

ON BINDING SCOPE AND ELLIPSIS SCOPE¹

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1. INTRODUCTION

In contexts of Antecedent Contained Deletion (ACD) such as (1), the size of VP-ellipsis (VPE) and the semantic scope of the quantifier containing the silent node are systematically related.² Simplifying somewhat³, the quantifier hosting the ellipsis site has to take scope at least as high as the node containing the antecedent. For (1), this generalization rules out the wide ellipsis reading (1)b if the object (*some play*) is construed *de dicto*, because such a combination would require the hosting quantifier to take scope below the ellipsis node.

- (1) John wanted to read some play Sam did \triangle .
a. \triangle = read
b. $*\triangle$ = wanted to read (relative to *de dicto* reading for the object)

The correlation between noun phrase interpretation and ellipsis in (1) represents a strong argument for the hypothesis that ellipsis resolution and quantifier scope are both encoded at a level of representation that also incorporates information about the syntactic organization of the expression (LF). Similar conclusions have been drawn from the interaction of ellipsis scope with binding scope, which tracks admissible coreference relations of NPs inside the elliptical clause (see e.g. Larson and May 1990; Fox 1999, 2000; Sag 1976). For instance, the R-expression *John* in (2) can be construed coreferentially with the preceding pronoun only if ACD is resolved with wide ellipsis, as in (2)b:

- (2) I expected him_j to buy everything that John_j thought I did. (Fox 1999: 187; (74))
a. $*\triangle$ = bought
b. \triangle = expected him_j to buy

In this paper, I will present further evidence indicating that ellipsis and scope are closely linked by considering the behavior of a related group of elliptical constructions, viz. phrasal comparatives

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²See Fiengo and May (1994); Larson and May (1990); Sag (1980), among others.

³The two dichotomies wide vs. narrow scope and *de dicto* vs. *de re* are well-known to match only partially (wide scope implies *de re*, but narrow scope is compatible with both *de dicto* and *de re*). This inaccuracy does not affect the exposition in the text, though, as the diagnostics to be used do not test for referential transparency.

(PCs; see (3)). Descriptively, PCs are comparative clauses in which the comparative complement (*than*-XP) only contains a single, nominal remnant (*Sam* in (3)):

- (3) John wanted to write more plays [_{than-XP} than Sam_{remnant} \triangle].

Although PCs resemble ACD in many respects, the former possess interesting properties that set them sufficiently apart from the latter in order to permit qualitatively new insights into the relation between ellipsis, scope and binding. In particular, it will be seen below that relocating the focus of attention from ACD to PCs entails that the triad (4)a, which defines properties of VPE, is substituted by the triple in (4)b, which marks corresponding characteristic of elliptical comparatives.

- | | | | | | | |
|-----|----|-------------------------------|---|------------------------|---|---------------|
| (4) | a. | Quantifier scope | – | Size of VP-ellipsis | – | Binding scope |
| | b. | Scope of | | Size of | | |
| | | <i>than</i> -XP extraposition | – | ‘Comparative Ellipsis’ | – | Binding scope |

This change in turn makes it possible to establish three results, two of which are of immediate relevance for the theory of ellipsis more generally.

First, it will be seen that PCs and ACD differ in that in PCs, the correspondence between ellipsis size and the scope of the category hosting the silent node can be described by a biconditional, whereas the implication holds only in one direction in contexts of ACD (section 2.1). This contrast will be attributed to differences in the types of ellipses involved in the two constructions. In addition, the operation marking the scope of ellipsis can be observed in overt syntax only in PCs. Thus, PCs elicit further evidence strengthening the hypothesis gained from the analysis of ACD that the size of ellipsis and the scope of the containing categories correlate. The specific analysis for the formation of PCs to be advocated will moreover be shown to support a new empirical generalization about syntactic restrictions on referentially transparent readings of verbal predicates (section 2.2).

Second, I will present data demonstrating that ellipsis scope and binding scope in PCs are systematically related, emulating closely the pattern that can be observed in ACD (section 3.1). However, the evidence in support of this view will be seen to manifest itself even more transparently in comparatives. This is so as in PCs, the diagnostics for binding scope do not test for properties of NPs embedded inside a relative clause, as in ACD (see (2)), but can be directly applied to the remnant. As a consequence, it becomes possible to control for the potentially aberrant influence of relative clauses (anti-reconstruction effects and counter-cyclic merger; see Fox 2002; Lebeaux 1990; a.o.).

Thirdly, the distribution of possible coreference dependencies between NPs inside the elliptical *than*-XP and potential antecedents in the matrix clause vindicates a specific perspective on the derivation of PCs, according to which PCs are not base-generated, but contain empty elliptical structure inside the *than*-XP that is accessible to the principles of Binding Theory. In this way, PCs provide additional evidence that ellipsis is structurally encoded at the same abstract level - LF - which also serves as the basis for the computation of referential dependencies (section 3.2).

2. THE SIZE OF ELLIPSIS IN PCs

2.1. COMPARATIVES AND CONJUNCTIONS

In Lechner (1999, 2001, 2004), it is argued that the syntactic processes responsible for phonological reduction in comparatives are defined by the same set of restrictions which characterize ellipsis operations that target conjunctions (Gapping, Right Node Raising and ATB-movement). As a result, the effects of Comparative Ellipsis (Bresnan 1975) can be subsumed under independent operations, and need no longer be listed separately in the grammar. What is of particular significance for present concerns is the fact that this hypothesis also leads to a new strategy for generating PCs, which treats them as Gapped clausal comparatives. The surface string in (5)a can for instance be assigned the underlying representation in (5)b:

- (5) a. John wrote more plays than Sam
 b. $[_{IP} [_{IP-First\ conjunct} \text{John wrote } [_{DegP} \text{more plays } t_k]] [_{than-XP} \text{than} [_{IP-Second\ conjunct} \text{Sam wrote } [_{Gapping} \text{d-many plays}_{CD}]]]_k]$
 c. $[_{IP} \text{John wrote } [_{DegP} \text{more plays } [_{than-XP} \text{than } [_{IP} \text{Sam wrote } \text{d-many plays}_{CD}]]]]]$

The configurational constraints on Gapping are usually held to include the requirement that the antecedent clause and the elliptical clause form part of a coordinate structure. But in the example above, the *than*-XP, which contains the Gap, originates in a subordinate position, inside the degree phrase (DegP) of (5)c (Abney 1987; Corver 1990). In order to resolve this conflict, it will be assumed that comparatives can satisfy the coordination criterion by extraposition of the *than*-XP (henceforth *than*-XP Raising or TR), resulting in a derived *comparative coordination* (for details see Lechner 2004). Thus, in an initial step, (5)b is generated from the underlying representation (5)c by TR of the *than*-XP to the right periphery of the clause. The derived comparative coordination (5)b, in which *than* mimics the syntax of a coordinator,⁴ is then sufficiently similar to regular coordinate structures in order to supply a suitable context for the application of Gapping, yielding the PC (5)a. (In addition, the surface appearance of comparatives is shaped by Comparative Deletion, signaled by the subscript CD in (5); see Bresnan 1973, a.o.)

On this conception, Gapped comparatives and Gapped coordinate structures are expected to behave alike in all respects. But, as will be explicated below, the two constructions also differ in important aspects, the identification of which will subsequently prepare the way for a refinement of the analysis.

The relevant asymmetry is empirically reflected by the varying degree to which comparatives and conjunctions, respectively, observe a syntactic condition on the structural relation between an

⁴See, e.g., Hankamer (1973a) and Pinkham (1982). In what follows, *than* will - for expository convenience - be bracketed as a coordinator in a ternary structure. For discussion of coordinate properties of comparatives and the structure of comparative coordination see Lechner (2004) and references therein.

elided string and its antecedent. This *Isomorphism* requirement demands that Gapping only affect environments in which the antecedent and the Gap are embedded at the same depth inside their conjuncts (Hankamer 1979; Hudson 1976; Johnson 2003; Sag 1980; a.o.). In (6), for instance, which is unambiguously associated with the wide ellipsis interpretation (6)b, Isomorphism is responsible for excluding the narrow reading (6)a. The antecedent in the first conjunct is embedded under two IP nodes, while the Gap is part of the matrix clause in the second conjunct.

- (6) $[_{IP}$ John wanted $[_{IP}$ to write plays]] and $[_{IP}$ Sam \triangle poems].
 a. $*\triangle$ = wrote/writes
 b. \triangle = wanted to write

It is well-known that unlike Gapping, VPE is not regulated by Isomorphism, but may choose its antecedent freely from inside the antecedent clause (Hankamer and Sag 1976; Hardt 1993; Hudson 1976; Johnson 2003; Sag 1980, a.o.). The missing VP in (7) can e.g. be recovered either from the higher or from the lower VP in the first conjunct:

- (7) John wanted to write plays, and Sam did \triangle , too.
 a. \triangle = write plays
 b. \triangle = wanted to write plays

The same observation has been made for ACD (Larson and May 1990; Fiengo and May 1994: 254). As illustrated by (8), a broad reading for a host quantifier (*some city*) is compatible with reconstruction of an embedded VP,⁵ although the elided VP, headed by *visited*, is non-isomorphic to its antecedent, which is embedded under an additional IP layer:

- (8) John wants to visit some city that you did \triangle . *want > some city*
 a. \triangle = visited
 b. $*\triangle$ = wanted to visit

PCs appear to instantiate a third, inhomogeneous group of constructions w.r.t. Isomorphism. To begin with, subject comparatives strictly observe Isomorphism, as documented by the observation that (9) lacks the narrow ellipsis construal (9)a.

- (9) $[_{IP}$ More people wanted $[_{IP}$ to write plays]] than $[_{IP}$ \triangle poems]].
 a. $*\triangle$ = d-many people write/wrote
 b. \triangle = d-many people wanted to write

⁵Wide scope in (8) cannot be attributed to a non-scoping mechanism (choice functions or non-local binding of world variables for *de re* readings; see section 2.2), as these devices do not evacuate the relative clause from the c-command domain of the antecedent. Moreover, on the standard assumption that VPE may only elide a single node, and not e.g. multiple terminals, reading (8)b leads to regress, as the antecedent still contains the ellipsis site.

Presupposing, as before, a Gapping analysis for PCs, the underlying source of (9) can be rendered as in (10). The representation in (10), which simultaneously captures the output of TR (i.e. extraposition of the *than*-XP) and the effects of Gapping, clearly respects the dictate of Isomorphism, as it locates the ellipsis site and the antecedent in structurally identical positions:

- (10) [IP [IP More people [IP wanted to write plays]] than
[IP ~~d-many people~~_{CD} [~~IP wanted to write~~_{Gapping} poems]]

Interestingly, object PCs tolerate a wider range of interpretations than their subject counterparts. In addition to the isomorphic, wide ellipsis reading (11)b, the expression (11) can also be assigned the narrow, and apparently non-isomorphic parse in (11)a.⁶ The contrast between (9) and (11) is puzzling inasmuch as it suggests that the formation of subject and object PCs implicates two distinct types of ellipsis, which display the Isomorphism properties of Gapping and VPE, respectively.

- (11) [IP John wanted [IP to write more plays]] than [IP Sam \triangle]
a. \triangle = write/wrote d-many plays⁷
b. \triangle = wanted to write d-many plays

The impression that PCs do not lend themselves to a unified analysis is reinforced by a second class of contexts which discriminate between Gapping and VPE. In all of the Isomorphism violations considered so far, the antecedent was more deeply embedded than the elided predicate. But VPE may also operate on strings which reverse the structural relations, such that it is the elliptical VP - and not the antecedent VP - which is located farther away from the root node (see Johnson 2003 and references therein):

- (12) [IP John wrote plays], and [IP Sally wanted [IP to \triangle]], too.
 \triangle = write plays

⁶Similar ambiguities have been discussed in McCawley (1988: 688) and Pinkham (1982: 130). McCawley assumes that the two readings in examples similar to (11) are not derivationally related, but arise from different deep structures. Pinkham considers (i), and concludes that reading (i)a is the product of a construction specific deletion process, while (i)b represents a base-generated PC which does not include any elliptical structure. As will be seen shortly, both views differ from the one advanced here, according to which all PCs derive from a clausal source (potentially a small clause, as in (i)b).

- (i) John seems taller than Bill \triangle .
a. \triangle = seems d-tall
b. \triangle = is d-tall

⁷In the narrow reading, the verb is also underspecified for tense. Note incidentally that atemporal readings are subject to the additional, curious restriction that the correlate has to be structurally higher than the comparative NPs (see Lechner 2004 for a partial analysis):

- (i) John will subject more students to this year's exam than \triangle to last year's exam.
 \triangle = John will subject/*subjected d-many students
(ii) John will subject this year's students to a harder exam than \triangle last year's students.
 \triangle = John will subject/subjected last years students to a d-hard exam

Corresponding examples of Gapping, in which the antecedent is less deeply embedded than the Gap are still excluded by Isomorphism:

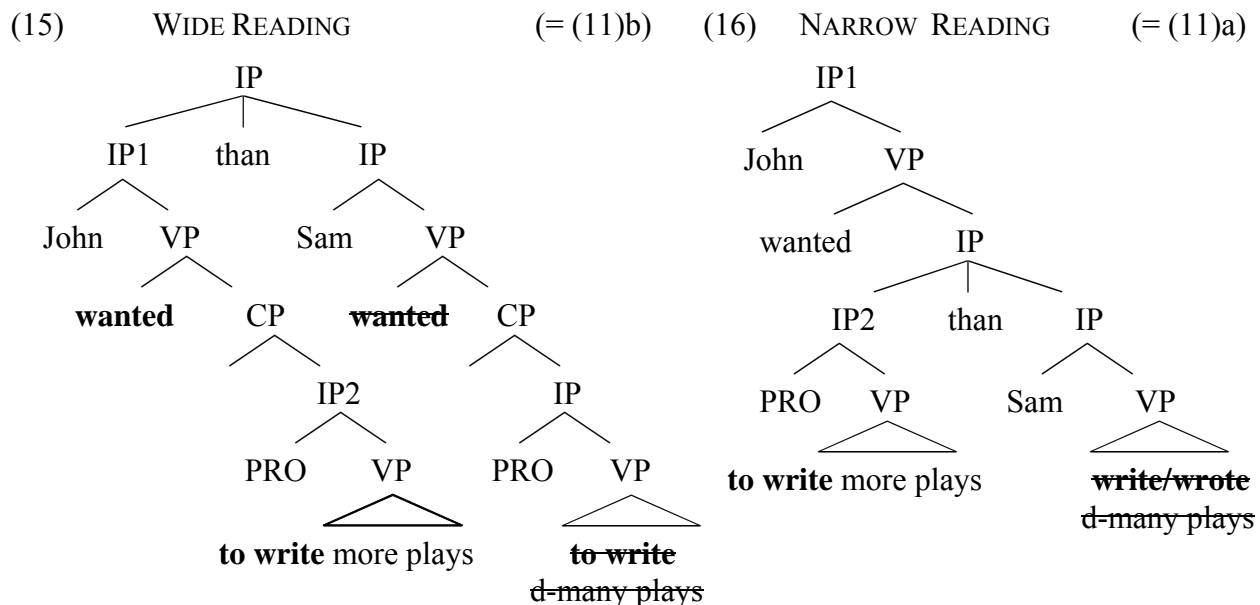
- (13) *_{[IP John wrote plays] and [_{IP} Sam wanted [_{IP} to write poems]]}.

Crucially, object comparatives behave just like Gapped coordinations, they equally fail to allow ellipsis to reach into an embedded clause:

- (14) *John [_{VP} wrote more plays] in a month than [_{IP} Sam wanted [_{IP} to \triangle in a year]].
 \triangle = write d-many plays

In sum, the ellipsis process which feeds PC-formation appears to share properties of Gapping as well as VPE. On the one hand, deletion displays the same restrictiveness as Gapping in subject PCs (see (9)) and object PCs that construe the Gap lower than the antecedent (see (14)). On the other hand, ellipsis was also seen to be licit in selected contexts which appear to violate Isomorphism (see (11)). The objective of an analysis which uniformly attributes PCs to the workings of Gapping accordingly has to consist in finding a principled explanation for why (11) also possesses the non-isomorphic reading (11)a. In what follows, it will be shown that the current approach is not only compatible with, but already implicitly contains such an account.

Above, it was assumed that the coordinate parse of comparatives is sponsored by the movement process of TR, which shifts the *than*-XP to the right periphery of the clause. If TR extraposes the *than*-XP into the higher clause, as suggested by the bracketing in (11) and the tree diagram (15), the narrow ellipsis interpretation (11)a can evidently only be obtained at the cost of an Isomorphism violation. But the TR-analysis also provides an alternative derivation, which proceeds in terms of local extraposition, and which parses the *than*-XP into a coordinate structure with the subordinate, instead of the matrix clause, as illustrated by (16).



In (16), low attachment to IP2 creates now an appropriate context for Gapping of the embedded predicate (*write*), generating the narrow interpretation (11)a. On this view, ellipsis ambiguity in PCs is resolved derivationally by mapping the two readings to two distinct syntactic representations. As a corollary, the analysis restores the homogeneity of PCs w.r.t. Isomorphism, removing an obstacle for a unified Gapping account of PCs.

As already pointed out above, subject PCs such as (9) contrast with object comparatives in that they fail to exhibit ellipsis ambiguity:

- (9) More people wanted to write plays than \triangle poems
 a. * \triangle = d-many people write/wrote
 b. \triangle = d-many people wanted to write

On current assumptions, this follows directly from the fact that in (9), the *than*-XP originates inside the matrix subject, as detailed in (17)a. Subsequent to TR in the transition from (17)a to (17)b, the *than*-XP enters a comparative coordination with the matrix IP node in (17)b:

- (17) a. [_{IP} [More people [~~than d-many people~~_{CD} want to write poems]] want to write plays]
 b. [[_{IP} [More people **t_k**] want to write plays] **than** [_{IP} ~~d-many people~~_{CD} **want to write poems**]_k]
 c. [[_{IP} More people **want to write** plays] **than** [_{IP} ~~d-many people~~_{CD} ~~want to write~~_{Gapping} poems]]

Isomorphism now ensures that Gapping in (17)b results in the wide ellipsis interpretation (17)c. The narrow reading (9)a cannot be produced, because Gapping of the embedded predicate to the exclusion of the higher verb would require the *than*-XP to lower into the subordinate clause, in violation of the ban on downward movement:

- (18) a. [_{IP} [More people [~~than d-many people~~_{CD} write/wrote poems]] want to write plays]
 b. *_{IP} [More people **t_k**] want [[_{IP} to write plays] **than** [_{IP} ~~d-many people~~_{CD} **write/wrote poems**]_k]]

Thus, the TR-analysis reduces an at first sight puzzling inconsistency in the behavior of PCs w.r.t. Isomorphism (subject vs. object PCs) to a general property of syntactic movement operations.

The account is furthermore supported by a third class of PCs, represented by adjunct comparatives, which pattern along with object PCs in that the *than*-XP can be read with narrow or broad ellipsis:⁸

⁸The *than*-XP must in some way be allowed to escape the adjunct. This problem is germane to all analyses of adjunct comparatives which scope parts of the DegP (such as e.g. Heim 2000).

- (19) The boys wanted to go to the movies more often than the girls \triangle
 a. \triangle = went to the movies d-often
 b. \triangle = the girls wanted to go to the movies d-often

Just as with object PCs, ambiguity derives from variation in the scope of TR. The adjunct originates inside the subordinate clause, and the *than*-XP may therefore extrapose locally, coordinating with the embedded IP, or move into the higher clause, leading to matrix coordination and wide ellipsis.

Before integrating additional data into the analysis, a remark is in order regarding the scope of the *than*-XP in (11)/(16) relative to the intensional predicate *want*. The following section will address this issue, proceeding from there to further empirical ramifications.

2.2. BINDING OF WORLD VARIABLES

The analysis for the object PC (11) advanced so far, which was made explicit in (15) and (16), encounters a complication. (Relevant portions of (11) are repeated below.)

- (11) John wanted [[PRO to write more plays] than [Sam ~~write~~/wrote]] *Narrow reading*

Even though in the narrow reading of (11) the *than*-XP resides within the syntactic scope of *want* (see also (16)), the content of the *than*-XP is not part of John's wishes. On this specific interpretation, sentence (11) compares the number of plays John wants to write with the number of plays Sam actually wrote, and not with the number of plays which John wants Sam to complete. Thus, it must be ensured that the Gapped predicate inside the *than*-XP is interpreted at the evaluation index w_0 , as in (20), and not at the bouletic alternatives provided by *want*, as in (21):

- (20) a. John wanted _{w_0} to write _{w} more plays than Sam wrote _{w_0} *(evaluated at w_0)*
 b. $\forall w[R_{\text{bouletic alternative for John}}(w_0)(w) \rightarrow \exists d[\text{John_writes_d-many_plays_in_}w \ \& \ d > \max\{d' | \text{Sam_wrote_}d'\text{-many_plays_in_}w_0\}]]$
*for all worlds w which are consistent with John's wishes in w_0 ,
 John writes more books in w than Sam wrote in w_0*
- (21) a. *John wanted _{w_0} to write _{w} more plays than Sam wrote _{w} *(evaluated at w_0)*
 b. $\forall w[R_{\text{bouletic alternative for John}}(w_0)(w) \rightarrow \exists d[\text{John_writes_d-many_plays_in_}w \ \& \ d > \max\{d' | \text{Sam_wrote_}d'\text{-many_plays_in_}w\}]]$
*for all worlds w which are consistent with John's wishes in w_0 ,
 John writes more books in w than Sam wrote in w*

This aspect of the analysis proves largely unproblematic, though. It has been observed by various authors that world variables associated with predicates inside comparative complements can be

anchored to the actual world by non-local binding of world variables, or double indexing,⁹ resulting in a *de re* reading without scoping of the *than*-XP (Heim 1985, 2005; Hoeksema 1984; Kennedy 1995; Postal 1974; Rullmann 1995). What needs to be added is the proviso that if the *than*-XP contains a Gap - to be precise, a finite Gap (see (25) below) - the double indexing strategy (20) is not only optional, but even obligatory.¹⁰

The present account also naturally extends to a slightly more complex class of examples, in which nominal comparatives serve as subjects of ECM-infinitivals, illustrated in (22). The paradigm in (22) is of specific interest inasmuch as it brings to light another factor which is instrumental in determining the interpretation of elliptical comparatives.

- (22) John wanted more people to write plays than \triangle poems.
 a. $*\triangle$ = d-many people write/wrote
 b. \triangle = John wanted d-many people to write

Observationally, the ECM-PC in (22) licenses the wide ellipsis interpretation (22)b, but lacks the narrow construal (22)a¹¹. Evaluated at some point in the actual world, (22) does not express the proposition that John wanted the number of playwrights to exceed the number of people who are actual poets under current circumstances. Rather, (22) conveys information about the relation between poets and playwrights in worlds that accord to John's desires.

On current views, (22) is parsed in the tree in (23)a, a representation similar to the one assigned to the narrow reading for the object PC in (11)a/(16) (repeated on the right-hand side of the table).

⁹I borrow here the terminology of Postal (1974). One classic examples motivating double indexing in comparatives is (i), which combines pronominal variable binding with a consistent, *de re* reading for the *than*-XP (Heim 1985; Hoeksema 1984; Kennedy 1995; Rullmann 1995). Variable binding controls for the LF-position of the *than*-XP, ensuring that it cannot take scope above *believe*. Moreover, the *de re* reading requires that the world variable of the *than*-XP be identified with the matrix world w_0 . These apparently conflicting requirements for the position of the *than*-XP can be satisfied by anchoring the embedded world variable directly to w_0 .

(i) We believed _{w_0} that every problem _{j} was _{w} harder [than it _{j} was _{w_0}]

¹⁰Maribel Romero (p.c.) notes that (15)a might also possess a reading in which the world variable is bound locally. If this intuition turns out to be correct, no stipulatory device needs to be added.

¹¹In addition, (22) lacks the wide 'mixed' construal (i), sponsored by TR to the matrix IP node. In (i), the comparative NP functions as the ECM-subject, while the CD-site is understood as the matrix subject:

(i) $*\triangle$ = d-many people wanted to write

The ban on (i) falls out from a more general restriction, though. As noted first in Hankamer (1973b), PCs lack mixed readings such as (ii)b, which associate the CD-site and the comparative NP with distinct grammatical functions. This constraint also filters out reading (i). (See Lechner 2001, 2004 for a possible account of Hankamer's generalization.)

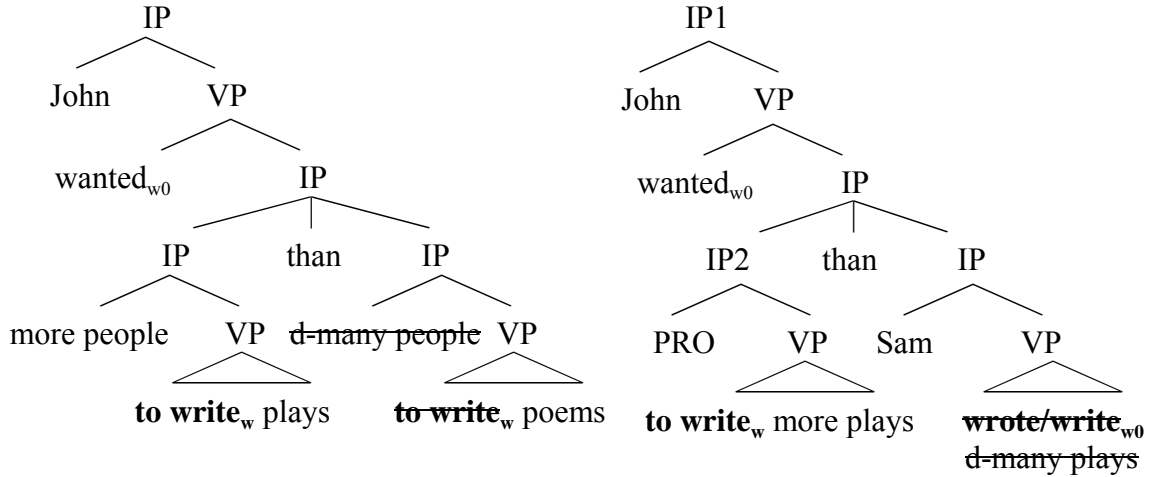
(ii) The Irish singers liked more Estonian singers_{Object} [*than*-XP than the French singers]
 a. *than*-XP = than the French singers liked [d-many Estonian singers]_{Object}
 b. $*\textit{than}$ -XP = than [d-many Estonian singers]_{Subject} liked the French singers

(23) a. ECM-PC

(= (22)b)

(16) OBJECT PC

(= (11)a)



But in contrast to the object PC (16), where the world variable inside the *than*-XP is bound by the highest evaluation index w_0 (see also fn. 10), the world variable in (23)a must be identified locally. If the world variable were bound at a distance, one would be incorrectly led to expect that the surface string (22) feeds the LF (24)a and its pertaining semantic translation in (24)b, both of which represent the absent narrow interpretation (22)a.

- (24) a. *John wanted_{w0} [[_{IP} more people to write_w plays] than [_{IP} \triangle poems]] *Narrow reading of (22)*
 \triangle = d-many people write_{w0} poems
- b. $\forall w[R_{\text{bouletic alternative for John}}(w_0)(w) \rightarrow \exists d[d\text{-many_people_write_plays_in_}w \ \& \ d > \max\{d' | d\text{-many_people_write_plays_in_}w_0\}]]$

Hence, the question emerges why non-local binding of world variables is attested in object PCs ((11)a/(16)), but not in ECM-PC ((22)/(23)a).

A possible answer to the question above can be devised by combining a descriptive condition on double indexing with an independent difference between object and ECM-PCs. Turning to the latter ingredient of the analysis first, observe that object PCs may embed nominative remnants (*John wants to write more books than Sam/he_{Nom}*), which is diagnostic of the presence of finiteness features inside the *than*-XP.¹² In contrast, the *than*-XP of ECM-PCs by definition lacks such a nominative term. In the ECM-PC (23)a, the topmost subject position of the *than*-XP is the accusative ECM-

¹²For most speakers, subject remnants in non-predicative PCs cannot surface with accusative case:

(i) *John wanted to write more plays than me.

Thus, predicates inside the *than*-XP of object PCs are always finite. For a (partial) account which does not rely on finiteness see Lechner (2004: 189ff).

subject,¹³ and the predicate is necessarily realized as an infinitival. This contrast suggests the hypothesis on double indexing in (25):

(25) **CONJECTURE ABOUT DOUBLE INDEXING (CDI)**

- a. A finite gapped predicate inside a *than*-XP must be double indexed (but see fn. 10).
- b. A non-finite gapped predicate inside a *than*-XP must be locally bound.

On the one side, clause (24)a of the CDI licenses double indexing in object PCs, such as (11)a/(16), because the nominative remnant signals that the Gapped predicate is finite.¹⁴ Clause (24)b on the other side prohibits long-distance binding of world variables if the predicate is located inside non-finite ECM-complements, accounting for the absence of the narrow ellipsis construal (24). In the latter case, the world variable of the infinitival must be identified by the next available binder, which is provided by the matrix predicate *want*, as documented by the LF (26)a. The translation (26)b finally reveals that the content of the *than*-XP is now correctly interpreted *de dicto*, as being part of John's desires:

- (26) a. John wanted_{w0} [[_{IP} more people to write_w plays] than [_{IP} \triangle poems]] *Wide reading*
 \triangle = d-many people write_w poems *of (22)*
- b. $\forall w[R_{\text{bouletic alternative for John}}(w_0)(w) \rightarrow \exists d[d\text{-many_people_write_plays_in_}w \ \& \ d > \max\{d' | d\text{-many_people_write_plays_in_}w\}]]$

To summarize the analysis of ECM-PCs, the embedded comparative coordination (23)a is - somewhat surprisingly - associated with the *wide* ellipsis reading (22)b/(26), while the *narrow* reading (22)a is blocked by the CDI (in case the string is parsed into a comparative coordination at the level of the embedded IP-node) and by the general isomorphism constraint on Gapping (if the string is parsed into a comparative coordination at the level of the matrix IP-node).¹⁵

¹³This follows from the parallelism requirement on the comparative NP and the CD-site (see fn. 10), which forces both the comparative NP and the CD-site of (23)a to be accusative ECM-subjects.

¹⁴The argument rests on the assumptions that nominative strictly correlates with finiteness. This view might turn out to be too strict, e.g. in case the system needs to incorporate nominative default case. Lechner (2004, p.189ff) pursues an alternative approach, which is compatible with the latter conception, and which links the contrast between ECM and object comparatives to differences in the respective structural relations between the CD-site and the remnant.

¹⁵There is a second derivation for the wide reading (22)b which involves high comparative coordination, ATB-subject movement of *John* and long-distance Gapping of the string *wanted to write*.
 (i) John_k [[_{IP} t_k wanted more people to write plays] than [_{IP} t_k ~~wanted~~ d-many people ~~to write~~ poems]].
 The derivation in (i) proves unproblematic, though, because the embedded predicate is non-finite, precluding double indexing. Note also that the alternative representation for the narrow reading (22)a in terms of wide TR, as given in (ii), violates Isomorphism as well as the CDI.
 (ii) *[[_{IP} John wanted more people to write plays] than [_{IP} d-many people ~~write/wrote~~ poems]].

While the two clauses of the CDI in (25) only express descriptive generalizations in their present form, at least (25)b can be reduced to a more general property of verbs. Percus (2000: 201) observes that verbal predicates differ from their nominal counterparts in that the world variables of the former are indiscriminately bound by the closest available binder. Percus does not consider evidence from ellipsis (or PCs, for that matter), though, and one might therefore speculate that this principle applies in all generality only to *overt* verbs, but that a proper subset of *silent* verbal predicates behaves more liberally in being able to skip the most local binder. As was seen above, the members of this set must minimally fulfill the additional requirement of finiteness. From this it directly follows that Gapped verbs inside object comparatives can be bound at a distance, while all other verbal predicates - including Gapped verbs in ECM-PCs - do not have access to the double indexing strategy. Finally, the fact that the world variables of nominal predicates are subject to looser binding conditions does not pose further complications (on transparent and opaque readings of narrow scope NPs see e.g. von Stechow and Heim 2002, and references). As Gapping is restricted to verbal predicates, NPs do not fall under (25) and a further qualification in the definition of (25) is therefore unnecessary.

At least three open questions remain, two of which are directly related to the CDI. First, any analysis of comparatives - elliptical or not - needs to explain why verbal predicates inside *than*-XPs are exempt from the locality condition on world-variable binding identified by Percus (see fn. 9). Second, why does the absence of a phonological matrix enforce double indexing (again, modulo fn. 10)? Finally, which role does finiteness play in licensing long-distance binding? Plausibly the ability of finite predicates to introduce independent eventualities contributes to their exceptional status (see e.g. Wurmbrand 2001). At the moment, I have to delegate a more solid theoretical grounding of these restrictions to further research. As will be shown below, there is some suggestive evidence, though, that at least the finiteness distinction should indeed be a component of the analysis, supporting the general direction of the present account.

Some independent confirmation for parts of the CDI in (25), in particular the assumption that only finite Gapped predicates can escape the verdict of Percus's generalization, comes from the distribution of reflexives inside the comparative complement and their interaction with *de dicto/de re* ambiguities. The argument has two steps to it. To begin with, note that PCs differ from clausal comparatives in that they license long distance reflexives (see e.g. Brame 1983):

- (27) a. John couldn't possibly be taller than **himself**.
 b. *John couldn't possibly be taller than **himself** is.

This contrast correlates with a further observation. The subject position of (predicative) PCs is not necessarily assigned nominative Case, but may be marked by default accusative (Brame 1983):

- (28) a. John is older than **me**.
 b. *John is older than **me** am.

These two properties discriminating PCs from clausal comparatives lend themselves to a unified analysis in terms of finiteness (Lechner 2001, 2004). On the one hand, PC remnants may bear accusative case because the *than*-XP of PCs does not (necessarily) contain finiteness features. Provided that binding domains are defined in terms of finiteness (Chomsky 1981; 1986), the *than*-XP of PCs does, on the other hand, not constitute a binding domain, and the anaphor in (27)a can therefore be licensed by an external antecedent.¹⁶ Finally, what is relevant for present concerns is the observation that reflexive remnants signal the absence of finiteness.

The second step of the argument builds on Russell's (1905) observation that predicates inside certain comparatives embedded under propositional attitude verbs can be bound by non-local world indices, as exemplified by (29). (29) possess a contradictory *de dicto* reading, which reports an inconsistent belief, as well as a sensible *de re* interpretation (Kennedy 1995; von Stechow 1984; Rullmann 1995):

- (29) Bill believes_{w0} that Mary is_w taller than she is \triangle . *de dicto/de re*
 $\triangle = d\text{-tall}_{w0/w}$

Proceeding to the synthesis, paradigm (27) demonstrated that long distance reflexives in the subject position of PCs are licensed only if the *than*-XP lacks finiteness features. Moreover, the CDI (25) precluded double indexing of non-finite predicates. Taken together, these two hypotheses entail the prediction that PCs with reflexive remnants should exclusively license a contradictory, *de dicto* reading. And in fact, this expectation is borne out. Substituting a reflexive for the name bleeds the consistent *de re* reading, in support of the CDI (McCawley 1967; Heim 1985; Hellan 1981; von Stechow 1984):

- (30) Bill believes_{w0} that Mary is_w taller than herself \triangle . *de dicto/*de re*
 a. $*\triangle = d\text{-tall}_{w0}$
 b. $\triangle = d\text{-tall}_w$

To recapitulate the findings of the current section, extraposition by TR was seen to mark the size of ellipsis for Gapped comparatives. PCs resemble in this respect ACD. However, contrary to ACD, which employs QR (or some variant thereof), the movement process which determines the size of ellipsis in PCs also feeds PF. Thus, its presence or absence can be directly verified. Moreover, unlike ACD, PCs are subject to strict Isomorphism.¹⁷ These two properties make it possible to infer a one-

¹⁶As for the fine grained structure of (27)a, assume that the *than*-XP is construed as a small clause embedding the remnant and the CD-site, as in (i):

(i) ...than himself [d-tall]

¹⁷But note that although VPE in isolation does not obey Isomorphism, VPE in ACD does so if ellipsis is correlated with principle C. That is, it is not possible to assign (i) a reading that mixes wide QR (bleeding Principle C) and narrow ellipsis.

(i) I expected him_j to buy everything that John_j thought I did. (Fox 1999: 187; (74))

to-one mapping between the overt syntactic position of the *than*-XP, and the scope of ellipsis. Analyses of ACD, on the other hand, arrive at a structural correlation (at LF) only by way of the additional hypothesis that not all movement can be detected at PF. Even though this latter assumption is well-established, the direct empirical evidence for the correspondence between movement and ellipsis scope which is elicited by PCs provides a missing link in the pattern, and thereby contributes substantially in consolidating the standard account of this subclass of ellipsis phenomena.

Object PCs and ECM-PCs were moreover seen to differ in that only the former display the effects typically associated with double indexing. While the content of the *than*-XP can be construed outside the scope of the matrix predicate in object PCs which are parsed into a narrow comparative coordination ((20)a), ECM-PCs do not tolerate long distance anchoring of the word variable ((26)a):

- (20) a. John wanted_{w0} [[_{IP} to write_w more plays] than [_{IP} Sam \triangle]].
 \triangle = writes/wrote_{w0} d-many plays
- (26) a. John wanted_{w0} [[_{IP} more people to write_w plays] than [_{IP} \triangle poems]].
 \triangle = d-many people write_w/*write_{w0} poems

The analysis proposed above reduces this contrast to a difference in finiteness and the empirical generalization in (25), which could be shown to receive additional empirical justification from the distribution of reflexive remnants in Russell sentences.

Section 2.2 put forward arguments for the hypothesis that ellipsis ambiguity in PCs correlates with ambiguous syntactic representations. In the next section, I will examine certain empirical ramifications of this view, presenting evidence from correlations between ellipsis scope and the binding scope of the remnant. The results will be seen to vindicate the TR-analysis as well as the assumption that PCs embed empty syntactic structure and can therefore not be base-generated.

3. BINDING SCOPE IN PCs

In the previous section, it was argued that Isomorphism ensures that in PCs, the height of comparative coordination directly determines the size of the Gap. This leads one to expect that the height of attachment of the *than*-XP (i.e. its scope) should also have repercussions on other c-command and scope sensitive phenomena. In the current section, I will address this prediction by means of an investigation of the interaction between ellipsis scope and the syntactic binding scope of the remnant embedded inside the *than*-XP. Since quantifier scope and anaphoric dependencies in

comparatives are subject to various interfering factors¹⁸, the discussion will be exclusively based on the distribution of disjoint reference effects.

3.1. THE SIZE OF ELLIPSIS AND BINDING SCOPE

On current assumptions, PCs are derived by extraposition by TR, followed by Gapping. Gapping is in turn restricted by Isomorphism, and the size of the ellipsis inside PCs therefore directly matches the scope of TR: narrow TR correlates with local Gaps, and wide TR with long-distance Gapping. (As was seen in section 2, PCs differ in this respect from ACD.) In addition, extraposition also interacts with Binding Theory, in that extraposed clauses do not reconstruct for the computation of Principle C (Fox and Nissenbaum 1999; Taraldsen 1981; Williams 1974):

- (31) a. ??I gave him_j a book that John_j liked yesterday.
b. I gave him_j a book yesterday that John_j liked.

Thus, comparatives which combine Gapping, extraposition and disjoint reference effects are shaped by two intersecting constraints: first, TR determines the size of ellipsis and second, TR marks the LF position of the extraposed category. In conjunction, these two generalizations also imply that the size of ellipsis in PCs should directly correspond to the syntactic binding scope of remnants inside the *than*-XP. In what follows, I will substantiate the TR-analysis by evaluating the correctness of a number of corollaries which follow from this hypothesized correlation between ellipsis scope and binding scope. The tests to be employed use disjoint reference effects as a diagnostic for the binding scope of the remnants. To anticipate, it will turn out that the facts corroborate the TR-analysis, but pose a challenge for base-generation analyses of PCs (Brame 1983; Napoli 1983; a.o.).

Ambiguous object PCs such as (32), in which the remnant contains an embedded R-expression and the matrix clause contains a pronoun to be construed coreferentially with the name, provide the first diagnostic context for the correctness of the TR-analysis.

- (32) [_{IP1} Mary promised **him_j** [_{IP2} PRO to invite more people than [**John_j**'s sister]]]

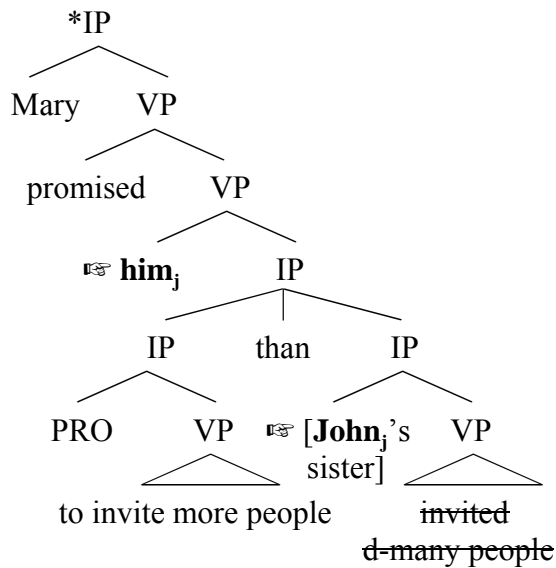
On the Gapping analysis of PCs, variation in the scope of TR is predicted to affect the shape of ellipsis as well as the size of the c-command domain of the pronoun. As illustrated by (33) and (34), this prediction is correct. The narrow ellipsis interpretation (33)a, which correlates with comparative coordination at the embedded node IP2 (see (34)a), induces a Principle C violation, as the name

¹⁸For one, quantifiers inside the *than*-XP show a strong - but not absolute (see Rullmann 1995) - tendency toward taking scope at least higher than the existential operator binding the degree variable (see Heim 1985; Heim 2000; Hoeksema 1984; Kennedy 1997; Rullmann 1995; Schwarzschild and Wilkinson 2000). This has the consequence that relative scope of quantificational terms inside the *than*-XP cannot be taken to directly reflect the position of the *than*-XP. Moreover, the binding domain of anaphors inside phrasal *than*-XPs extends in many cases into the matrix clause (see above). Thus, disjoint reference effects offer the most reliable test for the scope of remnants inside the *than*-XP.

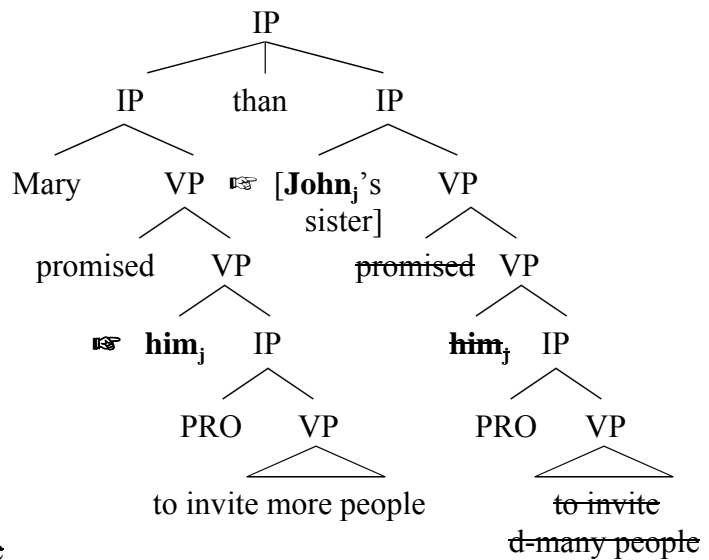
remains within the syntactic scope of the pronoun.¹⁹ Wide ellipsis, as in (33)b, on the other side involves comparative coordination at the matrix IP-node IP1 (see (34)b). Thus, the *than*-XP has been raised to a position outside the c-command domain of the pronoun, leading to obviation of a Principle C effect (see (2) for a related example involving covert movement and ACD).

- (33) Mary promised **him_j** PRO to invite more people than [**John_j**'s sister] \triangle .
 a. * \triangle = invited d-many people
 b. \triangle = promised **him_j** to invite d-many people

(34) a. NARROW READING



b. WIDE READING



The same contrast can also be replicated for comparatives embedded under object control verbs:

- (35) We convinced **him_j** PRO_j to donate more money than [**John_j**'s sister] \triangle .
 a. * \triangle = donated d-much money
 b. \triangle = convinced **him_j** to donate d-much money

In (33) above, the remnant contained the name, while the matrix clause embedded the trigger for the Principle C violation. But reflexes of the systematic covariation between the scope of TR - i.e. the height of coordination - and ellipsis scope can also be detected by examining the behavior of R-expressions which have been reconstructed into the *than*-XP via ellipsis resolution (see Fiengo and May 1994 for ACD). In particular, if the positions of binder and bindee are reversed, as in (36), only the narrow ellipsis reading (36)a, which is represented by (38)a, is compatible with a coreferential construal, while the wide ellipsis interpretation (36)b (tree (38)b) induces a disjoint reference effect:

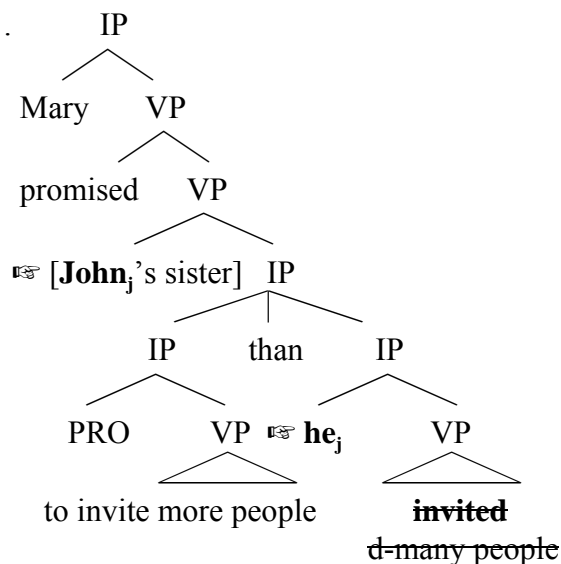
¹⁹(33)a/(34)a also testifies that Gapping differs from VPE in that it fails to license vehicle change of names into pronouns (Fiengo and May 1994).

- (36) Mary promised [**John_j**'s sister] to invite more people than **he_j**.
 a. \triangle = invited d-many people
 b. $*\triangle$ = promised [**John_j**'s sister] to invite d-many people

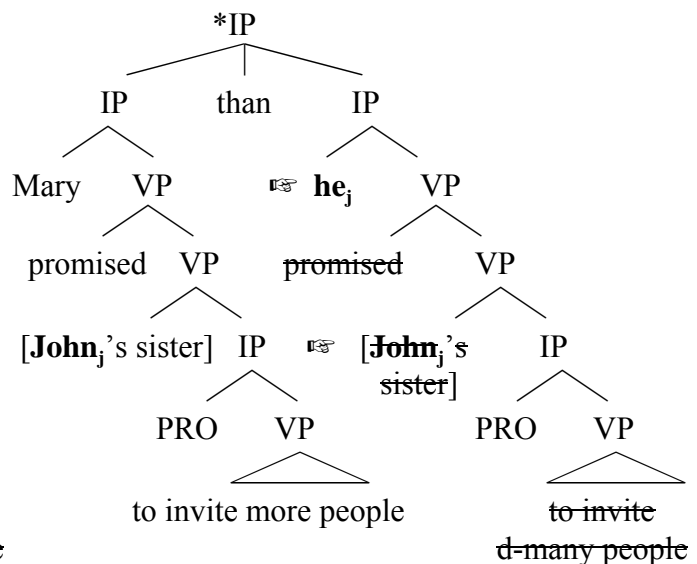
Since pronouns do not make good remnants in English for independent reasons, this second prediction can be better evaluated on the basis of the German example in (37).

- (37) Maria hat [der Schwester von **Hans_j**] versprochen mehr Leute einzuladen als **er_j**.
M. has the sister of H. promised more people to invite than he
 a. \triangle = promised to invite d-many people
 b. $*\triangle$ = promised [**John_j**'s sister] to invite d-many people

- (38) a. NARROW READING



- b. WIDE READING



Again, it is possible to find examples involving object control which attest to the same point:

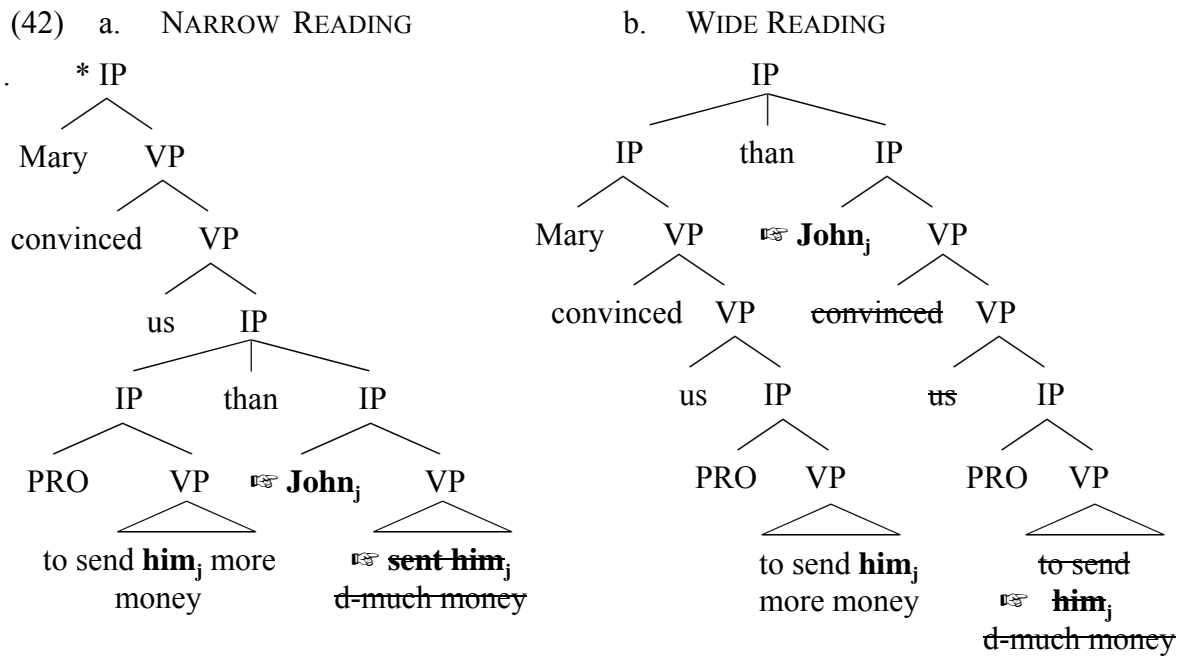
- (39) We convinced [**Bill Gates_j**'s sister] to donate more money than **he_j** \triangle .
 a. \triangle = donated d-much money
 b. $*\triangle$ = convinced [**Bill Gates_j**'s sister] to donate d-much money

- (40) Maria hat [die Schwester von **Hans_j**] überredet mehr Leute einzuladen als **er_j**.
M. has the sister of H. convinced more people to invite than he
 a. \triangle = convinced to invite d-many people
 b. $*\triangle$ = convinced [**John_j**'s sister] to invite d-many people

The first two predictions were based on tests for the *c-command* relations which obtain between the remnant and some other NP in the matrix clause. However, it is also possible to design a more fine grained diagnostic which measures the *distance* between the remnant and the NP inside the matrix clause, and which derives from the inspection of Principle B effects in contexts such as (41).

- (41) Mary convinced us to send **him_j** more money than **John_j**.
- a. * \triangle = sent **him_j** d-much money
- b. \triangle = convinced us_k PRO_k to send **him_j** d-much money

If (41) is read with narrow ellipsis, as in (41)a/(42)a, the pronoun is reconstructed into the local binding domain of the name, and Principle B accordingly prohibits coreference. Broad ellipsis as in (41)b and (42)b leads on the other side to the reconstruction of an additional binding domain which separates the name from the pronoun. Since the pronoun is now free in its minimal clause, the coreferential interpretation becomes available:



To summarize, it was illustrated that the height of coordination interacts with the interpretive component in a systematic way, furnishing strong support in favor of generating PCs by TR and the assumption that ellipsis resolution is subject to Isomorphism. This finding is also of broader theoretical interest, as it consolidates the insight gained from the study of ACD that ellipsis and binding scope are systematically related, in support of the view that each interpretation is assigned a distinct abstract syntactic representation, which is the output of a derivational process. But PCs and ACD also differ along two parameters. First, extraposition by TR proceeds in overt syntax, while ACD relies on covert movement (at least of the ACD-host²⁰). This disparity might be a welcome

²⁰But also the relative clause in (i)a arguably requires some mechanism of overt covert movement, as the relative clause must be attached at a node which supports ellipsis resolution only at LF (see (i)b)

(i) a. ?John believed [everyone you did \triangle] to be a genius.
b. [[John [_{VP} believed t to be a genius]] [everyone you did \triangle]]
 \triangle = [_{VP} believed t to be a genius]

result, as a conflation of properties is represented overtly in PCs, which can be inferred to exist only at an abstract level in ACD. Second, the ellipsis in PCs is contained inside an argument (the *than*-XP leaves an interpretable trace inside the DegP), while it is embedded inside a restrictive relative clause in ACD. This property strongly indicates that PCs cannot be treated as a special instance of ACD. In particular, it poses an obstacle for a common analysis of the two phenomena along the lines of a late merger account, as it has been developed for ACD (Fox 2002; Fox and Nissenbaum 1999), because only adjuncts can be merged counter-cyclically.

Next, I will turn to a comparison between the TR-analysis with (aspects of) Heim's (1985) direct analyses of PCs, which will revolve around the binding theoretic properties of remnants in simple root comparatives.

3.2. EVIDENCE FOR SYNTACTIC ELLIPSIS

Before proceeding to further empirical ramifications of the TR-analysis, section 3.2.1 outlines the essentials of the semantics for base-generated PCs developed in Heim (1985), and some predictions of the direct account. The remaining part of the paper presents a further set of binding effects in PCs, which will be seen to support the TR-approach over the competing direct analysis.

3.2.1. SEMANTICS FOR DIRECT ANALYSIS: HEIM (1985)

According to the direct analysis of PCs, the *than*-XP does not syntactically embed any other covert categories apart from the remnant. Heim (1985) demonstrates that such non-elliptical LF-representations can be given a compositional interpretation.²¹ More specifically, Heim assumes that the comparative morpheme *-er* denotes the function from pairs of individuals to individual properties in (43). (43) distributes the members of the pair <a,b> over the predicate P, and then compares the degree to which individual a is P to the degree to which individual b is P. The translation of the predicative PC (44) accordingly proceeds as in (45):

$$(43) \quad [-er] (<a,b>)(f) = 1 \text{ iff } f(a) > f(b)$$

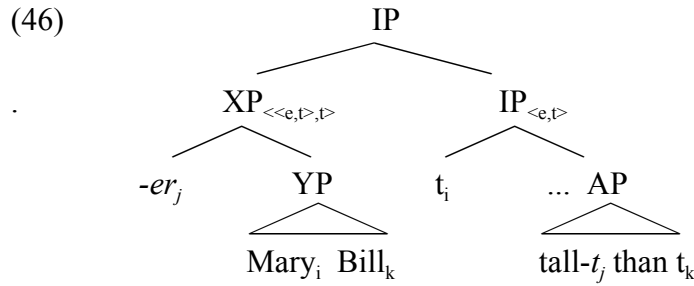
$$(44) \quad \text{Mary is taller than Bill.}$$

$$\begin{aligned} (45) \quad & [-er] (<[\text{Mary}], [\text{Bill}]>) (\lambda x \lambda y [[x \text{ is } y\text{-tall}]])) = \\ & = \lambda x \lambda y [x_is_y\text{-tall}](\text{Mary}) > \lambda x \lambda y [x_is_y\text{-tall}](\text{Bill}) = \\ & = \iota y [\text{Mary_is_y-tall}] > \iota y [\text{Bill_is_y-tall}] \end{aligned}$$

Three covert movement operations are implicated in the derivation of the transparent LF which provides the input for the semantic representation (45). The comparative morpheme *-er* covertly

²¹It should be noted that Heim compares the direct analysis with ellipsis approaches, but does not endorse one over the other.

raises to an IP-adjoined position, as illustrated by (46), followed by movement of the correlate and the remnant, which in turn adjoin to *-er* (ignoring the internal structure of the adjunction complex):



λ -abstraction over the trace of the correlate *Bill* yields the relation $\lambda x \lambda y [x \text{ is } y\text{-tall}]$ which serves as the second argument of the translation of *-er*. Moreover, movement of the remnant is semantically vacuous.

The account generates two predictions which constitute independent evidence in favor of Heim's claim that the correlate and the comparative morpheme undergo semantically motivated movement. First, Heim points out that the movement operation which raises the correlate to the comparative morpheme is subject to island constraints. Separating the correlate and the comparative by a complex NP, as in (47)a, leads to a deviant output, since LF-movement of the correlate (see (47)b) fails to observe syntactic locality:

- (47) a. ?*I spent more time with [_{NP} a woman [_{CP} that played **the clarinet** than the lute]].
(Heim 1985: 49, (52))
 b. ...[[[more time] **the clarinet**_{t_i}] the lute_{t_k}] with [_{NP} a woman [_{CP} that played t_i] than t_k]

Second, Heim demonstrates that movement of the comparative morpheme is equally subject to locality conditions. Structures in which only *-er* - but not the correlate and the remnant - is trapped inside an island, such as (48)a, are strongly ill-formed:

- (48) a. *[_{NP} Someone [_{CP} who could answer **fewer** questions]] made a good impressions on Bill than on Fred.
(Heim 1985: 47, (38))
 b. *[_{IP} [**-er**_j [Bill_i Fred_k]] [someone [_{CP} who could answer little-t_j-many questions] made a good impressions on t_i than on t_k]]

But the examples under (47)a and (48)a are also successfully handled by the TR-account, although they are excluded for a different reason. To begin with, the TR-analysis assigns to (47)a the parse in (49), in which all but one category of the *than*-XP have been removed by Gapping:

- (49) *I spent more time with [_{NP} a woman [_{CP} that played the clarinet]] than
~~I spent~~ \triangle ~~with~~ [_{NP} ~~a woman~~ [_{CP} ~~that played~~ the lute]]

The representation (49) reveals that the Gap includes an island as well as (parts of) a finite CP-node. Such instances of long-distance Gapping always result in ill-formed expressions, though, as illustrated by the reduced coordinate structure (50) (see e.g. Johnson 2003):

- (50) *Pat spent two hours with [_{NP} a woman [_{CP} that played the clarinet]] and
 Pat spent three hours with [_{NP} ~~a woman~~ [_{CP} ~~that played~~ the lute]]

Thus, the TR-analysis relates the deviance of (47) to a general property of Gapping, and not to a violation of the bounding conditions on movement.

Similar and additional considerations apply to (48). A derivation of (48) in terms of Gapping, as in (51), would once again imply an illicit instance of deletion of a finite CP-node:

- (51) *Someone [_{CP} who could answer fewer questions t_k] made a good impression on Bill than
 [~~someone~~ [_{CP} ~~who could answer~~ \triangle] ~~made a good impression~~ on Fred]_k

In addition, the extraposition process which supplies the context for the application of Gapping in (51) violates syntactic locality,²² as extraposition out of complex NPs in subject position is generally prohibited (Culicover and Rochemont 1990).

- (52) *Someone [_{CP} who could answer the question t_i] made a good impression on Bill [which had been asked in class]_i.

In sum, locality effects measuring the distance between the remnant and the comparative morpheme fall out both from the direct analysis and the TR-account. But the two hypotheses can be empirically distinguished on the basis of the predictions they entail for the distribution of coreference relations in PCs.

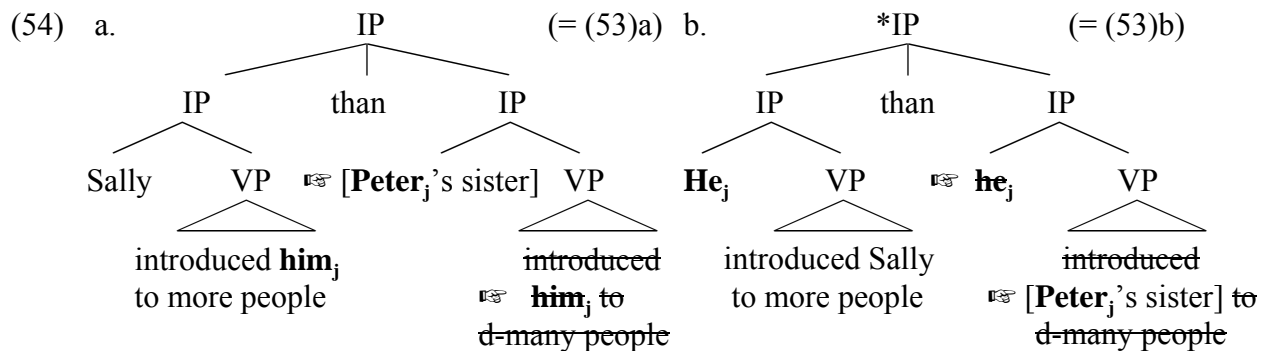
3.2.2. BINDING AND THE DIRECT ANALYSIS

Returning to disjoint reference effects in PCs, observe that the examples discussed in section 3.1. (at least potentially) exhibited ambiguity w.r.t. the interpretation of the ellipsis. Interestingly, though, it can be shown that legitimate binding relations are governed by structural restrictions also in simple, unambiguous PCs, whose interpretation is not a function of the scope of TR. In particular, these contexts illustrate that the correct determination of possible referential dependencies presupposes the assumption that the ellipsis in PCs replicates the structural relations of its antecedent clause. Thus, these findings provide straightforward evidence for the claim that PCs project structure at LF, but contradict the premise of the direct analysis, according to which the *than*-XP does not embed a syntactically represented ellipsis site.

²²Thus, the intermediate status of (47)a - as opposed to (48)a - can be related to the fact that its derivation only fails to obey the ban on Gapping of finite sentence boundaries.

The environments relevant for present purposes test for the effects of varying the structural positions of the remnant and its correlate in the matrix clause, while keeping constant an indexical dependency between (parts of) the remnant and a term distinct from the correlate in the matrix clause. To begin with, (53)a shows that a pronoun which resides in a position lower than the correlate can be construed coreferentially with a name inside the remnant. As documented by the tree in (54)a, the TR-analysis correctly captures this generalization, because it locates the reconstructed pronoun below the (non-c-commanding) name:

- (53) a. Sally introduced **him_j** to more people than [**Peter_j**'s sister]_{SUB}
 b. ***He_j** introduced Sally to more people than [**Peter_j**'s sister]_{DO}

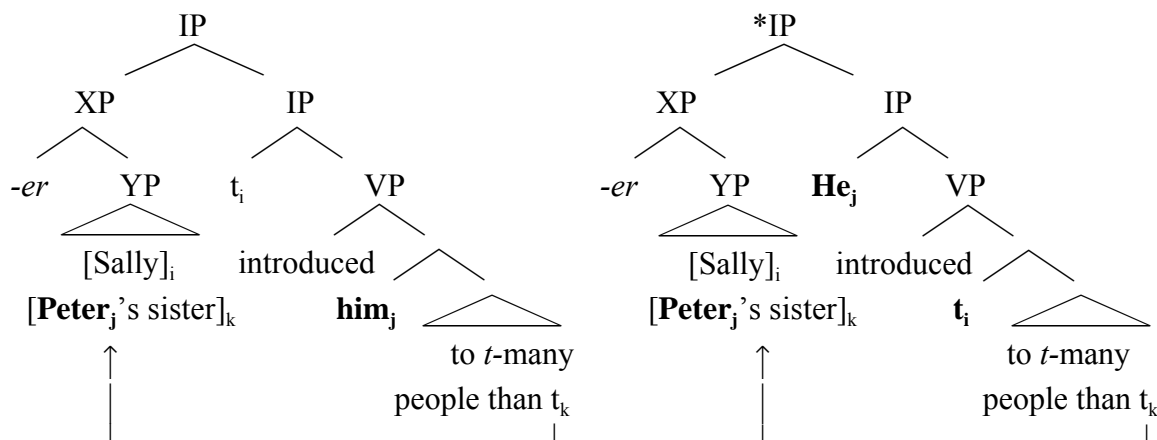


Moreover, once the content of the subject and the direct object is exchanged, as in (53)b/(54)b, a Principle C violation ensues. This is so as promotion of the pronoun to the subject position in the matrix clause leads to the same reversal in the *than*-XP, and the remnant therefore ends up within the c-command domain of the silent pronoun.²³ Thus, the strong disjoint reference effect in (53)b and the sharp contrast between (53)a and (53)b provides solid evidence that Principle C has access to information about the structural organization of the *than*-XP. Such a result is in line with the ellipsis analysis, but can be shown to pose a problem for the direct analysis of PCs, which employs covert raising of the remnant and the correlate.

More specifically, the direct analysis predicts (53)a and (53)b to be on a par, because LF-movement of the correlate and the remnant in (55)a and (55)b, respectively, generates indistinguishable LF-representations as far as the structural relations determining binding are concerned.

²³More correctly, the empty subject pronoun inside the *than*-XP is not elided by Gapping, but has been removed by ATB-movement. Nothing bears on this issue, though. See Lechner (2004) for details.

- (55) a. Sally introduced **him_j** to more people
than [**Peter_j**'s sister]_{SUB} (= (53)a)
- b. ***He_j** introduced Sally to more people
than [**Peter_j**'s sister]_{DO} (= (53)b)



In both LF-representations under (55), the remnant *Peter's sister* crosses over the pronoun and thereby escapes its c-command domain, regardless whether the pronoun originates in a position lower ((55)a) or higher ((55)b) than the correlate (*Sally*).²⁴ Depending on the particular perspective one takes on which positions of the remnant chain are visible to Binding Theory, the pronoun should therefore either trigger a Principle C effect in both structures (by reconstruction; but see below for a qualification), or in none of them. Hence, without the aid of additional assumptions, the direct analysis cannot account for the generalization that the structure of the ellipsis site plays an important factor in determining legitimate referential dependencies.

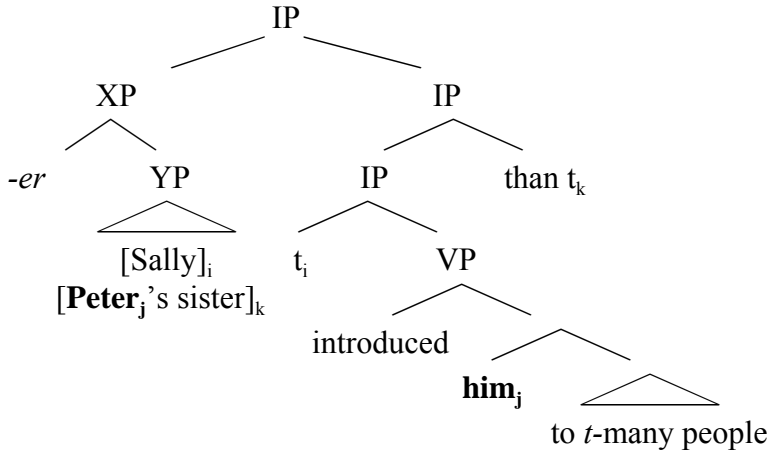
Before concluding, I will briefly consider a possible amendment to the direct analysis, which - at least at first sight - seems to restore the tie between the two competing accounts. Assume that the representations in (55) misconstrue the position of the *than*-XP, and that the *than*-XP does not always originate low in the right periphery, but is base-generated as an adjunct to the node immediately dominating the correlate.²⁵ For (53)a, this yields the alternative parse in (56) below, whereas the structure of (53)b remains unaffected:

²⁴Note on the side that (53)b cannot be excluded as a violation of *Secondary SCO* (Postal 1971, 1993). Secondary SCO prohibits movement of an embedded R-expression over a coindexed term, as in (i). However, given the plausible assumption that cross-over restrictions are conditions on the formation of operator-variable chains, and given that the remnant does not bind a variable (movement of the remnant is semantically vacuous), Secondary SCO does not apply in (53)b.

(i) **[Whose_j sister] did he_j like t_k*

²⁵In fact, this is more in line with Heim (1985: 52), who generates *than*-XPs in their surface positions.

- (56) Sally introduced **him_j** to more people than [**Peter_j**'s sister]_{SUB} (= (53)a)



Crucially, the analysis (56) succeeds now in capturing the contrast (53), because the R-expression inside the remnant (*Peter's sister*, index k) is generated above - and not below - the pronoun.²⁶ Thus, a Principle C effect can be avoided. But this modified version of the direct analysis equally faces complications.

First, there is strong evidence that the *than*-XP forms a syntactic constituent together with the comparative XP to the exclusion of the correlate, and should therefore originate in a position inside the DegP.²⁷ For instance, the *than*-XP and the comparative XP may move as a unit to the topic position in languages such as German, stranding the correlate (*jemand*/'somebody').

- (57) [_{CP} [Bessere Stücke als **Shakespeare**_{SU}] _{DO} hat noch nie [_{IP} jemand_{SU} [_{VP} t_{DO} verfasst]]]
better plays than S. has not yet somebody written
 Nobody has every written better plays than Shakespeare.

However, (57) cannot be derived from a structure such as (56). As demonstrated by (58)a, the subject remnant *Shakespeare* (by the assumptions adopted above) originates as an IP-adjunct, the node immediately dominating the correlate *jemand* /'nobody'. Hence, the *than*-XP would have to lower from its base position to the comparative NP in object position ((58)b) prior to topicalization ((58)c), in violation of the ban on downward movement (in German SpecCP may hold only a single XP, and adjunction to CP as well as to SpecCP is prohibited).

²⁶Example (i) indicates that it is necessary to adopt the additional assumption that the *than*-XP is transparent for c-command, which allows the subject remnant *Peter* to c-command the pronoun:

(i) *She introduced him_i to more people than Peter_{i, SU}

Given this premise, the two accounts become now empirically indistinguishable as far as their capacity to handle binding facts is concerned. They only differ in that while the ellipsis analysis copies all categories from the matrix clause (except for the correlate) around the remnant, the direct account 'squeezes' the remnant into a slot right above the correlate in the matrix clause.

²⁷See Lechner (2001, 2004) for additional arguments against the direct analysis from word order and surface properties of ellipsis.

- (58) a. $[_{IP} [_{IP} \text{ nobody } [_{VP} \text{ has written better plays}]] \text{ than Shakespeare}]$
 b. $[_{IP} [_{IP} \text{ nobody } [_{VP} \text{ has written } [_{NP} [_{NP} \text{ better plays}]] \text{ **than Shakespeare}_k**]]] \text{ t}_k]$
 c. $[_{CP} [_{NP} [_{NP} \text{ **better plays}]] \text{ **than Shakespeare}_k**]} \dots [_{IP} [_{IP} \text{ nobody } [_{VP} \text{ has written t}_j]]] \text{ t}_k]**$

Similar considerations carry over to VP-fronting in English, which can pied-pipe the *than*-XP to the exclusion of the correlate *nobody*.²⁸

- (59) ...and $[_{VP} \text{ write a better play than Shakespeare}]$, nobody did

Second, neither the revised nor the original version of the direct analysis is compatible with current assumptions about the nature of the LF-interface to semantics. Going back to the representation (55)b, which tracks the derivation of an ill-formed expression, notice that Principle C has to be computed on the basis of the *reconstructed* position of the remnant, whereas only the *non-reconstructed*, higher occurrence of the remnant is compositionally interpretable. (Note that the remnant had to QR for reasons of interpretability.) But this distribution of labor between the pre- and post-movement occurrences of the remnant is at conflict with the widely accepted hypothesis that binding and scopal properties of an NP are encoded in a single LF-copy (cf. ‘trapping effects’, as e.g. discussed in Lebeaux 1990 and Fox 1999). Moreover, it is not evident how reconstruction in (55)b can be effectuated in the first place, given that movement of the remnant does not leave an interpretable trace (recall from 3.2.1 that the raised remnant does not bind a variable). In sum, the alternative implementation outlined above fails to remove the obstacles for the direct analysis.

4. CONCLUSION

In the present paper, I defended a Gapping analysis of PCs which succeeds in capturing (i) restrictions on the size of ellipsis inside the *than*-XP (ii) co-dependencies between the size of ellipsis and the syntactic domain in which binding principles are evaluated and (iii) the impact of the structural organization of the matrix clause on possible referential dependencies between the remnant and the matrix clause. In addition, a descriptive condition was identified (Conjecture on Double Indexing), which restricted non-local binding of world variables to contexts in which the world variable is supported by a finite, silent predicate. Direct analysis of PCs were finally seen to be challenged by Principle C effects in PCs.

PC-formation by TR shares properties with ACD, but the two constructions also differ in important ways. As for the commonalities, both ACD-QR and TR feed ellipsis resolution and bleed Principle C. In both constructions, the respective types of ellipsis (Gapping and VPE) presupposes

²⁸On the current analysis, TR - which is a prerequisite for Gapping - could apply either subsequent to reconstruction of the object at LF or by ‘covert overt movement’ prior to topicalization. Crucially, lowering can be avoided.

a parse which relocates the container of the silent node. Moreover, ACD as well as PCs are characterized by a clustering of properties: the size of ellipsis matches the position in which binding scope is computed.

However, the two operations also differ in three, partially related, aspects. First, PCs mark the position of the node embedding the ellipsis in overt syntax, while in contexts of ACD, the location of the ellipsis host can only be inferred indirectly, as QR proceeds covertly. Second, in PCs, which by assumption implicate Gapping, but not in ACD, the match between the size of ellipsis and the syntactic position of the ellipsis host is conditioned by Isomorphism (for conditions on VPE in ACD see Fox 2000, a.o.). Third, the category which embeds the ellipsis is an adjunct relative clause in the case of ACD, but an argument of the Deg^o-head in the comparative construction.

These differences motivate the choice of diverging analytical approaches - although in the end, the strategies clearly reinforce each other. To begin with, in order to account for the correlation between ellipsis and binding scope, most studies of ACD hypothesize movement at a post-syntactic level (QR), or, more recently, overt, phonologically vacuous QR and late merger of the relative clause (Fox and Nissenbaum 1999; Fox 2002; on covert overt movement see also Pesetsky 1998). The latter view exploits the parallelism between extraposition and ACD-QR in their ability to obviate disjoint reference effects by adopting the assumption that the (extraposed) relative clause is combined with the hosting quantifier counter-cyclically, just like adjuncts of overtly fronted *wh*-phrases (Lebeaux 1990). Since on this account, only the hosting quantifier moves in overt syntax (by QR), marking the position in which the relative clause is merged, it follows that the correlation between size of ellipsis and binding scope is only indirectly mediated by movement in ACD.

In contrast, PCs provide direct evidence for a ‘traditional’ version of ellipsis resolution in terms of movement. Given that the *than*-XP in comparatives does not originate as an adjunct, a post-cyclic merger analysis is not viable for this type of construction.²⁹ Moreover, movement by TR proceeds overtly. Hence, the current analysis of PCs unifies all properties which by hypothesis collaborate in ACD: overt (and in the case of ACD silent) movement and a strict correlation between ellipsis and binding scope. In this way, PCs demonstrate that ellipsis interacts with movement in the same way in which coreference relations are influenced by dislocation, supplying a missing link in the evolution of the analysis of ellipsis phenomena.

²⁹But see Bhatt and Pancheva (2004), who find good reasons to merge *than*-XPs counter-cyclically. If this view turned out to be correct, the only difference between PCs and ACD would consist in the type of ellipsis involved.

REFERENCES

- Abney, Steven. 1987. *The English Noun Phrase in its Sentential Aspect*. Doctoral Dissertation, MIT, Cambridge, Mass.
- Bhatt, Rajesh and Pancheva, Roumyana. 2004. Late Merger of Degree Clauses. *Linguistic Inquiry* 35.1: 1-45.
- Brame, Michael. 1983. Ungrammatical Notes 4: smarter than me. *Linguistic Analysis* 12.3: 323-328.
- Bresnan, Joan. 1973. Syntax of the Comparative Clause Construction in English. *Linguistic Inquiry* 4.3: 275-343.
- Bresnan, Joan. 1975. Comparative Deletion and Constraints on Transformations. *Linguistic Analysis* 1.1: 25-74.
- Brame, Michael. 1983. Ungrammatical Notes 4: smarter than me. *Linguistic Analysis* 12.3: 323-328.
- Chomsky, Noam. 1981. *Lectures on Government and Binding*. Dordrecht, The Netherlands: Foris Publications.
- Chomsky, Noam. 1986. *Knowledge of Language*. New York, New York: Praeger Publishers.
- Corver, Norbert. 1990. *The Syntax of Left Branch Extractions*. Doctoral Dissertation, Katholieke Universiteit Brabant, Tilburg.
- Culicover, Peter and Michael Rochemont. 1990. Extraposition and the Complement Principle. *Linguistic Inquiry* 21.1: 23-47.
- Fiengo, Robert and Robert May. 1994. *Indices and Identity*. Cambridge, Mass.: MIT Press.
- von Fintel, Kai and Irene Heim. 2002. Notes on Intensional Semantics. Ms., Cambridge: MIT. Download: <http://www.phil-fak.uni-duesseldorf.de/summerschool2002/fintel.pdf>
- Fox, Danny. 1995. Condition C Effects in ACD. In R. Pensalfini and H. Ura (eds.), *Papers on Minimalist Syntax*, pp. 105-120. Cambridge: MITWPL.
- Fox, Danny. 1999. Reconstruction, Variable Binding and the Interpretation of Chains. *Linguistic Inquiry* 30.1: 157-196.
- Fox, Danny. 2002. Antecedent Contained Deletion and the Copy Theory of Movement. *Linguistic Inquiry* 33.1: 63-96.
- Fox, Danny and John Nissenbaum. 1999. Extraposition and Scope: A Case for overt QR. *WCCFL* 18.
- Hankamer, Jorge. 1973a. Why There are Two Than's in English. In *CLS 9*, Chicago Linguistic Society, University of Chicago, Chicago, 179-191.
- Hankamer, Jorge. 1973b. Unacceptable Ambiguity. *Linguistic Inquiry* 4.1: 17-68.
- Hankamer, Jorge. 1979. *Deletion in Coordinate Structures*. New York: Garland.
- Hankamer, Jorge and Ivan Sag. 1976. Deep and Surface Anaphora. *Linguistic Inquiry* 7.3: 391-428.
- Hardt, Dan. 1993. *Verb Phrase Ellipsis: Form, Meaning and Processing*. Doctoral Dissertation, University of Pennsylvania.
- Heim, Irene. 1985. Notes on Comparatives and Related Matters. Ms., UT Austin, Austin.
- Hellan, Lars. 1981. *Towards an Integrated Theory of Comparatives*. Tübingen: Gunter Narr.
- Hoeksema, Jan. 1984. To be continued: The Story of the Comparative. *Journal of Semantics* 3: 93-107.
- Hudson, Richard. 1976. Conjunction Reduction, Gapping and Right-Node Raising. *Language* 52.3: 535-562.
- Johnson, Kyle. 2003. In Search of the Middle Field. Ms., University of Massachusetts, Amherst.
- Kennedy, Chris. 1995. An Indexical Account of Certain Ambiguities. *ESCOL* 95, 103-115.
- Kennedy, Chris. 1997. Antecedent Contained Deletion and the Syntax of Quantification. *Linguistic Inquiry* 28.4: .
- Larson, Richard, and Robert May. 1990. Antecedent Containment or Vacuous Movement: Reply to Baltin. *Linguistic Inquiry* 21.1: 103-122.
- Lebeaux, David. 1990. Relative Clauses, Licensing, and the Nature of the Derivation. *NELS* 20, University of Massachusetts, Amherst, 318-332.
- Lechner, Winfried. 1999. *Comparatives and DP-Structure*. Doctoral Dissertation, University of Massachusetts, Amherst.
- Lechner, Winfried. 2001. Reduced and Phrasal Comparatives. *Natural Language and Linguistic Theory* 19.4: 683-735.

- Lechner, Winfried. 2004. *Ellipsis in Comparatives*. Berlin/New York: Mouton de Gruyter.
- McCawley, James D. 1988. *The Syntactic Phenomena of English*. Chicago: University of Chicago Press.
- McConnell-Ginet, Sally. 1973. *Comparative Constructions in English: A Syntactic and Semantic Analysis*. Doctoral Dissertation, University of Rochester, Rochester.
- Napoli, Donna Jo. 1983. Comparative Ellipsis: A Phrase Structure Account. *Linguistic Inquiry* 14.4: 675-684.
- Percus, Orin. 2000. Constraints on Some Other Variables in Syntax. *Natural Language Semantics* 8.3: 173-231.
- Pesetsky, David. 1998. *Phrasal Movement and its Kin*. Cambridge: MIT Press.
- Pinkham, Jessie E. 1982. *The Formation of Comparative Clauses in English and French*. Indiana University Linguistics Club, Bloomington, Indiana.
- Postal, Paul. 1971. *Cross-Over Phenomena*. New York, New York: Holt, Rinehart and Winston.
- Postal, Paul. 1974. *On Raising*. Cambridge, Massachusetts: MIT Press.
- Postal, Paul. 1993. Remarks on Weak Crossover Effects. *Linguistic Inquiry* 24.3: 539-556.
- Reinhart, Tanya. 1991. Elliptic Conjunctions - Non-Quantificational LF. In *The Chomskyan Turn*, ed. Asa Kasher, 360-384. Cambridge: Blackwell.
- Rullmann, Hotze. 1995. *Maximality in the Semantics of Wh-Constructions*. Doctoral Dissertation, University of Massachusetts, Amherst.
- Russell, Bertrand. 1905. On Denoting. *Mind* 14: 479-493.
- Sag, Ivan. 1976. Deletion and Logical Form. Doctoral Dissertation, Cambridge, Massachusetts: Massachusetts Institute of Technology. Published as: Sag, Ivan. 1980. *Deletion and Logical Form*. New York: Garland.
- von Stechow, Armin. 1984. Comparing Semantic Theories of Comparison. *Journal of Semantics* 3: 1-77.
- Schwarzschild, Roger and Karina Wilkinson. 1999. Interval Semantics for Scalar Predication. Ms., Rutgers University.
- Taraldsen, Knut Tarald. 1981. The theoretical interpretation of a class of marked extractions. *Theory of Markedness in Generative Grammar: Proceedings of the 1979 GLOW Conference*, Pisa, 475-516.
- Williams, Edwin. 1974. *Rule Ordering in Syntax*. Doctoral Dissertation, Massachusetts Institute of Technology.
- Wurmbrand, Susi. 2001. *Infinitives: Restructuring and clause structure*. Berlin/New York: Mouton de Gruyter.