

## Exceptive Constructions\*

Kai von Fintel  
University of Massachusetts at Amherst

### Introduction

Universally quantified statements exert an enormous attraction on language users. Their emotional force unfortunately clashes with the rather strict requirements on their truth. Small wonder then that there is a class of expressions used to reduce their force. These expressions typically diminish the domain quantified over. The exceptive constructions studied in this paper are prime examples. I will concentrate on the two types illustrated in (1), the highly grammaticized English *but*-phrase in (1a), and the 'free exceptive' with *except for* in (1b).

- (1) a. Every student but John attended the meeting.  
b. Except for John, every student attended the meeting.

This paper has two concerns, a narrowly descriptive one and a broader and potentially more interesting theoretical one. Although exceptive constructions and some of their core properties have been known since the times of the medieval semanticists, their proper analysis in a formal theory has proven very elusive.<sup>1</sup> The analysis proposed in this paper will hopefully at least be more adequate than earlier attempts.

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<sup>1</sup>Modern references include: Keenan & Stavi (1986), Hoeksema (1987, 1990), Landman & Moerdijk (1979), Reinhart (1989).

The broader concern of this paper, however, has to do with the notion of degrees of grammaticization and whether it can be captured in a compositional theory of the interaction between syntax and semantics. If the difference between the lexical items *but* and *except for* is only reconstructable by associating different kinds of lexical stipulations with them, this would be a disappointing result. A reduction to more general principles, on the other hand, would be a success. I will show that assuming something like Chierchia's three-layers hypothesis (1984), it can be derived that the free type of exceptive is less strong than the NP-internal type.

In Section 1 of this paper, I propose a semantic analysis of English *but*-phrases as in (2).

- (2) a. Every student but John attended the meeting.  
b. No student but John attended the meeting.

There is a problem of compositionality here: we would like to be able to give *but* a unified meaning that is applicable to both the positive determiner *every* and the negative one *no*. I show that it is indeed possible to give such a unified semantics, which turns out to have the added advantage of automatically explaining the co-occurrence restrictions of *but*-phrases. An interesting side-effect of the solution is that a previously unknown formal property is singled out that *every* and *no* share to the exclusion of all other basic determiners.

In Section 2, ways of connecting the semantics to the syntax are considered. The semantics of Section 1 puts certain constraints on possible syntactic analyses. I will argue for an NP-internal syntax of *but*-phrases and discuss two possible constituencies which merely correspond to different 'curryings' of the semantics.

Section 3 then is devoted to the analysis of free exceptives, especially those formed with *except for* as in (3).

- (3) Except for the usual dissenters, most members didn't object.

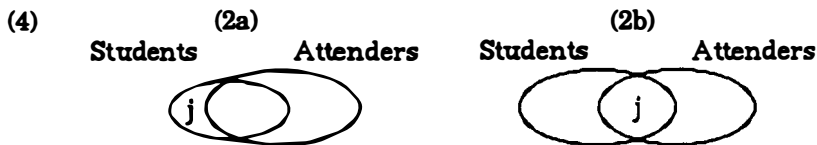
There are at least two intriguing problems raised by this type of exceptive. How are free roaming exceptives associated with their target quantifier? I will side with Reinhart (1989) who argues that quantifier raising (QR) brings about the rendez-vous of free exceptive and target quantifier. The compositionality problem remains: how do exceptive and target combine after the association is established? I will suggest that the adjunct exceptive gets inside the target by binding a context set variable. The lower degree of grammaticization of free exceptives will be traced back to restrictions on the possible logical type of such free variables.

## 1. A Semantics for 'But'-Phrases

### 1.1 What Do 'But'-Phrases Mean?

Considering the paradigm sentences with *but* in (2), repeated here, their truth-conditions are intuitively rather obvious. In (2a), John is the only student who did not attend the meeting. In (2b), John is the only student who did attend the meeting. The sentences, if true, correspond to the diagrams in (4).

- (2) a. Every student but John attended the meeting.  
b. No student but John attended the meeting.



In trying to derive the truth-conditions of *but*-sentences compositionally, we would like the determiners *every* and *no* to have their usual denotation creating the generalized quantifiers given in (5).<sup>2</sup>

- (5)  $[\text{every}](\llbracket \text{student} \rrbracket) = \{P \subseteq E \mid \bar{P} \cap \llbracket \text{student} \rrbracket = \emptyset\}$   
 $[\text{no}](\llbracket \text{student} \rrbracket) = \{P \subseteq E \mid P \cap \llbracket \text{student} \rrbracket = \emptyset\}$

We need to find a denotation  $[\text{but}]$  that together with the determiner meanings in (5) derives the meanings given in (6) for the whole NP.<sup>3</sup>

- (6)  $[\text{every student but John}] = \{P \subseteq E \mid \bar{P} \cap \llbracket \text{student} \rrbracket = (\llbracket \text{John} \rrbracket)\}$   
 $[\text{no student but John}] = \{P \subseteq E \mid P \cap \llbracket \text{student} \rrbracket = (\llbracket \text{John} \rrbracket)\}$

<sup>2</sup>The principal references on generalized quantifiers are Barwise & Cooper (1981) and Keenan & Stavi (1986). Throughout this paper, I will employ the notational framework of Barwise & Cooper instead of Keenan's Boolean semantics or the lambda-expressions of Montague semantics. Everything here should be straightforwardly translatable into the other frameworks.  $[\text{every}]$  is defined in (5) in a way different from but equivalent to the standard formulation ( $\llbracket \text{student} \rrbracket \subseteq P$ ); the definition given here has the advantage of making the fundamental similarity between *every* and *no* more obvious.

<sup>3</sup>The meanings in (6) are exactly those given by Keenan & Stavi (1986) in their brief mention of exceptives. They do not however attempt a compositional derivation, which is my main concern here.

The meanings in (6) are the result we want because they are equivalent to the intuitive meaning given for (1) above. What does  $\llbracket \text{but} \rrbracket$  have to be for us to get the results in (6)? We especially want to have a unified meaning for *but* that can combine with both *every* and *no* without sneaking in a disjunctive stipulation. In the following sections, I will go through three successively stronger analyses that ultimately culminate in such an adequate semantics for *but*.

### 1.2 'But' as a Minus Sign: Domain Subtraction

The intuition which I will found my treatment of exceptives on is that they subtract entities from the domain of a quantifier. In a first approximation then, we could treat *but* as creating a noun modifier with a semantics as in (7). Some discussion of such an analysis can be found in Hoeksema (1987).

$$(7) \quad \llbracket \text{students but John} \rrbracket = \llbracket \text{students} \rrbracket - (\llbracket \text{John} \rrbracket)$$

Our test sentence (2a) would then be true iff everyone who is a student but who isn't John attended the meeting. While I do think that domain subtraction as in (7) is the central part of the meaning of exceptive, as a semantics for *but* it fails on two grounds.

First, it fails to capture the co-occurrence restrictions of *but*-phrases. If *but* is a mere minus sign then the resulting set will be just like any other set without any distinguishing properties. The set of students minus John is a maximally dull set as far as set theory is concerned. There would then be no reason why *some* or *most* should not combine with it to form a well-formed noun phrase. But, *\*some students but John* and *\*most students but John* are clearly ill-formed.

Secondly, analyzing *but* as a minus sign allows some inferences to go through that are plainly illicit. The reason for this is that the universal determiners *every* and *no* are left downward monotone on their first argument as defined in (8).

$$(8) \quad \textit{Left Downward Monotonicity} (\downarrow\text{mon})^4 \\ P \in D(A) \text{ and } B \subseteq A \Rightarrow P \in D(B).$$

This property of universal determiners is what makes the inferences in (9) valid.

$$(9) \quad \begin{array}{l} \text{Every human being is mortal.} \\ \Rightarrow \text{Every male human being is mortal.} \end{array}$$

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<sup>4</sup>Barwise & Cooper (1981) use the term 'anti-persistent'.

- No human being is mortal.  
 $\Rightarrow$  No male human being is mortal.

If we put the left downward monotonicity of the universal determiners together with the view that *but* is a mere minus sign we now predict the inferences in (10) to be valid without further assumptions. The reason is that the set of students minus John and Jill is of course a subset of the set of students just minus John. Hence we should be able to infer down from the latter to the former.

- (10) Every student but John attended the meeting.  
 ? $\Rightarrow$ ? Every student but John and Jill attended the meeting.

- No student but John attended the meeting.  
 ? $\Rightarrow$ ? No student but John and Jill attended the meeting.

But the inferences in (10) are blatantly incorrect. The conclusions imply that Jill is a student who did or did not attend the meeting. But that is something which we cannot validly infer from the premise. A satisfactory treatment of *but* then has to make sure that the downward monotonicity of the universal determiners is blocked in some way to prevent the inferences in (10) from falsely going through.

These problems notwithstanding, I would like to maintain the initial intuition as far as possible. I will assume that the central part of the meaning of *but* is indeed set subtraction. The strategy I pursue will be to add enough further conditions to the right hand side of the implication arrow in (11) to make it an equivalence.<sup>5</sup>

- (11)  $D A \text{ [but] } C P = \text{True} \Rightarrow P \in D (A-C)$

Key for (11):  $D = \text{[every]}, \text{[no]}$   
 $A = \text{[student]}$   
 $C = \{\text{[John]}\}$   
 $P = \text{[attended the meeting]}$

At this point, I will not as yet commit myself to a particular bracketing of the noun phrase. Its internal constituency, the question of where the exceptive exactly operates, is the topic of Section 2.

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<sup>5</sup>For the semantics developed here to work, the NP after *but* has to introduce a set that can be subtracted from the set denoted by the head noun. This is arguably a healthy consequence because it appears that only NPs that can denote sets can appear after *but*; witness the ill-formedness of *\*all the students but each foreigner*.



Given the semantics for *but* in (13), the truth-conditions for exceptive sentences can be calculated as illustrated in (15). Apart from the application of the assumed standard definitions of **[[every]]** and **[[no]]**, all the steps in these derivations are justified by fairly elementary set-theoretic equivalences.<sup>6</sup> The resulting truth-conditions are exactly the ones that we set out to obtain. So far then, (13) is what we wanted. The test sentences get their desired meaning: (1a) is true iff John is the only student who did not attend the meeting, (1b) is true iff he is the only student who did attend the meeting.

- (15) **[[every]]** A **[[but]]** C P = True  
 $\Leftrightarrow P \in \text{[[every]]} (A-C) \ \& \ \forall Y (P \in \text{[[every]]} (A-Y) \Rightarrow C \subseteq Y)$   
 $\Leftrightarrow (A-C) \subseteq P \ \& \ \forall Y ((A-Y) \subseteq P \Rightarrow C \subseteq Y)$   
 $\Leftrightarrow \overline{P} \cap A \subseteq C \ \& \ \forall Y (\overline{P} \cap A \subseteq Y \Rightarrow C \subseteq Y)$   
 $\Leftrightarrow \overline{P} \cap A \subseteq C \ \& \ C \subseteq \overline{P} \cap A$   
 $\Leftrightarrow \overline{P} \cap A = C$
- [[no]]** A **[[but]]** C P = True  
 $\Leftrightarrow P \in \text{[[no]]} (A-C) \ \& \ \forall Y (P \in \text{[[no]]} (A-Y) \Rightarrow C \subseteq Y)$   
 $\Leftrightarrow P \cap (A-C) = \emptyset \ \& \ \forall Y (P \cap (A-Y) = \emptyset \Rightarrow C \subseteq Y)$   
 $\Leftrightarrow P \cap A \subseteq C \ \& \ \forall Y (P \cap A \subseteq Y \Rightarrow C \subseteq Y)$   
 $\Leftrightarrow P \cap A \subseteq C \ \& \ C \subseteq P \cap A$   
 $\Leftrightarrow P \cap A = C$

It is also easy to show that the unwanted inferences discussed earlier do not go through anymore. Consider the sentences in (16).

Assuming that (16a) is true, we can easily see that the semantics in (13) predicts that (16b) cannot be true at the same time. For if (16b) were true then all the sets of attending students would contain neither John nor Jill. But (16a) asserts that the set of students minus just John is a set of attenders, but it does contain Jill, in contradiction to (16b). The inference is therefore blocked.

- (16) a. Every student but John attended the meeting.  
 b. Every student but John and Jill attended the meeting.

To complete the demonstration that (13) is a successful semantics for *but*, it has to be shown that the co-occurrence restrictions are suc-

<sup>6</sup>The set-theoretic tautologies employed are:

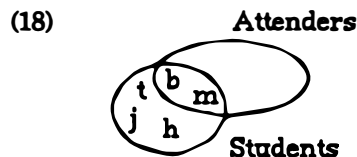
- (i)  $X-Y \subseteq Z \Leftrightarrow X \cap \overline{Z} \subseteq Y$   
 (ii)  $\forall Y (X \subseteq Y \Rightarrow Z \subseteq Y) \Leftrightarrow Z \subseteq X$   
 (iii)  $X \subseteq Y \ \& \ Y \subseteq X \Leftrightarrow X = Y$

cessfully captured. The crucial observation is that among simple natural determiners the existence of a unique exception set is only guaranteed by the universal ones, e.g., *all* (and its synonyms) and *no* (and its synonyms).

One direction is fairly elementary: if you have a universal determiner and it turns out that  $P \notin D(A)$ , then the unique exception is easy to obtain. If  $D$  is *no*, then  $P \cap A$  is the culprit, it should have been empty but wasn't; it is the unique exception we are looking for. If  $D$  is *all*, then  $\bar{P} \cap A$  is the offender and the unique exception, it should have been empty.

As an example of a determiner that is not universal and does not give rise to unique exceptions let us examine *most*. Consider the situation illustrated in (18) where (17a) is false because there are three students (Tom, John, and Harry) who did not attend the meeting while only two students (Bill and Mary) attended.

- (17) a. Most students attended the meeting.  
b. \*Most students but Tom and John attended the meeting.



We could try to make the *most*-quantification true by excluding a sufficient number of non-attending students from the set we are quantifying over. So, we attempt (17b), excluding Tom and John, thus creating a situation where still only two students attended (Bill and Mary) but only one non-attender (Harry) remains. So now a majority of the students under consideration did attend the meeting. But note that since the *most*-claim is not a universal one we did not have to exclude all non-attending students. Hence we had a choice of which students to exclude. We could equally as well have excluded Tom and Harry or John and Harry. There is then obviously no unique set of students that we have to exclude. The uniqueness condition encoded in (13) brandmarks (17b) as false, since Tom and John are not the unique exception set to the quantification in (17a). Parallel thought experiments can be carried out for all determiners that even stand a chance of having exceptions (recall that the upward monotone ones are excluded by even more elementary considerations).

It has to be noticed that there are limiting cases where even a *most*-quantification has a unique exception. If there were only two students John and Harry and only one of them, Harry, attended the

meeting, we can make the statement *Most students attended the meeting* true by excepting the unique student who did not attend the meeting: John. The existence of such exotic situations is obviously not enough for *but* to be able to occur with *most*.

The analysis of the co-occurrence restrictions of *but* that I propose then is that they are a grammaticization of the semantic fact that only universal determiners guarantee the existence of a unique exception set. In some way this will have to be built into the lexical entry for *but*. This concludes the demonstration that (13) is an adequate specification of the meaning of exceptive *but*. I have shown that (13) predicts the correct truth-conditions, that unwarranted inferences induced by the monotonicity of universal determiners are blocked, and that the co-occurrence restrictions of *but* are straightforwardly explained.

## 2. The Syntax of 'But'-Phrases

So far I have been careful not to commit myself to a position of how exactly the elements in a noun phrase like *every student but John* combine semantically and how this is linked to a particular syntactic structure. This section is devoted to these issues.

### 2.1 The NP-Internal Operator 'But'

A close look at the semantics in (13), repeated here in one of its formulations, reveals that the *but*-phrase must have access to both the determiner D and its domain A. D is applied more than once in (19) to different sets, and A is subtracted from at various points.

(19)  $D A \text{ [but]} C P = \text{True}$

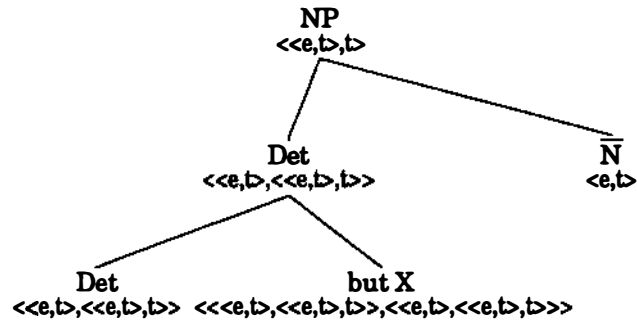
$$\Leftrightarrow P \in D(A-C) \ \& \ \forall Y (P \in D(A-Y) \Rightarrow C \subseteq Y).$$

The necessity of 'simultaneous access' then excludes two initially attractive implementations. It is first not possible to have the exceptive operate solely on the domain A, which would have made it possible to treat it as a fairly ordinary common noun modifier. It is also not possible to compute the noun-phrase denotation  $D(A)$  first and have the exceptive then take the result as its argument, which would have corresponded to an analysis of *but*-phrases as NP modifiers. The semantics in (19) forces more exotic analyses.

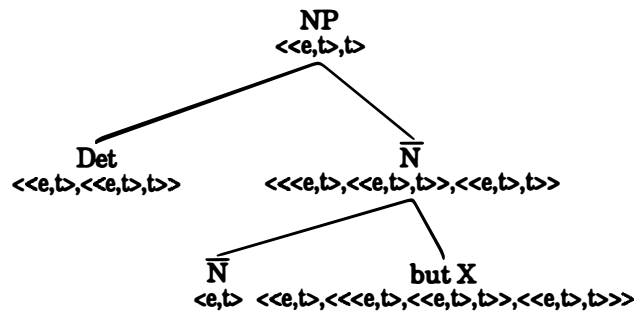
Assuming binary branching in both syntax and semantics, we have to decide whether the *but*-phrase applies first to the determiner and then to the common noun or the other way round. That is, we

have to decide between two different 'curryings'<sup>7</sup> of the function denoted by the *but*-phrase, given in (20).<sup>8</sup>

(20) a.



b.



The first possibility is to treat *but*-phrases as modifiers of determiners which make them be of the same type as adverbs like *almost* in *almost all* (namely, functions from determiner denotations to determiner denotations). This is actually implicit in an earlier proposal by Keenan & Stavi (1986) who, however, do not give any compositional derivation but treat *every...but...* and *no...but...* as complex lexical items instead. Syntactically this would force us to accept either a discontinuous constituency or a local movement around the head noun.<sup>9</sup> Treating *but*-phrases as modifiers of determiners may

<sup>7</sup>Or rather 'schönfinkelizations', cf. Schönfinkel (1924).

<sup>8</sup>Adopting the DP-hypothesis would of course multiply the possible structures even more. At the moment I do not see any strong arguments for any particular structure.

<sup>9</sup>Such local wrappings are presumably independently motivated by constructions like *an easy rug to clean* or *the first person we talked to* (Ed Keenan, pc). For references on the status of discontinuity in the theory of grammar see the

provide a natural connection to constructions like *all but at most five students* where we find a complex determiner phrase built with *but* to the left of the head noun.

The second and semantically more adventurous option has the *but*-phrase combine with the common noun first to give a higher type common noun which then takes the determiner as its argument, in a reversal of the usual function-argument structure. This high type for common nouns is not usually employed in semantic analyses and we would like independent evidence for it.<sup>10</sup>

It seems to me very difficult to decide between these options and in the absence of decisive evidence I will not commit myself to one of them in particular. It may even be that the data underdetermine the choice of structure, which would mean that there are two nearly equivalent grammars for this phenomenon.

What is crucial for the main argument of this paper is that the *but*-phrase, because of the built-in uniqueness condition, has to have a rather high logical type. In Section 3.4, I will suggest that this distinguishes them from the less grammaticized free exceptives.

### 3. Free Exceptives

Can the notion of degrees of grammaticization be reconstrued in a formal theory of grammar? That will be the focus of this section, in which I turn to the analysis of free exceptives with *except for*. The next subsections will establish that free exceptives are in some sense a less grammaticized cousin of *but*-phrases which at some point in their history presumably got 'subducted' from the status of an adjunct to the status of a logical operator inside the noun phrase. The main claim will be that the differences between the two types of exceptives follow from the fact that free exceptives have a lower logical type than the high one of *but*-phrases.

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contributions in Huck & Ojeda (1987) and Jim Blevins' dissertation (1990). See also Bach's (1979, 1981) Right Wrap operation which is one of the influences on the HPSG framework.

<sup>10</sup>There is one place in the literature I am aware of where this type is discussed. Partee & Rooth (1983: 374ff) cite a manuscript by Robin Cooper where he proposes to analyze the reading of (i) where it means "most men swim and most women swim" by raising the type of the common noun phrase.

(i) Most men and women swim.

Partee & Rooth discuss some of the issues that arise from admitting such type-raising.

### 3.1 'Except for'

What I call free exceptives are phrases marked with *except for*, which can appear both in left- and right-peripheral positions.

- (21) a. Except for the famous detective, no one suspected the cook.  
 b. No one suspected the cook, except for the famous detective.

This positional freedom makes free exceptives crucially different from *but*-phrases. I will assume without much argument that it is not possible to consider free exceptives as being related to their associate quantifier by an s-structure movement rule. This is in accord with Baltin (1985) who argues that modifiers cannot in general be extraposed to the left. Suppose then that free exceptives are base-generated as sentence adjuncts.

There are, I think, three degrees of semantic integration of the free exceptive into the sentence they modify. The loosest connection is found in cases where the exceptive is an afterthought, repair, or self-correction, illustrated by (22). It seems unlikely that these are amenable to a compositional analysis. I will leave them aside.

- (22) Everyone loved the new show and noone thought it would be cancelled so soon. Except for George, of course.

An intriguing, perhaps best termed 'appositive', use is shown in (23). If near-universal determiners like *most* or *few* are employed, this probably gives rise to an implicature that it was not possible to use a universal determiner. In other words, they implicate the existence of an exception set. The sentences in (23) seem to have as their most prominent reading one where the exceptive gives further information about the exception set. (23a) then would convey that Joan is a notable exception to the generalization that cabinet members liked the proposal. It seems obvious that this appositive reading should only arise with free exceptives. They can, so to speak, 'wait' until the implicatures of the sentence are computed.

- (23) a. Except for Joan, most cabinet members liked the proposal.  
 b. Except for John, few employees openly opposed the pay cut.

The third use of free exceptives, which is most similar to *but*-phrases, is the one I want to concentrate on here. In (24) the exceptive is used 'restrictively': only after the exceptive has done its thing will the quantification come out true.

- (24) a. Except for Jim, noone really liked the soup.  
 b. Except for Jane, my relatives are (all) total bores.  
 c. Except for the assistant professors, most faculty members supported the dean.

The account I will argue for again gives the exceptive a semantics of Domain Subtraction. The exceptive then has to 'get inside' the NP, which I show can be achieved via binding of a context set variable. Following work by Chierchia (1984), I will propose that such a variable can only be of type  $\langle e, t \rangle$ . As a consequence then, free exceptives will have a logically weaker semantics than *but*-phrases and can therefore also appear with non-universal determiners as (24c) shows.

### 3.2 Reinhart (1989): Free Exceptives and QR

Reinhart (1989) proposes that the association between free exceptive and target quantifier is established by quantifier raising (QR). The best evidence for this comes from examples where *s*-structure movement is routinely ruled out whereas QR is acknowledged to be possible. One such case is demonstrated in (25).<sup>11</sup>

- (25) a. \*Which city<sub>i</sub> does [somebody from t<sub>i</sub>] despise it?  
 b. Somebody from every city despises it.  
 c. Except for London, somebody from every city despises it.  
 d. \*Somebody from every city despises it but London.

It was May (1977, 1985) who presented 'inverse linking' examples like (25b) to show that QR is freer than overt *wh*-movement which cannot extract from a complex subject as in (25a). (25c) shows that a free exceptive can associate with a quantifier inside a complex subject. As a tidbit and another argument for an *s*-structure extraposition movement for *but*-phrases, (25d) clearly shows that the limited possi-

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<sup>11</sup>The discussion here is very much in the spirit of Reinhart's discussion. However, her own example (i) fails to make the point.

(i) Jokes about everyone were told except Felix.  
 The biggest problem with (i) is that it sounds ungrammatical to most native speakers. Note that the underlying sentence itself, i.e. (iia), seems degraded, perhaps because extraposition of the PP as in (iib) is strongly preferred.

(ii) a. \*? Jokes about everyone were told.  
 b. Jokes were told about everyone.

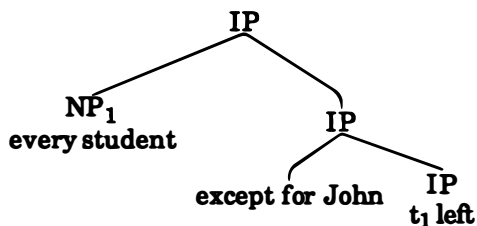
Furthermore, most of her examples have a right-peripheral exceptive formed with bare *except* (without *for*) and some of these do not sound as good as she claims. *Except* is perhaps more like *but* than she realizes (she actually does not discuss any differences between types of exceptives). To make sure that extraposition does not play a role, I use left-peripheral *except for*-phrases in my examples.

bility of having *but*-phrases sentence-finally is subject to much stronger constraints than free exceptives.

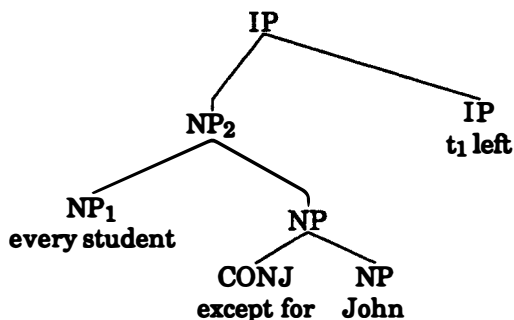
Reinhart (1989) now proposes that after QR has applied to the associate of a free exceptive, the resulting configuration is in fact sufficient to allow the semantic rules to operate successfully. Depending on certain theoretical decisions that do not have to concern us here, we can give a sentence like (26a) one of the LF representations in (26b).

(26) a. Except for John, every student left.

b.



or



The choice between the two LFs in (26b) depends on whether in the second version the raised quantifier will be able to antecedent-govern its trace. Reinhart suggest that in an adjunction structure like this the antecedent-government definition may be fulfilled. She has to give the exceptive a very dubious structure, though, treating *except for* as a conjunction. We may then prefer the first version as less theoretically dicey.

As Reinhart herself realizes, even after the LFs in (26) have been created, it still remains unclear how they are interpreted correctly. First, the NP *every student* on its own is of course not the correct semantic binder of its trace. It seems obvious that it has to be the LF-created constituent *every student except for John* that binds the argument trace in the IP. This problem will probably take care of

itself once we have solved the second problem: how does the exceptive get to operate inside the associate quantifier although we only have an adjunction structure?

### 3.3 Tricks of the Relative Clause Trade

Let us suppose that we cannot touch the structural integrity of the associate quantifier, that is, that we cannot blow it up and reassemble the pieces as we need them. In some ways, this situation is reminiscent of the long standing debate about the constituency of relative clauses.<sup>12</sup> Here, semantic arguments favour an  $\bar{N}$ -modifier analysis, while there are other considerations that support an NP-modifier analysis. The last word about this recently rather dormant issue has presumably not been spoken. The study of exceptives can probably profit from some of the precedents set in the realm of relative clauses.

Robin Cooper in his dissertation (1975) proposed a way of interpreting correlative clauses (Hittite was his particular data source) that made them common noun modifiers semantically despite their fairly indisputable S-adjunct status. Bach and Cooper (1978)<sup>13</sup> showed that this solution could also be used to reconcile an NP-level syntax of English relative clauses with an  $\bar{N}$ -semantics.<sup>14</sup> The crucial technique is the introduction of a free variable at the  $\bar{N}$ -level which can then later be filled in by the relative clause. In informal notation, the NP with relative clause in (27a) will be interpreted as in (27b).

- (27) a. [ [every man] who loves Mary ]  
 b.  $\lambda R$  [ [every] ( [man]  $\cap$  R ) ] ( [loves Mary] )  
 $\Leftrightarrow$  [every] ( [man]  $\cap$  [loves Mary] )

Non-trivial questions about the restrictiveness of the resulting framework arise then.<sup>15</sup> What is the status of the NP-internal free variable posited here? One way of conceiving of the status of such free variables is that they are something like miraculously base-generated traces of base-generated adjuncts; base-generation would have to be less constrained than actual movement traces. For Hindi correlative clauses, Srivastav (1990) presents an alternative where what the correlative clause binds in its associate is not a free

<sup>12</sup>A partial list of references should include at least: Stockwell, Schachter & Partee (1973: Chapter 7 on 'Relativization') and their list of earlier references, Partee (1973, 1975), Chomsky (1975), McCawley (1981). Further references will be mentioned below.

<sup>13</sup>This article is an elaboration of Appendix A of Cooper's dissertation.

<sup>14</sup>An application to German relative clauses is given in von Stechow (1979).

<sup>15</sup>Some discussion can be found in Janssen (1983) and Partee (1984).

variable *ex nihilo* but is in fact created by the demonstrative determiner of the NP.<sup>16</sup> I favor a third possibility which was actually briefly put forward by Cooper himself (1975: 258f). When the free variable inside the noun phrase is not bound off by a relative clause, he suggests, it may represent the contextual restriction of the NP-interpretation to a specific restricted set of entities.<sup>17</sup> The need for such restrictions has been discussed in some recent work on generalized quantifiers (Westerstahl 1985, Johnsen 1987) and can be traced all the way back to early contributions to logical theory by Wallis, Boole, and de Morgan.

### 3.4 Binding R

I would now like to urge that the analysis of free exceptives should be the one informally represented in (28).

- (28) a.  $[IP \text{ [every student]}_i [IP \text{ [except for John]} [IP t_i \text{ left} ]]]$   
 b.  $\lambda R ( \llbracket \text{every} \rrbracket ( \llbracket \text{student} \rrbracket \cap R ) \llbracket \text{except for John} \rrbracket ) ( \llbracket \text{left} \rrbracket )$   
 $\Leftrightarrow \llbracket \text{every} \rrbracket ( \llbracket \text{man} \rrbracket \cap \overline{\llbracket j \rrbracket} ) \llbracket \text{left} \rrbracket$   
 $\Leftrightarrow \llbracket \text{man} \rrbracket - \llbracket j \rrbracket \subseteq \llbracket \text{left} \rrbracket .$

A free variable  $R$  of type  $\langle e, t \rangle$  is introduced into the translation which is conjoined with the denotation of the common noun. The associate quantifier adjoins to the same IP that the free exceptive is a base-generated adjunct of. Following Reinhart's idea the two phrases can then be interpreted as if they were sisters. The free exceptive gets quantified into the free variable  $R$  inside the quantifier. The semantic effect is that of set subtraction.

Three obvious problems should immediately be addressed: (i) Why is this approach not also adequate for *but*-phrases? (ii) Does this approach explain why the co-occurrence restrictions of free exceptives are less rigid than those of *but*-phrases? and (iii) Why do sentences with universal determiners and free exceptives seem to have the same meaning as the corresponding sentences with *but* if all free exceptives do is set subtraction?

The important ingredient in answering all these questions is a restriction on the logical type of the context set variable. The particu-

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<sup>16</sup>I hope to be able to discuss Srivastav's analysis and a possible different treatment some other time.

<sup>17</sup>Cooper refers to a similar suggestion made by Vendler (1967) who used an unexpressed relative clause to introduce the implicit restrictions on definites. Another early reference is Hausser's dissertation (1974).

lar formulation I adopt comes from work by Gennaro Chierchia.<sup>18</sup> In his dissertation (1984: 74-90) he has some thoughts about the status of the hierarchy of logical types. There are, Chierchia says, basically three levels of natural language meanings: entities, properties, and functors. The third layer, the level of functors, is the exotic one. He proposes that there can be no variables of a functor type as formulated in (29).<sup>19</sup>

(29) The "No Functor Anaphora Constraint" (Chierchia 1984)

Functors do not enter anaphoric processes in natural languages.

Among the consequences of this constraint are the absence of *wh*-questions for determiners, non-predicative adverbs like *almost*, and other previously mysterious properties of natural language. For our context set variable the constraint will ensure that it can only be a set variable of type  $\langle e, t \rangle$ . Remember that the uniqueness condition grammaticized in the lexical meaning of *but* forced us in Section 2 to give the *but*-phrase a functor type rather higher than  $\langle e, t \rangle$ . The consequence of adopting (29) then is that an exceptive can only have the uniqueness condition as part of its lexical meaning if it is base-generated in an NP-internal position. Free exceptives which get inside via binding of a variable cannot have the uniqueness condition as part of their lexical meaning. Since it was the uniqueness condition that explained the strict co-occurrence restrictions of *but*-phrases, it is no surprise that free exceptives have looser restrictions and can indeed occur with non-universal determiners.

The weakness of the lexical meaning of free exceptives does not preclude that there are pragmatic strengthenings of that meaning. With universal determiners, the maximally relevant reading will

<sup>18</sup>Chierchia's ideas are inspired by Jespersen's hierarchy of primaries, secondaries, and tertiaries (1924: Chapter VII). I am very grateful to Paul Portner for reminding me of Chierchia's discussion.

<sup>19</sup>The use of a free variable to stand in for the choice between a number of sentential connective meanings (*because, in spite of, ...*) by Stump (1981, 1985) in his treatment of the interpretation of free absolutes and adjuncts might be a counterexample. I suspect though that his use of a free variable is rather different from the one discussed in this paper. His variable is not subject to *wh*-movement, anaphora, or binding. Still, this whole area needs a lot of further attention. For some comments on Stump's analysis see Partee (1984). Angelika Kratzer (pc) points out two further potential problems: *only* seems to be able to associate with focussed determiners or focussed bound variable pronouns, and functional questions (cf. Elisabeth Engdahl's work) seem to *wh*-move functors. At this point, I have no thoughts on these.

still be the one where the exception stated is the unique smallest one. The perceived equivalence of universal statements modified by *but*-phrases or free exceptives then merely conceals the different way these readings come about.

### Conclusion

The differences between the highly grammaticized *but*-phrases on the one hand and the somewhat looser free exceptives are then reconstructed as follows in my account.

Free exceptives are sentence adjuncts. Under their restrictive reading, they bind the context set variable in their intended target, which has been quantifier-raised to a position that makes it a sister of the exceptive. Since this is an anaphoric process, the type of the operation these exceptives denote can not be higher than  $\langle e, t \rangle$ . Domain Subtraction is then all they can lexically mean. Depending on the quantificational force of the target, the meaning may be pragmatically strengthened to implicate uniqueness or minimality of the exception.

*But*-phrases are NP-internal operators. As such they are not subject to the constraint in (29). They incorporate the uniqueness condition into their lexical meaning, hence they are ungrammatical with non-universal associates. It is rather pleasant to speculate that *but*-phrases at some point may have been free exceptives just like *except for*-phrases are today. The process of grammaticization then would have sucked them down into the noun phrase (a generally active process in the history of languages that Roger Higgins has termed 'subduction'). Concomitantly to becoming an NP-internal operator, it could have acquired a stronger meaning incorporating the uniqueness condition. At this point, this is mere speculation, although I strongly suspect that something like this has to be what happened.

Let me conclude by saying that even if the specific decisions made in this paper turn out to be mistaken, the following four points might survive. (i) The study of exceptives and in general domain restrictors on quantifiers can serve as a probe into quantificational structures. (ii) Careful investigation of the techniques available to describe operators "from the outside" is still needed. (iii) Constraints such as the "No Functor Anaphora Constraint" of Chierchia deserve further attention. (iv) A formal reconstruction of the notion of grammaticization may not be impossible.

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Dept. of Linguistics  
 South College  
 University of Massachusetts  
 Amherst, MA 01003

fintel@linguist.umass.edu