Pseudocleft connectedness: Implications for the LF interface level

Caroline Heycock and Anthony Kroch

This version: June 1998. To appear in *Linguistic Inquiry*

1 Introduction: The pseudocleft problem

In the early days of transformational grammar, it was recognized that the syntactic properties of pseudoclefts posed a challenge to the emerging theory.[1] The problem is simple to state, at least in a preliminary form: Pseudoclefts exhibit the same patterns with respect to various syntactic constraints as the simple sentences that paraphrase them. We illustrate with the pairs in (1)–(3), which exhibit Principle A, B, and C effects respectively.

(1) a.   What Mary$_i$ was was proud of herself$_{i/*j}$.

  b.   Mary$_i$ was proud of herself$_{i/*j}$.

(2) a.   What Mary$_i$ was was proud of her$_{*i/j}$.

  b.   Mary$_i$ was proud of her$_{*i/j}$.

(3) a.   What she$_i$ was was proud of Mary$_{*i/j}$.

  b.   She$_i$ was proud of Mary$_{*i/j}$.

Ordinarily, the patterns of grammaticality and interpretation illustrated in the (b) examples above are described by constraints on the relationship between noun phrases of different anaphoric types (i.e. reflexives/reciprocals, ordinary pronouns, and full noun phrases) and potential c-commanding antecedents. In pseudoclefts like the (a) sentences, however, the antecedents of the bound noun phrases do not c-command them.

Although this initial illustration uses facts of anaphora and coreference, whose susceptibility to a purely syntactic analysis is the subject of much debate, it is crucial to note that this is only one part of a more general phenomenon: what Higgins 1979 termed *syntactic connectedness*. For example, pseudoclefts show connectedness also in the licensing of Negative Polarity Items:

(4) a.   He bought lots of textbooks; what he didn't buy was any good novels.

  b.   He didn't buy any good novels.

Again, given that the negative element is buried inside the free relative *what he didn't buy*, the surface syntax in (4a) should not support the licensing any more than it does in a (non-pseudocleft) example like (5).

(5)   * What he didn't buy shocked anyone.

An obvious solution in early versions of transformational grammar was to say that these constraints should be stated at D-Structure and that the pseudoclefts in the (a) examples are syntactically derived from their non-cleft paraphrases. Already in 1973, however, Higgins demonstrated that such a derivation for pseudoclefts was not possible, a demonstration that still stands—and has if anything been bolstered by subsequent theoretical developments.

It might then be thought that these cases could be handled in the same way as other cases that fall under the rubric "reconstruction," as in (6).

(6)   [which picture of himself$_{i/*j}$]$_k$ does John$_i$ prefer t_k

This possibility was pursued by Barss 1986: 238–258, who concluded, however, that such an assimilation was impossible and that the problem remained unsolved. Some of the reasons for Barss's conclusion will arise in the course of our discussion; but the essential point is that the phenomenon in (6) is much narrower than the connectedness effects found in pseudoclefts (for example, Negative Polarity Items cannot be licensed under ordinary A-bar reconstruction).

The central puzzle of pseudoclefts, then, is that despite their complex structure, they apparently pattern like simple sentences with respect to syntactic conditions that include those of the Binding Theory. Nor are these connectedness effects in the least marginal: all the syntactic effects that show up in simple sentences are found equally robustly in pseudoclefts.

This problem is as alive today as it was when Higgins wrote in the early 70s. It seems clear that if our syntactic theory cannot account for the pattern in the (a) sentences of (1)–(4) as well as it does for the same pattern in the (b) sentences, our theory must be wrong. Conversely, pseudoclefts provide a real opportunity for rethinking some of our fundamental assumptions about syntactic representations: they show that the representations over which we state syntactic constraints must be much more abstract than we have concluded on the basis of simpler cases.

The conclusion that we must state syntactic constraints over some quite abstract structure falls in with the recent proposal of Chomsky 1993, 1995, according to which the only available representations are those at the interface with the articulatory/perceptual and conceptual systems. We believe that a solution to the problem of pseudoclefts will indeed center on their representation at this latter interface, and that this solution will enable us to draw conclusions about the nature of the interface itself. As we will demonstrate, however, some of these conclusions are unexpected from the surface-oriented perspective of the approaches to syntax that have dominated the field for the past twenty years.

Our discussion will begin with Higgins' insight that specificational pseudoclefts are one case of a more general type of *specificational copular sentence*. This type of sentence has since been called *inverse* (Moro 1990), and analyzed as involving a predicate in the apparent subject position, while the true subject appears after the copula. This inverse predication analysis also forms the basis of the recent account of connectedness effects in pseudoclefts in Williams 1994. We will show, however, not only that this account has certain weaknesses, but also that the analysis of inverse predication on which it rests cannot be maintained. Instead, we will pursue the alternative line, suggested by Higgins' work (although he himself rejected this conclusion (Higgins 1979, pp. 17–18)), that specificational sentences are a kind

2

of equative sentence. The semantics of equation then imposes the constraint that the two arguments equated be of the same semantic type. We will go on to show that this representation must undergo further derivational steps of a kind not found in overt syntax, and that this LF-internal derivation yields the necessary interface representation. Finally, we will argue that this representation must be thought of as part of a model of the ongoing discourse.

2   Specificational sentences as inverse predication

2.1   Higgins' observations

Higgins 1979 makes the crucial observation that specificational pseudoclefts like those in (7) share most of their properties with non-cleft copular sentences like those in (8).[1]

(7) a. * What he$_i$ claimed was that John$_i$ was innocent.

  b.   What he$_i$ promised was to reform himself$_i$.

  c.   What he$_i$ produced was a picture of himself$_i$.

(8) a. * His$_i$ claim was that John$_i$ was innocent.

  b.   His$_i$ promise was to reform himself.

  c.   His$_i$ sole output for the day was a picture of himself$_i$.

¿From this observation, he concluded that the two sentence types should receive essentially the same analysis, although he was at the time unable to provide an treatment which could handle in a satisfactory way the connectedness facts that he documented.

2.2   Moro: Inverse predication

Higgins himself was not prepared to reduce the construction exemplified in (7) and (8) to any other type of copular sentence. More recently, however, it has been proposed in Moro 1990, 1997 that all copular sentences can be analyzed with a copula that takes a small clause complement, one part of which must raise past the copula to occupy the initial position in the full clause. The crucial innovation of Moro's account of the "specificational" type of copular sentences is the proposal that in these cases it is the predicate of the small clause, and not its subject, that raises past the copula.[2] The D-Structure in (9), for example, could give rise to either the S-Structure in (10a) or that in (10b), depending on whether the subject or the predicate raises.

---

[1] Here and throughout, the judgments that we report are for sentences with "neutral" stress assignment, in which there is no contrastive stress or anaphoric destressing, whether on the second mention of the coreferential element or elsewhere. If the phrase containing the coreferential element is not given a neutral stress assignment, judgments of unacceptability become less clear, but this is true in a wide range of cases, including simple sentence paraphrases of pseudoclefts. The interaction of stress/focus and possible coreference deserves more study, but its effects are orthogonal to the issues of concern to us here.

[2] Moro (1990, 1997) makes little reference to Higgins' work, and does not explicitly equate Higgins' *specificational* copular sentences with his own *inverse* copular sentences. We believe however that this is how specificational sentences would have to be analyzed in the system envisaged by Moro.

3

(9)   was [$_{SC}$ [that John was innocent][his claim]]

(10)   a.   [that John was innocent]$_i$ was [$_{SC}$ t_i [his claim]]

        b.   [his claim]$_i$ was [$_{SC}$ [that John is innocent] t_i]

Moro derives various properties of these "inverse" copular sentences—that is to say, sentences in which it is the predicate that has raised—from the analysis that he proposes, but he does not discuss the connectedness facts or, except in passing (Moro 1997: 92–93), the possible implications of his analysis of copular sentences for pseudoclefts.

2.3   Williams: Connectedness as binding into the subject

While Moro's account of predicate raising in copular sentences is among the first in a now current framework to go into detail about the mechanisms involved, Edwin Williams had already proposed in 1983 that pseudoclefts are sentences in which the predicate precedes the subject, an idea that is developed further in Williams 1994.[3] Williams' proposal is subsequently formalized in the semantic account of Partee 1986, used in turn in Jacobson 1994.

Furthermore, in Williams 1983 and 1994 an approach to connectedness is developed which depends on this "inversion" analysis. Williams recasts the Binding Theory in terms of thematic roles. While we will not go into the details of this reformulation here, the important point in this context is that it predicts the possibility of "backwards" binding into the subject by a non c-commanding antecedent, as in (11).

(11)   A picture of himself$_i$ upset John$_i$

Williams then points out that if we adopt the proposal that in inverse/specificational sentences it is the initial noun phrase that is the predicate and the final noun phrase that is the subject, his system predicts that binding by a non c-commanding antecedent will superficially run left-to-right in these sentences, as it does in examples like (12) and (13), but the element being bound will still be inside the (now postcopular) subject.

(12)   [$_{Predicate}$ What John is] is [$_{Subject}$ proud of himself].

(13)   [$_{Predicate}$ John's greatest problem] is [$_{Subject}$ a fear of himself]

2.4   Limitations on the parallel with binding into the subject

One problem that Williams faces in bringing in the cases of "backwards binding" under his revised Binding Condition is that backwards binding appears to be optional in a way that ordinary binding is not. For example, within the subject an anaphor may alternate with an R-expression; this is clearly not possible in other cases of binding, as shown by the contrast between (14b) and (15b).

(14)   a.   Each other's$_i$ mother pleased them$_i$.

        b.   [John and Mary's]$_i$ mother pleased them$_i$.

---

[3]An analysis similar to that of Moro 1990 was developed in Heggie 1988, who, like Williams, proposes that the same analysis should be applied to pseudoclefts.

(15) a.   They$_i$ liked each other's$_i$ mother.

　　　b.   * They$_i$ liked [John and Mary's]$_i$ mother.

Williams ultimately formulates his proposal so that the contrast between the (b) examples is accommodated. Again we will not discuss the details of his analysis here; what is crucial for our purposes is that he groups together all cases of binding into the subject by a non c-commanding antecedent—and recall that, by hypothesis, this includes all the cases of pseudocleft connectedness. Thus we expect binding in pseudoclefts to be optional, just as it is in the case of binding into the subject in examples like (14).

However, this is not a correct result. In a regular pseudocleft the connectedness effects are categorical, as noted also in Barss 1988:243. Thus, for example, the Condition C effect is not optional in (16a): the example is ungrammatical, just like its simple sentence paraphrase in (16b).

(16) a.   * What he$_i$ could not believe was that Mary had been lying to John$_i$.

　　　b.   * He$_i$ could not believe that Mary had been lying to John$_i$.

In this respect, then, the connectedness effects found in pseudoclefts do not parallel the cases of binding into the subject in ordinary monoclausal sentences. Moreover, this failure of parallelism is not an isolated phenomenon. Indeed, although much attention has been paid to the binding conditions as evidence of connectedness, Higgins 1979 documented several other connectedness phenomena found only in pseudoclefts and related copular sentences. For example, as illustrated above in (4a), repeated here as (17a), pseudoclefts show connectedness in the licensing of Negative Polarity Items. Here there is no parallel with any kind of "backward NPI licensing," as illustrated in (17b).

(17) a.   He bought lots of textbooks; what he didn't buy was any good novels.

　　　b.   * Any picture of himself pleased nobody.

Further, Higgins noted other related phenomena which remain unexplained under the proposal that a pseudocleft is an "inverse" predication. There is a collection of very striking examples which show that selection restrictions imposed by the dominating context on the clause containing the pseudocleft are satisfied, not at the usual clausal level, but *within* the first argument of the pseudocleft. Consider, as just one example, the case of "emotive" *should*, a subjunctive modal which can appear in the complement of emotive factive predicates, as illustrated in (18).

(18)   It's a pity that John's job should be so uninteresting.

As one would expect, the subjunctive interpretation of *should* cannot be obtained if the modal is buried inside an argument within the complement clause, as illustrated in (19a); rather, the modal must appear at the topmost level of the selected clause, as in (19b) (note that the complement clause in (19a,b) is not a specificational pseudocleft but an ordinary predicational sentence with a free relative subject).

(19) a.   It's a pity that what John should do is so uninteresting. *[Deontic* should *only]*

　　　b.   It's a pity that what John does should be so uninteresting. *[Emotive* should *possible]*

5

However, in a pseudocleft emotive *should* can only appear inside the initial argument (Higgins 1979:323):

(20)   a.   It's a pity that what John should be is proud of himself. *[Emotive should possible]*

b.   ?* It's a pity that what John is should be proud of himself.

These data are clearly of a piece with the binding and negative polarity facts that we have already seen: Again the pseudocleft is behaving exactly like its simple sentence paraphrase and there seems to be no way to extend Williams' account to this data.[4]

3   Specificational sentences: inversion or equation?

We must conclude from the foregoing that an analysis of pseudoclefts which relies on treating them as "inverse predications" does not account adequately for the connectedness effects they display; but it also suffers from a more fundamental defect. The core assumption on which it is based—that specificational sentences are instances of "inverse predication"—is, in our opinion, itself incorrect. In this section we will first present briefly the arguments in favor of the inversion analysis and then go on to show that these arguments do not hold up, principally—although not exclusively—because the account cannot be extended to cover incontrovertible cases of equative sentences. Having established that equative sentences exist, we will argue that specificational sentences have to be treated as equatives.

3.1   Motivation for the inversion analysis

As mentioned in Section 2.2, Williams (1983), Heggie (1988), Moro (1990, 1997), and the various authors who have followed their lead (*e.g.* Heycock 1991, 1992, Dikken 1995) have argued that certain copular sentences, like (10b) above and (21) below, should be analyzed as syntactically inverted.

(21)   My only friend is my dog.

This analysis has strong *prima facie* appeal because it captures in a direct and simple way our clear semantic intuition that in "inverse" sentences the superficial subject noun phrase does not refer in the ordinary way while the postcopular noun phrase does (for early observations concerning this intuition, see Fodor 1979:215). Obviously, this fact is directly expressed by the inversion analysis since the initial noun phrase is a predicate and predicates are non-referential, while the postcopular noun phrase is an argument of the fronted predicate.

In addition to its intuitive appeal, this analysis has other attractive features. First, it treats the copula as structurally and semantically unambiguous: copular sentences are always predicational, and differ only in their derivation. Second, under fairly natural auxiliary assumptions, the analysis can explain why small clauses like those in (22) only allow "canonical" order.

---

[4]These objections to Williams' analysis of the connectedness effects apply equally to the analysis in Heggie 1988.

(22)　a.　*I consider my only friend my dog.

　　　b.　I consider my dog my only friend.

Specifically, this result follows if the order in a small clause is always subject $\prec$ predicate and if there is no functional head within it whose specifier is available as a landing site for a raised predicate. Third, again given some further assumptions, the analysis offers an explanation for an intriguing extraction asymmetry pointed out by Moro. Briefly, the asymmetry is as follows. A D-linked postcopular phrase in a canonical sentence can be extracted but a D-linked postcopular phrase in an inverse sentence cannot:

(23)　a.　*Canonical:* [Which of the themes]$_i$ do you think that phrase of music is t_i?

　　　b.　*Inverse:* *[Which phrase of music]$_i$ do you think one of the themes is t_i?

Not only is extraction of the entire postcopular phrase unacceptable in the inverse construction but extraction of an element from within the postcopular phrase is also unacceptable:

(24)　a.　*Canonical:* What$_i$ do you think the photograph of the president was the cause of t_i?

　　　b.　*Inverse:* *What$_i$ do you think the cause of the riot was the photograph of t_i?

The crucial point for an account of this asymmetry under the inversion analysis is that in this analysis the postcopular phrase in the inverse construction is actually in a subject position: it is the subject of the small clause complement to the copula (for detailed discussion, see Moro 1990, 1997, Heycock 1992).

　　In Italian, there are cliticization facts which parallel the wh- extraction pattern. The oblique clitic *ne* can be extracted out of a noun phrase in object position (Burzio 1986:31–36). However, although *ne* can be extracted from a postcopular predicative noun phrase, it cannot be extracted from the postcopular phrase in an "inverse" sentence. Further, the clitic *lo* which pronominalizes the predicate in copular sentences cannot pronominalize the postcopular noun phrase in an "inverse sentence" (Moro 1997: 28–29). These two patterns show beyond doubt that the postcopular phrase in an "inverse" sentence is not a predicate; they do not show, however, that it must be a subject. We will demonstrate in Sections 3.2–3.4 that indeed only the former of these two conclusions is tenable.[5]

---

[5]An indirect motivation for the inversion analysis of specificational sentences is that it has been argued to extend to the type of DP illustrated in (5) (den Dikken 1997).

(i)　a.　[that [$_{Predicate}$ idiot]$_i$ of [$_{Subject}$ a doctor] t_i]

　　　b.　[a [$_{Predicate}$ hell]$_i$ of [$_{Subject}$ a problem] t_i]

We do not consider it to be demonstrated that there is any parallel between these DPs and specificational sentences. Den Dikken argues for two parallels: the failure of *wh*-movement of the post-*of*/postcopular "subject" noun phrase in both cases, and the unacceptablity of Negative Polarity Items in this position. However, as den Dikken himself observes, *wh*-extraction of the post-*of* noun phrase is probably blocked in any case because it is not a full DP (a point for which there is independent evidence). This then leaves the failure of NPI-licensing as a shared parallel: but in fact den Dikken is mistaken in taking NPIs to be blocked from the postcopular position in specificational sentences, as shown by the following grammatical examples.

(ii)　a.　The cause of the riot wasn't any of *my* pictures.

　　　b.　I don't think that the cause of the riot was any of *my* pictures.

　　　c.　I don't think that the culprit was anyone here.

3.2 Limitations of the inversion analysis

3.2.1 Nonreferential interpretations for other non-predicate noun phrases

Returning now to copular sentences proper: much of the support for the inversion analysis comes from arguments from simplicity/economy. This is true of the argument based on the non-referential interpretation of the initial noun phrase. The underlying idea is that predicates are independently known to be non-referential, while subjects—being arguments—are typically (potentially) referential. Under the inversion analysis an apparent complication to this picture (the existence of non-referential arguments) is removed—these syntactic subjects are in fact not arguments but rather predicates.

We would argue, however, that there is no overall gain in simplicity, as consideration of other types of sentence reveals that subjects which cannot be analyzed as inverted predicates display the same kind of non-referential interpretation as Moro's putative inverted predicates. Thus, (25a) and (25b) would be analyzed as canonical and inverse constructions respectively, based on the fact that only the first can appear in a small clause, where inverse constructions are impossible—see (26).

(25) a. One hundred yen is the best value for the dollar.

     b. The best value for the dollar is one hundred yen.

(26) a. The banks consider one hundred yen the best value for the dollar.

     b. * The banks consider the best value for the dollar one hundred yen.

But now observe that the same "non-referential" reading of *the best value for the dollar* also occurs in the sentence (27a), as is evident from the possible continuation in (27b).

(27) a. The best value for the dollar has changed—

     b. —it used to be one hundred and thirty yen, but now it is only one hundred.

These examples show that the type of non-referential interpretation given to the initial noun phrases in the "inverse" copular construction must be available to the subjects of verbs such as *change* (also *rise*, *drop*, etc.); but these are cases where there is no plausible derivation in which the subject is an underlying predicate.[6] The existence of examples like (27) does not, of course, entail the absence of predicate raising (that is, "inversion") in the copular examples, but it does greatly weaken the motivation for it. Without these examples it appears that the inversion analysis of copular sentences is economical because it does not have to postulate ambiguity for noun phrases generated in subject position: the "non-referential" interpretation is uniquely associated with the underlying predicate position. The examples with verbs of the *change* class, however, show that this economy is illusory, as the "non-referential" interpretation must also be available to noun phrases that are not predicates.

Whether NPIs can also appear in the DP construction is not clear. Even if they can, equal grammaticality would not constitute grounds for treating the two constructions as linked.

   [6]At most, the surface subject might be an underlying unaccusative object rather than a subject; but it is certainly not a predicate.

3.2.2 The existence of true equatives

Now consider two additional sorts of economy claimed for the inversion analysis. First, it limits copular sentences to a single interpretation (they are always predicational, differing only in which noun phrase constitutes the predicate and which the argument); and, second, it provides a simple explanation for the pattern of grammaticality in small clauses. These apparent economies, however, also can only be maintained if certain examples are left out of account. In all of the examples that we have considered so far, there is one order for the noun phrases which is grammatical in a small clause, and there is one noun phrase which is clearly "less referential" than the other. But although this is the most common situation, there is a class of examples in which neither order is grammatical in a small clause, and where both noun phrases are equally referential. Consider for example the sentences in (28).

(28) a.   Your attitude toward Jones is my attitude toward Davies.

b.   Your opinion of Edinburgh is my opinion of Philadelphia.

In neither case does it seem possible to interpret one of the noun phrases as less referential/more predicative than the other. Consistent with this, neither order is possible in a small clause:

(29) a.   *I consider your attitude toward Jones my attitude toward Davies.

b.   *I consider my attitude toward Davies your attitude toward Jones.

(30) a.   *I consider your opinion of Edinburgh my opinion of Philadelphia.

b.   *I consider my opinion of Philadelphia your opinion of Edinburgh.

Further, as pointed out in Rothstein 1995 with respect to (31a), her (45), both noun phrases may be modified by non-restrictive relative clauses.

(31) a.   The duty nurse, who is very efficient, is Rina, who I am very fond of.

b.   Your opinion of Edinburgh, which you learned from your parents, is my opinion of Philadelphia, which I learned from mine.

This kind of non-restrictive modification is disallowed for predicative noun phrases:[7]

(32) a.   *I consider Rina the duty nurse, who is very efficient.

b.   *I consider that your opinion of Edinburgh, which you learned from your parents.

The evidence here again points to the existence of equative copular sentences alongside the predicative ones.

A further clear case of equation is the kind of tautology illustrated in (33).

---

[7]The facts concerning non-restrictive relative clauses are more complex than noted by Rothstein: predicates can in fact be modified by non-restrictive relatives if the gap position allows for an attributive interpretation, as illustrated in (i).

(i)   I consider Rina the duty nurse, who is supposed to direct the other nurses.

The relatives in the text, however, are not of this type, and cannot modify predicates.

(33) a. When it comes down to it, honest is honest.

     b. In the end, long is long.

     c. You can dress it up if you like, but in the end being dishonest is just being dishonest.

It is quite clear from the interpretation that in (33a), for example, honesty is not being ascribed to the property of being honest; rather, the *honest* property is asserted to be identical to itself.

3.3 Specification as equation

Once the existence of examples like those just discussed is taken into account, it seems that there are only two options for analyses which treat all copular sentences as predications (in one or the other order). One is to concede that equative sentences do exist as a separate construction: under such an account there are two types of predicative copular sentences, canonical and inverted, and in addition there are equative sentences. Clearly, a significant disadvantage of this approach is that it abandons the economy advantage that the inversion approach appeared to have. The other is to claim that the equative sentences are really predicative, but an obvious problem for such a move is capturing the facts in (29)–(33) above. We will now argue that there is further evidence—evidence that appears to us conclusive—for recognizing equation as distinct from predication.

3.3.1 Type ambiguity

Consider the examples in (34).

(34) a. Honest is what I want a man to be.

     b. John is what I want a man to be (i.e. he's honest).

Since both sentences are grammatical, an approach that denies the existence of equatives has to allow the free relative *what I want a man to be* to be ambiguous as to logical type, so that it can not only be of type $\langle e, t \rangle$ as required by (34b), where the subject translates as a constant, but also of type $\langle \langle e, t \rangle, t \rangle$, as required by (34a), where the subject translates as a property. If on the other hand we allow for the existence of both predicative and equative copular sentences, the type of the free relative can be $\langle e, t \rangle$ in both (34a) and (34b). The difference between the sentences is simply that in the first the two properties are equated, while in the second the property is applied to the subject. This result is attractive since $\langle e, t \rangle$ must, in both examples, be the type of the position out of which *what* is extracted.

3.3.2 Tautologies

The problem of type ambiguity arises in an even sharper form in the case of tautologies like those in (33) above, repeated here as (35).

(35) a. When it comes down to it, honest is honest.

     b. In the end, long is long.

c. You can dress it up if you like, but in the end being dishonest is just being dishonest.

The syntactic problem here is the same: the adjectives *honest, long*, etc. will have to be ambiguous as to type: as well as being of their normal type $\langle e, t \rangle$, in these sentences one of them must be of the higher type $\langle\langle e, t \rangle, t \rangle$. By hypothesis, this might be the first or the second one in the sentence, depending on whether it is interpreted as inverse or canonical.

These sentences make it clear, however, that there is also a semantic problem. As discussed above, in (35a) honesty is not being ascribed to the property of being honest in the way that honesty is ascribed to John in the sentence *John is honest*. Instead, this sentence is a tautology, in which the *honest* property is asserted to be identical to itself. In order to get this interpretation from a predicative analysis of (35a), it will be necessary to associate with the type-raising of the adjective a change in its meaning, from *honest*(x) to *be identical to honest*(x). In other words, if equation is removed from the syntax, it has to be put back into the semantics.

Notice that, paradoxically, the predicational analysis of tautologies actually obviates the need for syntactic inversion in so-called inverse copular sentences, including pseudoclefts. Consider the following example:

(36) What John is is honest.

On the inversion analysis of this sentence, the free relative has the type $\langle\langle e, t \rangle, t \rangle$. But as Williams (1990) acknowledges, the same phrase must sometimes have the type $\langle e, t \rangle$, as in (37).

(37) I am what John is.

Further, we have shown that under the predicative analysis one of the occurences of *honest* in the tautology (33a) must be of type $\langle\langle e, t \rangle, t \rangle$. We can now assign the type $\langle e, t \rangle$ to the free relative in example (36) and the type $\langle\langle e, t \rangle, t \rangle$ to the postcopular adjective. With this assignment of types, the sentence is no longer inverse. Like the tautologies, it has become syntactically predicative and semantically equative.

3.3.3 The order of the logic of natural language

Williams (1990) has noted that the type raising operation needed to generate sentences like (34a) under the inversion analysis cannot be allowed to apply freely. If it did, we could construct a free relative like (38)

(38) what honest is

out of the structure in (34a) in the same way as we can construct the free relative *what I want a man to be* out of the structure in (39).

(39) I want a man to be honest.

The free relative (38) should then be a predicate over predicates over predicates (*i.e.*, a third order predicate); and with it we should then be able to construct sentences like (40).

(40) * What John is is what honest is.

However, such sentences are always ungrammatical and uninterpretable.[8]

Williams himself gives no reason why such third order predicates are not constructable, supposing their non-existence to be a primitive property of natural language. Since Williams' higher order predicates are constructed syntactically, however, and since syntactic operations are generally recursive, the absence of recursive type raising is actually surprising if the operation is available to natural language syntax. Under an equative analysis, there is no type raising involved in these sentences, hence no need to stipulate a limit to its application.

3.3.4   Wh-extraction revisited

Having established that there is a class of "true equatives" that cannot be analyzed as inverted predications, we return to perhaps the most convincing argument in favor of the predicate inversion analysis: the explanation that it offers for the impossibility of *wh*-extraction of and from the second noun phrase in an "inverse" structure. The first point to note here is that the "true equative" sentences in (28) display the same restrictions on extraction that Moro observed for "inverse" sentences. That is, in contrast to canonical predicational copular sentences, the second noun phrase in this construction cannot be extracted, nor can anything be extracted from it. Thus, the (a) examples in (41) and (42) parallel the "inverse" example in (23), repeated here as (43a) and the (b) examples parallel the "inverse" example in (24), repeated as (43b).

(41)   a.   * [Whose attitude toward Davies]$_i$ would you say that your attitude to Jones is t_i?

     b.   * Who$_i$ is your attitude toward Jones my attitude towards t_i?

(42)   a.   * [Whose opinion of Philadelphia]$_i$ do you think that your opinion of Edinburgh is t_i?

     b.   * [What city]$_i$ is your opinion of Edinburgh my opinion of t_i?

(43)   a.   *Inverse:* *[Which phrase of music]$_i$ do you think one of the themes is t_i?

     b.   *Inverse:* *What$_i$ do you think that the cause of the riot was the photograph of t_i?

As we have seen, the sentences in (41) and (42) cannot be treated as inverted since the two arguments of the copula are entirely identical in structure and degree of referentiality. Accounts for the limitations on extraction that are crucially based on the assumption of inversion simply cannot be extended to this case. Clearly, however, we are dealing with the same phenomenon here as in (43), and therefore need to pursue a unified analysis. Hence analyses like those in Moro 1990, 1997 and Heycock 1994b, which rely on the assumption of inversion, must be wrong.

Even more striking than the extension of Moro's asymmetries to equative sentences is a fact not discussed by proponents of the inversion analysis: In inverse (and equative)

---

[8]This example would be possible under an equative analysis of the post-copular free relative's internal structure through relativization on the second argument. However, the free relative clause itself is equative under this analysis and we know that extraction out of equatives is not possible (see Heycock and Kroch 1996).

sentences, the extraction of the surface subject is just as ungrammatical as the extraction of the post-copular noun phrase. Consider the following examples:

(44)   a.   * [Which of the themes]$_i$ do you think t_i is that phrase of music?

       b.   * [Whose opinion of Edinburgh]$_i$ do you think t_i is your opinion of Philadelphia?

This fact is entirely surprising under a Moro-style analysis since there is no reason to expect the predicate, once it has moved to the specifier of IP, not to behave like any other surface subject. Once again, the "inversion" analysis fails to account for the full range of behavior of copular sentences; and once again apparently inverse sentences behave like equatives.

Moro's analysis of extraction also fails on its own terms. Under his 1997 account only one DP in a copular sentence can leave the small clause, whether by A or A-bar movement. In this way, he captures the failure to extract of the postcopular small clause subjects in his "inverse" sentences, because the "predicate" has already moved to Spec(IP). Equally, he predicts that that the predicate of a canonical copular sentence cannot be extracted (p. 59), since the small clause subject has moved to Spec(IP). This he takes to be a correct prediction and therefore an argument in favor of his analysis, on the strength of the ungrammaticality of (45) (his (93)).

(45)   * [which cause]$_i$ do you think [$_{DP}$ a picture of the wall]$_i$ was [$_{SC}$ t_i t_j]

On closer inspection, however, it turns out that the extraction of DP-predicates in canonical copular sentences is perfectly grammatical. This can be seen in (46a,b).

(46)   a.   There are kind teachers and vindictive teachers: Which kind of teacher do you think Harold is?

       b.   Whose child do you think Harold is?

Moro's example is ungrammatical because the extracted *which*-phrase is, in fact, not a predicate. In general, *which*-phrases have a similar distribution to DPs containing the demonstratives *this* and *that*. The indicative sentence parallel to Moro's example is (47).

(47)   ?? A picture of the wall was that/this cause.

As the ungrammaticality of (48) below indicates, even to the extent that (47) is grammatical, it cannot be taken to be a canonical sentence (*i.e.*, *that/this cause* cannot be interpreted as a predicate).

(48)   * I consider a picture of the wall that/this cause.

On the other hand, the grammaticality of (49a,b) shows that *that kind of teacher* and *my child* can be interpreted predicatively, supporting a predicative analysis of *which kind of teacher* and *whose child* in (46a,b) above.

(49)   a.   I consider Harold that kind of teacher.

       b.   I consider Harold my child.

In sentences which force a referential interpretation for these noun phrases, however, extraction is ungrammatical, as predicted.

(50)   a.   * Whose child do you think the problem is? *[Equative: cf. *I consider the problem my child.]*

b. * That school has nice teachers and vindictive teachers: Which kind of teacher do you think the problem is? *[Equative: cf. *I consider the problem that kind of teacher.]*

In other words, *contra* Moro, a predicative postcopular noun phrase can be freely extracted out of a small clause even when the subject has raised. Extraction is impossible if and only if the extracted expression is interpreted referentially rather than predicatively, that is, if and only if the sentence is equative.

Significantly, putting aside the question of inversion, the general blocking of extraction in sentences like (44) does not have any obvious explanation under standard assumptions. Though we shall not pursue the matter further in this article, the facts suggest to us that these sentences lack any lexical predicate, verbal or otherwise. Perhaps this fact, which is unique to equative sentences, is the source of the general blocking of extraction. It does not seem useful to us to give a partial account, as the inversion analysis does, for what is a general failure of extraction.[9]

3.3.5 The ungrammaticality of predicates in subject position

In addition to the arguments we have presented, there is further evidence that we think shows the inversion analysis to be not only uneconomical, but untenable. It has frequently been objected to the inversion analysis that only a subset of predicates invert. Specifically, APs and (some) indefinites do not "invert" in this construction:

(51) a.   John is the best candidate for the job.

   b.   John is a doctor.

   c.   John is proud of his daughters.

(52) a.   The best candidate for the job is John.

   b.   * A doctor is John.

   c.   * Proud of his daughters is John.

If (52a) is an example of a small clause predicate raising to the subject position of IP, why is this movement not possible for AP predicates or non-specific predicate nominals?

___

[9]One possible avenue that has been explored as a guide to the analysis of extraction is that it is blocked in equative sentences because the second noun phrase is in some kind of "constructional focus" position. See Heggie 1988 for the proposal that the second noun phrase in at least some of these cases is in such a position, and Guéron 1993 for the proposal that this is what prevents extraction. The fact that the failure of extraction in equatives extends to subjects, however, suggests that this line is not correct. A more promising avenue to pursue may be to look for a structural relationship between equatives and the only other symmetric construction in natural language syntax: coordination. Equatives show the same restrictions on extraction as coordinate structures do; that is, despite the ungrammaticality of singular extraction from the precopular and postcopular noun phrases, Across-The-Board extraction from both at once is acceptable.

(i) a.   * Which city$_i$ is your opinion of t_i my opinion of Philadelphia?

   b.   * Which city$_i$ is your opinion of Edinburgh my opinion of t_i?

   c.   Which city$_i$ is your opinion of t_i my opinion of t_i?

One possible response is that for some reason APs and non-specific indefinite predicate nominals are barred from the IP subject position, possibly because they cannot be assigned nominative case directly. This solution cannot be correct, however, since APs do occur in the surface subject position in other cases. One is the tautologous equative sentences illustrated in (33) above; another is "reverse" pseudoclefts—pseudoclefts in which the focus precedes the free relative:

(53) a. Proud of his daughters is what he is.

  b. Intelligent is what he thinks he is.

As pointed out in Williams 1983, there is evidence that the initial phrase in these examples does occupy the subject position (rather than, say, a topic position). Thus, it freely undergoes subject-to-subject raising and inverts under subject-aux inversion:

(54) a. Proud of his daughters seems to be what he is.

  b. Is intelligent what he thinks he is?

Further, the generalization that it is APs and non-specific indefinite noun phrases that are barred from this position is too weak. Consider (55), in which the predicate is a noun phrase headed by *thing*, which, as Higgins observed, behaves very much like a free relative.

(55) John is the one thing I have always wanted a man to be (that is, he's honest).

The same noun phrase can occupy the initial position in an "inverse" sentence that parallels very closely the related pseudocleft:

(56) a. The one thing I have always wanted a man to be is honest.

  b. What I have always wanted a man to be is honest.

But now observe that although (56a) shows that *the one thing* can occupy the initial position in a sentence, the "inverse" counterpart to (55) is ungrammatical (except on the marginal and irrelevant reading where *John* is taken to name some kind of property), having exactly the same status as (52c):

(57) * The one thing I have always wanted a man to be is John.

These data suggest very strongly that the actual generalization is not that a particular category is barred from appearing in the IP subject position, but rather that it is not possible to treat any constituent appearing in this position as predicated of a postcopular argument. Indeed, whenever such an apparently inverse sentence lacks an equative interpretation and would have to be given an inverse predicational one, it is ungrammatical. This generalization explains the contrast between (52c) and (53a,b), and between (56a) and (57) In all of these cases the precopular noun phrase denotes a property, which can be equated to another property (as in (53a,b) and (56a,b)) but not to an individual (as in (52c) and (57)). It rules out any analysis under which the "inverse" construction really involves movement of the

predicate of the small clause past its subject into the IP subject position.[10,11]

We do not see any way of avoiding this fundamental problem for the predicate inversion analysis. On the basis of the discussion in this section, therefore, we conclude that the analysis of specificational sentences as derived by predicate raising or "inversion" cannot be sustained; so-called "inverse" copular sentences are rather equatives.[12]

3.3.6 Predication and equation: Summary

We are now in the following position. We have established that, in addition to canonical predicative sentences like (58a), there is a class of "true equatives" like (58b). Further, we have shown that specificational sentences like (58c) cannot be treated as inverted predications, but instead are a subtype of equatives.

(58)   a.   Your attitude toward Jones is a very serious problem.

b.   Your attitude toward Jones is my attitude toward Davies.

c.   The most serious problem is your attitude towards Jones.

This assimilation of specificational sentences to equatives runs afoul of the intuition that the former are asymmetric in interpretation in a way that "true equatives" are not. The analytic issue, however, is whether the undeniable asymmetry in the status of the two noun

---

[10]Partee 1986 adopts Williams' inverse predication analysis for pseudoclefts, but notes in passing the problem stated here, by pointing out that the inverse predication account offers no explanation for the fact that (i) (her (20)) is unambiguously a (reverse) specificational pseudocleft (that is, *unusual* cannot be taken as predicated of *what John is*).

(i)   Unusual is what John is.

Although we believe we have demonstrated that specificational sentences cannot be analyzed as A-movement of the predicate into the IP subject position, there is no obvious reason why a predicate might not be able to move to the left of its subject by A-bar movement. In Heycock and Kroch 1998 we have argued that this is the correct analysis for the kind of predicate fronting discussed in Birner 1992. Crucially, this construction displays a number of properties that distinguish it from the specificational sentences at issue here.

[11]In languages that allow subjects to remain in postverbal position, leftward movement of the second argument in an equative sentence can occur, yielding a surface configuration misleadingly similar to predicate fronting. Most strikingly, agreement in these sentences is with the postcopular noun phrase, as in the following Italian example:

(1)   Il   re   della Francia sono io.
       the king of-the France am   I

       The king of France is me.

In Heycock and Kroch 1998 we discuss such examples, and show that they are equative sentences in which scrambling has occurred. Hence their existence, far from posing a threat to the equative/predicative distinction, actually reinforces it.

[12]To the extent that the account in Jacobson 1994 relies on an analysis in which the difference between a specificational and a predicational sentence is simply the order of the subject and the predicate, the facts just discussed present a problem for her account as well. Jacobson herself says that although she adopts such an analysis, "any other reasonable semantics for specificational copular sentences would appear to do just as well," but it is quite difficult to determine whether this is true, in particular because it is not clear that the Williams/Partee analysis that she uses in fact gives her the result that she needs. Her approach seems rather to require the equative analysis that we propose (but which is rejected in the Williams/Partee analysis).

phrases in a specificational sentence is in fact a subject–predicate asymmetry. Our evidence shows clearly that it is not and hence that an alternative account is required. In Section 5.3 we provide such an account and show that the asymmetry can instead be assimilated to the focus–ground opposition.

3.4 Ambiguous copular sentences without ambiguous "be"

Our conclusion that the predicative/equative distinction is irreducible leads to a problem in the analysis of the copula. It seems at first glance to imply that the copula is ambiguous, an undesirable result. However, we believe that the interpretive difference between predicative and equative sentences should not be traced back to the copula: rather, there is evidence that the copula is always semantically vacuous. The difference between the two types of copular sentence is due instead to the existence of two types of small clause.

The existence of a distinction among small clauses of the relevant sort was argued for in Heycock 1994a (although the analysis given in that paper differs from the one that we have now arrived at). Heycock 1994a shows that, alongside the more familiar predicational small clauses like (59a), we can find in the English *make* construction "inverse" small clauses like (59b,c), which have the typical specificational/equative interpretation.

(59)   a.   I consider John the real murderer.

       b.   But if what you say is true, that would make the real murderer John!

       c.   But if what you say is true, that makes your attitude towards Jones my attitude towards Davies!

¿From the examples in (59), we must conclude that equative semantics is independent of the presence of the copula. Indeed, there is also evidence, first noted in Heycock 1994a, that equative small clauses also occur as the complements to raising verbs other than *be*. The verbs *remain* and *become*, to cite the two clearest examples, also subcategorize for equative small clauses, as illustrated in (60) and (61).

(60)   a.   The real problem remains what to do next.

       b.   The best solution remains instant retreat.

(61)   a.   At this point our real problem becomes John.

       b.   The critical problem now becomes how to set the parameters.

We will not discuss these examples in detail here; but their existence reinforces the point that the predicative/equative distinction is independent of *be*[13] and allows us to maintain that *be* is a semantically empty raising verb in all cases. Of course, some verbs select only for predicative small clauses, while others can select for either type.[14]

We conclude, therefore, that there are both equative and predicative small clauses. The copula (like the aspectual verbs *become* and *remain*) can take either type as its complement:

---

[13]Other arguments, based on data from Hebrew and Irish, against deriving the two readings of copular sentences from lexical ambiguity of the copula can be found in Doron 1983, Rapoport 1987, and Rothstein 1995 (for Hebrew), and Carnie 1995 (for Irish).

[14]We are not aware of any heads that select *only* equative small clauses. We have not yet explored possible reasons for this implicational asymmetry.

hence the ambiguity of copular sentences. Clearly a question that now arises is the nature of the difference between predicative and equative small clauses. It seems that equative small clauses involve some functional head, absent from the predicative cases (this conclusion is reached for copular sentences in Irish in Carnie 1995, and for independent reasons in Heycock 1994a), but more research is needed on this question. What we take to be established is the location of the ambiguity of copular constructions in the ambiguity of the small clause complement, and not in any lexical ambiguity of the copula itself.

One advantage of treating equative small clauses as projections of an empty functional head is that it is compatible with a straightforward account of the Italian cliticization facts mentioned in Section 3.1 above. Cliticization of or out of the second noun phrase in an equative sentence is ungrammatical, in contrast to cliticization of or out of a predicative noun phrase or the object of a transitive verb. Under the inversion analysis this can be taken to be an ECP effect because the second noun phrase in an "inverted" sentence is the subject of a small clause, one not governed by a higher lexical verb. Our analysis allows us to appeal to the ECP in essentially the same way: the equative head is not lexical, so movement of or from its complement is expected to give rise to ECP effects. In a predicative sentence there is no empty functional head of the small clause, hence cliticization to Tense is local. In the case of transitive sentences, cliticization of the direct object requires crossing an additional maximal projection, but this additional distance is licensed by the presence of a lexical head. In the case of extraction from within a direct object, yet a further maximal projection is crossed, but once again an additional lexical head exists to license the further extension of the movement domain.

4   Equatives and the semantic type of arguments

If specificational copular sentences like (62) must be analyzed as equatives, then so must pseudoclefts like (63).

(62)   Fiona's only purchase was that ancient dictionary.

(63)   What Fiona bought was that ancient dictionary.

Clearly, we do not wish to abandon Higgins' insight that specificational pseudoclefts are simply another case of the specificational sentence type (for an analysis of pseudoclefts that implicitly rejects the possibility of treating them as a type of equative, see Bošković 1997). If we take seriously the notion of "equation," however, a pseudocleft like (63) poses a problem that a non-cleft copular sentence like (62) does not. In (62) it is clear that two expressions of the same semantic and syntactic type are being equated: *Fiona's only purchase* and *that ancient dictionary* both denote individuals. In (63), on the other hand, it is not obvious what the type of the first argument in the equation, *what Fiona bought*, is. Most simply, it could be taken to denote a set of individuals (in Generalized Quantifier terms, a set of sets of properties).

(64) λy[Fiona bought y]

But a set cannot be directly equated with an individual (a set of properties in Generalized Quantifier terms), the denotation of *that ancient dictionary*. This apparent problem is

solved, however, if, following Jacobson 1988, we take an NP free relative like *what Fiona bought* to denote an individual rather than a set. Thus, we take *what Fiona bought* to denote the maximal individual (a plural individual in the sense of Link (1983)) of which the sentence *Fiona bought y* holds; namely:

(65) ιy[Fiona bought y] ,

where the definition of the Russellian ι operator is:

(66) ιy[f(y)] denotes a iff f(a) AND ($\forall z$)(f(z) iff $z \leq a$)

Hence, a pseudocleft like (63) will have the interpretation in (67).

(67) ιy[Fiona bought y] = 'that ancient dictionary'

Interestingly, our equative analysis of pseudoclefts allows a simplification of the treatment of free relatives in Jacobson 1988. Jacobson accepts Williams' analysis of pseudoclefts as inverse sentences; as a result, while she gives most NP free relatives the denotation in (65), she must give the free relative in a pseudocleft like (63) the denotation in (64) so that it can function as a predicate, thereby introducing a type ambiguity. We, on the other hand, since we treat pseudoclefts as equational, can (indeed must) give pseudocleft free relatives the same denotation as other free relatives; that is, the denotation in (65).

Our use of Jacobson's analysis of ordinary NP free relatives extends easily to pseudoclefts with adjectival and other predicate foci. We must simply allow the type of the ι-bound variable to range over all the semantic types that free relatives can denote. Moreover, it is clear that, on our treatment, only those expressions can appear as the foci of pseudoclefts whose types match the type of a free relative with which they can be equated. Thus, free relatives introduced by *what* can apparently denote either individuals, as in (63), or predicates, as in (1), repeated here as (68), or (69).

(68)   What Mary was was proud of herself.

(69)   What Mary did was run the marathon.

Free relatives with *what*, however, cannot denote objects of a higher semantic type than predicates; and as a result, the focus of a pseudocleft with a *what* free relative cannot be an essentially quantificational NP.

(70)   * What Fiona bought was at most three books.

In the vernacular language, there is a grammatical, if marked, variant of (70) which uses the *wh-* quantifier *how many*, as in (71); but the type of this sort of free relative is clearly that of a quantifier.

(71)   ? How many books Fiona bought was at most three.

Noun phrases which in other contexts may be interpreted quantificationally are interpreted as denoting plural individuals when they appear as the focal constituent in a pseudocleft with a *what* free relative. Quantified noun phrases that resist this interpretation are thus awkward or unacceptable in such pseudoclefts. The distinction between quantificational phrases that introduce a group referent (a plural individual) and those that

are only quantificational has already been drawn for independent reasons in Beghelli 1994, 1995. The class of G[roup] Q[uantifier] P[hrase]s, which introduce a group referent, includes indefinite noun phrase built with *a*, *some*, and *several*, as well as definites and unmodified numerals such as *two books*; the class of C[ounting] Q[uantifier] P[hrase]s, which are only quantificational and do not introduce a group referent, includes decreasing QPs and modified numerals such as *less than three books*. QPs headed by *every* and *each* are somewhat intermediate in nature, in that they need to distribute (essentially a quantificational attribute), but they also introduce a group referent.[15]

Our analysis, together with Beghelli's categorization of the kinds of QP, predicts which QPs will be acceptable as the foci of pseudoclefts:[16]

(72) a. What she bought was two books on linguistics.

      b. ?* What she bought was less than three books on linguistics.

      c. ?? What she bought was every book on linguistics.

(72a) is fully acceptable, as the GQP *two books on linguistics* introduces a group referent; (72b), like (70) above, is basically unacceptable, as the CQP *less than three books on linguistics* is only quantificational; (72c) is, we judge, somewhat better, presumably because *every book on linguistics* introduces a group referent—but it is still awkward, as the QP cannot distribute: compare the more natural example in (73), where the object QP can distribute over the event of buying.[17]

(73) What she did was buy every book on linguistics.

A direct, and very positive, consequence of our account is that it explains the facts concerning the lack of certain scope readings in pseudoclefts first pointed out in Williams 1994:60. Arguing against any type of reconstruction analysis for pseudoclefts, Williams observes that the scope behavior of quantifiers in pseudoclefts and in their simple sentence paraphrases is quite different. In an example like (74a) the postcopular indefinite appears to

---

[15]*Every* and *each* QPs actually behave somewhat differently with respect to distributivity (see Kroch 1979, Beghelli and Stowell 1996 and references therein).

[16]We are grateful to Anna Szabolcsi for drawing our attention to these issues, and to Filippo Beghelli for extensive discussion.

[17]There are exceptions to the generalization that CQPs such as modified numerals cannot occur as the focus of a pseudocleft (or an equative sentence): these involve intensional verbs such as *need* and *want*.

(i) a. ?* What every student finished up with was fewer than six fails.

     b. What every student wants is fewer than six fails.

(ii) a. ?* What he used was between two and five eggs.

      b. What you need is between two and five eggs.

We do not have an worked-out explanation for this fact, but we assume that it will follow from the semantic type of the argument that these verbs may select. A probably related fact is that these verbs allow narrow scope for QPs headed by *no* (*cf.* Zimmermann 1993).

(iii) a. Jane detected no errors.

       b. Jane wanted no errors.

be able to take narrow scope with respect to the universal quantifier inside the free relative, just as it can take narrow scope in the paraphrase in (74b). That is to say, each boy could be seeing a different friend.

(74) a. What every boy saw was a friend of his.

  b. Every boy saw a friend of his.

On the face of it, this seems like another case of connectedness, in that the indefinite in the postcopular position appears to be taking the scope that would be expected if it were in the position of the object of *saw*. However, Williams points out that a universal quantifier in the postcopular position cannot take wide scope over an existential quantifier inside the free relative, in sharp contrast to the interpretations available in the paraphrase. That is to say, in (75b) it is possible that only one friend was bothered per article, but in (75a) the only available reading is the one in which a single friend was bothered by all the articles.

(75) a. ? What bothered a friend of mine was every article that appeared.

  b. Every article that appeared bothered a friend of mine.

The failure of the universal quantifier to take wide scope with respect to any quantifier inside the free relative is independent of the position of the gap inside the free relative; (76a) is also unambiguous, in contrast to (76b).

(76) a. ? What someone is prepared to read is every article on linguistics.

  b. Someone is prepared to read every article on linguistics.

Williams' conclusion is that there is no reconstruction of any kind into the free relative. The one apparent case of scope reconstruction—(74a)—is in fact simply an instance of unselective binding, where the indefinite is construed as a function from its context to individuals (Williams 1994:63).

What Williams does not observe, however, is that exactly parallel behavior is found in non-cleft specificational sentences, as discussed in Moro 1990. Consider (77a,b).

(77) a. That boy is the problem in this school.

  b. The problem in this school is that boy.

(77a) is a straightforward predicational copular sentence and (77b) is its specificational counterpart. Strikingly, exactly the same pattern of scope readings is found in these examples as in the pseudocleft examples in (74)–(76).

(78) a. Some boy is the problem in every school.

  b. The problem in every school is some boy.

(79) a. Every boy is the problem in some school.

  b. ? The problem in some school is every boy.

In the predicational—(a)—sentences, there is scope ambiguity. Scope ambiguity seems also to show up in the specificational sentence in (78b); but note that this is the case that is parallel to (74a) above, which also appeared to allow narrow scope for the existential.

Example (79b), however, is unambiguous: the universal quantifier cannot take wide scope, just as it cannot in (75a).

Under our account, all of these examples behave exactly as expected. What is at issue here is not the lack of a particular scope for the postcopular quantified phrase, but rather the fact that the second noun phrase in an equative/specificational sentence cannot function as a pure quantifier at all. Both Williams' original pseudocleft examples and the non-cleft specificational sentences in the (b) examples in (77)–(79) above are equatives; hence, due to the type matching between subject and predicate nominal imposed by the semantics of equation, it cannot be taken quantificationally but instead must denote a plural individual. Under this approach we also understand why (79b) is somewhat awkward.

As for the ambiguity of (74a), repeated here as (80a), we agree with Williams that the apparent narrow scope reading of *a friend of his* must be due to something other than the ordinary scope ambiguity found in the corresponding simple sentence (80b).

(80) a.   What every boy saw was a friend of his.

  b.   Every boy saw a friend of his.

One indication that in fact the universal is not distributing over the existential is that an indefinite modified by *different* cannot occur in the focal position (except on the (irrelevant) reading where *different* means "not identical to some specific entity previously mentioned").

(81) a.   Every boy bought a different book.

  b.   *What every boy bought was a different book.

We do not, however, adopt Williams' solution in terms of unselective binding, but rather propose that the two readings derive from the two possible scope relations between *every student* and *what*. This scope ambiguity within the free relative is quite independent of the pseudocleft, as it is evident in predicational sentences.

(82)   What everyone ate was fattening.

This example is clearly ambiguous due to the varying scope of *everyone*. On one reading, only the kind of food eaten by everyone was fattening; on the other reading, for every person eating, what that person ate was fattening.[18]

---

[18]Examples along the lines of (80a), where a pronoun is apparently bound by a quantified noun phrase in the pre-copular phrase, are taken by Jacobson 1994 to be core cases of connectedness, and are the basis of her analysis. Two of her own examples are given in (i).

(i) a.   The woman who every Englishman$_i$ admires the most is his$_i$ mother.

  b.   The only woman that no Englishman$_i$ will invite to dinner is his$_i$ mother.

She contrasts these specificational examples with predicational examples like (iia,b).

(ii) a. ?*The woman who every Englishman$_i$ likes the most killed his$_i$ mother.

  b. ?*The woman who no Englishman$_i$ invited to dinner killed his$_i$ mother.

However, there are a number of cases where the binding is possible in predicational examples (note that these are closer to minimal pairs with (ia,b) as the main clause is generic):

(iii) a.   The uniform every English soldier$_i$ receives has his$_i$ name written on the collar.

  b.   The woman that every man$_i$ wants to marry cooks his$_i$ meals every day without complaint.

While the lack of a distributive reading for a universal quantifier in the postcopular position of a non-cleft equative sentences is not discussed in Williams 1994, it is pointed out and analyzed in Moro 1990. Moro's analysis is, however, quite different from the one that we have given above: he proposes that the missing reading is the result of the impossibility of LF quantifier-raising from this position (parallel to the impossibility of overt *wh*-movement from this position pointed out in the same paper and discussed above in Section 3.1).

Although Moro's analysis does capture the lack of a wide-scope reading for the universal quantifier in an example like (79b), it does not generalize to the other effects that we have described here. Moro assumes that the postcopular noun phrase can be interpreted quantificationally; the only limitation is that it must have narrow scope. Therefore, the analysis, as it stands, predicts grammaticality for sentences in which the postcopular phrase is unambiguously quantificational; that is, where the postcopular phrase is a QP that does not introduce a group referent. In contrast, as discussed above, we predict that such a case would be ungrammatical. The examples in (72) already support our analysis; here we include additional sentences closer to the original examples in Moro 1990.

(83) a.   Every student bought fewer than six novels.

b. ?* What every student bought was fewer than six novels.

c. ?* Every student's purchase was fewer than six novels.

d.   Every student's purchase was stuffed into fewer than six bags.

(83a) is fine, as anyone would expect. (83b), on the other hand, is basically unacceptable. This is predicted on our account (the CQP in postcopular position can only be interpreted quantificationally). The same is true of the example in (83c), a non-cleft equative (for Moro an "inverse" sentence). This is not explained under Moro's account; the CQP should get narrow scope and the sentence would be fine. Note that the problem is not that "every" cannot scope out of the subject noun phrase in this example, as illustrated by the perfectly acceptable (83d). Moreover, if the only restriction is that the postcopular second QP must take narrow scope, there is no obvious explanation for the failure of indefinites modified by *different* to occur in this position (see (81) above).

5   Returning to connectedness

5.1   The representation of pseudoclefts at the LF interface

We have now arrived, on the basis of considerable evidence, at the conclusion that a pseudocleft is an equative copular sentence. At this juncture, we have to return to our starting point and ask what consequences this conclusion has for the explanation of connectedness effects. Clearly, the treatment of pseudoclefts as equative sentences provides no direct solution to the problem of accounting for these effects. Indeed, because the equative analysis yields a semantic interpretation of pseudoclefts that is read directly off surface structure, it may seem to make the connectedness problem worse. After all, it is exactly the surface form

---

It thus seems that this type of binding is not a true connectedness effect at all; conversely, the clearer cases (such as reflexive binding) are not handled by Jacobson's account, as she herself admits. Her tentative proposal that reflexive binding, and presumably other cases of syntactic connectedness, are not really structural seems to us untenable on empirical grounds.

of pseudoclefts that poses the connectedness problem. Our view is that the connectedness effects in pseudoclefts are evidence that neither surface structure nor anything close to it can be the level at which crucial aspects of semantic interpretation are determined. Rather there must be a quite abstract level of logical form which supports interpretation and it is at this level that pseudoclefts must have a structure identical in relevant respects to their canonical paraphrases. At the same time, the fact that pseudoclefts are equative sentences on the surface means that surface structure or something close to it is also, in some sense, a semantically interpreted level. Hence, the process of derivation that maps surface form onto logical form, while syntactic, must also be semantic, in that its transformations map interpreted structures onto interpreted structures. However, various aspects of interpretation, most notably binding relations, are postponed until the output of the derivation, what we are calling "logical form," is reached.

Recall that a pseudocleft like (63), repeated here as (84a), can be translated with the formula in (67), repeated here as (84b).

(84) a.   What Fiona bought was that ancient dictionary.

b. ιy[Fiona bought y] = 'that ancient dictionary'

We take (84b) to be a representation of the surface structure of (84a) considered as a semantically interpreted object and hence as the starting point of the derivation of the sentence's logical form. We can, without altering the truth conditions of (84b), alter its structure by applying the definition of the ι operator in (66) to the equative formula, given that '=' means simply 'has the same denotation as'. This procedure, which we can call "ι-reduction," eliminates the ι operator and substitutes the focus of the pseudocleft for the ι-bound variable.

(85)   Fiona bought that ancient dictionary AND $(\forall z)$ (Fiona bought z iff $z \leq$ 'that ancient dictionary')

The connectedness effects in pseudoclefts will reduce to the corresponding effects in canonical sentences if (1) they are determined at a level of logical form at which a pseudocleft has the derived form in (85) rather than the surface equative form (84b) and (2) the second conjunct in (85) can be excluded from the logical form relevant for connectedness. We leave aside the second condition for the moment because the presence of the second clause in the definition of the ι operator will turn out, in the course of later discussion (see Section 5.3) to be unnecessary. The clause is present in the definition to capture the uniqueness/maximality presupposition of definite expressions; but this presupposition has often been argued to be pragmatic rather than semantic (Christophersen 1939, Stalnaker 1974, Prince 1978b); and if it is, it will not appear in the logical form of sentences. Since we will be driven for independent reasons to a pragmatic account of pseudocleft interpretation, the problematic clause will in the end disappear from our logical form representations. As for the first condition, we believe that it holds; that is to say, part of the (syntactic) derivation leading to the logical form of a pseudocleft sentence is the step from the visible equation of two expressions to a formula with the structure of the logical form of a canonical sentence via ι-reduction.

Our best evidence for treating ι-reduction as part of the syntactic derivation of pseudocleft logical form is that making it an obligatory step in the derivation of pseudoclefts

directly yields a quite complete account of connectedness effects. If the equative and reduced forms of the pseudocleft were no more than logically equivalent options, we would not expect ι-reduction to have syntactic effects. At most, it might "rescue" sentences that would otherwise violate some constraint by providing an alternative representation for them, though the theoretical status of this representation would be unclear. To illustrate, the reduced form of an example like (86a) places the reciprocal and its antecedent in the right configurational relation for binding, just as they already are in the surface form of the canonical sentence (86b).

(86) a. What they$_i$ wanted to buy was pictures of each other$_i$.

  b. They$_i$ wanted to buy pictures of each other$_i$.

What would clearly be impossible under a treatment of ι-reduction as simply a logical option would be for it to *create* ungrammaticality; but it does. Recall that there is no "antireconstruction" effect in pseudoclefts, so that for example (87a) is a Condition C violation, despite the fact that a representation in which the ι-reduction step was not taken would be grammatical, as illustrated by the contrast with the (non-pseudocleft) (87b).

(87) a. *What he$_i$ had said to Mary was that she had been lying to John$_i$.

  b. What he$_i$ had said to Mary was a real embarrassment to John$_i$.

The same point can be made with respect to connectedness with Negative Polarity Items (Filippo Beghelli, personal communication). As already discussed, connectedness effects in pseudoclefts extend to NPI licensing, as (88) shows.

(88) He bought lots of books, but what he didn't buy was any good novels.

Further, negation in the matrix *cannot* license an NPI in the focus, although the superficial structure of the sentence should allow this. The judgment is complicated by the fact that matrix negation in pseudoclefts is known to be marginal in any case, but there is a clear contrast between (89a), with no NPI, and (89b).

(89) a. ?What he bought wasn't novels; he bought text books.

  b. *What he bought wasn't any novels; he bought some text books.

Again it appears that the ι-reduction step is obligatory. If it were only optional, both (88) and (89b) would be grammatical; on the first case the NPI would be licensed in the structure after conversion, and in the second in the structure without conversion.

In a pseudocleft, then, ι-reduction is obligatory, hence part of the syntactic derivation of the logical form of pseudocleft sentences. That is, the output of ι-reduction, distant though it may be from surface structure, is the only representation of a pseudocleft sentence available at the interface with the conceptual system. Indeed, this point holds for specificational sentences in general. The connectedness effects in non-cleft specificational sentences like (8a) are, as Higgins knew, identical to those in pseudoclefts and must have the same explanation. Hence, at the level of interpretation, a noun phrase like "his claim" in (7a) must be represented in the same way as the free relative "what he claimed" in (8a) so as to be equally subject to ι-reduction.

5.2 Connectedness and discourse processing

5.2.1 Connectedness in non-cleft discourse contexts

We stated in our opening remarks that a theory which cannot account for the syntactic behavior of pseudoclefts in terms of the same sort of representation that it uses for simple sentences cannot be correct. A further fact of the same type—often ignored by syntacticians, with the notable exception of Higgins—is that a syntactic theory which accounts for connectedness effects in pseudoclefts must be extendable to other cases that arise in discourse. The cases that we have in mind include the following:

(90) a. A: What did Mary$_i$ see?

   B: Herself$_i$/her$_{*i}$ in the mirror.

   b. A: What did she$_i$ claim?

   B: Only that Mary$_{*i}$ will be late.

(91) a. There was something that they$_i$ continued to deny, and that was each other's$_i$ guilt.

   b. There is something he$_i$ still wants to commission; it's a portrait of himself$_i$ /him$_{*i}$ /John$_{*i}$.

   c. There is something that he$_i$ denies. It is that John$_{*i}$ was at the scene of the crime.

The question-answer pairs in (90) show that the construction of a logical form full answer to a question from an actually uttered partial answer, which is necessary to make the answer semantically interpretable, yields a representation to which binding constraints apply, just as they do in pseudoclefts. Here, however, the connectedness is between the partial answer and the question, whose syntactic form is the basis for the construction of the full answer as a logical form representation. Clearly, the logical form full answer is constructable only in the course of discourse interpretation.[19] The examples in (91) show that binding theory must apply to a structure which has undergone resolution of discourse anaphora, followed by the construction of an intermediate equative (that is, pseudocleft) representation. Specifically, in the case of (91a) the second clause is transformed into a representation identical to the surface representation of (92), which is then transformed by ι-reduction into a representation containing the equivalent of the canonical sentence (93).

(92) What they$_i$ continued to deny was each other's$_i$ guilt.

(93) They$_i$ continued to deny each other's$_i$ guilt.

---

[19]Groenendijk and Stokhof (1983) discuss the problem of binding in question answer pairs in sentences like:

(i) A: Who did every Englishman$_i$ invite?

   B: His$_i$ mother.

Their treatment, however, is a purely semantic analysis of pronoun binding, which does not extend to the binding of reflexives and other connectedness effects.

These examples show clearly that the syntactic derivation of the LF interface representation relevant for such phenomena as binding follows operations that are part of discourse interpretation. And, therefore, they point to the need for a dynamic approach to meaning, in the sense of Groenendijk and Stokhof 1990 and Chierchia 1995. In particular, discourse anaphora resolution must be part of a single derivational process that maps surface form onto interpretation; that is, there is no level of semantic representation that gives fully-specified truth conditional interpretations of sentences in isolation out of which discourse representations are subsequently built. We are not in a position to provide a full and properly formal account of the needed derivational process; but we can point out some conceptual and empirical requirements that such an account should meet.

5.2.2   Further evidence for the nature of the derivation

The examples in (91) demonstrate that discourse anaphora resolution can produce structures that are the input to the derivational step of ι-reduction that applies obligatorily in pseudoclefts. The following example shows that a free relative in a predicational sentence can be referred back to by a pronoun that is functioning as the subject of an equative sentence.

(94)   What John said was interesting. As I remember, it/*that was that the Republicans would lose the next election.

This example indicates that a free relative has the same semantic/syntactic structure in a predicational sentence as it does in an equative, whether cleft or not. As a result, the anaphoric reference with *it* is possible because the pronoun points to the same semantic/syntactic object that the free relative denotes. Thus, the example supports our identification of the semantic type of free relatives in pseudoclefts with their type in other constructions, as against the type ambiguity proposed in Jacobson 1988 (see Section 4 above).

Notice, however, that (94) contrasts sharply with (95), where the first sentence is specificational and the second predicational.

(95)   What John said was that the Republicans would lose the next election. In my opinion that/*it was interesting.

In this case anaphora is only possible with *that*, which can refer back to the complement clause but not to the free relative, to which anaphoric reference is impossible. Why should it be impossible to refer back to the free relative just in the case where it is the subject of a pseudocleft? If we assume that discourse interpretation and generation are incremental, as they surely must be, this question receives an obvious answer on our account: Reference back to the free relative subject of a specificational pseudocleft is impossible because at the level of interpretation there is no longer a semantic/syntactic object corresponding to the free relative. That is to say, the transformational steps that the structure must undergo in order to arrive at the logical form representation relevant to anaphora resolution, like other steps in a syntactic derivation, are unidirectional and irreversible.

5.3 On deriving the logical form of sentences

The obligatory character of connectedness effects and their persistence across sentence boundaries in discourse, along with the assumption of incremental interpretation needed to make sense of them, lead us to the conclusion that our conception of nature of equative sentences and the character of the ι-reduction operation require further explication. As we have noted, despite its apparent similarity to logical operations like λ-reduction, ι-reduction cannot be a step in a logical deduction, because logical operations by their nature are not unidirectional or irreversible. Instead, we propose that ι-reduction be understood as a part of the procedure that interprets sentences dynamically in their discourse context, in the spirit of dynamic Montague Grammar (Groenendijk and Stokhof 1990, Chierchia 1995). What has to be added to the dynamic semantic approach as so far developed is an account of how variation in the syntactic form of sentences with the same propositional content determines variation in their contribution to discourse interpretation. Here the work of researchers in linguistic pragmatics is directly relevant. Following Prince (1981), we believe that the syntax of natural language sentences should be seen as combining propositional content with information packaging "instructions" to a hearer on how to use that content to update the shared discourse context (see Vallduví 1990 for details and references). The packaging instructions, on this view, are encoded in surface syntactic form and intonation; and following these instructions yields a canonical form representation of the propositional content of the sentence added to the hearer's knowledge store in the appropriate place. In other words, the interpretation of natural language sentences is a procedure which takes surface syntactic form as input and processes it to extract and store a logical form.

The domain in which the information packaging approach has been best worked out is the representation of focus. In the work of Vallduví the focus/ground distinction is treated as a division of the sentence into an open proposition, the ground, which is taken as background in the discourse context and a value for the variable of the open proposition, the focus. The new information content of a sentence in a discourse, then, is the fact that the focus can be substituted for the variable in the ground to make a true sentence. Any sentence with a syntactically and/or intonationally indicated focus contains an implicit packaging instruction to its hearers to look in their knowledge store for an address where the open proposition is stored and to update the content of that address by substituting the focus for the open proposition variable. To give a simple example, consider the following sentence:

(96)   Max likes hot dogs.

In a discourse context in which Max's eating habits are under discussion, the fact that Max likes some foods (and presumably dislikes others) will be a salient proposition in the minds of discourse participants. Then, if the sentence (96) is uttered with an unmarked intonation in that context, it will be taken as a contribution to the specification of Max's tastes. In Vallduví's terms, the open proposition "Max likes x," where x ranges over foods, will be part of the shared background of the discourse participants, and sentence (96) will be interpreted by hearers as an instruction given by the speaker for them to update their discourse model by adding "hot dogs" to the address where they store Max's culinary preferences.

This line of analysis is directly relevant to our investigation of pseudoclefts because, as is well-known (Prince 1978a), pseudoclefts have a fixed information structure in which the free relative denotes the ground and the other argument of the copula denotes the focus of the

sentence.[20] More specifically, the pseudocleft form disambiguates the focus interpretation of a sentence. Canonical sentences with default intonation are ordinarily ambiguous as to focus because the focus of such a sentence can be any constituent containing the main sentence accent. Thus, in an example like (97) below, with the sentence accent on "Fido," the focus can be the direct object, the verb phrase, or the entire sentence, since all of these constituents contain the accented word. The only excluded option is focus on "John."

(97) [John [hit [Fído.]]]

In a pseudocleft, on the other hand, the focus is the non-free relative argument of the copula. The various focus interpretations of (97) can thus be disambiguated in distinct pseudocleft paraphrases:

(98) a. What John hit was Fido.
      b. What John did was hit Fido.
      c. What happened was that John hit Fido.

In each of these pseudoclefts, the free relative expresses the ground, an open proposition that the speaker assumes to be a salient member of the belief set that the hearer is using to interpret the discourse; and the focus of the pseudocleft expresses the value of the variable that the speaker intends the hearer to add to his/her belief set. Thus, the speaker of (98a) assumes that the hearer holds as a belief relevant to the discourse that John hit something; the speaker of (98b) assumes only that the hearer believes that John did something. By saying (98a), the speaker informs the hearer that the thing hit was Fido; and by saying (98b), the speaker informs the hearer that the action performed was hitting Fido.

If we accept the above treatment of the information structure of pseudoclefts, we see quite easily how the equative syntax of a pseudocleft encodes its information packaging effect; but the analysis of pseudoclefts as equative sentences takes on a somewhat different significance. In logic, "a = b" and "b = a" are indistinguishable; but in natural language, the two arguments of an equative sentence typically differ in informativeness. It is this difference in information packaging that is the true source of the asymmetry that has been wrongly described as a subject–predicate asymmetry by proponents of the syntactic inversion analysis of copular sentences. The asymmetry is better captured by reconceiving "equality" as an instruction to assign a value to a variable; that is, as an instruction to assign to the precopular phrase the denotation of the postcopular one. In the pseudocleft case, the expression "$\iota x[f(x)]$" into which we have translated free relatives will denote a variable that the hearer can be supposed by the speaker to have created in his/her discourse model on the basis of prior context. The variable is identified by the content of the free relative, which restricts its denotation. The presupposition of familiarity here is simply the pragmatic account of the observation that free relatives behave like definite noun phrases, so that the uniqueness/maximality clause in the definition of the ι operator is replaced by a

---

[20]This statement is actually an oversimplification. The focus of a pseudocleft need not be identical to the non-free relative argument so long as it is contained within it. This can be seen in a sentence like:

(i) What John did was hít Fido.

This complication, however, does not affect the force of our discussion, though it would have to be accommodated in a detailed account.

constraint on the interpretive procedure associated with a free relative as a kind of definite expression (see Section 5.1 above).

As an equative sentences, the pseudocleft structure itself now encodes an instruction to assign the focus of the pseudocleft as the value of the variable introduced by the free relative, and that assignment procedure is the true content of the ι-reduction operation. To illustrate, the "semantic translation" of a pseudocleft like (98a) would be the following instruction:

(99)   Assign to the variable x in the expression "John hit x" the value "Fido."

Carrying out this instruction in his/her space of mental representations leaves the hearer with the expression "John hit Fido." Thus, merely by following the information packaging instructions encoded in pseudocleft syntax, the hearer winds up with a representation identical in shape to the canonical sentence paraphrase of the pseudocleft. If that representation is the level at which connectedness effects are active, then the obligatory character of these effects is immediately explained. The derivation from surface form to logical form is not a matter of replacing one expression by a logically equivalent one but rather a matter of carrying out instructions to extract propositional content from a syntactic encoding.

6   Conclusion

Our analysis of pseudoclefts has led us to reject the possibility of treating them as cases of "inverse predication." Indeed, we have argued that there are no cases of such inversion; so-called "inverse copular sentences" are better analyzed as equative. This conclusion has then led us to pursue the line in Higgins 1979, who shows that connectedness is not limited to pseudoclefts but occurs throughout the class of copular sentences interpreted specificationally (for us equatively). To capture the connectedness effects within this perspective, we have proposed that the level of representation of specificational sentences that is relevant for semantic interpretation (including binding relations) is quite distant from surface syntax and requires postulating a derivation in which interpreted forms undergo transformations into the configurations needed for semantic evaluation. Since there are no grounds for making a special case of specificational sentences, we must conclude that this is true of all sentences. Finally, we have given evidence that these transformations are part of an interpretive component that evaluates sentences in sequence to build up discourse models. This component, we claim, is the information packaging component discussed by Vallduví and others. It is, we believe, the most plausible candidate for the interface between the computational system of syntax and the conceptual/intensional system of mind. Nothing less abstract seems capable of performing the interface function.

References

Barss, Andrew. 1986. *Chains and Anaphoric Dependencies*. PhD thesis, MIT.

Barss, Andrew. 1988. Paths, connectivity, and featureless empty categories. In Anna Cardinaletti, Guglielmo Cinque, and Giuliana Giusti (eds.), *Constituent structure*, 9–34. Dordrecht: Foris.

Beghelli, Filippo. 1994. A minimalist approach to quantifier scope. In *Proceedings of NELS 23*. University of Massachusetts, Amherst.

Beghelli, Filippo. 1995. *The Phrase Structure of Quantifier Scope*. PhD thesis, University of California, Los Angeles.

Beghelli, Filippo and Tim Stowell. 1996. Distributivity and negation. In A. Szabolcsi (ed.), *Ways of scope taking*. Dordrecht: Kluwer.

Birner, Betty. 1992. *The discourse function of inversion in English*. PhD thesis, Northwestern University.

Bošković, Željko. 1997. Pseudoclefts. *Studia Linguistica* 51(3):235–277.

Burzio, Luigi. 1986. *Italian syntax. A Government-Binding approach*. Dordrecht: Reidel.

Carnie, Andrew. 1995. *Non-Verbal Predication and Head-Movement*. PhD thesis, MIT.

Chierchia, Gennaro. 1995. *Dynamics of Meaning: Anaphora, Presupposition, and the Theory of Grammar*. Chicago, IL: University of Chicago Press.

Chomsky, Noam. 1993. A minimalist program for linguistic theory. In Kenneth Hale and Samuel J. Keyser (eds.), *The view from Building 20*, 1–52. Cambridge, MA: MIT Press.

Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.

Christophersen, P. 1939. *The Articles: A Study of their Theory and Use in English*. Copenhagen: Munksgaard.

den Dikken, Marcel. 1997. Predicate inversion in DP. In A. Alexiadou and C. Wilder (eds.), *Studies on the Determiner Phrase*. Amsterdam: John Benjamins.

Dikken, Marcel den. 1995. Copulas. Ms., Free University Amsterdam.

Doron, Edit. 1983. On a formal model of code-switching. In Mary Dalrymple et al. (ed.), *Texas Linguistic Forum 22*, 35–59. Austin, TX: Department of Linguistics, University of Austin.

Fodor, Janet Dean. 1979. *The Linguistic Description of Opaque Contexts*. New York: Garland.

Groenendijk, J. and M. Stockhof. 1983. Interrogative quantifiers and Skolem functions. In K. Ehlich and H. van Riemsdijk (eds.), *Connectedness in Sentence, Discourse and Text*, Tilburg Studies in Language and Literature. Tilburg University.

Groenendijk, J. and M. Stokhof. 1990. Dynamic Montague Grammar. In G. Chierchia et al. (eds.), *Quantification & Anaphora I*, 1–35. Edinburgh: DYANA, Centre for Cognitive Science, University of Edinburgh, July.

Guéron, Jacqueline. 1993. Beyond predication: The inverse copula construction in English. Ms., Université Paris X, July.

Heggie, Lorie. 1988. *The Syntax of Copular Structures*. PhD thesis, USC.

Heycock, Caroline. 1991. *Layers of predication: the non-lexical syntax of clauses*. PhD thesis, University of Pennsylvania. Published in 1994 in the *Outstanding dissertations in linguistics* series. New York: Garland.

Heycock, Caroline. 1992. Layers of predication and the syntax of the copula. *Belgian Journal of Linguistics* 7:95–123.

Heycock, Caroline. 1994a. The internal structure of small clauses: New evidence from inversion. To appear *Proceedings of NELS* 25.

Heycock, Caroline. 1994b. *Layers of predication: the non-lexical syntax of clauses*. New York: Garland. Penn PhD dissertation.

Heycock, Caroline and Anthony Kroch. 1996. Identity, predication and connectivity in pseudoclefts. Paper presented at the 19th GLOW Colloquium, Athens, Greece, April.

Heycock, Caroline and Anthony Kroch. 1998. Inversion and equation in copular sentences. In Artemis Alexiadou, Nanna Fuhrhop, Ursula Kleinhenz, and Paul Law (eds.), *Papers in Linguistics*, Vol. 10, 71–87, Berlin. ZAS.

Higgins, Francis Roger. 1979. *The Pseudo-Cleft Construction in English*. New York: Garland.

Jacobson, Pauline. 1988. On the quantificational force of English free relatives. Ms., Brown University.

Jacobson, Pauline. 1994. Binding connectivity in copular sentences. In *Proceedings of SALT 4*.

Kroch, Anthony S. 1979. *The semantics of scope in English*. New York: Garland.

Link, Godehard. 1983. The logical analysis of plurals and mass terms: a lattice-theoretical approach. In Bäuerle, Schwarze, and von Stechow (eds.), *Meaning, Use, and the Interpretation of Language*. Berlin/New York: deGruyter.

Moro, Andrea. 1990. There-raising: Principles across levels. Paper presented at the 1990 GLOW Colloquium, Cambridge, England.

Moro, Andrea. 1997. *The Raising of Predicates: Predicative Noun Phrases and the Theory of Clause Structure*. Cambridge: Cambridge University Press.

Partee, Barbara. 1986. Ambiguous pseudoclefts with unambiguous *be*. In S. Berman et al. (eds.), *Proceedings of NELS 16*, 354–366, Amherst, Mass. GLSA.

Prince, Ellen. 1978a. A comparison of wh-clefts and it-clefts in discourse. *Language* 54:883–906.

Prince, Ellen. 1978b. On the function of existential presupposition in discourse. In Donka Farkas et al. (ed.), *Papers from the Fourteenth Regional Meeting of the Chicago Linguistics Society*, 362–376. Chicago Linguistics Society.

Prince, Ellen. 1981. Toward a taxonomy of given/new information. In Peter Cole (ed.), *Radical Pragmatics*, 223–255. New York: Academic Press.

Rapoport, Tova. 1987. *Copular, Nominal, and Small Clauses: A Study of Israeli Hebrew*. PhD thesis, MIT.

Rothstein, Susan. 1995. Small clauses and copular constructions. In Anna Cardinaletti and Maria Teresa Guasti (eds.), *Small Clauses*, 27–48. New York: Academic Press.

Stalnaker, Robert. 1974. Pragmatic presupposition. In Milton K. Munitz and Peter K. Unger (eds.), *Semantics and Philosophy*, 197–230. New York, NY: New York University Press.

Vallduví, Enric. 1990. *The informational component*. New York: Garland.

Williams, Edwin. 1983. Semantic vs. syntactic categories. *Linguistics and philosophy* 6.3:423–446.

Williams, Edwin. 1990. Pseudoclefts and the order of the logic of English. *Linguistic inquiry* 21:485–489.

Williams, Edwin. 1994. *Thematic Structure in Syntax*. Cambridge, MA: MIT Press.

Zimmermann, Thomas. 1993. On the proper treatment of opacity in certain verbs. *Natural Language Semantics* 1:149–179.

Caroline Heycock
Department of Linguistics
University of Edinburgh
Adam Ferguson Building
George Square
Edinburgh EH8 9LL
Scotland
heycock@ling.ed.ac.uk

Anthony Kroch
Department of Linguistics
University of Pennsylvania
Philadelphia, PA 19104-6305
USA
kroch@change.ling.upenn.edu