

The Cartography of Negative Markers: why negation breaks the assumption of LF/PF isomorphism

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In a recent review of the cartographic approach to syntactic structures, Cinque & Rizzi (2010) suggested the possibility that functional hierarchies might be the reflex of semantic principles of compositionality which have been grammaticalized. This view carries the implicit assumption that the relation between LF and PF is isomorphic, at least for what concerns clausal operators. However, this assumption seems to be untenable once extended to clausal negation, where cross-linguistic variation in the IP field (Zanuttini 1997, Ouhalla 1990, Miestamo 2003) and in the Left Periphery (Moscatti 2010a) does not translate in an analogous LF variation.

1. Introduction

Almost every topic in the Generative Grammar framework has been permeated by the work of Luigi. And often, many of his core ideas have passed over the narrower boundaries of linguistic theories to flow into adjacent fields. As an example, one can simply look back at the ideas presented in *Relativized Minimality* (1990), where many of his intuitions on intervenience effects have contributed to shape fundamental limits on the locality of syntactic dependencies and are now considered, more than 20 years later, to be likely to affect sentence processing and language acquisition.

Having learned much from Luigi, honestly I wouldn't be able to say where my work originally departed from his own. It would be much easier, instead, to find these points of contact where I built on his foundations. One of these is certainly the work on the clausal representation of sentential negation, begun during my doctorate (Moscatti 2006).

In this paper I would like to present some issues related to the positions where sentential negation can be realized and interpreted, adopting a cartographic approach to the Left Periphery of the clause based on Rizzi (1997). I set two goals for this short paper: the first is to offer a cartographic representation of the positions where negation is realizable in the higher clausal skeleton; the second is to sketch an issue concerning the PF-LF mapping, related to the interpretation of the negative operator.

As pointed out in Cinque & Rizzi (2010), Cartography is fundamentally a research paradigm able to provide a principled framework to organize linguistic data. The adoption of a well-structured and framed set of assumptions is crucial in science, in that new generalizations as well new research questions often emerge with clarity from a coherent organization. I'll show here that once the positions of clausal negation are plotted in a richly articulated clausal representation, cross-linguistic data become more readily comparable and new questions emerge, as the one concerning the proper semantic treatment of inverse scope.

2. The cartography of negative particles in the IP and in the Left Periphery

Cinque (1999) proposed a universal organization of the inflectional system, where the functional lexicon is organized in accordance to an invariable order. An hypothesis which is strictly conform to the Uniformity Principle (Chomsky 2001). However, within this extremely fine-grained representation, it stands out the fact that clausal negation doesn't find an exact collocation. Although there is no doubt that negative particles belong to the functional lexicon, exactly as temporal or modal elements.

The reason for this omission is due to the fact that even closely related languages behave differently with regard to the relative order of negation and other functional elements. This point has been well illustrated for Northern Italian dialects in Zanuttini (1997). As an example, consider the relative position of the negative adverbials *nen* in Piedmontese and *no* Milanese in relation to another adverb expressing habitual aspect:

- (1) A l' ha *nen* dine *sempre* tut (Piedmontese)
 s.cl scl'aux neg told-us always everything
 'He hasn't always told us everything'
- (2) L' a *sempre* pagà *no* i tas (Milanese)
 s.cl'aux always paid neg the taxes
 'It's always been the case that he hasn't paid taxes'

the negative adverbial *nen* in the Piedmontese example (1) precedes 'always', while *no* in Milanese respects the opposite order. This difference shows that, if we assume that 'always' occupies the same position in the two languages, negation is hosted in two different NegPs: higher for Piedmontese and lower for Milanese. By repeatedly applying this logic, Zanuttin proposed the existence of at least four NegPs, required to account for the variations in a narrow set of Northern Italian dialects.

The idea that the position of NegP is variable over different languages is further supported by the observation of affixes in the verbal morphology (Ouhalla 1990, Miestamo 2003) and on the basis of these and other comparative studies, it seems that a range of NegPs needs to be assumed within the inflectional system. A maximally unrestrictive parameter able to capture this dimension of variation can be formulated as in (3)

- (3) NegP c-commands XP or is C-commanded by XP, where XP is any of the functional projections immediately dominating VP

However this parameter, broad has it is, is still insufficient to capture the full range of variation associated with the position of sentential negation, given that many languages adopt the option to realize it by means of negative complementizers. In order to obtain a clearer picture of the variation range associated with clausal negation, in Moscati (2010a) I examined different negative complementizers¹, framing them in the CP skeleton offered in Rizzi (1997, 2001)

- (4) FORCE (TOP*) INT (TOP*) FOC (TOP*) FIN IP

¹In this respect, the work in Moscati (2010) can be considered as complimentary to Zanuttini (1997).

An articulated structure of the CP as the one in (4) offers us a straightforward way to capture the differences between various types of negative complementizers, clustered in accordance to a relevant set of properties as +/-Finiteness and +/- Root. These distinctions are readily captured in the extended CP: finite complementizers, able to Clause type the sentence (Cheng 1991), sit in the upper projection ForceP while non-finite complementizers mark instead the lower edge of the CP, being in FinP.

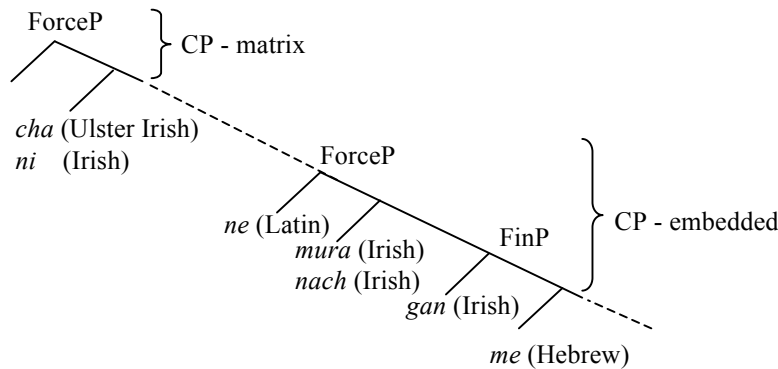
To illustrate the richness of negative complementizers, let me briefly consider Irish, which presents at once many of the options found cross-linguistically. Irish has an articulated paradigm of comp-particles and according to McCloskey (2001, 2003), it has five different elements used to express negation within the CP. Consider here the particle *nach*

- (5) a. Creidim *go* gcuirfidh sí isteach air.
I-believe comp put-fut she in on the job
'I believe that she'll apply for it'
- b. Creidim *nach* gcuirfidh sí isteach air.
I-believe comp-neg put-fut she in on it
'I believe that she won't apply for it'

this particle is in complimentary distribution with the positive complementizer *go* and it triggers, as other Irish complementizer particles, a series of morphological phenomena (McCloskey 2001) on the following verb. *Nach* is ultimately employed to deny an embedded finite clause. Other particles are instead used (as *gan*, discussed also in Svenonius 1994) to express negation on embedded non-finite clause. In addition, certain varieties of Ulster Irish have a finite complementizers, the particle *cha*, which is employed only in negative matrix clauses.

Irish is not an isolated case and many other languages make use of negation in the CP. Classic Latin, Basque (Laka 1990) and Hebrew (Landau 2002) all have negative complementizers and these particles can be organized in accordance to the extended CP proposed in Rizzi (1997):

(6)



For a discussion on the interpretive properties of the complementizers presented in (6) and a more complete representation, I remand to Moscati (2010a).

Given the richness of negative particles in the CP system, it seems that the parameter in (3) can hardly capture the full array of cross-linguistic variations related to the position of the sentential negative marker. The conclusion is that, combining the variation found by Zanuttini in the IP field with the one presented in Moscati (2010a) for the CP field, it seems that no universal governs the position of negation in the clausal skeleton. In this respect, NegP departs from other functional projections as Tense or Modality.

2. The Logic Form behind the variations

Cinque & Rizzi (2010) suggest that the hierarchies ruling the clausal organization might be derived from semantic primitives. For example, we may think that epistemic modality can be evaluated only

when the proposition has already been placed in time. This kind of reasoning, if supported by the right semantic analysis, could explain why a certain order and not its inverse is found in natural language. The cartographic approach ultimately assumes a substantial isomorphism between LF and PF and under this view the clausal organization can be considered to mirror a series of semantic principles that have been grammaticalized. Following this reasoning, a deep understanding of semantic compositionality will derive the clausal hierarchies from well-formedness conditions active at LF.

In the case of sentential negation, things are different, since no universal seems to constraint its surface position²: in the previous section, I showed that the negative operator can be inserted in any structural position, from above the edge of the VP up to ForceP, the highest clausal projection. Now the question is to determine how this variability relates to semantic interpretation.

As a working hypothesis, we could tentatively assume that the negative operator behaves as all the other operators/functional heads and that a transparent mapping between LF and PF exists. This hypothesis can be stated as follows:

- (7) The logical scope of the negative operator is bound to the syntactic position of NegP

This hypothesis can be empirically tested and we can look at the interpretation of the negative operator in languages that differentiates in the surface position of NegP. Let us take two different languages, with a different value of (3). The only difference between them is that the first realizes the NegP right above the VP, while the second language adopts an higher clausal position. Will the scope of negation be narrower for the first language, compared to the second one? According to the hypothesis in (7), this question will receive an affirmative answer.

In order to check this prediction, we can observe the behavior of negation in relation to other logical operators. If we assume that the scope of Tense, Aspect and Modality is tied to an universal hierarchical representation and that the LF-PF mapping is direct, a language with a very low NegP shouldn't be able to derive inverse scope readings over higher logical operators. We may expect that this language will adopt alternative syntactic means, as for example using negative clefts to widen the scope of the negative operator, but no inverse scope should be available clause internally.

Let us go back again to the case of Milanese, whose NegP is the lowest among the Romance varieties studied by Zanuttini (1997). Consider the following sentence with a deontic modal:

- (8) El *gà* de studià *no*
 s.cl must of to-study neg
 a. he is required not to study $\square\neg p$
 b. he is not required to study $\neg\square p$

in (8) the modal verb *gà* has a meaning similar to the quasi-modal English verb 'have to' and it c-commands negation. In this respect, nothing changes if we decided to adopt a restructuring analysis of modal clauses (Rizzi 1982) or if we consider the modal as a functional head (Cinque 2004). According to this last proposal, the deontic modal will be base generated in the head ModP, in a structural position above NegP.

- (9) ${}_{AgrP}[E]_i ga_k$ ${}_{ModP}[t_k$ ${}_{TP}[de\ studià_v$ ${}_{NegP}[no$ ${}_{VP}[t_j t_v]]]]$

Given the structure in (9), the interpretation (8a) is expected under the hypothesis in (7): the modal c-commands negation and the narrow scope reading follows. Here we have an isomorphic LF-PF mapping. Now consider the alternative reading in (8b), where negation takes wide scope over the modal verb, negating the necessity of studying. This interpretation in (8b) is problematic and it clearly shows that the hypothesis in (7) is too rigid.

² Restrictions on the scope of negation, active at LF, have not to be confounded on PF restrictions. One example on LF constraints is the interactions between Epistemic Modality and the negative operator, where the latter seems to be preferably interpreted within the scope of the modal. However this constraint seems to be easy to violate and wide scope of negation on epistemic modality is possible (von Stechow and Iatridou 2003; Moscati 2010a)

This conclusion is further supported in other languages, which adopt a low NegP (see Moscati 2010b, for Germanic languages). Moreover, the need for a semantic operation able to generate wide scope is also suggested by negative quantifiers in object position (Rullmann 1995; Penka & Zeijlstra 2005), in all those cases where a negative feature within the DP is able to express clausal negation.

3. One overt projection, alternative logic representations

Once we adopt a fine-grained topography of functional heads, the tension between the structural realization of the negative projection and its logic interpretation becomes evident. Scope-ambiguities suggest that, although Language has to choose the exact position where it realizes clausal negation, the logic interpretation of the negative operator is not committed to this parametric variation.

One way to capture inverse scope facts would be to assume that a NegP sits on top of any functional projection in the IP field and that all these negative positions are available at LF, while only one is realized at PF. Alternatively, we could assume that a semantic operation can widen the scope of the negative operator by moving it to the topmost clausal projections, the same employed by languages as Irish which overtly use a negative complementizer to mark clausal negation.

As a starting point, I would assume the last option, since it requires only one extra position at LF and it carries the strong prediction that the negative operator can take scope over any other logic operator when an alternative reading has to be generated or when polarity forces scope widening. However, in order to choose between the two options, a pairwise comparison between the scope of negation and every other sentential operator is needed to detect the range of interpretable positions, following a method similar to the one used in Beghelli & Stowell (1997).

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