

Subject Inversion in French: Equality and Inequality in LFG

Annie Zaenen and Ronald M. Kaplan

Palo Alto Research Center

{Kaplan|Zaenen}@parc.com

Abstract: We reanalyze the data presented in Bonami, Godard and Marandin (1999), Bonami & Godard (2001) and Marandin (2001) in an LFG framework and show that the facts about Stylistic Inversion fall out of the LFG treatment of equality. This treatment, however, necessitates a different approach to object-control and object-raising constructions. We treat these as cases of subsumption and suggest that subsumption, not equality, might be the default way of modeling this type of relation across languages

1. Subjects in object position in French¹

It is by now well known that French exhibits a number of constructions in which the subject follows rather than precedes the verb it is a dependent of. Examples of this are given in (1) through (5).²

- (1) Comment va Madame?
“How is Madame doing?”
- (2) Voici le texte qu’a écrit Paul. (BG&M)
“Here is the text that Paul wrote.”
- (3) Sur la place se dresse la cathédrale. (B&G)
“On the square stands the cathedral.”
- (4) Je voudrais que vienne Marie. (M)
“I wished that Marie would come.”
- (5) Alors sont entrés trois hommes. (M)
“Then came in three men.”

These various cases, however, do not all illustrate the same phenomenon. In this paper we will restrict our attention to what has been called Stylistic Inversion (Kayne, 1973), which we will contrast with what Marandin (2001) has called Unaccusative Inversion. Stylistic Inversion is illustrated above with the examples (1) and (2) and arguably (3) (see Bonami, Godard, and Marandin, 1999). Unaccusative Inversion is illustrated in (4) and (5). Stylistic Inversion occurs only in what Zaenen (1984) calls Binding Domains. In simple and not completely correct terms, a Binding Domain is the domain between a preposed constituent and its gap (see section 3 for a more accurate characterization).

Inversion constructions across languages have been analyzed in various ways, e.g. the notional subject has been argued to be a syntactic object (e.g. Bresnan (1994) for English locative inversion) or a subject or a chomeur in theories that have that notion (e.g. Perlmutter and Zaenen, 1984, for there-insertion inversions in Dutch). Hence, it is not possible to propose an account based on universal properties of inversion constructions without going into a careful analysis of the facts in a particular language. For French such a factual analysis is available in Bonami, Godard & Marandin (1999), Bonami & Godard (2001) and for Unaccusative Inversion, Marandin (2001). Our account is based on the facts and generalizations presented in these three papers. We summarize their findings in the next section.

¹ This is a slightly revised and corrected version of a paper of the same title that appeared in C. Beyssade, O. Bonami, P. Cabredo-Hofherr and F. Corblin, eds., *CSSP 2001*, Paris, Presses Universitaires de la Sorbonne. The basic ideas presented here were developed in conversations with Mary Dalrymple. Thanks also to Annie Delaveau, Danièle Godard, Jacques Jayez and XRCE colleagues for their judgements and to Olivier Bonami, Joan Bresnan, Mary Dalrymple and Danièle Godard for comments on an earlier version. Usual disclaimers apply.

² Several examples in this paper come from Bonami et al. (1999), Bonami and Godard (2001) and Marandin (2001). They are marked (BG&M), (B&G) and (M) respectively.

2. The postposed NP in the Stylistic Inversion Construction is a subject.

Bonami, Godard and Marandin (1999) conclude that the postposed NP in the Stylistic Inversion Construction is a subject on the basis of a careful review of subject and object properties in French. We quickly summarize first the tests they use and then the behavior of the postposed NP with respect to those tests.

Characteristics that distinguish between subjects and objects in French

In French, subjects, but not objects, can control reflexive *se* (6). Likewise, only subjects can be bare quantifiers such as *tous* ('all') or *quelques-uns* ('some of them') as shown in (7–8); and only subjects agree in person and number with the verb (9).

- (6) Jean *se* paie un secrétaire.
 Jean REFL pays a secretary
 "Jean_i pays a secretary_j for himself_{i/*j}."
- (7) Tous s'accordent à y voir un bon signe.
 All agree to in-it see a good sign.
 "Everybody agrees to see a good sign in it."
- (8) *J'ai vu tous.
 I have seen all.
- (9) Marie et moi habitons un vieil immeuble
 Marie and I live in an old building

On the other hand, only objects allow quantitative *en* cliticization (10–11); quantifier-*de* NP split (12–13); extraction of the determiner *combien* (14–15); and *de N* in negative contexts (16–17).

- (10) J'en ai lu trois
 I of-them have read three
 "I have read three of them."
- (11) *Trois en travaillent ici.
 Three of them work here.
- (12) Il a beaucoup lu de best-sellers.
 He has a-lot read of bestsellers
 "He read many bestsellers."
- (13) *Beaucoup travaillent d'hommes.
 Many work of men
 "Many men work."
- (14) Combien as-tu lu de livres?
 How-many have-you read of books
 "How many books have you read?"
- (15) *Combien crois-tu que de gens habitent dans cet immeuble?
 How-many think-you that of people live in this building
 "How many people do you think live in this building?"
- (16) Je n'invite jamais de clients.
 I NEG invite never of clients
 "I never invite clients."

- (17) *De clients n' habitent pas ici.
 Of clients NEG live not here
 "Clients don't live here."

Given these characteristics of subjects and objects, let us now follow Bonami, Godard and Marandin in their assessment of the characteristics of the inverted NP in a Stylistic Inversion construction.

The inverted NP in a binding domain (BD)

The inverted NP in a Binding Domain has mixed characteristics. On the one hand, it behaves like a canonical subject in that it can control reflexive *se* (18); it does not allow quantitative *en* (19), or quantifier-*de N* NP split. On the other hand, it behaves more like an object in not allowing bare quantifiers such as *tous* (21); in allowing *de N* in negative contexts (22); and in allowing *combien* extraction (23).

- (18) le miroir où se voit Paul (BG&M)
 the mirror in-which himself sees Paul
 "the mirror in which Paul sees himself..."
- (19) *les livres qu' en ont lu trois (BG&M)
 the books that of-them have read three
 "the books that three of them have read..."
- (20) *l' année où sont beaucoup paru de best-sellers (BG&M)
 the year where are many appeared of bestsellers
 "the year in which many bestsellers appeared..."
- (21) *un problème que connaissent tous (BG&M)
 a problem that know all
 "a problem that everyone knows"
- (22) une maison où ne viennent plus jamais d'enfants... (BG&M)
 a house where NEG come no-more never of children
 "a house where kids don't come anymore..."
- (23) Combien sont venus de clients aujourd'hui? (BG&M)
 How-many are come of clients today
 "How many clients have come today?"

With respect to agreement, the inverted NP does not behave like a canonical subject, nor like an object. As we can see in (24), it agrees in number but not in person with the verb.

- (24) l'immeuble où habitaient/*habitions Marie et moi (BG&M)
 the building where lived.3PL/*1PL Marie and I
 "the building where Marie and I lived..."

This agreement pattern is, however, found in other inversion constructions as is illustrated below for Unaccusative Inversion.

Bonami, Godard and Marandin (1999) conclude nevertheless that the NP is a subject and propose that the objectlike properties can be explained by assuming that it is marked with accusative case. While we have not done a reanalysis of their facts to see whether a casemarking solution would work in the LFG framework, we accept their general conclusion because of a final property of the inverted NP: the inverted NP is compatible with a non nominal object.

- (25) La piece où les prépare le professeur de Marie (M)
 The room where them prepares the teacher of Marie
 "The room in which Marie's teacher prepares them."

In LFG it is not possible to have two direct objects for one predicate. So, this state of affairs makes it impossible for

us to analyze the NP as an object.³ This conclusion is reinforced by the contrast in behavior between the inverted NP's in Stylistic Inversion and those in what Marandin (2001) calls Unaccusative Inversion, which are analyzed as objects. We quickly summarize their behavior now.

Unaccusative Inversion (Marandin 2001)

In Unaccusative Inversion, the inverted NP is incompatible with an object, whatever its form (26); quantitative *en* is allowed (27); the separation between *beaucoup* and its NP complement is allowed (28)⁴; *quantifier-de N* NP split is allowed (29); *de N* in negative context is allowed (30); and the NP agrees in number but not in person with the verb (31).

- (26) *Je voudrais que chante la Marseillaise la fille de Marie (M)
I would-like that sings the Marseillaise the daughter of Marie
"I would like Marie's daughter to sing the Marseillaise."
- (27) *Je voudrais que la chante Marie. (M)
I would-like that it sings Marie
"I would like Marie to sing it."
- (28) Je voudrais qu' en viennent trois.
I would-like that of-them came three
"I would like for three of them to come."
- (29) Qu' aient été beaucoup condamnés d'innocents, ça te laisse indifférent? (M)
That have been many convicted of innocents, that you leaves indifferent
"That many innocent people have been convicted leaves you indifferent?"
- (30) Je regrette que ne viennent plus d' étudiants. (M)
I regret that NEG come longer of students.
"I regret that students no longer come."
- (31) Je voudrais que viennent Marie et toi.
I would-like that come Marie and you.
"I would like for Marie and you to come."

Given these contrasts, Marandin (2001) analyses the inverted NP in unaccusative inversion as an object, whereas as we said before, the inverted NP in Stylistic Inversion is analyzed as a subject.

To summarize, we find the properties summarized in (32) in the constructions under discussion.⁵

³ Bresnan and Moshi (1993) argue for limited cases of multiple objects. Their arguments do not concern us here.

⁴ Not everybody seems to allow this separation in this context

⁵ Marandin doesn't give examples for the case in parentheses in the table. Examples of real reflexives are difficult to find because of other constraints on the construction. Some examples of inherent reflexives are given in (i) and (ii). *Tous* is clearly ungrammatical as illustrated in (iii).

- (i) Je voudrais que s' en aillent les soldats.
I would-like that REFL go-way the soldiers
"I would want the soldiers to go away."
- (ii) Je regrette que s' autocondamnent tant d' innocents.
I regret that REFL selfcondemn so many if innocent
"I regret that so many innocent people condemn themselves."
- (iii) *Je regrette que soient entrés tous
I regret that have come-in all
"I regret that they all came in."

(32)

	Canonical subject	Canonical object	Stylistic inversion NP	Unaccusative inversion NP
Reflexive <i>se</i>	yes	no	yes	(??)
<i>tous</i>	yes	no	no	(no)
agreement	yes	no	Number only	Number only
Quantitative <i>en</i>	no	yes	no	yes
<i>beaucoup</i>	no	yes	no	yes
<i>combien</i>	no	yes	yes	yes
Negative <i>de N</i>	no	yes	yes	yes
Cooccurs with object	yes	no	yes	no

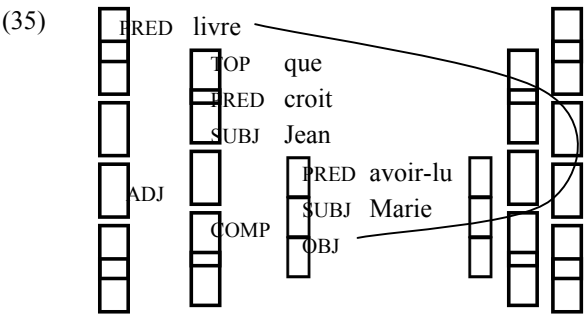
3. The treatment of extractions in LFG: Functional uncertainty

Let us now see how this set of facts would be formalized in an LFG framework. As said above, Stylistic Inversion takes place in a binding domain created by a long distance dependency. Long distance dependencies in LFG are handled by the formal device of Functional Uncertainty and are introduced by annotated phrase structure rules of the type illustrated in (33) (see Kaplan and Zaenen, 1989).

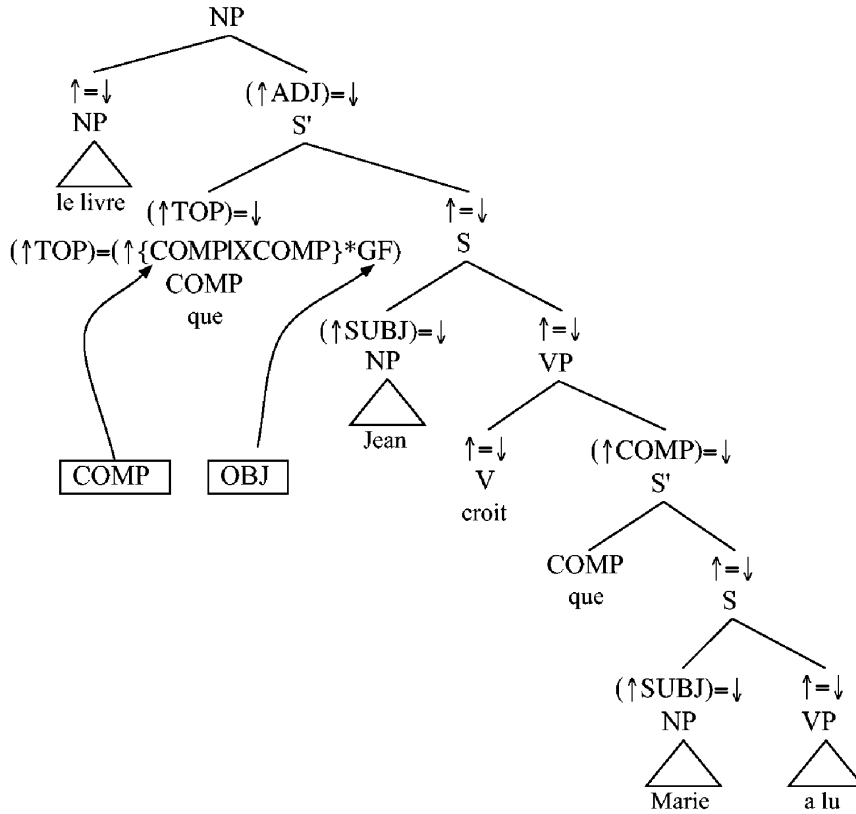
(33) $S' \rightarrow \begin{matrix} XP \\ (\uparrow \text{TOP}) = \square \\ (\uparrow \text{TOP}) = (\uparrow \{ \text{COMP} | \text{XCOMP} \} * \text{GF}) \end{matrix} S$

Here COMPS is an abbreviatory symbol that ranges over COMP,XCOMP and e (the empty body of the long distance equation) and GF ranges over the usual set of terminal functions (SUBJ, OBJ,...). These equations insure that a noun phrase like (34) is assigned the f-structure and the c-structure in (35) and (36).

(34) le livre que Jean croit que Marie a lu...
the book that John believes that Marie has read...



(36)



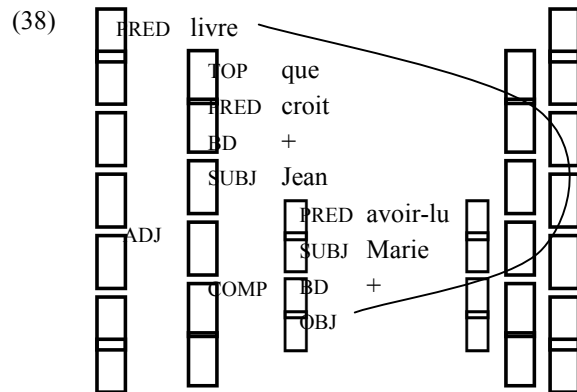
In this example the values chosen for the long distance equation are COMP and OBJ. Hence the f-structure value of the TOP is equal to that of the OBJ, which is indicated by the line linking them in the f-structure representation.

In most languages, it is not necessary to mark the binding domain explicitly, as nothing special happens in this domain. In some languages, however, the binding domain is the locus of specific syntactic phenomena. (see Zaenen, 1983, for a discussion of such phenomena in several languages). In the phrase structure approach of Zaenen (1983) the Binding Domain is defined as all the clausal units down from the one containing the extracted constituent to the one containing the gap. In functional terms this is all the clausal f-structure domains (COMP and XCOMP) down from the one containing the discourse function to the one containing the function that is equated to it included. We make the Binding Domain explicit in f-structure by introducing the BD feature in an off-path constraint as shown in (37).

$$\begin{array}{lcl}
 (37) \text{ S}' & \square & \text{XP} \quad \text{S} \\
 & & (\uparrow \text{TOP}) = \square \\
 & & (\uparrow \text{TOP}) = (\uparrow \{ \text{COMP} | \text{XCOMP} \} * \text{GF}) \\
 & & (\square \text{ BD}) = +
 \end{array}$$

The right arrow in the off-path constraint refers to the f-structure immediately contained in the f-structure it is attached to,⁶ in this case the COMP function. The previously given f-structure is now revised as in (38).

⁶ See Dalrymple (2001) for a more technical discussion of this and other formal issues raised in this paper



4. The position of the post verbal subject in Stylistic Inversion

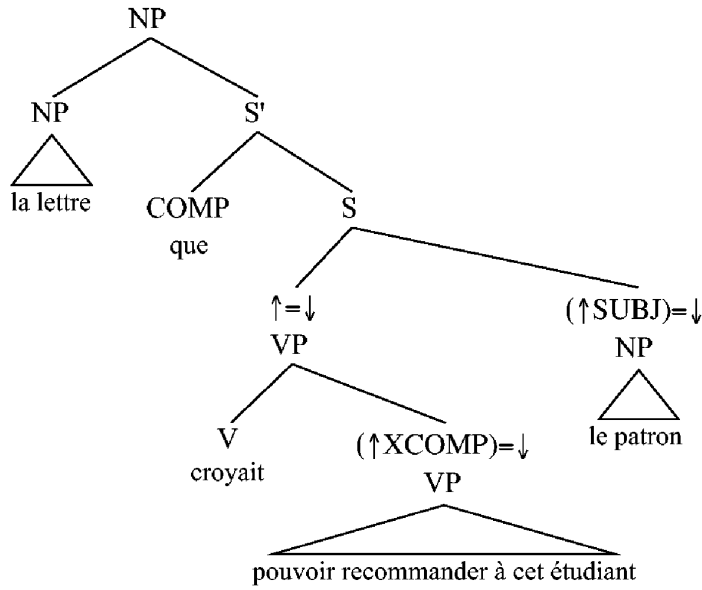
With these technical details out of the way, we now come to the most interesting part of the observations of Bonami, Godard and Marandin (1999), namely the various positions in which the post verbal subject can show up. These positions are illustrated in examples (39–42).

- (39) la lettre qu'enverra à la direction le patron...
 the letter that will send to the management the boss
 "the letter that the boss will send to the management..."
- (40) la lettre qu' enverra le patron à la direction...
 the letter that will-send the boss to the management
 "The letter that the boss will send to the management..."
- (41) le livre que pouvait recommander le patron du labo à cet étudiant
 the book that could recommend the head of-the lab to this student
 "the book that the head of the lab could recommend to this student..."
- (42) le livre que croyait pouvoir recommander le patron du labo
 thebook that thought be-able to-recommend the head of-the lab
 à cet étudiant
 to this student
 "the book that the head of the lab thought that he could recommend to this student..."

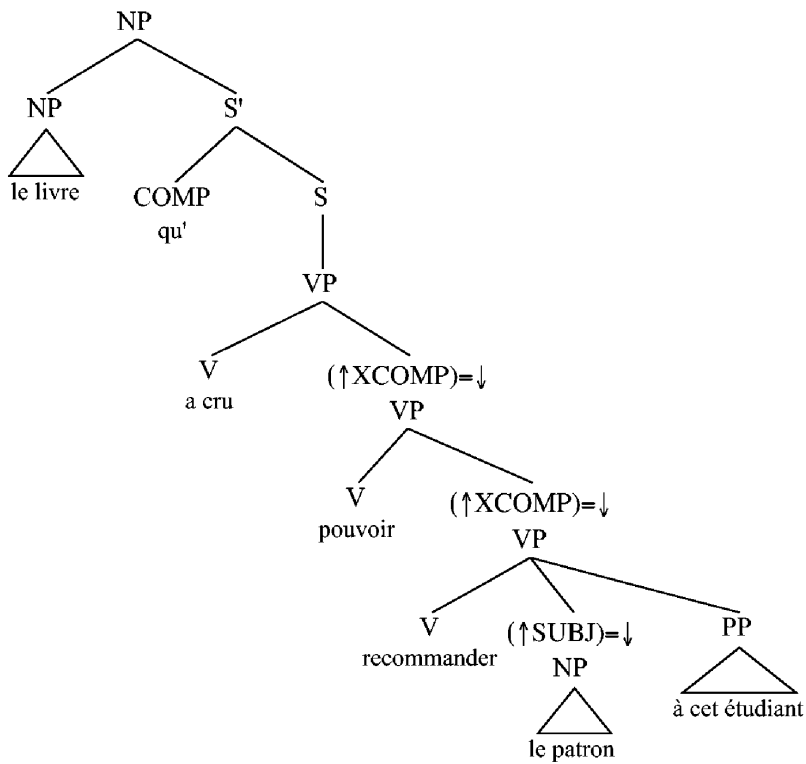
We see from examples (39) and (40) that there are two positions where the inverted subject NP can show up: in clause final position and in a position among the dependents of the most embedded verb. (41) and (42) show that the dependents of the most embedded verb of a verbal complex are relevant. This suggests the two subject positions diagrammed in (43) and in (44):⁷

⁷ In fact it is not clear whether the position in (39) is within a lower VP or within the highest one. We will assume that it is in the highest one but nothing hinges on this except our account of the contrast between (52) and (53) which can be seen as an argument in favor of the analysis. In the rest of the paper we only discuss the position exemplified in (40)-(42).

(43)



(44)



Phrase structure rules which would create these structures are given in (45) and (46).⁸

(45) S → NP VP NP
 (↑ SUBJ) = □ ↑ = □ (↑ SUBJ) = □

⁸ These rules are meant to be illustrative and not complete or definitive. The place of post-verbal complements in French is influenced by various factors and is most likely better treated via a hierarchy of various ordering constraints than with hard and fast PSRs of the type given in the text. For the discussion of some factors see Abeillé et Godard (2000) and Bonami and Godard (2001).

but not lowering rules in transformational frameworks). As we can see from the analysis above, in standard LFG this pattern is a reflection of the superficial arrangement of VP phrase structure rules that do not have internal SUBJ NP positions. In the following sections we will show that this treatment is not sufficient to account for a wider range of facts.

5. Object control verbs I

The formalization that we have described up to now will also handle the basic object control facts that Bonami, Godard and Marandin (1999) discuss. The lexical entry for *convaincre* in (51) equates the object of the matrix clause with the subject of the embedded complement. If the intended subject of a matrix clause is realized within the embedded VP, the matrix will end up with an object instead of a subject, and the Completeness condition will not be satisfied. This is illustrated by the contrast between (52) and (53): in (52) *un libraire*, although extraposed, is in the matrix clause and the sentence is grammatical. Example (53) is an unsuccessful attempt to realize the subject in the embedded VP; this is inconsistent as well as incomplete since it is also assigned a subject by the control equation in (51).

- (51) convaincre V (↑PRED) = 'convaincre[↑SUBJ], (↑OBJ), (↑XCOMP)
(↑OBJ) = (↑XCOMP SUBJ)

- (52) le livre que m'a convaincu d'offrir à ma fille un libraire.
"the book that a bookseller convinced me to offer to my daughter"

- (53) *le livre que m'a convaincu d'offrir un libraire à ma fille ...

There is, however, another set of facts that needs further discussion. Both (54) and (55) are impossible:

- (54) *le livre que le libraire a convaincu d'offrir à ma fille Jean
the book that the bookseller has convinced to offer to my daughter Jean
"the book that the bookseller convinced Jean to offer to my daughter..."
- (55) *le livre que le libraire a convaincu d'offrir Jean à ma fille
the book that the bookseller has convinced to offer Jean to my daughter
"the book that the bookseller convinced Jean to offer to my daughter..."

The version in (55) can be improved for certain speakers if the extraposed NP is made longer as in example (56).

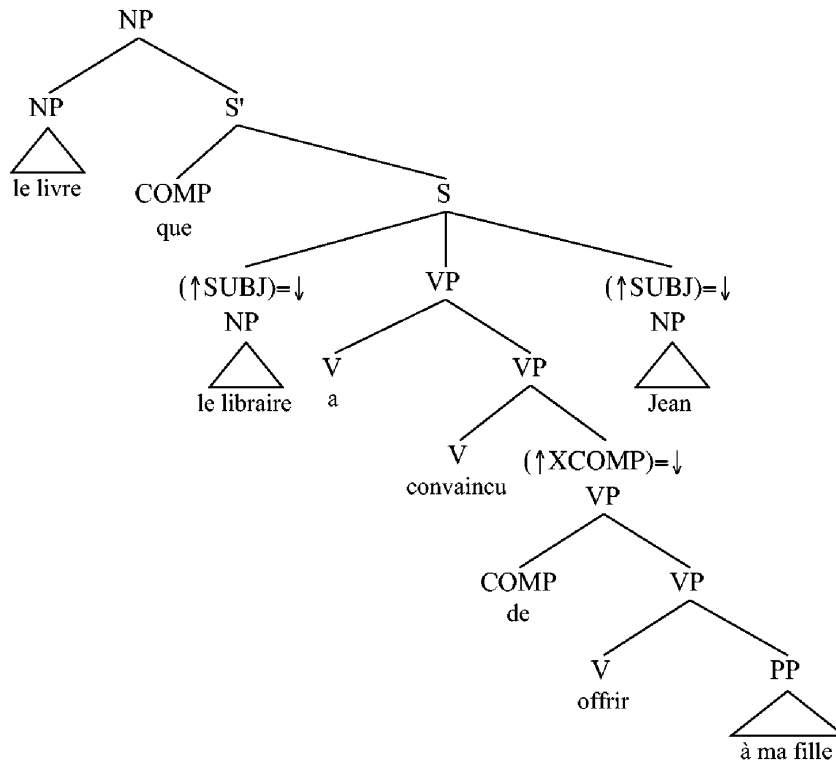
- (56) Voici le livre que le libraire avait convaincu d'offrir
See here the book that the bookseller had convinced to offer

à ma fille un ami bien intentionné.
to my daughter a friend with good intentions

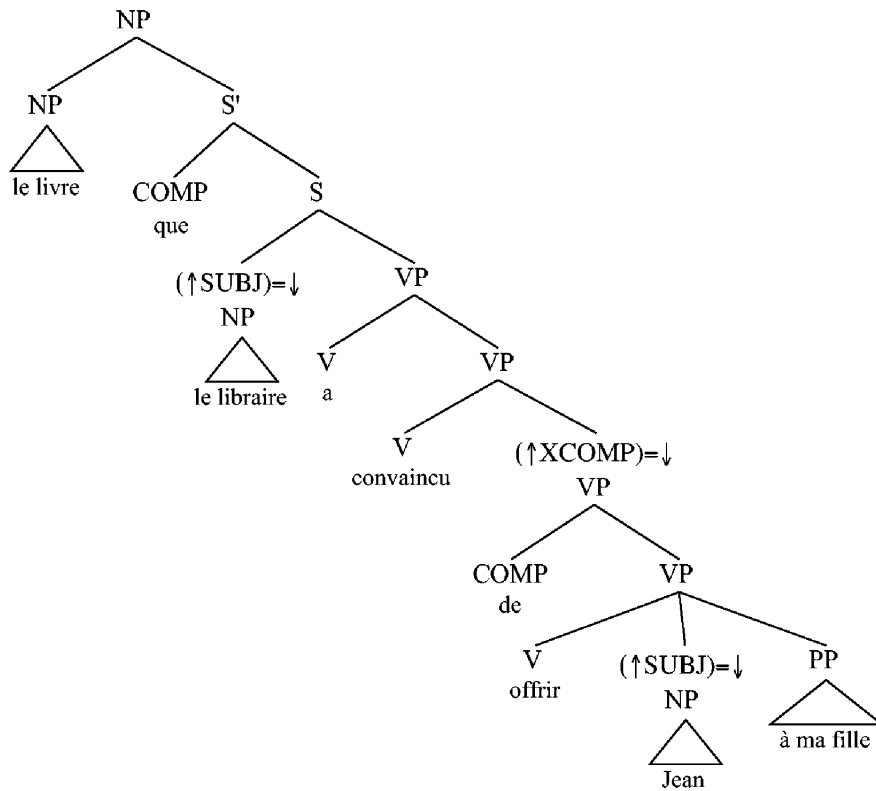
"Here is the book that the bookseller convinced a well-intentioned friend to offer to my daughter."

We will assume here that these are heavy NP shift effects that need to be studied further and concentrate on the cases in which the postposed NP is within the embedded VP. These are clearly bad for all speakers.

(57) c-structure for (54)



(58) c-structure for (55)



With object control verbs like *convaincre*, one might wonder whether the ungrammaticality of examples like (54) and (55) is due to the fact that object control in French is a case of anaphoric control rather than of functional control as we assumed when proposing the lexical entry for *convaincre* given above. Anaphoric control in LFG does not assume equality of the functional values. Clear Object Raising construction examples are difficult to find in French but plausible candidates are the complements of *croire* and of perception verbs (see Abeillé, 1997, for arguments that complements of perception verbs are cases of subject-to-object raising in French). We discuss these in turn.

Croire can take a full VP complement in some circumstances; adjectival or participial complements are, however, more usual and we will restrict our attention to those. The object raising construction with *croire* is only possible with relative clauses (or for some speakers with a clitic object). So, there can be no overt object after *croire*. The construction is illustrated with a relative clause in the following example.

- (59) ce professeur russe que je crois sincèrement persuadé de devoir
 this professor Russian that I believe sincerely convinced to have-to
 enseigner cette version de l'histoire à ses étudiants
 teach this version of the history to his students
 “this Russian professor that I think sincerely persuaded to have to teach this
 version of history to his students...”

Extrapolating the object of the matrix clause to the end of the embedded clause is accepted by some speakers and not by others. This is parallel to what we found in object control and we will assume again that this has to do with some type of heavy NP shift that needs further study.

- (60) %Voilà la version de l'histoire récente que je crois persuadé de devoir
 see-here the version of the history recent that I believe persuaded to have-to
 enseigner à ses étudiants ce professeur russe par ailleurs probablement honnête
 teach to his students this professor Russian otherwise most likely honest
 “See here the version of recent history that I think this Russian professor, otherwise most
 likely honest, is sincerely persuaded to have to teach to his students.”

If we try to insert the object NP into the embedded AP/PARTP, however, we get results that are clearly ungrammatical, as illustrated below.

- (61) *Voilà la version de l'histoire récente que je crois persuadé de devoir
 see-here the version of the history recent that I believe persuaded to have-to
 enseigner ce professeur russe à ses étudiants, encore aujourd'hui.¹⁰
 teach this professor Russian to his students even now
 “See here the version of recent history that I think this Russian professor,
 is sincerely persuaded to have to teach to his students even now.”

¹⁰ Whereas versions with *être* as the embedded verb are in general judged grammatical, they do not allow extraposition to any position. We have no explanation for the difference between the VP and the AP/PartP complements.

- (i) ce professeur russe que je crois être sincèrement persuadé de devoir enseigner cette version de l'histoire à ces étudiants
- (ii) *Voilà la version de l'histoire récente que je crois être persuadé de devoir enseigner à ses étudiants ce professeur russe, par ailleurs probablement honnête.
- (iii) *Voilà la version de l'histoire que je crois être persuadé de devoir enseigner ce professeur russe à ses étudiants, encore aujourd'hui

Perception verbs give similar results: extraposition to the end is judged acceptable by some people and unacceptable by others whereas postposition to a position within the embedded VP is unacceptable for everybody, as illustrated by the contrast between (62) and (63).

- (62) J'ai vu ce gamin lancer une pierre contre le gendarme.
I have seen this kid throw a stone against the policeman

- (63) %la pierre que j'ai vu lancer contre le gendarme ce sale gamin
the stone that I have seen throw against the policeman this nasty kid
"the stone that I have seen this nasty kid throw against the policeman"

- (64) *la pierre que j'ai vu lancer ce sale gamin contre le gendarme
the stone that I have seen throw this nasty kid against the policeman
"the stone that I have seen this nasty kid throw against the policeman"

The facts for raising cases then are parallel to those found in the case of object control. In the absence of other evidence it is reasonable to treat both in the same way, namely as functional control. Under such an analysis we need to distinguish them from the subject control and subject raising cases, which behave differently as we have seen.

6. Object Control and Object Raising: Subsumption

There is a simple way in which we can distinguish the object and subject cases. Constraint-based grammatical frameworks have tended to use equality as the main relation for expressing dependencies between various pieces of structure, but there is no formal necessity to restrict oneself to equality. There is mounting evidence that this is not the right idea in all cases and that it would be good to go back to some of the observations made in earlier versions of generative grammar to the effect that some relations are asymmetric. Before going further into these general considerations, let us see what an asymmetrical treatment of the object constructions would look like.

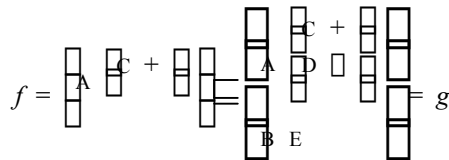
In fact the only change necessary with respect to the facts discussed above consists in replacing the equation in (51) with the constraint in (65). This makes use of an asymmetric subsumption relation, notated by \sqsubseteq , that establishes an ordering relation between two units of information.

- (65) convaincre V (\uparrow PRED) = 'convaincre' (\uparrow SUBJ), (\uparrow OBJ), (\uparrow XCOMP) \sqsubseteq
(\uparrow OBJ) \sqsubseteq (\uparrow XCOMP SUBJ)

The difference between equality and subsumption can be summarized as follows.

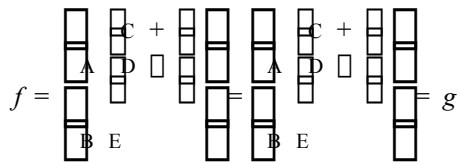
- (66) **Subsumption:** $f \sqsubseteq g$ iff

f and g are the same symbol or semantic form, or
 f and g are both f-structures, $\text{Dom}(f) \sqsubseteq \text{Dom}(g)$, and $(f a) \sqsubseteq (g a)$ for all $a \sqsubseteq \text{Dom}(f)$, or
 f and g are both sets, every element of $f \sqsubseteq$ some element of g



- Equality:** $f = g$ iff

f and g are the same symbol or semantic form, or
 f and g are both f-structures, $\text{Dom}(f) = \text{Dom}(g)$, and $(f a) = (g a)$ for all $a \sqsubseteq \text{Dom}(f)$, or
 f and g are both sets, every element of $f =$ some element of g and every element of $g =$ some element of f .


$$(67) \ f = g \text{ iff } f \sqsubseteq g \text{ and } g \sqsubseteq f \quad (\text{symmetry})$$

To see more clearly what this means, let us look at the f-structure of *convince* clauses under both hypotheses and introduce some notational conventions. Under the hypothesis that *convince* has a lexical entry as given in (68), a sentence like (69) would have the f-structure representation in (70a).

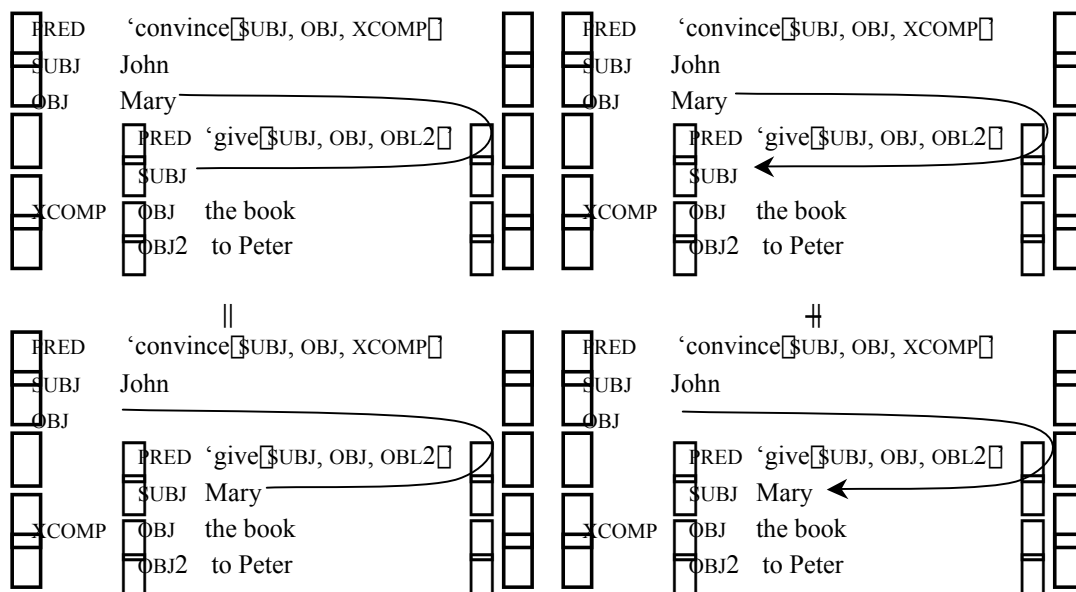
(68) convince V (↑ PRED) = 'convince' [↑ SUBJ], (↑ OBJ), (↑ XCOMP) [↑ OBJ] = (↑ XCOMP SUBJ)

(69) John convinced Mary to give a book to Peter.

(70)

a.

b.



In (70a) the curved line indicates the equality between the contents of the matrix OBJ and the XCOMP SUBJ, *Mary* in the case at hand. Whether *Mary* “shows up” in the matrix clause or in the embedded clause makes no difference, the two ways of diagramming the f-structure are strictly equivalent.

In (70b), following the revised lexical entry in (71), the matrix OBJ subsumes the XCOMP SUBJ. Hence the contents of both are no longer postulated to be equal. The content of the matrix OBJ will also be the content of the XCOMP SUBJ but the opposite is not true. So if *Mary* is found in OBJ position, this information will be shared with the XCOMP SUBJ but if *Mary* is found in the XCOMP SUBJ position, this content will not flow up to the OBJ.¹¹ We diagram this by adding an arrow indicating the direction of the flow of information.

¹¹ To understand this, it is important to remember that in LFG only minimal models compatible with the equations that describe the structures are chosen. For instance a simple sentence like that in (i) will, by virtue of the associated lexical equations and the phrase structure equation that tells us that John is the subject, get the f-structure diagrammed in (ii) but not that in (iii). The latter is compatible but not minimal.

(i) John walks.

John N (↑ PRED) = 'John'
walks V (↑ PRED) = 'walk' (↑ SUBJ) □
 (↑ TENSE) = present

- (71) convince V (\uparrow PRED) = 'convince' (\uparrow SUBJ), (\uparrow OBJ), (\uparrow XCOMP)
 (\uparrow OBJ) \sqsubseteq (\uparrow XCOMP SUBJ)

7. Equality, inequality and linguistic intuitions

The use of subsumption models an intuition that was quite prevalent in transformational grammars but that has not been addressed very explicitly in constraint-based theories. The cyclic application of transformations would insure that constituents could raise but not be lowered, so that traces were commanded by their binders. This intuition is not captured by equality constraints as they are used in constraint-based frameworks. Instead this asymmetry is presumably to be taken care of by phrase structural rules. But this is not a theoretical necessity; subsumption is an asymmetrical relation that is available as part of the formal apparatus used in a framework like LFG. The discussion above shows that the phrase structure solution is also not descriptively adequate: Stylistic Inversion in French requires that a distinction be made between objects and subjects. Subsumption allows us to make this distinction in a natural way whereas, if our treatment of *croire* and of perception verbs is correct, a simple phrase structural treatment does not suffice.

Of course, if this were the only phenomenon that warranted the appeal to the subsumption relation, one might wonder whether our analysis was not misguided and it would not be better to introduce some ad hoc features to treat an accidental phenomenon. There are, however, other phenomena that are also better modeled through inequalities than through equality relations. Zaenen and Kaplan (2002) discuss a well-known case in point, partial VP topicalization in German. This phenomenon is illustrated in (72).

- (72) Ein Buch geben will Hans dem Mädchen.
 A book give wants Hans the girl
 "Hans wants to give the girl a book."

Traditionally, as we have seen above, topicalized constituents are introduced by an annotated phrase rule that has the general structure in (73).

- (73) S' \sqsubseteq XP S
 (\uparrow TOP) = \sqsubseteq
 (\uparrow TOP) = (\uparrow {COMP, XCOMP} *GF)

Combined with a VP rule such as the one given in (74) it will allow for sentences like (72).

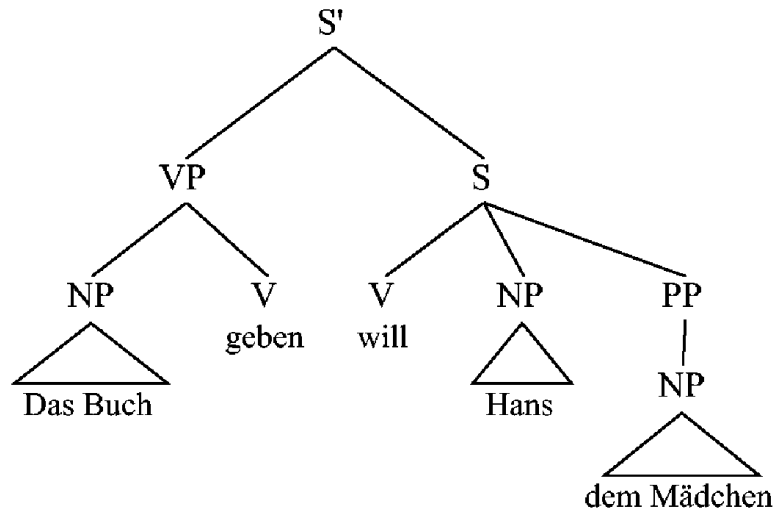
- (74) VP \sqsubseteq (NP) (NP) V
 (\uparrow OBJ2) = \sqsubseteq (\uparrow OBJ) = \sqsubseteq \uparrow = \sqsubseteq

It will assign them a c-structure as given in (75).

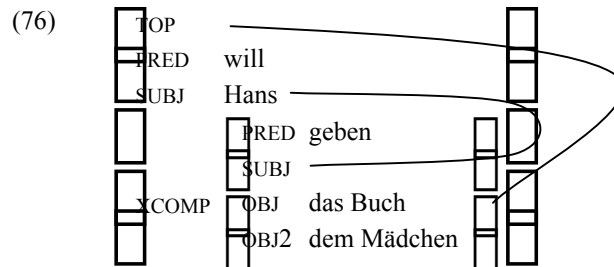
- (ii)
- | | | | | | | | |
|---------------|-------|---------------|---------|---------------|------|---------------|--|
| \sqsubseteq | PRED | \sqsubseteq | walk | \sqsubseteq | SUBJ | \sqsubseteq | |
| \sqsubseteq | SUBJ | \sqsubseteq | John' | \sqsubseteq | | \sqsubseteq | |
| \sqsubseteq | TENSE | \sqsubseteq | present | \sqsubseteq | | \sqsubseteq | |

- (iii)
- | | | | | | | | |
|---------------|-------|---------------|--------------|---------------|------|---------------|--|
| \sqsubseteq | PRED | \sqsubseteq | walk | \sqsubseteq | SUBJ | \sqsubseteq | |
| \sqsubseteq | SUBJ | \sqsubseteq | John' | \sqsubseteq | | \sqsubseteq | |
| \sqsubseteq | TENSE | \sqsubseteq | present | \sqsubseteq | | \sqsubseteq | |
| \sqsubseteq | ADJ | \sqsubseteq | in the park | \sqsubseteq | | \sqsubseteq | |
| \sqsubseteq | | \sqsubseteq | drinking tea | \sqsubseteq | | \sqsubseteq | |

(75)



But in the f-structure we will lose the information that *Ein Buch geben* is in the fronted position whereas *dem Mädchen* is in sentence internal position as can be seen in the f-structure representation of this sentence, given in (76).



This loss of information is not desirable if, as in many versions of LFG, discourse interpretation relies solely on f-structure information. If we replace the equation in (73) with the subsumption in (77), the annotated phrase structure rule will insure that we do not lose this information.¹² Here too we have a case of a link between two positions where the one f-commands the other and here too a phrase structure plus equality approach does not give the right results.

$$\begin{aligned}
 (77) \quad S' & \sqsubseteq \begin{array}{c} \text{XP} \\ (\uparrow \text{TOP}) = \square \end{array} S \\
 & (\uparrow \text{TOP}) \sqsubseteq (\uparrow \{\text{COMP}, \text{XCOMP}\}^* \text{GF})
 \end{aligned}$$

Our analysis of French Stylistic Inversion thus shows that a straightforward treatment of the facts should be framed in terms of a subsumption relation as well as the traditional equality relation, and moreover that the equality relation is used to model the marked case whereas the subsumption relation models the cross-linguistically unmarked one. This relation brings into the constraint-based framework an old intuition of transformational analyses, namely that raising and control relations are asymmetric. The analysis shows that this asymmetry is not only a question of phrase structure configurations but needs to be modeled as a relation between functional units. It raises the question whether subsumption might not be the default way to model relations between f-structures where one f-commands the other.

¹² Note that this proposal requires a revision of the notion of completeness to the effect that only maximal sub-structures must be complete. See Zaenen and Kaplan (2002) and Kaplan and Zaenen (2003) for a proposal.

Bibliography

- ABEILLÉ, A. (1997). Fonction ou position Objet? *Le gré des langues* 12: 8–33.
- ABEILLÉ, A. and D. GODARD (2000). French Word Order and Lexical Weight. In R. Borsley (ed.) *Syntactic Categories*, pp. 325–360. Academic Press, New York.
- BONAMI, O. & D. GODARD (2001). Inversion du sujet: constituance et ordre des mots. In J.-M. Marandin (ed.) *Cahier Jean-Claude Milner*, pp. 117–174. Editions Verdier, Paris.
- BONAMI, O., D. GODARD & J.-M. MARANDIN (1999). Constituency and Word Order in French Subject Inversion. In G. Bouma, E. Hinrichs, G.-J. Kruijff & R. Oehrle (eds.) *Constraints and Resources in Natural Language Syntax and Semantics*, pp. 21–40. CSLI Publications, Stanford.
- BRESNAN, J. (1994). Locative Inversion and the Architecture of Universal Grammar. *Language* 70: 71–131.
- BRESNAN, J. & L. MOSHI (1993). Object Asymmetries in Comparative Bantu Syntax. In S. Mchombo (ed.) *Theoretical Aspects of Bantu Grammar*, pp. 47–91. CSLI Publications, Stanford, CA.
- KAPLAN, R. M. & A. ZAENEN (1989). Long Distance Dependencies, Constituent Structure, and Functional Uncertainty. In M. Baltin and A. Kroch (eds.) *Alternative Conceptions of Phrase Structure*, pp. 17–42. Chicago University Press, Chicago.
- KAPLAN, R. M. & A. ZAENEN (2003). Things are not always equal. In Alexander Gelbukh (ed.) *CICLing-2003 Computational Linguistics and Intelligent Text Processing*, Lecture Notes in Computer Science N 2588, pp. 12–22, Springer-Verlag.
- KAYNE, R. (1972). Subject Inversion in French Interrogatives. In J. Casagrande & B. Saciuk (eds.) *Generative Studies in Romance Languages*, pp. 70–126. Newbury House, Rowley, MA.
- PERLMUTTER, D. & A. ZAENEN (1984). The indefinite Extraposition Construction in Dutch and German. In D. Perlmutter and C. Rosen (eds.) *Studies in Relational Grammar* 2, pp. 171–216. The University of Chicago Press, Chicago.
- MARANDIN, J.-M. (2001) Unaccusative inversion in French. In Y. d'Hulst, J. Rooryck and J. Schroten (eds.) *Going Romance 1999*, J. Benjamins, Amsterdam.
- ZAENEN, A. (1983). On Syntactic Binding. *Linguistic Inquiry*, 14: 469–504.
- ZAENEN, A. & R. M. KAPLAN (2002). Subsumption and equality: German partial fronting in LFG. In M. Butt & T. H. King (eds.), *Proceedings of the LFG02 Conference*. CSLI Publications, Stanford. <http://csli-publications.stanford.edu/>.