should be given the same analysis as other types of comparative constructions. In arguing for *wh*-movement of an amount/degree denoting adverbial expression within the subcomparative clause I was able to account for the fact that subcomparatives obey islands without having to resort to an illicit left-branch extraction.

The present proposal has further implications. All comparative constructions are now analyzed as involving *wh*-movement but this movement is of a different constituent in the different types of comparatives. In both subcomparatives and *of*-comparatives the extracted *wh*-phrase corresponds to the type of the interpreted variable: a degree/amount expression; yet in 'ordinary' comparatives the extracted constituent is distinct from the interpreted operator: recall that copying of the compared element without the degree/amount quantifier is employed in interpreting this type of comparatives (as illustrated in (32)). In other words, at the level of interpretation 'ordinary' comparatives are treated as subcomparatives. It seems logical then to extend the analysis defended here to 'ordinary' comparatives as well. Thus instead of moving the whole compared constituent (as in (5)), we can extract only the null degree/amount denoting adverbial, as in subcomparatives. Ellipsis can then remove the remaining constituent because it is identical to the compared constituent in the matrix clause. If such an analysis of 'ordinary' comparatives is adopted, there will be no disparity between the syntax and semantics of this construction and the uniformity with the other comparative constructions will be complete.

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