Andrea Moro (andrea.moro@hsr.it)   **Preliminary version**

Vita-Salute San Raffaele University, Milan

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Clause structure folding and the "wh-movement in situ effect"[1]

Abstract: *Why can a coordinative head show up before a wh-phrase in situ in a certain variety of Italian? In this paper I will explore this rather neglected fact showing that it reveals an otherwise hidden structure. More specifically, I will suggest that this head does not directly merge with the wh-phrase it precedes, rather it takes a full clausal complement inducing remnant movement and stranding of the highest wh-phrase. This configuration yields the observed word order and explains many properties of these constructions by means of independent locality conditions. I will suggest that it is a strategy languages adopt to maintain some characteristic property of the left periphery and address some questions that the comparative perspective raises.*

The aim of this paper is to explore certain aspects of interrogative sentences in Italian, in particular the so-called "wh-movement in situ" constructions. By "wh-movement in situ constructions" I am referring here to the case where at least two distinct wh-phrases cooccur in a clausal structures and only one appears to be dislocated with respect to the position it would have in its declarative counterpart. [2] Formally, I will be concerned with cases which are standardly represented as follows:

(0.1) $[_{CP}$ wh-phrase C $[_{TP}$ … wh-phrase …$]]$

It is generally assumed that UG provides the possibility to check the wh-features of either wh-phrases in a different way: the wh-features of the phrase within the CP field

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[1] This paper expands an idea first presented in Moro 2007 and elaborated during my stay as a visiting scientist at MIT in the spring semester of 2008. I am very grateful to Gennaro Chierchia, Noam Chomsky, Michel De Graff, Danny Fox, Sabine Iatridou, Richard Kayne, Clemens Mayr, Andrew Nevins, David Pesetsky, Masha Polinsky, Omer Preminger, Norvin Richards, Jacopo Romoli, and those who attended a seminar I gave at Harvard University in April 2008 for many helpful observations. All the errors are obviously mine.

[2] UG allows three distinct types of strategies for multiple wh-questions: languages like Bulgarian and Polish where all wh-elements move to the left; languages like Japanese and Chinese where all wh-elements stay in situ; languages like Italian and English that combine these two opposite strategies and move only one wh-element (see Richards 1993 for a detailed and comprehensive analysis of multiple wh-movement; see also Boeck – Grohman 2003 for multiple wh-fronting and Cheng – Corver 2006 for an updated collection of works on this issue). In this paper I will only concentrate on this third class of languages.

are checked by a head endowed with wh-features in the left periphery; the ones of the phrase within the TP field, instead, are checked "in situ." The central proposal of this paper is to show that this representation is not correct: both wh-phrases undergo movement and wh-feature checking is performed in the same portion of the clause structure; the "in situ effect" is due to a movement operation that rearranges the phrases in the observed linear order.

This paper is organized in three sections: in the first one, I will explore the interaction of wh-movement with the presence of a coordinative head; in the second section, I will try to generalize the analysis given in the first section to a broader class of phenomena; finally, in the last section, I will address the comparative issue following the lines of reasoning elaborated in the first part.

I. CP-splitting and the wh-in situ effect: the role of *e*.

The following contrast shows that a causative adverbial like *per quale ragione* (for what reason) requires a coordinative head *e* (and) when it occurs in situ (1.1)a; the same coordinative head, on the other hand, is banned with the non interrogative counterpart of the same adverbial, namely *per quale ragione* (for what reason) in (1.1)b:

(1.1)a Mi chiedo quando sono partiti *(e) per quale ragione

      (I wonder when they left and for what reason)

   b Mi chiedo quando sono partiti (*e) per questa ragione

      (I wonder when they left and for this reason)

The coordinative head *e* (and) does not only occur with the expression *per quale ragione* (for what reason) but its distribution is not totally free with interrogative adverbials in postverbal position. For example, paralleling the contrast in (1.1), the following minimal pairs can be construed, using four different single word wh-adverbials, namely *perché* (why) *come* (how), *quando* (when) and *dove* (where):

(1.2) a Mi chiedo quando sono partiti *(e) perché

      (I wonder when they left and why)

b * Mi chiedo perché sono partiti (e) quando

  (I wonder why they arrived and when)

c Mi chiedo come sono partiti *(e) perché

  (I wonder how they left and why)

d* Mi chiedo perché sono partiti (e) come

  (I wonder why they left and how)

e Mi chiedo dove sono andati *(e) perché

  (I wonder how they gone and why)

f* Mi chiedo perché sono andati (e) dove

  (I wonder why they gone and how)

These contrasts indicate that *perché* (why) tends to occur in a postverbal position: a rather unexpected fact, considering that it is generally assumed that it is generated in a high portion of the left periphery, in fact as the highest wh-element. This was proved by Rizzi (1996) relying on contrasts of the following kind comparing *perché* (why) with other interrogative adverbs like *come* (how):

(1.3)a Perché Gianni è partito?

      (why Gianni has left)

   b* Come Gianni è partito?

      (How Gianni has left)[3]

   c Come è partito Gianni?

      (how has left Gianni)

Notice that this contrast cannot be due to any phonological property of *perché* (why) as opposed to *come* (why), because when *come* (how) is followed by *mai* (ever) the

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[3] The following contrast found in the Italian variety spoken in Fano (Marche, Italy) provides a further contrast to support the structural difference between *perché* (why) and other interrogative adverbs like for example *come* (how):
(i) Sei andato là, perché/*come?
   (you are gone there why/how; "you have gone there, haven't you?")
Only with *perché* (why) can the lower portion of the clause be moved to a higher spec-position. For a critical reflection on the order of wh-elements see also Cinque – Krapova (to appear).

complex *come mai* is interpreted as "why" and the subject can stay in situ as in the case with *perché* (why): *come mai Gianni è partito?* (how ever Gianni is left; "why has Gianni left) paralleling (1.3)a.

 On the other hand, when two interrogative adverbials other then *perché* (why) cooccur in the same sentence - such as *quando* (when) and *come* (how) - the relative order of the two interrogative adverbials is free, although the presence of the coordinative head *e* (and) is still obligatory:

(1.4)a Mi chiedo quando sono partiti *(e) come

     (I wonder when they left and why)

   b Mi chiedo come sono partiti *(e) quando

     (I wonder why they left and when)

These contrasts in (1.1)-(1.4) raise an immediate question as to why the coordinative head shows up and to what its structural position is. The most conservative hypothesis is of course to admit that this head is merged with the wh-phrase it precedes but if this were so it would be very hard to explain both the contrasts in (1.2) and the very presence of the coordinative head itself: what could the interrogative adverbial be coordinated with? Why is one order preferred? Another possibility would be to reproduce a sluicing-like analysis following the seminal work elaborated by Merchant (see Merchant 2001, 2005 and references cited there) admitting that the coordinative head is merged with a clausal constituent which then undergoes deletion of everything but the topmost wh-phrase. Unfortunately, this solution would be unable to explain the constrasts in (1.2), since there is no principled reason not to generate the structures (1.5)a-b and then delete the portion of the clause which is lower then the wh-phrase yielding structures like (1.5)c (cf. (1.2.)b):

(1.5)a Mi chiedo [quando sono partiti] e [perché sono partiti]

     (I wonder when they left and why they left)

   b Mi chiedo [perché sono partiti] e [quando sono partiti]

     (I wonder why they left and when they left)

   c*Mi chiedo [perché sono partiti] e [quando ~~sono partiti~~]

     (I wonder why they left and when they left)

Moreover, a sluicing-like analysis seems to be not appropriate in these cases for independent facts. Consider for example the following constrasts:

(1.6)a Mi chiedo [com'è che si è comportato] e [quand'è che si è comportato così]

   (I wonder how is that he behaved and when is that he behaved so)

   b * Mi chiedo [com'è che si è comportato] e [quand'è __]

   (I wonder how is that he behaved and when is)

   c So che Gianni si comportato male in quella data ma non so [quand'è __]

   (I know that Gianni behaved badly in that date but I don't know when is)

In Italian, especially in the Northern varieties spoken in Lombardy, wh-movement is normally manifested via a pseudocleft construction (for pseudoclefts, see Den Dikken (2005) and references cited there). So, for example, a simple sentence like *chi parla?* (who speaks) would be rather rendered as *chi è che parla?* (who is that speaks; "who is it that speaks?"). Now, the sentence is (1.6)a is a genuine case of coordination of two full clauses. Crucially, however, deletion of the lower portion of the clausal constituent in the second member of this coordinate structure yields a sharply ungrammatical sentence ((1.6)b). Notice that nothing prohibits the occurrence of a wh-phrase in a pseudocleft construction in case of a genuine sluicing construction such as (1.6.)c.

   I would like to suggest an alternative proposal that shares with the sluicing analysis the idea that the coordinative head is merged with a clausal constituent rather then the interrogative phrase it precedes but that does not involve deletion. This proposal can be formally captured as follows:

(1.7)a … [come C [pro sono arrivati t]]

   (how pro are arrived)

   b … [perché C [come C [pro sono arrivati t]]]

   (why how pro are arrived)

   c … [_ e [perché C [come C [pro sono arrivati t]]]]

   (and why how pro are arrived)

   d … [[come C [pro sono arrivati t]] e$_G$ [perché C t]]

   (how pro are arrived and why)

The derivation follows these steps. First, *come* (how) is raised from the postverbal position to the specifier of a suitable head in the Comp-field (indicated here with a series of C heads) as in (1.7)a; *perché* (why) is generated in a high portion of the Comp-field as in ((1.7)b); third, the coordinative head is merged to this complex clausal structure as in (1.7)c; fourth, the lower portion of the clausal constituent (a fragment of a complex CP structure) is raised to the spec of the coordinative head yielding the observed word order where the coordinative head precedes the highest wh-element as in (1.7)d. In other words, I would like to suggest that there is no wh-movement in situ in these cases: the appearance of a wh-phrase in its based generated postverbal position is just an effect due to a complex mechanism that we could label "CP-splitting".[4]

This analysis provides independent empirical advantages that I will illustrate here. Consider the following sentences:

(1.8)a [$_{DP}$ chi è arrivato per questa ragione] è stupido

(who has arrived for this reason is fool)

   b [$_{CP}$ chi è arrivato per questa ragione] è ovvio

(who has arrived for this reason is obvious)

The free relative occuring in subject position can be the subject of predication of semantically different types of predicates: a predicate like *stupido* (fool) that takes an individual as a subject ((1.8)a) and a predicate as *ovvio* (obvious) that rather takes a proposition as a subject ((1.8)b). This could be captured by labelling the two preverbal constituents in a different way, along the lines suggested by Donati (2006), DP and CP respectively, assuming that in the former case the wh-DP is projecting whereas the CP is in the latter. The crucial point here is that if the causative adverbial *per questa ragione* (for this reason) is turned into an interrogative adverbial *per quale*

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[4] I will not considere here the alternative to raise *perché* (why) in (1.7)c as opposed to the CP yielding *perché e t come sono arrivati* (why and how they arrived). In fact, the properties of the coordinative head require the two elements to be coordinated to belong to the same category, here a CP ruling out sentences like * *mi chiedo perché e chi telefona* (I wonder why and who phones; we will come back to the properties of the coordinative head in the paper. The fact that the sentence *perché e come sono arrivati* (why and how they arrived) is grammatical is rather due to the fact that *perché* (why) and *come* (how) can indeed be coordinated, paralleling the case two arguments (cf. *mi chiedo chi e cosa adora*; who and what s/he adores); we will also consider this specific case in the next sections of the paper.

ragione (for what reason) obligatorily involving the coordinative head, the following sharp contrast is yielded:

(1.9)a *[_{CP} chi è arrivato e per quale ragione] è stupido

      (who has arrived and for what reason is fool)

    b [_{CP} chi è arrivato e per quale ragione] è ovvio

      (who has expressed and what is obvious)

If the causative adverbial where in situ, this contrast would go uncaptured. Instead, if we adopt the CP-splitting analysis this contrast can be explained straightforwardly. The occurrence of the conjunction and (remnant) movement of a clausal constituent are not compatible with an individual reading of the free relative (and the associated DP labelling): the only reasonable label for *chi è arrivato e per quale ragione* (who has arrived and for what reason) can be a CP, resulting in the incompatibility of a non propositional predicate like *fool* in (1.9)a.

    The following sentence also provides independente piece of evidence for the CP-splitting analysis:

(1.10) Mi chiedo [quando negheranno che i ragazzi sono arrivati e perché]

      (I wonder when will deny that the boys are come and why)

      "I wonder when they will deny that the boys have come and why"

Potentially, *perché* (why) can be interpreted both as referring to the deny or to the arrival. In fact, the only available interpretation here is the one where *perché* (why) refers to the denial. The fact that a verb like *negare* (deny) can restrict the interpretation of a causative interrogative adverbial is not new. Rizzi's (1990) theory of relativized minimality, for example, accounted for the following contrasts:

(1.11)a Mi chiedo perché dicono [t che i ragazzi sono arrivati]

      (I wonder why they say that the boys have arrived)

    b*Mi chiedo perché non dicono [t che i ragazzi sono arrivati]

      (I wonder why they say that the boys have arrived)

    c*Mi chiedo perché negano [t che i ragazzi sono arrivati]

      (I wonder why they deny that the boys have arrived)

A negative operator (whether it is independently realized as *non* (not) or inherently expressed in a verb like *negare* (deny)) is able to block the lower reading of *perché* (why) intervening between the antecedent (*perché*; why) and its trace. More explicitly, the sentence in (1.11)a is ambiguous: it can either be a question on the reason of the arrival or of the affirmation; the one in (1.11)b-c can only be interpreted as questions on the affirmation or the denial. This contrast, however, cannot be immediately exploited to explain (1.10): the verb *negare* (deny) is in fact higher then *arrivare* (arrive) and thus should not interfere with the antecedent-trace relation. On the other hand, if *negare* (deny) would stand between *perché* (why) and *arrivare* (arrive) at some point in the derivation this would explain the selected reading for (1.10). This configuration where *negare* (deny) stands between *perché* (why) and *arrivare* (arrive) is immediately available, on the other hand, if we adopt the CP-splitting analysis, as in the following representation:

(1.12) Mi chiedo [[quando negheranno [che [i ragazzi sono arrivati t]] e perché t]

(I wonder when they will deny that the boys have come and why)

Before the whole constituent *quando negheranno che i ragazzi sono arrivati* (when will deny that the boys are arrived) is raised to the spec position of the coordinative head, *negare* (deny) would stand in between *perché* (why) and *arrivare* (arrive) blocking the unwanted reading: in other words, (1.10) (and its associated structure in (1.12)) can only be a question on the timing and the reason of the denial because *perché* (why) cannot be referred to *arrivare* (arrive) but only to *negare* (deny).[5]

I have so far called the element e cooccuring in these constructions "a coordinative head" and glossed it by means of the English counterpart to Italian conjucton *e*, i.e. *and*. This analysis raise least two subquestions: one is whether this is an instance of a real conjunction - the same one occurring in all other cases of

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[5] This conclusion can be indirectly supported by analyzing the occurrence of the negative form of the coordinative head *e* (and) , namely *né* (nor). This element, of course, can occur only if the first member of the coordination contains a negative word (for example, *non* (not). The following contrast, thus, reinforces the hypothesis that *perché* (why) cannot be in situ:
(i)a Gianni non sa quando diranno che hanno telefonato né perché
    (Gianni not knows when pro say that have phoned and why)
  b* Gianni sa quando non diranno che hanno telefonato né perché
    (Gianni knows when pro not say that have phoned and why)

coordination; the second is, of course, why does a conjunction need to show up in these cases of apparent wh-in situ. I will address the second issue in the last section of this paper and concentrate on the first one here.

The coordinative head *e* that shows up in these constructions appears to share an important property with other cases of conjunction, namely the fact that when more then one element is coordinated only one occurrence of *e* is overtly realized – in the unmarked case - and, crucially, the one coordinating the last two elements. So for example, in Italian (as in many other languages) we do have:

(1.14)a Dante baciò Beatrice e Virgilio

(Dante kissed Beatrice and Virgil)

   b Dante baciò Beatrice (?e) Virgilio e Francesca

(Dante kissed Beatrice, Virgilio and Francesca)

The identical pattern is shown when coordinating adverbials and, what is more important here, when coordinating interrogative adverbials:

(1.15)a Mi chiedo come sono arrivati (?e) quando *(e) perché

(I wonder how they arrived when and why)

   b Mi chiedo chi è arrivato in auto (?e) ieri *(e) per questa ragione

(I wonder who has arrived in auto yesterday and for this reason)

Another important property of the coordinative head *e* paralleling the properties of the conjuction *e* is the very well-know fact that the two elements it coordinates must belong to the same lexical category (cf. *Gianni legge due libri e una rivista/*in cucina*; Gianni reads two books and a magazine/in the kitchen).

The fact that the *e* occurring with interrogative adverbs shares this property with the conjunction *e* leads to some other interesting contrasts. Consider for example the following sentence:

(1.16) Mi chiedo [cosa e chi adori]

(I wonder what and who adores)

This sentence has two potential meanings (related to the fact that the subject in Italian can be expressed by pro): "I wonder who adores what" or "I wonder what and who s/he adores", that is *chi* (who) can either be an object coordinated with *cosa* (what) – *pro* being the subject of *adori* (adores) as in (1.17)a- or it can be a subject - *cosa* (what) being coordinated with the CP *chi adori* (who adores) as in (1.17)b:

(1.17)a Mi chiedo [cosa e chi] pro adori t

      (I wonder what and who he adored)

   b*Mi chiedo [cosa e [chi t adori t]]

      (I wonder what and who adored)

In fact, only (1.17)a is a proper interpretation of (1.6); (1.17)b and the corresponding interpretation, is ruled out by the requirement that *e* coordinates two same lexical categories: two DPs in the first case, but a DP and a CP in the second one. Moreover, notice that this analysis taking *[cosa e chi]* (what and who) as a coordination of two noun phrases predicts that the order can be inverted, a prediction which is fully borne out: *mi chiedo chi e cosa adori* (I wonder who and what pro adores; "I wonder who and what he adores"). In conclusion, it seems that the natural choice is to take this *e* just as an occurrence of the same *e* that is used to coordinate phrases in non interrogative constructions.

     This analysis raises a legitimate question concerning the impact of a conjunction on the semantic interpretation of these constructions. Recall that we are assuming that *e* takes a clausal constituent and that the first conjunct is a copy of a subpart of the clausal constituent internally merged to the spec position of *e*.[6] In other words, the logical form of a sentence like *mi chiedo quando pro arriva e perché* (I wonder when pro arrives and why) should in first approximation be similar to one like *mi chiedo quando pro arriva e perché pro arriva* (I wonder when s/he arrives and why s/he arrives). Now consider a simple case of conjunction, combining two propositions p and q to yield are a [p & q]:

(1.18) I know that [[John left] and [Mary arrived]]

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[6] The copy theory of movement raises *per se* interesting questions concerning the interpretation of copies independently of the interaction with coordination: see Fox (2002) and references cited there.

The contribution to the truth value of the whole sentence by the two conjoined propositions is independent, of course, in the sense that the truth conditions of *John left* are indepentend of the truth conditions of *Mary arrived*. The meaning of the sentences involving CP-splitting cannot be derived in a similar fashion: a sentence like *mi chiedo quando pro arriva e perché* (I wonder when pro arrives and why) is not a question asking the time when someone arrives and the reason why someonelse arrives. Rather it is the question concerning one single individual, it's the time of the arrival of this individual and the time of the departure of the *same* individual. The hypothesis that *e* (and) is a conjunction seems prima facie to be problematic here: why should the subjects of two coordinated sentences have the same reference? To solve this potential problem (and explain how movement – and the deleted copy – contributes to the interpretation) I will provide some further data.

A closer inspection to the interpretation of coordinated questions provides us with a quite suprizing piece of evidence to support the analysis suggested here. Consider for example the following sentences:

(1.19)a Voglio sapere [[chi t arriva] e [chi t parte]]

 (I want to know who arrives and who leaves)

  b Voglio sapere [[chi t arriva] e [come pro si comporta t]]

 (I want to know who arrives and how he behaves; obligatory binding of *pro*)

In the first sentence the subjects can (in fact, for most speakers, must) be referring to independent individuals, that is (1.19)a is a question about the arrival of someone and the departure of someone else. In the second one ((1.9)b), instead, *pro* behaves like an anaphor, that is *pro* has to have the same reference as the subject of the first sentence.

Whatever the explanation for this sharp and unexpected contrast is (and I am not aware of any), this facts provides us with an independent piece of evidence to support the theory proposed here since it shows that the interpretation of two coordinated questions is not independent. In other words, it shows that the interpretation of *mi chiedo quando pro arriva e perché* (I wonder when he arrives and why) as *mi chiedo quando arriva e perché arriva* (I wonder when pro arrives and why pro arrives) is consistent with the idea that *e* is a genuine conjunction because the two subjects must be interpreted as referring to the same individual as a consequence of an independent property of coordination of interrogative questions.

II. Generalized CP-splitting

In the second part of this paper I would like to suggest that the analysis given for interrogative adverbials "in situ" can be extended to all other cases involving wh-movement. More specifically, I would like to suggest that all instances of wh-movement in situ in Italian are just the effect of CP-splitting or, equivalently, that there is no wh-movement in situ in Italian.

There is a first problem here. The distribution of e is not as sharp as in the case of adverbials. A simple collection of grammatical judgment would show that in Italian there are at least three subvarieties when it comes to wh-movement in situ with argumental phrases: those who do not accept wh-movement in situ at all, those who do accept it without the occurrence of the coordinative head e and those who do accept it with both a coordinative head and without it. However, all the native speakers of Italian that I tested have given consistent judgments concerning the distribution of e. The hypothesis that I will pursue here, then, is that whether or not it is overtly realized, an overt coordinative head is involved in apparent wh-in situ constructions in Italian, paralleling the cases illustrated in the first section. I will show that this proposal provides us with the explanation of some crucial facts characterizing these constructions and new questions. As for the reason why e is obligatorily overt for adverbials I have no explanation to suggest.

Let us start with a case involving subject and object wh-movement. From an abstract point of view, the relevant part of the derivation is the following:

(2.1)a   … C [wh$_2$ C [wh$_1$ C [t$_1$ t$_2$]]

   b   … C [[wh$_1$ C [t$_1$ t$_2$]] [(e)] [wh$_2$ C t]]

Both wh-phrases are moved to the left periphery to the proper functional head: the subject (wh$_1$) and the object (wh$_2$) are dislocated to the left periphery in the suitable spec position (see Richards 2006 for a critical and detailed account of this proposal in a comparative perspective). Then the lower portion of the clausal constituent is moved to the spec position of the coordinative head, stranding the highest wh-phrase yielding the "wh-in situ effect".

As indicated in the abstract representation in (2.1) the derivation involves nested rather then crossing movements, a restriction which is independently witnessed

by contrast like the following along the line suggested by the seminal work of Pesetsky (1980) and much subsequent work:

(2.2)a ? [Cosa$_2$ C ti chiedi [chi$_1$ C persuadere [t$_1$ a comprare t$_2$]]]

   (What are you wondering who to persuade to buy)

   b * [Chi$_1$ C ti chiedi [cosa$_2$ C persuadere [t$_1$ a comprare t$_2$]]]

   (who do you wonder what to persuade to buy)

Thus, one of the immediate predictions that the theory proposed here makes is that only wh-objects can appear after the verb, as opposed to subjects and – for those who do accept the occurrence of an overt coordinative head – only with objects *e* can occur. This is due to the fact that the highest wh-phrase before remnant movement takes place must be the object, due to the nesting condition on chain formation. This can be illustrated by means of several contrasts involving different types of argumental wh-phrases with the subject. Let us start with a subject/object asymmetry:

(2.3)a   Mi chiedo chi ha espresso (e) cosa

   (I wonder who has expressed and what)

   b *   Mi chiedo cosa ha espresso (e) chi

   (I wonder what has expressed and who)

   c   Gianni ha espresso *(un'opinione)

   (Gianni has expressed an opinion)

In this example an obligatory transitive verb like *esprimere* (express) allows the wh-object to appear postverbally, while the subject is banned from this position. The fact that D-linked expressions are used here is irrelevant, witness the following contrast where non D-linked expression occurr:

(2.4.)a Mi chiedo quale uomo ha espresso (e) quale opinione

   (I wonder which man has expressed and which opinion)

   b* Mi chiedo quale opinione ha espresso (e) quale uomo

   (I wonder which opinion has expressed and which man)

Notice that the very fact that the subject cannot appear in a postverbal position is particularly surprizing in a *pro*-drop language like Italian. In fact, if both (2.5)a-b are acceptable, the interrogative counterpart of (2.5)b is not, leaving (2.5.)d with wh-movement to the left periphery as the only option, even if the complementizer *se* (if) is endowed with wh-features (cf. *mi chiedo se pro è arrivato qualcuno*; I wonder if pro is arrived someone):

(2.5)a   Mi chiedo se Gianni è arrivato
            (I wonder if Gianni has arrived)
      b   Mi chiedo se pro è arrivato Gianni
            (I wonder if has arrived Gianni)
      c *Mi chiedo (se) pro è arrivato chi
            (I wonder has arrived who)
      d   Mi chiedo chi è arrivato
            (I wonder who has arrived)

Similar constrasts can be detected by testing the occurrence of a wh-subject with a predicative noun phrase such as *cosa* (what) with a verb like *diventare* (become) which requires an obligatory predicative element:

(2.6)a   Mi chiedo chi è diventato (e) cosa
            (I wonder who has become and what)
      b * Mi chiedo cosa è diventato (e) chi
            (I wonder what has become and who)
      c   Gianni è diventato *(un professore)
            (Gianni has become a professor)

Another contrast is also provided by testing subject wh-movement with wh-movement of an interrogative adverb with a verb such as *comportarsi* (behave):

(2.7)a   Mi chiedo chi si è comportato (e) come
            (I wonder who has behaved and how)
      b * Mi chiedo come si è comportato (e) chi
            (I wonder how has behaved and who)

c   Gianni si è comportato *(bene)

(Gianni has behaved well)

All these cases, mutatis mutandis, can be explained by the same derivation (2.1): both the wh-subject and the other wh-phrase move to the left periphery creating a nested dependency, then the lower clausal constituent undergoes movement to the spec position of the (abstract) coordinative head stranding the element which has been raised to the highest position yielding the wh-in situ "effect".

Interestingly, similar contrasts can be construed whenever wh-movement builds up an ordered fixed hiearchy in the left periphery. So, for example, extraction of a wh-element out of an object noun phrase and the occurrence of a wh-subject yields the following contrast:

(2.8)a   Mi chiedo chi abbia acquistato alcune foto (e) di chi

(I wonder who has purchased some photos and of who)

   b*   Mi chiedo di chi abbia acquistato alcune foto (e) chi

(I wonder of who has purchased some photos and who)

If the object and part of the object are wh-moved, instead, we have:

(2.9)a   Mi chiedo quali foto abbia acquistato (e) di chi

(I wonder which photos he has purchased and of who)

   d * Mi chiedo di chi abbia acquistato (e) quali foto

(I wonder of whom he has purchased and which photos)

The latter example, of course, can be derived only if one assumes that the object wh-movement takes place before extraction from the object in the following fashion:

(2.10)a … [[quali foto di chi] C …t …

   b …[[di chi] C [[quali foto t] C … t …

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Otherwise, if extraction from the object could take place before, the contrast in (2.9) should be reversed.[7] Again, we could take it to be the consequence of the requirement of wh-paths not to intersect but rather to procede by nested dependencies.

If three wh-elements are all cooccurring in the same sentence, we do get the following contrast where the relative order of the wh-phrases pertaining to the object is reversed with respect to (2.10)b (excluding the case with postverbal wh-subject which are ungrammatical):

(2.11)a Mi chiedo chi abbia acquistato quali foto (e) di chi

     (I wonder who has purchased which fotos and of whom)

  b* Mi chiedo chi abbia acquistato di chi (e) quali foto

     (I wonder who has purchased of whom and which photos)

The contrast in (2.11)a-b is consistent (and in fact predicted) by the theory suggested here. The derivation procedes as follows:

(2.12)a … [[quali foto di chi] C [chi C t abbia acquistato t]]]

     (which photoes of whom who has purchased)

  b … [[di chi] C [[quali foto t] C [chi C t abbia acquistato t]]]

     (of whom which photos who has purchased)

  c … [[quali foto t] C [chi C t abbia acquistato t] [e] [di chi t …

     (which photos who has purchased and of whom)

  d … [chi C abbia acquistato] [e] [[quali foto t] C t [e] [di chi

     (who has purchased which photos and of whom)

First, the subject and the object are wh-moved to the left periphery (2.12)a; then, *di chi* (of whom) is extracted from the object (2.12)b; as a last step, the inner clausal constituent is moved to the spec of a second coordinative head (exactly as in the simple case involving the subject and the object only).

Another case involving three wh-elements is given by verbs like *consegnare* (deliver) that takes three arguments as in *Gianni consegnò un libro a Maria* (Gianni

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[7] This example shows that there is no freezing effect on the first wh-phrase (Clemens Mayr, personal communication). If this effect is related to phases, though, one could argue that it is the highest phasal head that counts.

delivered a book to Mary) or *Gianni consegnò a Maria un libro* (Gianni delivered to Mary a book). In this case, the following pattern is observed: the subject can never be postverbal, as expected ((2.13)a-d); the relative ordering of the other two wh-arguments instead (either when they coocurr with a wh-subject or when they do not) doesn't seem to have any ungrammatical ordering, as a consequence of the fact that for most speakers there is no preferential ordering in the affirmative case as well, ((2.13)e-h), with a slight preference for stranding of the PP argument:

(2.13)a Mi chiedo chi abbia consegnato a Gianni (e) cosa

(I wonder who has delivered to Gianni and what)

  b* Mi chiedo cosa abbia consegnato a Gianni (e) chi

(I wonder what has delivered to Gianni and who)

 c Mi chiedo chi abbia consegnato un libro (e) a chi

(I wonder who has delivered a book and to whom)

 d*Mi chiedo a chi abbia consegnato un libro (e) chi

(I wonder to whom has delivered a book who)

 e Mi chiedo chi abbia consegnato cosa (e) a chi

(I wonder who has delivered what and to whom)

 f Mi chiedo chi abbia consegnato a chi (e) cosa

(I wonder who has delivered to whom and what)

 g Mi chiedo cosa pro abbia consegnato (e) a chi

(I wonder what pro has delivered and to whom)

 h? Mi chiedo a chi pro abbia consegnato (e) cosa

(I wonder to whom pro has delivered and what)

Summarizing, in this section I have extended the analysis adopted for interrogative adverbials in situ to interrogative argumental phrases, including direct and indirect objects and subextraction from (interrogative) noun phrases, suggesting that those wh-phrases that appear to be "in situ" are rather stranded after having been wh-moved. The "wh- in situ effect" is also in this case due to remnant movement of a subpart of the clausal constituent to the specifier of a coordinative head which can be silent or overtly realized as *e* for some speaker.

In the next section I will address two conceptually related issues synthetically. First, I will suggest an explanation for the reason why a coordinative head must show up when two wh-phrases cooccurr in the same sentence; then, I will attempt to cast the kind of expectations this theory leads to on the comparative side.

III. Clause structure folding and the structure of the left periphery: a case study in comparative syntax.

The analysis illustrated in the previous sections for Italian multiple wh-phrases – arguing that there is no wh-movement in situ in this language - is based on the idea that when more then one wh-phrase occurs in a sentence a coordinative head intervenes, inducing CP-splitting and providing a landing site for a clausal constituent. Assuming that this analysis as to *how* lexical items are composed proves correct, still the natural question remains as to *why* UG requires coordination. There are at least two conceptually independent solutions that I would like to highlight and compare here which both raise interesting questions on the comparative grounds that I will only be able to partially address here. For the sake of clarity, let me first recall the core part of the theory suggested here. Whenever more then one wh-phrase coocurr in a sentence, a(n abstract) coordinative head is inserted inducing CP-splitting generating the following derivational steps:

(3.1)a … [$_{TP}$ wh-phrase$_1$ … wh-phrase$_2$]

   b … [wh-phrase$_2$ C [wh-phrase$_1$ C [$_{TP}$ …t … t$_2$ …]]]

   c … [_ [(e)] [wh-phrase$_2$ C [wh-phrase$_1$ C [$_{TP}$ …t … t$_2$ …]]]]

   d … [[wh-phrase$_1$ C [$_{TP}$ …t … t …]] [(e)] [wh-phrase$_2$ C t]]]

The first possibility is to assume that the C head either wh-phrase moves to in (3.1)b is a defective one in Italian, in the sense that it is not sufficient to check the wh-features: the head which can check the wh-features is rather a higher head contained in the CP-field that must enter into a Probe Goal Relation (PGR) with the (wh-phrases in the) C head either wh-phrase moves to. Thus, abstracting away from irrelevant details, the reason why (3.1)b is not sufficient for the derivation to converge is that a PGR cannot be established in a configuration like the following:

(3.2.) * … C_{+wh} …C_{-wh} …C_{-wh} …

Why is it so? Feature checking is basically a criterial phenomenon of grammar: for a certain phrase containing a feature X (a Goal) there must be a head containing the same feature X (a Probe) in a local configuration. So, for example, if a noun phrase endowed with an Accusative case feature does not enter into a local relation with a Probe head V endowed with the same feature the derivation results in an ungrammatical structure. The lack of a probe head is not the only case of failure in a PGR. Another prototypical case is the presence of two Goals with only one head. Consider for example a simple case like *John met [her him]. In an abstract way, the offending configuration could be represented as follows:

(3.3.) * … V_{+Acc} … DP_{+Acc} … DP_{+Acc} …

It is reasonable to assume that this derivation crashes because the criterial nature of PGR is not met.[8] One way to rescue this structure is to insert a coordinative head *and* providing the structure with the proper configuration yielding *John met [her [and him]]*. Why does the coordinative head *and* rescue the structure here? The role of the coordinative head *and* - when it comes to PGR - is just to become itself the non-ambiguous target of the Probe and then spread the features to the two phrases it is merged with. Notice that one must also assume that the coordinative head must not necessarily be overtly expressed to account for those cases of multiple conjunction as in *John met [her [(and) [him [and them]]]]* which contains the substring *John met her him*. In other words, the coordinative head *and* creates a "parallel structure", so to speak, where two homogeneous elements can undergo the PGR by the mediation of a functional head whose role is to become the unambiguous target of the Probe:

(3.4)   … V_{+Acc} … [DP [and_{+Acc} DP]] …

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[8] Another way to look at it is to consider a fragment of (3.3) as too symmetrical in the sense of Moro (2000), (2008). That is, (3.3) is ruled out because it contains a structure of the kind H [XP YP] which is unstable for the computation sincw both X and Y are potential Goals for the same probe H, which makes the process of labelling impossible.

The intuition that I would like to address here is that the occurrence of a coordinative head with multiple wh-phrases – whether it is overt or phonetically null – may be regarded as analogous to the example illustrated here with Case assignment, namely it is required to let the PGR be established via parallel probing. Limiting the representation to heads, we get the following abstract schema:

(3.5) … C_{+wh} …[… C [[(e)] $_{-wh}$ [… C…

Synthetically, the CP-splitting would be a way to allow a PGR avoiding ambiguous relations.

Along with this explanation based on the PGR mechanism, however, a second one can be proposed which is based on conceptually and empirically different considerations. This further explanation relies on the fact that in certain languges, including Italian, the left periphery of the clause structure may contain only one position for wh-elements. Assuming, for example, Rizzi's (1997) seminal analysis of the left periphery, we get the following abstract representation:[9]

(3.6) … Force > Top > <u>Foc</u> > Top > Fin > TP

Crucially, the head which is endowed with wh-features is Foc (underlined here) which, unlike Top, cannot occurr more than once in the structure, i.e.:

(3.7) * … Force > Top > <u>Foc > Foc</u> >Top > Fin > TP

This makes (3.1)b an impossible structure for Italian without further assumptions: the sequence of two heads endowed with wh-features contained in it is simply not an option in this language. The intuition that I would like to pursue here is that CP-splitting and coordination is a way, so to speak, to "fold" the clause structure that contains two wh-phrases in a way that makes it compatible with the architectural specification in (3.6):

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[9] This is orthogonal with respect to the idea that there may be focal positions in other portions of the clause structure lower than the left periphery: see Belletti (1999) and Longobardi (2000); as for the existence of further clausal heads in Italian such as those pertaining toVocative see Moro (2003).

(3.8) … Force > [Wh C [[(e)] $_{+Foc}$ [Wh C …

Coordination then is nothing but a way to make the structure meet the uniqueness of Foc head in the left periphery of a clause structure. The role of the coordinative head here is to "absorb" the wh-features of the two Foc heads in whose spec-position either wh-phrase has been moved by providing the left periphery with a proper structure to allow folding.[10]

Notice that the hypothesis that the functional head that license wh-phrases in Italian is unique is not only based on the fact that two wh-phrases cannot occurr in the left periphery. In fact, it is also indirectly supported by sentences like the following first observed by Rizzi (1997):

(3.9) *? Mi domando [a chi Foc [QUESTO Foc [abbiano detto (non qualcos'altro)]]]
        (I wonder to whom THIS they have said (not something else))

The ungrammaticality of this example shows both wh-phrases (like *a chi*; to whom) and focus phrases (like *QUESTO*; THIS) compete for the same functional head of the Comp-field, or equivalently that there is only one such head.

Of course, this way of rescuing the sentence by folding the clause structure is not unrestricted, in particular it must meet the morphological restrictions related to the coordinative head. For example, as we saw in section 1 of this paper (see in particular the comment to the example in (1.16)). The category of the two elements that the coordinative head is merged with must be homogeneous. This is what makes CP-splitting the only solution to rescue the structure: it is the only possibility for the coordinative head to have two same categories as specifier and complement, namely two CPs. Moreover, this also explains why the same strategy could not rescue a sentence like (3.9): since the Foc-phrase does not contain the same set of morphological features as a wh-phrase, coordination is not allowed.

Both explanations - the one based on the criterial nature of the PGR and the one based on the uniqueness of Foc heads in the left periphery - seem to me to be

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[10] A natural question arises here as to why *e* (and), rather than say *o* (or), is exploited in this operation of clause structure folding (cf. **mi chiedo chi arriva o perché*; I wonder who arrives or why). I do not have clear answers at the moment, although the ungrammaticality of *o* (or) in this sentence is a reflex of a much broader incompatibility of *o* (or) to occurr in interrogative sentence coordination, witness cases like **mi chiedo chi arriva o perché arriva* (I wonder who arrives or why he arrives).

plausible, but the latter has the advantage of not requiring any further assumption on the deficiency of C heads that can host wh-phrases or equivalently assume a higher head as a Probe for the lower Goals. For this reason, the latter solution seems to me to be preferable to the former one.

Obviously, in this explanation there is a language specific assumption that plays a role, namely that there is only one Foc head in the left periphery. If this is true for languages like Italian, and many others, it is also true that things may differ in other languages, and in fact I do not see any principled reason why this assumption should be universal. In languages like Bulgarian, Romanian, Serbo-Croatian and Polish, for example, all wh-words are free to move to the left periphery in the spec position of C heads endowed with wh-features and stay there without further modifications of the structure (these examples, taken from Boskovic 1995 are cited in the seminal work of Richards 1993 which constitute the guiding reference for the discussion developed here; for wh-fronting see also Boeckx 2006 and references cited there; see also Cheng – Corver 2006 for an updated collection of works on wh-movement and Cinque – Krapova (to appear) for a detailed analysis of the order of wh-phrases in multiple fronting in Bulgarian):[11]

(3.10)   [kogo C [kakvo C e pital Ivan]]?
        (whom what aux asked Ivan)
        "Who did Ivan aske what?"

Thus, one of the empirical advantages of the proposal suggested here is that it predicts variability across languages as to whether the presence of multiple wh-phrases in the same clausal structure forces clause structure folding. More explicitly, if the inventory of clausal heads in the left periphery of a given language is richer than in Italian then the complex phenomena of clause structure folding we have observed in the first sections of this paper should not exist in that language.

In a much broader perspective, however, the empirical advantage on comparative grounds of this theory may be less trivial. If this analysis proves tenable, in fact, it would allow a simplification of the taxonomy of languages as far as multiple

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[11] Coordination can of course be exploited in languages without involving clause structure folding. For an interesting analysis of the occurrence of conjunction in Russian – potentially extendible to other Slavic languages such as Bulgarian see Chaves – Paperno (2007) (David Pesetsky, personal communication).

questions are concerned. As anticipated in footnote 2, it is standardly assumed that UG allows three distinct types of strategies for multiple wh-questions: languages like Bulgarian and Polish where all wh-elements move to the left; languages like Japanese and Chinese where all wh-elements stay in situ; languages like Italian and English that combine these two opposite strategies and move only one wh-element. If the clause structure folding analysis proves to be correct for the whole class of languages Italian belongs to, then this taxonomy would be reduced to two distinct families: those languages where all wh-phrases move to the left periphery (modulo the language specific restrictions on the number of Foc heads) and those where no wh-phrase moves at all. Thus, there would exist no mixed languages. Whether or not this simplification is tenable (and the taxonomy further simplified) can only be left for future research.

Summarizing, in this paper I have suggested that there is no such a thing as a wh-movement in situ in Italian. Rather, all wh-elements move to the left periphery while the resulting word order is due to a rearrangement of the structure, as supported by the occurrence of a coordinative head and CP-splitting. Finally, I have argued that this case of clause structure folding is due to a language specific restriction on the architecture of the left periphery requiring the syntactic locus for wh-movement to be unique.

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