TWO TYPES OF SUBJECT INVERSION IN ITALIAN WH-QUESTIONS

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Abstract. In this paper, we discuss the phenomenon of subject inversion in Italian wh-questions. Experimental evidence is provided for the distinction pointed out in Rizzi (2001) between direct questions introduced by *perché* 'why' and wh-questions introduced by other bare wh-phrases with respect to subject inversion. In particular, we show that why-questions display information-structure motivated subject inversion, while other wh-operators obligatorily require the subject to occur postverbally. Contrasting the respective focus structure, we then offer a semantic explanation of the two types of subject inversion: in why-questions a narrow focus is semantically motivated and, thus, possible, whereas in the other wh-questions the presence of a narrow focus would yield a clash in the calculation of question-answer congruence. We finally propose an implementation of this asymmetry in cartographic terms.

Keywords: subject inversion, wh-questions, wh-operators, why-questions, question-answer congruence, focus.

1. INTRODUCTION

Ever since the seminal work of Rizzi (1982) and Torrego (1983, 1984), it has been known that in Romance pro-drop languages, wh-movement triggers obligatory subject inversion in direct questions. Although the analysis of this phenomenon has changed over the years, there is a consensus view that this type of obligatory inversion differs radically from the so called 'free' subject inversion of declarative clauses. In more recent years, the latter has come to be related to the Information Structure (IS) of the clause: it is taken to signal either narrow focus on the subject (Belletti 2004) or broad focus in a presentational/thetic clause (see, among others, Lambrecht 1994, Pinto 1997, Cardinaletti 2004, Giurgea this issue).

In this paper we contrastively examine these two types of subject inversion in Italian direct wh-questions featuring different wh-operators. In particular, building on Rizzi (2001), we will focus on the distinction between *why*-operators and other bare wh-phrases in Italian. We will provide experimental evidence that

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supports the original distinction, showing that *why*-questions display the IS-motivated subject inversion, while other wh-operators trigger obligatory inversion.

This result will lead us to discuss the focus structure of wh-questions: we will argue that in *why*-questions, a narrow focus is semantically motivated, whereas in the other wh-questions, it would lead to a clash in the calculation of question-answer congruence. We will then propose a semantically motivated cartographic implementation of this asymmetry.

1.1. Bare wh-operators

In Italian wh-questions with a bare wh-element, the subject cannot intervene between the wh-phrase and the verb. If present, the subject must occur postverbally. Compare the examples in (1) with those in (2) (adapted from Rizzi 2001: (16)):

(1) a. * Che cosa Gianni ha fatto?
what Gianni has done
b * Dove Gianni è andato?
where Gianni is gone
c * Come Gianni è partito?
how Gianni is left

(2) a. Che cosa ha fatto Gianni?
what has done Gianni
'What did Gianni do?'
b. Dove è andato Gianni?
where is gone Gianni
'Where did Gianni go?'
c. Come è partito Gianni?
how is left Gianni
'How did Gianni leave?'

We consider this phenomenon a case of subject inversion triggered by the interrogative context, although a clarification is in order. Interrogative subject inversion in Italian does not exhibit the same rigid pattern of English or German. As a matter of fact, in Italian the subject need not be postverbal: under the appropriate contextual conditions, it could be dislocated to the left or else, Italian being a null subject language, it could simply be omitted. In fact, the fundamental property of Italian wh-questions is the adjacency requirement that requires the verb to immediately follow the wh-phrase (cf. Calabrese 1982, Rizzi 1996, 2001, a.o.).[4]

[4] On the debated question of whether the postverbal subject of Italian wh-questions is necessarily right-dislocated or can stay in its base-generated position, see Cardinaletti (2001, 2002) and Belletti (2004). See also Cardinaletti (2007) for apparent exceptions to the adjacency requirement involving certain elements, in particular specific types of adverb, which can intervene between the wh-phrase and the verb. Since in this paper we are dealing with subjects, we do not consider these cases here and refer to her work for the relevant data.

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Another interesting, but less discussed property of Italian wh-questions is their 'frozen' focus structure. Rizzi (1997, 2001) observes that fronted foci are incompatible with a wh-phrase within the left periphery of the clause, irrespective of the linear order and of the grammatical role (cf. (3a-d) from Rizzi 2001: (13)):

(3) a. * A chi QUESTO hanno detto (non qualcos' altro)?
to whom this have.3PL said not something else
b. * QUESTO a chi hanno detto (non qualcos' altro)?
this to whom have.3PL said not something else
c. * A GIANNI che cosa hanno detto (non a Piero)?
to Gianni what have.3PL said not to Piero
d. * Che cosa A GIANNI hanno detto (non a Piero)?
what to Gianni have.3PL said not to Piero

It is important to add that this restriction does not exclusively concern the left periphery of the clause, as noticed by Rizzi (2001), but it generally operates independently of the position of the focus: in wh-questions with bare wh-operators (other than *why*), narrow focus on any other sentential constituent, *even in situ*, is not possible (cf. 4):

(4) * Quando hanno consegnato IL LIBRO a Leo? (Bocci 2013: 19)
when have.3PL given the book to Leo

From the characteristics of wh-questions discussed above, two closely-related properties of subject inversion in Italian wh-questions follow. Firstly, in neutral contexts – where the subject does not have a salient antecedent and resists dislocation or omission – inversion is obligatory and the subject must appear postverbally. Secondly, given that the focus structure of wh-questions is frozen and cannot be altered by deliberate manipulations of the context, the subject can never be narrowly focused, but must be part of the background (in the sense of Krifka 2007).

1.2. The special status of *why*-questions

Rizzi (2001: §3) points out that the wh-operators *perché* 'why' and *come mai* 'how come' differ from other bare wh-operators in that they do not trigger obligatory subject inversion (see also Shlonsky&Soare 2011). Compare(1)–(2) above to (5)–(6):

(5) a. Perché Gianni è venuto? (Rizzi 2001: (21))
why Gianni is come
'Why did Gianni come?'
b. Come mai Gianni è partito?
how ever Gianni is left
'How come Gianni left?'

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(6) a. Perché è venuto Gianni?
why is come Gianni
'Why did Gianni come?'
b. Come mai è partito Gianni?
how ever is left Gianni
'How come Gianni left?'

Rizzi correlates the optionality of subject inversion to the lack of obligatory I-to-C movement with these types of wh-operator.[5] He then proposes that *perché* and *come mai*, contrary to other wh-operators, do not move from a position within the sentence radical, but they are externally merged in a dedicated left-peripheral position (labelled Int) above the landing site of the other bare wh-operators, which he identifies as the Spec of the left-peripheral FocP:[6]

(7) $[_{FP}$ Force $[_{IntP}$ perché/come mai$_{WH}$ [Int$_{WH}$ $[_{IP}$ Gianni è partito]]]]?
(8) $[_{FP}$ Force $[_{IntP}$ Int $[_{FocP}$ dove$_{WH}$ $[_{I°}$ è$]_{WH}[_{IP}$*pro*<è> andato Gianni <dove>]]]]?

Notice that under this analysis, the interpretable wh-feature appears in two distinct positions in Italian wh-questions: with *why*-operators, it is directly merged in the Int layer; with other bare wh-operators, instead, it is specified on a wh-phrase which is attracted from within the sentence radical to the specifier of a projection lower than Int.

Besides lacking obligatory subject inversion, *why*-operators are special in that they are compatible with a narrow focus within the same clause. Indeed, in the examples (6) above, the optionally inverted subject can be interpreted as narrowly

[5] As witnessed by the acceptability of the IP-initial adverbs *già* 'already'and *ancora* 'yet' in a position preceding the inflected verb (examples from Rizzi 2001: (22)):

(i) Perché (i tuoi amici) già hanno finito il lavoro?
why (the your friends)already have.3PL finished the work
'Why have your friends already finished the job?'

(ii) Come mai (voi) già siete tornati a Milano?
how ever you.PL already are.2PL come-back to Milan
'How come you have already come back to Milan?'

[6] The higher position of *why*-operators is empirically justified on the grounds that they can be followed by a topic, again contrasting with other bare wh-operators:

(i) Il mio libro, perché, a Gianni, non glielo avete ancora dato?
the my book why to Gianni not him.DAT-it.ACC have.2PL yet given
'My book, why haven't you given it to Gianni yet?' (Rizzi 2001: (26))

(ii) ??A chi, il mio libro, non lo avete ancora dato?
to whom, the my book not it.ACC have.2PL yet given

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focused; the following examples show that the left-peripheral focus position is available as well (compare to (3) above):[7]

(9) a. Perché QUESTO avremmo dovuto dirgli, e non
why this have.COND.1PL must.PP say.INF-him.DAT and not
qualcos' altro? (Rizzi 2001: (23))
something else
'Why should we have said *this* to him and not something else?'

b. Come mai IL MIO LIBRO gli ha dato, e non il tuo?
how ever the my book him.DAT has given and not the yours
'How come she gave him *my book*, and not yours?'

This follows from the fact that the Int layer that hosts *why*-operators is distinct from, and higher than, the Focus projection (cf. (8) above).

In sum, Rizzi's analysis distinguishes two types of subject inversion in Italian wh-questions:

(i) with *why*-operators, subject inversion is not mandatory – i.e. it is not triggered by obligatory I-to-C movement – and on the other hand, the focus structure is not 'frozen'. We therefore expect that subject inversion in *why*-questions should manifest the Information Structure status of the subject, as is generally the case for the so called 'free' subject inversion in Italian (see Belletti 2004);

(ii) with the other bare wh-operators, subject inversion is triggered by a syntactic requirement of I-to-C movement; hence, Information Structure is *a priori* irrelevant.

In the following section we present a forced choice experiment that we designed in order to test this distinction.

2. THE EXPERIMENT

Bocci and Pozzan (2014) carried out a series of experimental investigations (i. e. rating and forced-choice experiments) to understand the distribution of subjects in Italian questions with unergative verbs. They report that, in neutral contexts that disfavour an interpretation of the subject as right-dislocated or narrow focus, monolingual speakers of Italian strongly prefer subjects in preverbal position in two types of interrogative sentence: wh-questions introduced by *perché* 'why' and yes-no questions. The opposite pattern is observed in wh-questions introduced by *dove* 'where': subjects in postverbal position were rated much more highly and were overwhelmingly preferred over preverbal subjects.

[7] The same difference between *why*-operators and other wh-operators is observed in Hungarian (see Horvath 2013: (32), (33)).

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These results provide empirical support to the hypothesis that, in neutral contexts, subject inversion does not take place obligatorily in *why*-questions, in contrast to questions with other bare wh-elements.

What these results do not tell us is whether subjects that qualify as narrow foci in *why*-questions are or are not placed in postverbal position, as observed for narrow-focus subjects in declarative questions. In order to provide an answer to this question, we designed and ran a dedicated experiment.

2.1. Procedure, design, and materials

In order to investigate whether an interpretation of narrow focus can license subject inversion in *why*-questions, we carried out a web-based two-alternative forced choice experiment. 64 native speakers of Italian, who were recruited via Facebook, volunteered the experiment.

The experimental materials consisted of 72 written fictional scenes introduced by a brief description (see (10)–(12)). The task was to choose the sentence that sounded more natural in the provided context between two alternatives that minimally differed with respect to the position of the subject: preverbal vs. postverbal. All the experimental sentences consisted of an unergative verb and the subject.

(10) [*A causa di un problema tecnico hanno dovuto spostare la prova generale e le aule per le prove individuali sono state riassegnate, per cui Giulia chiede al direttore:* 'Because of a technical problem the dress rehearsal was postponed and the rooms for the individual rehearsals have been reallocated, so Giulia asks the director:']

G: Perché Stefano balla?
why Stefano dances
G: Perché balla Stefano?
why dances Stefano
'Why is Stefanodancing?'

(11) [*Giulia non sa che hanno cambiato il primo ballerino per il pas à deux e chiede stupita:* 'Giulia doesn't know that the lead dancer for the *pas à deux* has been replaced and, surprised, asks:']

G: Perché Stefano balla?
why Stefano dances
G: Perché balla Stefano?
why dances Stefano
'Why is *Stefano* dancing?'

(12) [*A causa di un problema tecnico hanno dovuto spostare la prova generale e le aule per le prove individuali sono state riassegnate, per cui Giulia chiede al direttore:* 'Because of a technical problem the dress rehearsal was postponed and the rooms for the individual rehearsals have been reallocated, so Giulia asks the director:']

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G:	Dove	Stefano	balla?
	where	Stefano	dances
G:	Dove	balla	Stefano?
	where	dances	Stefano

'Where is Stefano dancing?'

We tested (i) *why*-questions in neutral contexts (see (10)) and (ii) *why*-questions in contexts that favoured a focus interpretation of the subject (see (11)). For the sake of comparison, we also tested (iii) wh-questions introduced by other bare wh-adjuncts (*dove* 'where' and *come* 'how') presented in neutral contexts (see (12)).

These three conditions resulted from two independent binomial factors combined in a non-factorial design. The first factor was "context type": neutral context vs. context eliciting a focus interpretation of the subject. The second factor was "wh-question type": *why*-questions vs. other types of wh-elements. Both factors were manipulated within participants and within items.[8]

The material consisted of 24 items presented under 3 conditions for a total of 72 experimental stimuli. The examples in (10)–(12) illustrate the set of stimuli that constituted one experimental item. We tested 24 (pairs of) *why*-questions in neutral contexts, 24 (pairs of) *why*-questions in contexts favouring a focus interpretation of the subject, and 24 (pairs of) wh-questions introduced by a wh-adjunct (12 by *dove* 'where' and 12 by *come* 'how') presented in neutral contexts. For each item, the neutral context used for *why*-questions was identical to the context we used for the wh-questions with *dove* and *come* (cf. (10) vs. (12)). Moreover, in order to prevent a right-dislocation topical interpretation of the postverbal subject, the subject was never introduced in the preceding context.

Three lists were created so that each pair of experimental sentences would only be presented once to each participant. The 24 experimental trials of each list were presented in a pseudo-randomized order along with 24 fillers. The fillers included pairs of declarative sentences which differed for the position of a constituent (either fronted to the left periphery or in situ) and were presented in different types of contexts. The experimental session was preceded by a short familiarization session (3 trials, with materials unrelated to the experimental sentences). The entire experiment lasted on average between 20 and 30 minutes.

[8] Since the latter type of bare wh-elements (i.e. bare wh-operators other than *why*) are incompatible with narrow focus on any other constituent of the sentence (cf. § 1.1), we did not consider the fourth logical possibility as a condition of the experiment, that is, wh-questions introduced by the bare wh-adjuncts *dove* 'where' and *come* 'how' in contexts that favour a focus interpretation of the subject.

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2.2. Results

As can be seen in Figure 1, in the case of wh-questions with *dove* and *come* in neutral contexts, postverbal subjects were virtually always preferred over preverbal subjects.[9] In the case of *why*-questions in neutral contexts, however, the picture is different: there is a clear preference for subjects in preverbal position (62.6%) over postverbal subjects. On the other hand, when *why*-questions are presented in a context that favours a focus interpretation of the subject, the preferences flip over again and postverbal subjects (66.5%) prevail over preverbal subjects.

We performed statistical analyses based on multi-level mixed effects regressions with log odds of a postverbal subject response as the dependent variable. We specified "type of wh-question" as independent factor with 3 levels: questions introduced by *dove* and *come* in neutral contexts,[10] why-questions in neutral contexts, and wh-questions in contexts favouring a narrow focus interpretation. The error structure included crossed by-subject and by-items random intercepts and slopes. We applied a backward difference coding schema that allowed us to compare a level of the independent factor with the precedent level.

The results are the following: Postverbal subjects responses are significantly less likely in *why*-questions in neutral contexts than in wh-questions introduced by *dove* and *come* in neutral contexts (Estimate=–4.536, SE=.6364, z value=–7.128, p<.001). By contrast, postverbal subjects responses are significantly more likely in *why*-questions in contexts that favour a focus interpretation of the subject than in *why*-questions in neutral contexts (Estimate=1.2, SE=.2525, z value=4.751, p<.001).

These experimental findings confirm that in bare wh-questions other than *why*-questions, subject inversion takes place obligatorily. By contrast, in *why*-questions, subjects are not forced to appear postverbally in neutral contexts, whereas they are in fact preferred in a preverbal position. Subjects of *why*-questions are preferred in postverbal position only when they qualify as narrow foci.

The different behaviour of *why*-questions as opposed to wh-questions introduced by other bare wh-elements raises important theoretical issues and calls for an analysis. In the next sections, we therefore address the issue of the focus of wh-questions in Italian and offer a semantic account for the different pattern with respect to narrow focalization and, hence, with regard to the phenomenon of subject inversion.

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[9] In Figure 1, we collapsed the results for the wh-questions introduced by *dove* and those introduced by *come*. In fact, the overwhelming preference for postverbal subjects was equally observed with both types of wh-elements. See footnote 10.

[10] We preliminarily ascertained by means of an independent statistical model that the preferences for postverbal subjects in *dove*-questions and *come*-questions did not differ (Estimate=.134, SE=.2.5534, z value=.053, p>.05).

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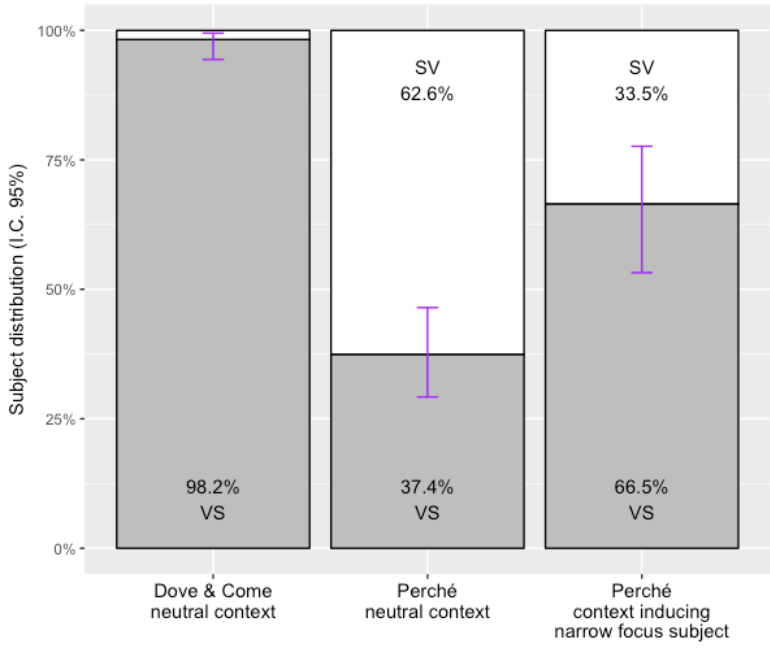

Figure 1
Preference for postverbal subjects (VS) over preverbal subjects (SV) across conditions

3. FOCUS IN WH-QUESTIONS

The results presented above give rise to two theoretical issues. The first one concerns the asymmetry between *why*-questions and other wh-questions with respect to obligatory subject inversion. Rizzi's account is based on the insight that *why*-operators are special in that they are not extracted from within the sentence radical (and for this reason, they do not trigger I-to-C movement to satisfy the Wh-Criterion). But as noted above, this leads to the stipulation of two alternative 'realization sites' for the wh-feature in the left periphery. This insight would become more attractive if it could be justified on independent grounds.

The second issue concerns the ability of *why*-questions to host a narrowly focused constituent (whether postverbal or fronted), as opposed to the unavailability of a narrow focus in the other wh-questions. This requires an additional stipulation, namely, that the landing site of the other wh-operators coincides with the left-peripheral focus position (in direct wh-questions), whereas the External Merge position of *why*-operators is distinct from, and higher than, the focus position.

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We will argue that in both respects, the asymmetric syntactic behaviour is rooted in the special semantics of *why*-questions with respect to other wh-questions.

3.1. An approach to *why*-questions

In the examples above in (9), the narrow focus has a straightforward contrastive interpretation which clearly interacts with the meaning of *why/how come.* For example, in (9b), repeated here below, the speaker is asking the reason why the proposition expressed by the sentence radical is the case *instead of another relevant focus alternative*: i.e, why the interlocutor gave to Gianni the speaker's book instead of her own.

(9') b. Come mai IL MIO LIBRO gli ha dato, e non il tuo?
how ever the my book him.DAT has given and not the yours
'How come she gave him *my book*, and not yours?'

This intuition can be made more precise in the terms of van Fraassen's (1980) approach to *why*-questions, as elaborated on in Shaheen (2010). Within his general approach to explanation, van Fraassen proposed the following structure for *why*-questions (cf. Shaheen 2010: §3.1):

(13) $\langle P_k, C, R \rangle$

where P_k is the *topic proposition* expressed by the sentence radical of the *why*-question, C is the *contrast class*, i.e. a set of alternatives to the topic proposition, and R is a relevance relation that relates the potential answers A to the pair $\langle P_k, C \rangle$: "P_k instead of (the rest of) X because A". We need not be concerned here with the intricate issues related to the nature of the relevance relation; what is crucial for our purposes is the idea that the interpretation of a *why*-question necessarily involves a set of relevant alternative propositions to the one denoted by the sentence radical.

This is precisely what can be provided by a narrow focus. In Alternative Semantics (Rooth 1992), any constituent $[_\beta \ldots \alpha_F \ldots]$ containing a focus-marked phrase α_F has, in addition to its ordinary denotation, a focus semantic value consisting of a set of alternative denotations, which differ from one another in the position of the focused phrase. The alternatives are exploited at the compositional level where the focus operator ~C attaches.

Consider for example the focus semantic value of the same sentence realized with focus on the direct object (14) and on the subject (15) respectively (we ignore tense for the sake of simplicity):

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(14) [[[Ed drank [coffee]$_F$] ~C]
i) Ordinary value: λw. drink′$_w$ (coffee′) (Ed′)
ii) Focus semantic value: set of propositions of the form "Ed drank x";
more formally: $\{\lambda w.\ drink'_w\ (x)\ (Ed')\ |\ x \in D\}$ (with D the domain of entities)
iii) $C \subseteq \{\lambda w.\ drink'_w\ (x)\ (Ed')\ |\ x \in D\}$

(15) [[[Ed]$_F$ drank coffee] ~C]
i) Ordinary value: λw. drink′$_w$ (coffee′) (Ed′)
ii) Focus semantic value: set of propositions of the form "y drank coffee";
more formally: $\{\lambda w.\ drink'_w\ (coffee')\ (y)\ |\ y \in D\}$ (with D the domain of entities)
iii) $C \subseteq \{\lambda w.\ drink'_w\ (coffee')\ (y)\ |\ y \in D\}$

If we now embed (14) and (15) in a *why*-question, we obtain two different questions:

(16) Why did [[Ed drink [coffee]$_F$] ~C]?
i) topic proposition = ordinary value = λw. drink′$_w$ (coffee′) (Ed′)
ii) contrast class C = a contextually relevant subset[11] of the focus semantic value:
$C \subseteq \{\lambda w.\ drink'_w\ (x)\ (Ed')\ |\ x \in D\}$
iii) Intended meaning (informally): Which relevant proposition A explains why it is the case that Ed drank coffee instead of being the case that Ed drank tea, or that Ed drank Coca-cola, etc.?

(17) Why did [[[Ed]$_F$ drink coffee] ~C]?
i) topic proposition = ordinary value = λw. drink′$_w$ (coffee′) (Ed′)
ii) contrast class C = a contextually relevant subset C of the focus semantic value:
$C \subseteq \{\lambda w.\ drink'_w\ (coffee')\ (y)\ |\ y \in D\}$
iii) Intended meaning (informally): Which relevant proposition A explains why it is the case that Ed drank coffee instead of being the case that Alex drank coffee, or that Bill drank coffee, etc.?

This approach motivates two of the syntactic assumptions that we discussed above. First, notice that the proposition expressed by the sentence radical is one element of the question denotation (namely, it is the topic proposition); this motivates on compositional grounds the fact that *why*-operators are generated outside the sentence radical.

Second, notice that in van Fraassen's account the *why*-operator requires a contrast class for a proper interpretation to obtain. From this perspective, the availability of a narrow focus in *why*-questions is semantically justified: focus provides precisely a set of alternatives within which it is possible to contextually delimit a relevant contrast class.[12] The alternatives must be defined at a compositional level below the *why*-operator: this justifies the fact that the left-peripheral focus position is located below the *why*-operator (cf. (9)).

[11] In Alternative Semantics, interpretation always exploits a contextually delimited subset C of the focus semantic value. We omit the formal details, as they are not essential to make our point.

[12] Note that Shaheen (2010) himself does not exploit focus to generate the contrast class, but has recourse to an underlying Question Under Discussion.

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Given that in van Fraassen's account a contrast class is always required, we may even be led to assume that *why*-operators necessarily associate with a narrow focus. However, this would be too strong an assumption: in fact, *why*-questions like (5) are felicitous, even though the context does not support any narrow focus within them. We will hence assume, without argument, that when the sentence radical does not contain a narrow focus, the contrast class consists of the topic proposition and its negation.

Finally, a very natural constraint on the interpretation of *why*-questions is that the topic proposition is true and no other distinct proposition in the contrast class is true (cf. Shaheen 2010: 18–19). From this perspective, the type of narrow focus involved may be conceived of as *exclusive*, rather than merely contrastive. We leave this point open for future research.

Summing up, we have argued that a particular view of the semantics of *why*-questions, rooted in van Fraassen's approach, justifies the availability of a narrow focus in *why*-questions, the fact that the *why*-operator is externally merged outside the sentence radical, and the fact that it is merged above the left-peripheral focus position.

3.2. Other wh-questions

Turning now to the other type of wh-questions, let us consider whether we can justify the opposite properties, namely the fact that the wh-operator is externally merged within the sentence radical, and that it is incompatible with a narrow focus (cf. (3) above).

Among various possible approaches, we shall adopt for concreteness a partition semantics for wh-questions (see Groenendijk and Stokhof 1984, 1997). In this approach, a wh-question denotes a set of disjoint propositions, where each proposition is a set of possible worlds, and the union of all the cells in the partition covers the whole logical space.

The partition is obtained in two steps. First, wh-movement creates a variable within the sentence radical, which is abstracted over:

(18) Which novel did Ed read?
$[\lambda w.\ [\lambda x.\ \text{novel}'_w(x)\ \&\text{read}'_w(x)\ (\text{Ed}')]]$

We thus obtain a function which, for every possible world w, returns the value True only for those novels that Ed read in w. On the basis of this, it is then possible to partition the logical space in distinct cells: intuitively, each cell will contain a subset of possible worlds in all of which Ed read the same novel(s).

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Without going into the formal details, what is crucial for us is the fact that the interpretation is built on an operator-variable structure introducing a variable within the sentence radical. Following standard assumptions (e.g., Heim & Kratzer 1998), we can take wh-movement to provide the required operator-variable pair at the interface. This provides semantic justification for the first syntactic property.

Let us now turn to the incompatibility of wh-phrases with a narrowly focused constituent, exemplified in (3) above. Following Rizzi (1997) and especially Bocci (2013: 56–74), we assume that in Italian focus is unique, in that every sentence has at most one available position to license focus in the left periphery. From this perspective, the incompatibility observed in (3) could be explained by the assumption that wh-operators other than *perché/come mai* are focal, and hence block the occurrence of another independent focus in the same sentence.This is indeed the insight that Rizzi (2001) expresses by assuming that the landing site of the wh-phrase is the left-peripheral focus position, Spec,FocP.

Note, however, that this assumption cannot be ascribed to an inherently focal nature of wh-phrases (as implied by e.g. Beck 2006 or Ishihara 2003). Rizzi (2001) points out that interrogative wh-phrases can actually co-occur with a fronted focus in indirect questions:[13] compare (19a) to (3c) above, repeated here for convenience:

(19) Mi domando A GIANNI che cosa (*A GIANNI) abbiano detto
me ask.1SG to Gianni what (to Gianni) have.SBJV.3PL said
(non a Piero).
(not to Piero)
'I wonder what they said to *Gianni* (not to Pietro).' (Rizzi 2001: (14c))

(3) c. * A GIANNI che cosa hanno detto (non a Piero)?
to Gianni what have.3PL said not to Piero

Rizzi points out that in (19), the fronted focus has to precede the wh-phrase; from the semantic viewpoint, this implies that the focus operator outscopes the wh-phrase. This can in fact be expected on compositional grounds: the focal alternatives could not be defined at the proposition level, because this contains a variable (the trace of the wh-phrase) that would remain unbound. The focus operator outscoping the wh-phrase will then generate a set of alternative wh-questions.

Notice that this is the semantic value that Büring (2003) attributes to *contrastive topics*. In his approach, the contrastive topics in (20) outscope the foci; the foci introduce sets of alternative propositions, which correspond to the denotation of wh-questions (where a wh-phrase substitutes for the focussed element) and topics, in turn, introduce a set of alternative wh-questions:

[13] Rizzi actually claims that a direct object cannot be fronted to the peripheral focus position, but a PP can. This asymmetry remains to be tested in future research.

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(20) A: What did the boys eat?
B: $[\text{Fred}]_{CT}$ ate $[\text{the beans}]_{F}$.

1. Replace the focussed term *the beans* with a *wh*-word and front the latter;
2. Form from this question a set of alternative questions by replacing the CT *Fred* with some alternative to it.

Step 1: What did Fred eat?
Step 2: {What did x eat?} with (x ∈{ Ed′, Fred′, George′,...})
or, more formally:
Step 1: $\{[\lambda w.\ ate'_w\ (y)(\ Fred')] \mid y \in D\}$ (a question: a set of propositions)
Step 2: $\{\{[\lambda w\ .ate'_w\ (y)(x)] \mid y \in D\} \mid x \in D\}$ (a set of questions)

The contrastive topics conveys that the alternative wh-questions are all entailed by a more general question (here, (20A)), but the assertion (20B) only answers one of the alternative subquestions, and thus constitutes a partial answer to the general question. From this perspective, one may wonder whether the fronted PP in (19) should rather be analysed a contrastive topic.

This move seems unwarranted, for the following reasons: first, the fronted constituent in (19) clearly bears the main prosodic prominence of the sentence, and thus qualifies as focal on prosodic grounds; second, it licenses a negative coda, something that contrastive/partial topics à la Büring cannot do.[14]

Leaving aside for the time being the interpretation of the narrow focus in (19), the only point that is relevant here is the following: the mere possibility of such a structure is incompatible with the claim that the wh-phrase is inherently focal and, hence, necessarily fills the only available left-peripheral slot for focus. As a matter of fact, Rizzi (2001) assumes that in embedded wh-questions like (19), the wh-phrase targets a peripheral position lower than FocP, contrary to direct questions.

The contrast between (3) and (19) reveals a root/embedded asymmetry (see also Horvath 2013 for a parallel asymmetry in Hungarian wh-questions). It is therefore reasonable to tackle it by looking for some property that distinguishes root (direct) from embedded (indirect) questions.[15]

One such property is question-answer congruence. There is a consensus view that information-seeking[16] wh-questions call for an answer which must bear narrow focus on the constituent corresponding to the wh-phrase of the question (Rooth

[14] Wagner (2012) proposes that contrastive topics are just foci that outscope another focus. This approach would not allow us to draw the distinction that we are aiming at about (19).

[15] We are indebted to Ion Giurgea for his insightful comments on this part of our argument.

[16] This does not hold for more marked types of wh-questions, like echo questions and rhetorical questions. These also have distinctive syntactic properties (see, e.g., Obenauer 2004, 2006, Garzonio 2004).

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1992, Roberts 1998, a.o.). Thus, (14) above, repeated here, is congruent to question (21b) and (15) is congruent to question (22b):

(21) a. Ed drank $[\text{coffee}]_F$.(= (14))
b. What did Ed drink?
(22) a. $[\text{Ed}]_F$ drank coffee. (= (15))
b. Who drank coffee?

Suppose now that a wh-question like (22b) contained a narrow focus, say on the subject. As discussed above, the focus cannot generate alternatives at the proposition level (below the wh-operator) because these would contain an unbound variable. Two possibilities remain: (i) the focus operator attaches to a constituent small enough so as not to contain the wh-trace, e.g. the subject NP, and gives rise to non-propositional alternatives, as in (23b); or (ii) it attaches above the wh-phrase, yielding a set of alternative wh-questions (23c):

(23) a. What did $[\text{Ed}]_F$ drink?
b. What did $[[\text{Ed}]_F \sim C]$drink? $\Rightarrow$ $C \subseteq \{\text{Ed}', \text{Fred}', \text{George}', \ldots\}$
c. [[What did $[\text{Ed}]_F$drink] ~C]? $\Rightarrow$ $C \subseteq \{\text{What did x drink?} \mid x \in D\}$

We leave open the issue of sub-propositional contrastive focus as in (23b);[17] the asymmetry between (19) and (3), featuring left-peripheral foci, must be stated in terms of the interpretation in (23c): alternatives generated at the level of the whole wh-question are allowed in indirect questions, but not in direct ones.

Note that the fronted focus in (19) has a "replacive" import:[18] it conveys that the ordinary semantic value of the embedded wh-question replaces one alternative wh-question that is salient in the context. In plain terms, the speaker asserts that she stands in the wondering-relation to the question of what was said to Gianni, and not to the salient alternative question of what was said to Piero.

[17] Ion Giurgea (p.c.) pointed out that in Romanian wh-questions, it is possible to have a narrow contrastive focus *in situ* in a wh-question, as exemplified in (i):

(i) [Context: A has explained to B why Irina didn't attend the meeting; then B asks:
Da' ce s-a întâmplat cu CRISTI?
but what happened with Cristi

Here the main prominence is on *Cristi*. When the question is out-of-the-blue and no contrast is involved, instead, the main prominence goes on the wh-phrase:

(ii) [Context: Cristi has not showed up at a meeting; A asks B:]
CE s-a întâmplatcuCristi?
what happened with Cristi

The distribution of sub-propositional foci in wh-questions requires a deeper investigation than we can undertake here.

[18] This replacive import is reminiscent of the corrective import of focus, as characterized in Bianchi, Bocci & Cruschina (2015); the latter, however, is only defined for declarative clauses.

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We propose that such a replacement is not possible in the case of a direct question: here (pace any neo-performative approach) the wh-question is not the argument of an attitudinal relation, but rather, it constitutes a speech act on its own. [19] Specifically, the (information-seeking) wh-question is an initiating conversational move which, when defined,[20] requires the interlocutor(s) to address it by means of a relevant discourse move.We assume here the definition of Roberts (1998/2012):

(24) A move *m* is *relevant* to the Question Under Discussion qiff m either introduces a partial answer to *q* (*m* is an assertion) or *is part of a strategy to answer q* (*m* is a question) (Roberts 1998/2012, (15); emphasis ours).

According to (24), when a (wh-)question q has been asked, it is possible to reply by another question q′ only if q′ is a subquestion entailed by q, i.e. it is such that any complete answer to it will also constitute a partial answer to q. In other terms, q′ must be part of a strategy of inquiry to answer the original question q by "breaking it down" into a number of subquestions (cf. above the discussion around (20)). To illustrate, (25B) is a relevant subquestion that addresses (25A), whereas (25B′) is not:

(25) A: Who ate the beans?
B: Did Fred eat them?
B′: Who ate the soup?

Note now that in example (3c) (and similarly in the other examples in (3)), the wh-question that constitutes the ordinary semantic value of the interrogative sentence (i.e., the question of what was said to Gianni) is not a subquestion aiming at answering a more general question previously asked; rather, it replaces the previous question (what was said to Piero). But according to the criterion in (24), reacting to a yet unaddressed QUD with a distinct alternative (whose answer is irrelevant to the QUD) is a non-relevant discourse move. To put it a bit more explicitly, it is not possible to just replace a wh-questions setting a discourse goal with another wh-questions setting a distinct goal: the first question has to be addressed first, if only by showing that it is currently unanswerable.

We therefore assume that such a non-relevant move is illicit, and as such, the grammar itself prevents its realization. In the cartographic spirit of Rizzi (1997) and Cinque & Rizzi (2010), we will implement this constraint by assuming that the root Int layer, hosting the interrogative operator, selects for a *syncretic head* that consists of the bundle of features { [WH], [focus] }. We also assume a basic tenet

[19] It is immaterial for our argument whether we assume or not an illocutionary operator in the compositional structure.

[20] That is, in the absence of any presupposition failure.

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of cartography, namely, that a feature bundle cannot license multiple specifiers via selective agreement of each feature with a distinct phrase: consequently, only one phrase can be licensed in the Spec of the syncretic head. In this way the wh-phrase, agreeing for the { [WH], [focus] } bundle, also 'goes proxy' for a focus; as a matter of fact, the [focus] feature in the bundle is visible to the prosodic computation, and triggers the realization of a marked prosodic structure (Bocci, Bianchi & Cruschina 2017). Given that it is impossible to license more than one [focus] head in the left periphery (Bocci 2013), a fronted focus cannot be licensed in any way.

On the other hand, indirect questions differ from direct ones in that they do not require a relevant responding move (in the sense of (24) above). We propose that for this reason, their Int layer does not enforce the bundling of the [WH] and [focus] features: the two features can head separate projections and license independent specifiers, as exemplified in (19) above.

It is fair to admit that this analysis requires the postulation of two 'flavours' of Int: root Int, which selects for a syncretic {[WH], [focus]} head, and non-root Int, which allows for the separate projection of [focus] and [WH]. Although stipulative, this split has some empirical justification: in English, for instance, only root Int triggers obligatory subject-auxiliary inversion. On the other hand, the proposed analysis avoids Rizzi's (2001) stipulation of two different landing sites for wh-phrases in root vs. embedded wh-questions.

The line of reasoning that we have been exploring implies that a focus taking clausal scope (i.e., in our terms, licensed by the peripheral FocP projection) should be universally incompatible with a wh-phrase in direct questions. A wh-operator can instead co-occur with a focusing operator that has sub-clausal scope, e.g. the focusing adverb *solo* 'only' in (26), which exploits the focal alternatives at the level of the predicate:

(26) Chi ha mangiato solo il primo?
who has eaten only the first-course
'Who ate only the first course?'

On the other hand, in Italian a narrowly focused constituent *in situ* that does not associate with an overt sub-clausal focus operator, like *solo* in (23), seems to automatically take clausal scope: whence the unacceptability of such *in situ* foci in direct wh-questions (cf. also (4) above). It may be the case that other languages are more flexible in this respect, allowing for a narrow focus *in situ* to take a more limited scope, so as not to generate a set of alternative questions: under this interpretation, a question like (23a) would in fact be possible. We leave this issue open for future research.

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4. CONCLUDING REMARKS

In this paper we have analysed the subject position in Italian direct questions introduced by a bare wh-element. Building on Rizzi (2001), we have provided experimental evidence in support of the distinction between *why*-operators and other bare wh-operators. The former do not trigger obligatory subject inversion, but rather, they license 'free' (IS-motivated) inversion in contexts where the subject is narrowly focused; the latter instead trigger syntactically motivated, and obligatory, subject inversion.

We have argued that the syntactic asymmetries between *why*-operators and other wh-operators, concerning their derivational history and their (in)compatibility with a fronted focus, can be justified on semantic grounds. *Why*-operators are externally merged in the left periphery because they must semantically combine with a complete proposition, and they license a lower FocP because the focal alternatives are used to constrain the contrast class of the *why*-question.

Other wh-phrases, on the contrary, move to the left periphery because they have to bind a variable within the sentence radical. Concerning the (in)compatibility with a narrow focus, we have argued that wh-phrases originating within the sentence radical are not inherently focal: there is a root/embedded asymmetry, which can be related to the Relevance requirement imposed by root (information-seeking) wh-questions, but not by indirect questions. Under this approach, wh-phrases always target a position in the left periphery agreeing for the [WH] feature in the scope of Int; in root questions, however, [WH] is necessarily bundled with the [focus] feature.

If this approach is on the right track, we can conclude that the structure of the left periphery of direct and indirect wh-questions and its impact on the phenomenology of subject inversion need not be stipulated in purely syntactic terms, but comply with the interface requirement that the syntactic structure be straightforwardly interpreted by compositional rules (cf. Cinque &Rizzi 2010).

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