University of Pennsylvania Working Papers in Linguistics

1-1-2003

Appositives and Quantification

Francesca D. Gobbo

Appositives and Quantification

Appositives and Quantification[*]

Francesca Del Gobbo

1 Introduction

Appositive relative clauses have been traditionally analyzed as independent sentences, or "assertions-to-follow" (see Emonds 1979, Sells 1985, Demirdache 1991, among others). I will show that such an analysis is correct, to the extent that the role played by the nominal status of the relative is given its due importance. We shall see that the position of attachment of the relative clause inside the matrix does matter and that a grammatical version of E-type anaphora (Heim 1990) is better suited to account for the data.

2 Review of the Data

Since Smith (1964), it has been observed that appositive relative clauses can modify proper names (and pronouns), definite descriptions and specific nominals:

(1) John, who was late, came to the party with Mary.

(2) The new professor, who was late, came to the party with Mary.

(3) They invited a student from UCLA, who arrived late.

It has furthermore been observed that appositive relative clauses cannot modify quantified NPs (Ross 1967, Rodman 1976, McCawley 1981, 1988):

(4) *Every/*No ... professor, who was late/busy, came to the party with Mary.

On the other hand, restrictive relative clauses can modify quantified nominals, definite descriptions and specific nominals:

(5) Every/No ... professor that we invited came to the party.

(6) The professor that we invited came to the party.

(7) They invited a new student from UCLA that I had never met before.

But, differently from appositives, restrictives cannot modify proper names (or pronouns).

(8) *John that we invited came to the party.

The generalization we can draw from these data is that while restrictives and appositives are in complementary distribution when proper names (or pronouns) and quantified NPs are involved, the sets of nominals they can modify overlap when it comes down to definite descriptions and specific nominals. An obvious way to deal with such a distribution is to account for it in terms of type-driven interpretation: it is the semantic types of the nominals and relative clauses that determines their reciprocal distribution.

In the following section I shall spell out the details of an approach based on type-driven interpretation.

3 Type-driven Interpretation

I propose that appositives are sentences, hence of type t (Sells 1985, Demirdache 1991). As it is usually assumed in the literature, restrictives are predicates, hence of type $\langle e,t \rangle$. The proposal will have to formalize the observation that appositives (type t) can only modify nominals which are referential (type e) – see Partee (1975) – while restrictives (type $\langle e,t \rangle$) can only modify nominals which are predicates (type $\langle e,t \rangle$).[1]

Appositives are not crucial for the interpretation of the nominals they modify – they simply add information about it. On the basis of this, we can assume that an appositive does not need to be computed together with the nominal it modifies syntactically. It is semantically independent from it. In

---

[1] Dayal (1996) maintains that appositives are of type $\langle e,t \rangle$ and that they combine with DPs of type e. The structure is acceptable if the individual denoted by the DP is a member of the set denoted by the appositive.

order to allow the computation of an appositive and the nominal it modifies, I propose the following principle of semantic interpretation:

(9) PRINCIPLE OF INDEPENDENT COMPUTATION:

If two nodes α and β get a primitive denotation (type e or t), the node which gets the t value is computed separately by raising to a Text node.[2]
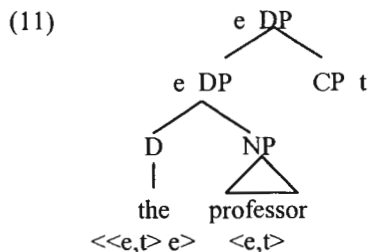
The principle in (9), together with our assumption that appositives are of type t, accounts for the data in (1)-(8). Let's see a few examples:

The DP subject in (1) can be represented as follows:

(10)

```
          e DP
         /    \
     e DP      CP t
      |        /\
     John   who was late
```
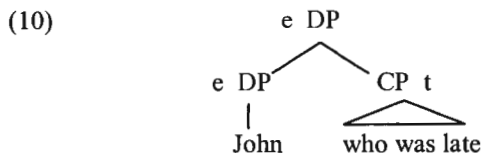
In (10), the appositive CP, of type t, adjoins to the DP *John*, of type e. The Principle of Independent Computation applies and CP, which has the value t, is computed independently, while the value of the lower DP passes onto the higher one.

In the case of a definite description, as in (2), it is the type-driven interpretation that dictates the level of adjunction of the appositive. Consider the following representation:

(11)

```
              e DP
             /    \
         e DP      CP t
        /    \
       D      NP
       |      /\
      the  professor
   <<e,t> e>  <e,t>
```

In (11), first we apply functional application between D and NP, and we obtain the denotation of the lower DP, which is of type e. From this point on,
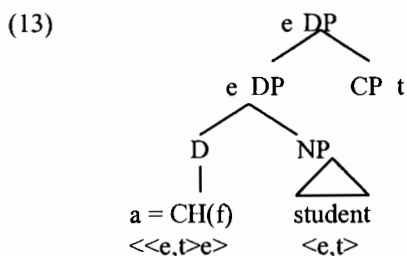
---

[2] For a definition of TEXT FORMATION, see (34) below.

the computation proceeds as for the case of the proper name above. Notice that with the definite description the CP could in principle be adjoined to the NP:

(12)   *   DP
                      /   \
               D   NP   ???
               | / \
             the   professor   CP
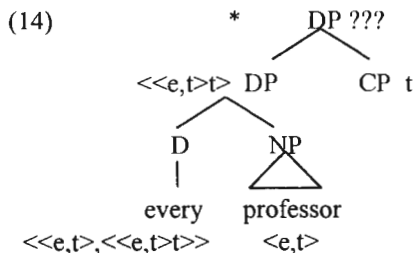 $<<e,t> e>$ $<e,t>$ t
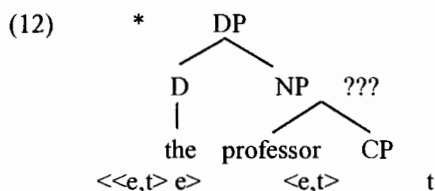
But in (12) the computation is interrupted at the level of NP, because it is not clear how to compose the denotation of the predicate *professor* with the appositive CP. This leaves only one option of adjunction for the appositive: the higher DP, as illustrated in (11).

As for specific indefinites, I follow Reinhart (1997) and take them to be interpreted by a choice-function, where the function variable is existentially closed arbitrarily far away, thus allowing free scope. Specifics are referential because the choice function assigns an individual to the restriction predicate. It follows that they behave exactly like a definite description: the appositive adjoins to the higher DP and it is computed independently.

(13)   e DP
                            /   \
                    e DP   CP t
                   /   \
              D   NP
              | /\
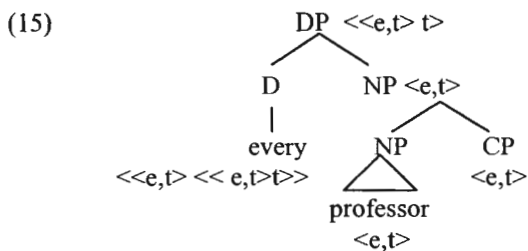 $a = CH(f)$ student
       $<<e,t>e>$ $<e,t>$

This line of reasoning also explains why appositives cannot modify quantified NPs. A nominal headed by a quantifier such as *every* and *no* is of type $<<e,t>t>$, hence a generalized quantifier. Again, due to type mismatch and to the impossibility to apply the rule in (9), such nominal cannot combine with an appositive:

(14)   *   DP ???
                                  ╱╲
        <<e,t>t> DP   CP t
               ╱╲
            D   NP
            │   ╱╲
         every   professor
   <<e,t>,<<e,t>t>>   <e,t>

We can conclude from the overview of these examples that an appositive relative clause can only modify a nominal of type e, hence a referential nominal. When there is a choice, it is the type-driven interpretation that dictates the level of adjunction: always DP, for the appositive CP.

Let's now turn to restrictive relative clauses. We know that they are of type <e,t>; this allows them to combine with other predicates through Predicate Modification. Let's start with quantified NPs, as in the example (5). We can assume the following structure:

(15)   DP <<e,t> t>
                     ╱╲
                 D   NP <e,t>
                 │   ╱╲
              every   NP   CP
        <<e,t> << e,t>t>> ╱╲   <e,t>
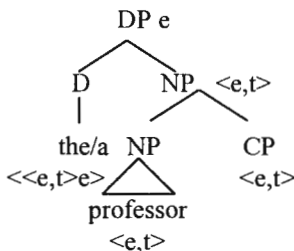   professor
                        <e,t>

In (15) the two predicates *professor* and the restrictive relative clause are combined by Predicate Modification, yielding another predicate: *professor that we invited*. The determiner *every* takes this as its argument and gives us the generalized quantifier: *every professor that we invited*.

Notice that given the semantic types in (15) and the principles of semantic composition, the restrictive CP can only adjoin to NP. Its adjunction to the higher DP would yield a truth value, hence provide the wrong denotation.

We saw that the distribution of appositives and restrictives overlaps when they modify a definite or specific nominal. This is a consequence of the type of the definite and specific article, namely <<e,t> e>, and of the possibility for the relatives to adjoin either to DP or to NP. For the two examples in (6) and (7), I propose the following structure:

(16)

```
                    DP e
                   ╱    ╲
                  D      NP  <e,t>
                  │     ╱   ╲
               the/a  NP     CP
            <<e,t>e>  ╱╲     <e,t>
                  professor
                   <e,t>
```
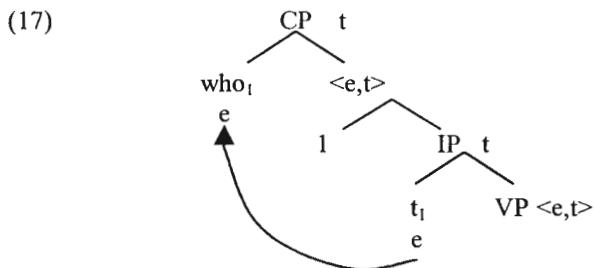
Here, *professor* and the relative clause combine by Predicate Modification. The result, a predicate itself, is taken as its arguments by the determiner, and the output of Functional Application in this case provides a nominal of type e, as expected. Notice that in (16), the restrictive CP can only adjoin to NP. If it were to adjoin to DP, the two nodes would combine by Functional Application and erroneously give a truth value as the denotation of the entire nominal.

Why can't restrictives occur with proper names (or pronouns, for that matter)? Because a restrictive relative clause adjoined to a DP of type e would again yield the wrong denotation for the entire nominal, namely a truth value.

Summarizing, we have seen that a type-driven interpretation account captures the distribution of various nominals with the relative clauses. It also provides a formal explanation for the different levels of adjunction usually assumed for appositives and restrictives.

Nothing has been said up to now with respect to the internal structure of the relative clause. As far as restrictives are concerned, I simply assume the standard predicate structure analysis: restrictive relative clauses are predicates of type <e,t>, created by Predicate Abstraction.

As for appositives, we need to explain what it means for them to be of type t. In a restrictive relative clause, it is the movement of the operator that creates a predicate structure. I will assume that this also holds for appositives, but for the latter I propose, following Sells (1985) and Demirdache (1991), that the relative pronoun is an E-type or referential pronoun. As such, it will be of type e:

(17)

```
                    CP    t
              ╱        ╲
         who₁           <e,t>
          e          ╱      ╲
        ▲           1        IP   t
        │                 ╱      ╲
        │               t₁       VP <e,t>
        │               e
        ╰──────────────╯
```

In (17) above, the node marked as <e,t> is created by the movement of the operator. The crucial difference between a restrictive and an appositive lies in the denotation of the relative pronoun. In an appositive relative clause, the relative pronoun is not semantically vacuous: it is a referential pronoun. When combined with the predicate <e,t>, it provides us with the right result: a truth value.

In this section I have entertained the possibility of accounting for the distribution of appositives and restrictives with different kind of nominals making use of a type-driven interpretation approach. What nominals each type of relative can occur with as well as what level of adjunction is selected is determined by the semantic type of the relative and the nominal and by the rules of semantic composition. We shall see that unfortunately things are not so simple, and we shall have to revisit part of this proposal in order to capture some interesting new data.

4 Appositives as Anaphora across Discourse

It has been proposed (Sells 1985, Demirdache 1991) that appositives are like independent sentences, "assertions-to-follow". In this sense, we can say that uttering the relatives in the examples (1)-(4) is equivalent to uttering the following pieces of discourse:

(18) John came to the party with Mary. He was late.

(19) The new professor came to the party with Mary. He was late.

(20) They invited a student from UCLA. He arrived late.

(21) *Every/*No professor came to the party with Mary. He was late/busy.

On one hand, we start to notice from cases such as (21) that the type-driven account cannot go too far. Even if it were to be the correct approach for the ungrammaticality of (4), it would not be able to explain the one in (21), therefore missing the opportunity of capturing the fact that probably the same factor is responsible for both cases of ungrammaticality.

On the other hand, the parallelism between sentences-across-discourse and appositives breaks down when a wider range of quantifiers are taken into consideration:

(22) *Many students, who were late, came to the party with their parents.

(23) *Most students, who were late, came to the party with their parents.

(24) Many students came to the party with their parents. They were late.

(25) Most students came to the party with their parents. They were late.

While the two sequences of sentences in (24) and (25) are grammatical, the same does not hold for the examples in (22) and (23). This supports the idea that appositives cannot simply be treated as anaphora-across-discourse. Within such an approach, in fact, we would predict (22)-(23) and (24)-(25) to behave in the same way.

An analysis in terms of type-driven interpretation, as the one sketched in the previous section, would account for the above contrast: only in the case of the appositive, in fact, we expect the sentences to be ungrammatical. But, as hinted at before, this cannot be the whole story. Compare (22) and (23) with the following examples:

(26) They invited many students, who arrived very late.

(27) They invited most students, who arrived very late.

The contrast in grammaticality now shows that even a simple-minded proposal in terms of type-driven interpretation will not work. We would expect (26) and (27) to be ungrammatical just like (22) and (23) are.

Two questions arise at this point:
1. If we view appositive relative clause à la par with independent sentences, hence we attempt to capture their similarities in terms of anaphora-across-discourse, how can we explain the different behavior with *many* and *most*?

2. If appositive relative clauses are grammatical when they modify a quantified NP in object position, does this mean that the position of attachment of the relative clause inside the matrix matters?

In the following sections I shall propose an account of the data that provides an answer to the questions above.

5 Appositives as E-type Anaphora

5.1 Heim (1990): Grammatical Account

Following Evans (1977) and Parsons (1978), Heim (1990) proposes that "E-type pronouns are syntactically linked to their antecedents, and their interpretation is completely fixed by this link and the semantic rules of the grammar."

According to her proposal, first, we index freely NPs. Pronouns not coindexed with anything are represented as free variables and are interpreted deictically. Those coindexed with an antecedent are treated in three different ways:

1. If the pronoun is in the antecedent scope, it becomes a bound variable;

2. If the antecedent is definite (name, pronoun, demonstrative, definite description), the pronoun is replaced by a copy of the antecedent;

3. If the antecedent is not definite and does not have scope over the pronoun, the pronoun is re-written according to the following rule:

(28) X S Y NP$_i$ Z $\Rightarrow$ 1 2 3 4 + 2 5
     1 2 3 4   5

    Conditions: 4 is a pronoun, 2 is of the form [$_S$ NP$_i$ S]
                                 6 7

4. A semantic rule is defined to give the intended interpretation of the augmented pronoun as a definite description.

(29) [[it [[Det$_x$ α] β]]]$^{gx/x}$ = the unique x s.t. [[α]]$^{gx/x}$ = [[β]]$^{gx/x}$ = True
    (undefined if there is no unique such individual)

This proposal provides the right denotation for the pronoun *it* inside a donkey sentence:

(30) Every man that owns a donkey beats it.

(31) [Every man that 1 [$_S$ a donkey 2 t_1 owns t_2]] 1 t_1 beats it.

The sentence in (30) has the LF structure in (31), where Quantifier Raising and Predicate Abstraction have applied. Heim's (1990) rule adjoins the S in (31) to the pronoun. The output is then interpreted using the rule in (29), which provides the right denotation, namely *the donkey he owns*.

5.2 Proposal

We are now back to our initial puzzle, namely what can account for the following contrast:

(32) a. They invited many students, who arrived late.
     b.*Many students, who arrived late, came to the party.

My system needs two mechanisms: a rule for the interpretation of the pronoun, and a process that makes the appositive a sentence independent from the matrix. I propose that such a process can occur pre- or post-Spell Out. Let's first look at the rule for the interpretation of the pronoun.

The appositive relative pronoun is an E-type pronoun. It is coindexed with the 'head' of the relative clause (following Heim 1990):
1. If the 'head' is definite, the pronoun is replaced by a copy of the 'head';[3]
2. If the 'head' is not definite, the pronoun is re-written according to the transformational rule in (28).
The intended interpretation of the augmented pronoun as a definite description is given by the semantic rule in (29).

Under certain conditions, the appositive relative clause can be 'restructured', namely it can change its syntactic status from that of a nominal modifier to that of a sentence, sister to the matrix one. I label this process Restructuring.

(33) RESTRUCTURING:
     "Transform an appositive relative clause into a matrix clause under a T node".

---

[3] Specific nominals are subsumed under definites: once the choice-function applies to them, their denotation is that of an individual, hence they are of type e. It is this denotation that the E-type pronoun copies.

Restructuring is a process that modifies the hierarchical structure of the tree, but cannot change the linear order, namely it is a pre-Spell Out process. Restructuring was first envisaged to explain the behavior of clitic climbing in Italian (Rizzi, 1978). In those specific cases, Restructuring was necessary in order to change a bi-clausal structure into a mono-clausal one. In the case of appositive relative clauses, I take Restructuring to modify a mono-clausal structure into a bi-clausal one.

At LF, once the appositive is detached from the matrix, it needs to be interpreted as an independent sentence. For this purpose, I shall make use of Heim's (1982) rule of Text Formation:

(34) TEXT FORMATION:
     "Attach a sequence of sentences under a T node."   (Heim 1982)

The following tree represents the structure for (32a).

(35)
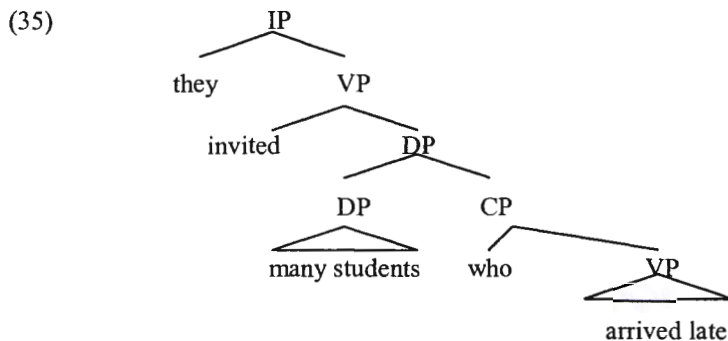
Because the appositive appears in final position, Restructuring can apply, yielding a structure where the matrix IP and the appositive CP are sister nodes, immediately dominated by a Text node. Once Restructuring applies, the quantifier raises and adjoins to IP:

(36)
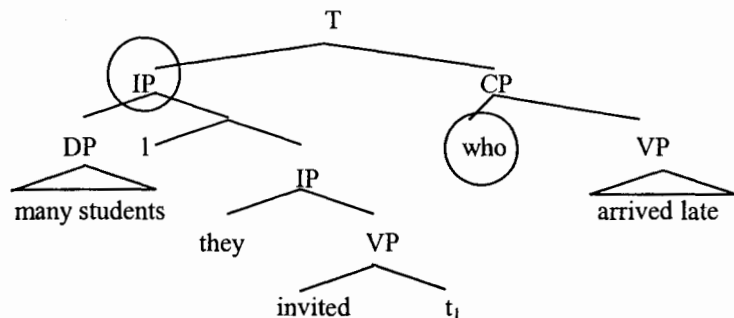
In a configuration such as (36), Heim's (1990) rule can apply: the IP adjoins to the appositive pronoun, and by an appropriate semantic rule for plural definites,[4] it yield the desired denotation, namely *the students they invited*. When the appositive modifies a nominal not in final position, Restructuring cannot apply. So, in the following structure, the appositive cannot be separated from the matrix that contains it before Spell Out.
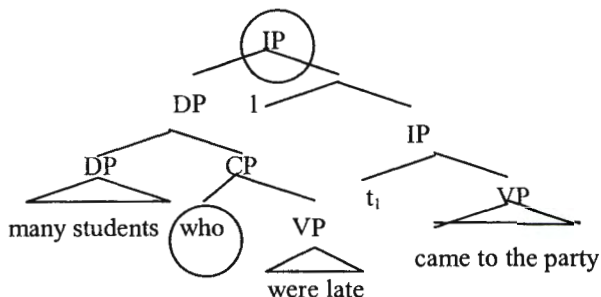
(37)
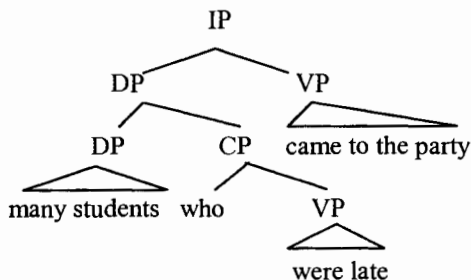
The quantifier in (37) raises dragging along the relative clause, and yielding a structure such as (38):

---

[4] The rule in (29) works only with singular count NPs. Here, I simply assume that the rule will have to be modified in order to include plural definite descriptions.
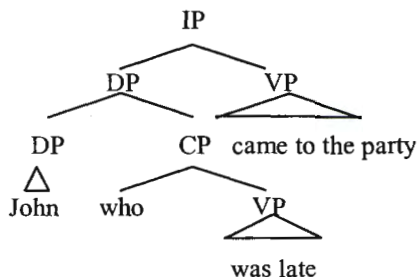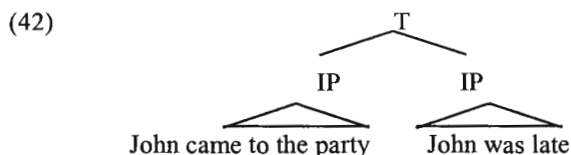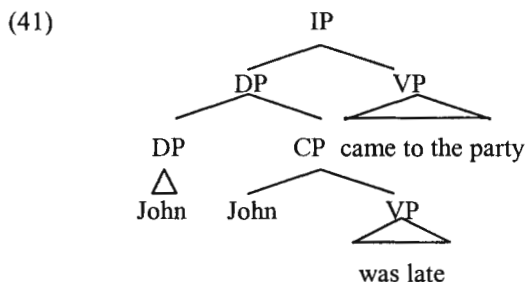
(38)

In (38) the appropriate rule cannot apply, since the appositive pronoun is contained in the sentence which is supposed to adjoin to it. Notice that such a problem does not arise with proper names and definite descriptions. A sentence such as (39) can be represented as (40):

(39) John, who was late, came to the party.

(40)

In (40), Restructuring cannot apply, but this is irrelevant, since the denotation of the pronoun is obtained by copying the preceding proper name. Once the appositive pronoun obtains its denotation, the appositive CP is detached from the structure and it becomes an independent sentence, after Spell Out. Namely a Text structure is created at LF, but not previously. These two steps are exemplified by the structures in (41) and (42):

(41)

IP

DP   VP

DP   CP   came to the party

△
John   John   VP

was late

(42)

T

IP   IP

John came to the party   John was late

It remains to be explained what it is that rules out *no* and *every*. I maintain that the reason is linked to the necessity for the singular E-type pronoun to have a uniqueness presupposition. In order to interpret a singular E-type pronoun we need to presuppose the existence of a unique potential referent. Notice in fact that the ungrammaticality of (43) and (44) is recovered once the singular pronoun is substituted by a plural one:

(43) Every congressman admires Kennedy. *He is/They are junior.

(44) No congressman admires Kennedy. *He is/They are too senior.

(43) becomes good because now the plural pronoun can refer back to the multiple congressmen who admire Kennedy. (44) becomes good because *they* does not refer to the congressmen who admire Kennedy (since there are none) but to the congressmen who do not admire him (or to the entirety of the congressmen). It is not clear what exactly is responsible for the switch in grammaticality in (43) and (44). What is obvious, though, is that the plurality of the pronoun is playing a crucial role. With *every* the appositive pronoun can never be plural, since it needs to agree in number with the 'head' of the relative clause:

(45) *Kennedy invited every congressman, who is/are junior.

(45) then cannot be salvaged if the relative pronoun is singular: the sentence is ungrammatical because *who* cannot refer back to the multitude of congressmen. And if it the pronoun is plural (as indicated by the morphology of the verb), the result is number agreement mismatch with the 'head' of the relative.

6 Conclusion

In this paper I argue that appositive relative clauses are CPs that behave syntactically like nominal modifiers and semantically like sentences (type t). An analysis of their distribution in terms of type-driven interpretation would have to capitalize on their role as nominal modifiers, and explain their impossibility to occur with quantifiers in terms of type mismatch. Such an analysis would leave unexplained why an appositive that adjoins to *many NPs* yields different grammaticality judgments depending on where the appositive occurs inside the matrix clause. On the other hand, an analysis that draws on the parallelism between appositives and independent sentences misses the chance of explaining why a *many NP* modified by an appositive is bad in matrix internal position, but a *many NP* can be referred back to by a pronoun in the following sentence. The proposal I outlined emphasizes the "sentencehood" of appositives, by claiming that they are semantically of type t. At the same time, it gives the right importance to the status of appositives as nominal modifiers, by making reference to the position they occupy in PF (through Restructuring) and by making use of a grammatical version of E-type anaphora. The outcome is a principled coverage of the data presented, which could not have been explained by a type-driven approach or by an anaphora-across-discourse one.

References

Cooper, Robin. 1979. The interpretation of pronouns. In *Selections from the Third Groningen Round Table (Syntax and Semantics 10),* eds. Frank Heny and Helmut S. Schnelle, 61-92. New York: Academic Press.

Dayal, Veneeta. 1996. *Locality in Wh-Quantification.* Dordrecht: Kluwer Academic Publishers.

Demirdache, Hamida. 1991. *Resumptive chains in restrictive relatives, appositives and dislocation structures.* Doctoral dissertation, MIT, Cambridge, Mass.

Emonds, Joseph. 1979. Appositive relatives have no properties. *Linguistic Inquiry* 10: 211-243.

Evans, Gareth. 1977. Pronouns, quantifiers, and relative clauses (I). *Canadian Journal of Philosophy* 7: 467-536.

Evans, Gareth. 1980. Pronouns. *Linguistic Inquiry* 11: 337-362.

Heim, Irene. 1982. *The semantics of definite and indefinite noun phrases*. Doctoral dissertation, University of Massachusetts, Amherst.

Heim, Irene. 1990. E-type pronouns and donkey anaphora. *Linguistics and Philosophy* 13: 137-177.

McCawley, James. 1981. The syntax and semantics of English relative clauses. *Lingua* 53: 99-149.

McCawley, James. 1988. *The Syntactic Phenomena of English*. Chicago: Chicago University Press.

Parsons, Terence. 1978. *Pronouns as paraphrases*. Ms., University of Massachusetts, Amherst.

Partee, Barbara. 1975. Montague Grammar and Transformational Grammar. *Linguistic Inquiry* 6: 203-300.

Reinhart, Tanya. 1997. Quantifier scope: how labor is divided between QR and choice functions. *Linguistics and Philosophy* 20: 335-397.

Rizzi, Luigi. 1978. A restructuring rule in Italian syntax. *In Recent Transformational Studies in European Languages*, ed. Samuel J. Keyser, 113-158. Cambridge, Mass.: MIT Press.

Rodman, Robert. 1976. Scope phenomena, movement transformations, and relative clauses. In *Montague Grammar*, ed. Barbara Partee, 165-176. New York: Academic Press.

Ross, John R. 1967. *Constraints on variables in syntax*. Doctoral dissertation, MIT, Cambridge, Mass.

Sells, Peter. 1985. *Restrictive and non-restrictive modification*. CSLI Report No. CSLI-85-28, Stanford University, Stanford, Calif.

Smith, Carlota. 1964. Determiners and relative clauses in a generative grammar of English. *Language* 40: 37-52.

Department of Linguistics
University of California, Irvine
3151 Social Science Plaza
Irvine, CA 92697-5100
fdelgobb@uci.edu

Department of Linguistics
Harvard University
Boylston Hall, 3rd floor
Cambridge, MA 02138
delgobbo@fas.harvard.edu