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Hilda Koopman
Université du Québec à Montréal

THEORETICAL IMPLICATIONS OF THE DISTRIBUTION OF QUOI

HILDA KOOPMAN

Département de Linguistique
Université du Québec à Montréal

The distribution of the French question word quoi has been extensively discussed in the literature, among others by Obenauer (1976, 1977), Hirschbühler (1978), and Goldsmith (1981).* Here, we will show that quoi's idiosyncratic distribution can be reduced to the existence of one language specific filter. The existence of this filter will allow us to study directly some properties of Logical Form (LF).
More specifically, we will argue that:
a. It provides a simple and strong argument in favor of the hypothesis that the ECP applies at LF.
b. It provides support for the property that movement to COMP in LF does not create proper government configurations and for the distinction between wh-raising and quantifier raising Aoun, Hornstein & Sportiche (1981) argue for.
Moreover, our analysis will provide evidence supporting the following conclusions:
c. There is no prohibition against string vacuous rule application
d. Wh-words heading free relatives are in COMP at S-structure.

2.0. In French, wh-questions are formed either by syntactic wh-movement moving the wh-word into COMP, or by leaving a wh-word in argument position (henceforth wh-in-situ). We discuss the distribution of quoi for standard French in both constructions.

2.1. Quoi in COMP.

Examples (1), (2) and (3) illustrate the distribution of quoi, as opposed to that of a " regular" wh-word such as qui, in direct and indirect questions.

(1) a. Qui/*quoi as- tu vu ?
Who/*what did you see

b. A qui/à quoi penses-tu
About who/about what are you thinking

(2) a. Je me demande qui/*quoi tu as vu
I wonder who/*what you saw

b. Je me demande à qui/à quoi tu penses
I wonder about who/about what you are thinking

(3) a. Qui/quoi voir
Who/what to see

b. Je me demande qui/quoi voir
I wonder who/what to see

These examples illustrate the impossibility for quoi to appear in the COMP of a tensed sentence (1a,2a), unless it is preceded by a preposition (1b, 2b). Quoi may appear freely in the COMP node of an infinitival sentence (3a, 3b).
The distribution of quoi can thus be summarized as follows:
Quoi cannot appear exhaustively dominated by a +Tense COMP node.[1]
In order to account for this distribution, an odd fact, we adopt the following filter:

(4) * $[_{\text{COMP}}^{+T}$ quoi $]$, where COMP exhaustively dominates quoi
$^{+T}$

This filter is in essence a reformulation (integrating Chomsky & Lasnik, 1977) of the rule PAS-DE-QUOI of Obenauer (1976), and can be considered the core of the analysis of the quoi/que and ce que alternations (see Koopman,1982).

Since Chomsky & Lasnik (1977), it is generally assumed that filters apply in the phonological component (PR).[2] What is important for the discussion in this article is to show that filter (4) cannot apply at the LF level of representation.
The following argument shows this is in fact the case.
Consider the (non-echo) question (6) in which a wh-word occurs in-situ:

(5) Tu as fait quoi
You did what

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It is shown convincingly in Aoun, Hornstein & Sportiche (1981), (henceforth AHS) that structures like (5) are subject to an LF movement rule they call " wh-raising". This rule moves a (non-echo) wh-phrase into COMP in LF (and is therefore distinct from quantifier raising (QR) which adjoins a quantifier to S), deriving representations like (6):

(6) $[_{S'}\ [_{COMP}\ quoi_i]$ tu as fait $[e]_i]]$

Suppose now (4) applies at LF. Then (6) would be marked as ungrammatical , since quoi occurs in a tensed COMP which exhaustively dominates it. But (5) is grammatical. We therefore conclude (4) cannot apply to the output of wh-raising, hence not at LF. We may therefore assume it applies at PR (or at S-structure).

2.2. Quoi in-situ.

Examples (7), (8) and (9) illustrate the distribution of quoi and qui in argument position.

(7) a. Tu as décidé quoi
You decided what

b. Tu as vu qui
You saw who

(8) a. Tu comptes sur quoi
You count on what

b. Tu comptes sur qui
You count on who

(9) a.* Quoi est arrivé
What happened

b. Qui est arrivé
Who arrived

The distribution of quoi is asymmetric: whereas quoi can appear in-situ in object position (7a), or as the object of a preposition (8a), it is excluded from subject position (9a). (We can conclude quoi cannot appear in subject position from the fact that , had quoi moved to COMP in (9a), the sentence would be filtered out by (4)) Before showing that a natural explanation can be given for the observed subject/object asymmetry, note that we cannot follow Goldsmith (1981), who argues that the paradigm of quoi is unpredictably defective in the sense that quoi lacks a nominative form.
In the first place, it is possible to find quoi in subject position in which case the sentence must receive an echo interpretation and intonation (showing incidently that the restriction that quoi be excluded from subject position only holds for general questions).[3]

(10) QUOI a été décidé
WHAT has been decided

A second argument can be constructed based on constructions which contain multiple wh-questions and in which stylistic inversion has applied.[4]

(11) a. ? Je me demande où e_i a été arrêté qui
I wonder where has$_i$ been arrested who

b. ? Je me demande où e_i est tombé $quoi_i$
I wonder where has$_i$ fallen what

In these sentences, a wh-word in subject position has been moved by stylistic inversion to postverbal position. Although not perfect, (11a) and (11b) exhibit no contrast in judgment. Moreover, the judgments in (11b) do not compare with the impossibility of sentences like (9a).We conclude therefore that the question mark status of (11) is due to the postverbal wh-subject, rather than to quoi lacking nominative case.[5]
The examples thus show it is impossible to stipulate the paradigm of quoi is defective.

3. Let us return to the question why quoi cannot appear in situ in subject position in non-echo questions. Suppose quoi is generated in D-structure in subject position. Depending on the application of wh-movement, which is optional in French, the S-structures(12) are derived.

(12) a. $[_{S'}\ [_{COMP}\ quoi_i\ ]\ [[\ e_i\ ]$est arrivé $]]$
b. $[_{S'}\ [_{COMP}\ \ ]\ [$ quoi est arrivé $]]$

We know that (12a) will be filtered out by (5), since quoi cannot be exhaustively dominated by a tensed COMP. Nothing rules out S-structure (12b). We will see that (12b) is in fact excluded in LF.
In LF, quoi in (12b) must move in COMP by wh-raising (which is obligatory), yielding (13).

(13) LF: $[_{S'}\ [_{COMP}\ quoi_i\ ][\ e_i\ ]$ est arrivé $]]$

Movement of quoi leaves a trace in subject position which is subject to the ECP (Chomsky,1981), the principle restricting the appearence of a trace to a properly governed position. For reasons which become clear below,[6] we adopt the following definition of proper government:

(14) $_{NP}[e]$ must be properly governed

properly governs iff: a. α governs β and
b. α and β are coindexed.

If we assume now that the trace in (13) is not properly governed the impossibility of quoi in subject position is immediately accounted for: quoi in-situ at S-structure has to move by wh-raising,

yielding a representation which violates the ECP.
This explanation raises questions about the notion of proper government.Why is it that in (13) quoi$_i$ in COMP does not properly govern e$_i$ in subject position ? Clearly, movement to COMP in LF does not create proper government configurations for the subject trace.
There is in fact independant motivation for such an assumption based on the analysis of wh-in-situ and superiority put forth in AHS(1981). Let us briefly sum up their argumentation.
They consider the following pair:

(15) a. I know who saw what

b.* I know what who saw

The difference in grammaticality between these two forms cannot be stated at LF because the application of wh-raising to them yields the representations (16a) and (16b) respectively.

(16) a. I know [who$_i$ what$_j$][e$_i$] saw [e$_j$]

b. I know [what$_j$ who$_i$][e$_i$] saw[e$_j$]

These forms are identical, besides the order of the wh-phrases in COMP. The difference, they claim, must therefore lie at S-structure. It is at S-structure that there exist such rules as deletion of that in English, or the change of que to qui in French. These rules affect the COMP node and have the effect of making proper government of the trace in subject position possible. These rules are specific to S-structure, since in English for example, the presence or the absence of the complementizer that does not have any effect on ECP violations created by LF rules like wh-raising,viz (17):

(17) * Who expects (that) who leaves

More precisely they adopt the idea that:
1. It is COMP rather than what it contains which may properly govern the subject position
2. It does so iff it is coindexed with the subject position. The way it gets an index is by the following (optional) percolation rule applying at S-structure.

(18) $[_{COMP} X'' \ldots] \rightarrow [_{COMP_i} X''_i \ldots]$ iff COMP dominates only i-indexed elements

Thus, the index of a phrase contained in COMP can optionally percolate up if the COMP dominates only i-indexed elements.
The idea is clear: configurations of proper government involving COMP must be present at S-structure, or, in other words, movement to COMP in LF(i.e. wh-raising) does not create a new proper government configuration.[7] In conclusion, no well formed sentence corresponds to the form (12b).

The impossibility of quoi appearing in subject position can thus be explained in the following way: quoi in subject position at S-structure, must move in COMP in LF by wh-raising.

The ECP applies to the output of wh-raising. Movement to COMP in LF however does not create proper government configurations, which can only be created at S-structure by (18), and therefore movement to COMP from the subject position in LF will be ruled out by the ECP.

4. Consider next a string like qui est arrivé, to which the following S-structures can correspond, by the same reasoning as above:

(19) a. $[_{S'}[_{COMP_i}\ qui_i]\ [[e_i]$ est arrivé $]]$

b. $[_{S'}[_{COMP}\ \ ]\ [$qui est arrivé $]]$

We see that (19b) is not a possible S-structure, since it will lead to an ECP violation in LF in exactly the same way (12b) does. S-structure (19a), however, will lead to a well-formed sentence since (18) applies to allow the COMP to become proper governor. French is thus forced to apply syntactic wh-movement to wh-phrases in subject position, although it is optional elsewhere.

5. Quoi and free relatives.

A further observation concerning the distribution of quoi is that it cannot head a free relative clause, contrary to other wh-words:

(20) J'aime qui/*quoi tu aimes
I love who/*what you love

Several articles appeared in recent years concerned with the syntax of free relatives, among others Bresnan & Grimshaw (1978) and Groos & van Riemsdijk (1979). The debate on free relatives concerns the position of the wh-head. Bresnan & Grimshaw (1978) present arguments in favor of a structure in which the wh-word occupies the head position. According to their analysis, (20) would have structure (21).

(21) J'aime $[_{NP}$ quoi$[$ tu aimes [e] $]]$

Groos & van Riemsdijk (1979), on the other hand, argue in favor of a structure in which the wh-word occurs in COMP. According to their analysis (20) would have structure (22).

(22) J'aime $[_{NP}\ [_{S'}\ [_{COMP}quoi_i][$tu aimes $[e_i]\ ]]]$

Here it will be shown that the ungrammaticality of (20) can only be explained if it is assigned the representation (22), supporting thus Groos & van Riemsdijk's hypothesis.
To see this, suppose wh-words occur in the head position in free relatives. Then what excludes (21)?
The difficulty lies in the fact that quoi may otherwise occur in the head position of a relative clause, as shown by the following examples drawn from Hirschbühler (1978).

(23) a. Qui pense à [$_{NP}$ quoi [$_{S'}$ que [Pierre a acheté]]]
Who thinks about what that Pierre bought

b. [$_{NP}$ Quoi $_{S'}$ [que [tu n'aime pas]]] Pierre a-t-il acheté.
What that you don't like Pierre bought

Under hypothesis (21), the required distinction between (21) and (23) appears hard to draw. On the contrary, under the hypothesis (22), i.e according to which quoi occurs in COMP in free relatives, nothing special needs to be said about its ungrammaticality: since quoi occurs in a tensed COMP which exhaustively dominates it, the sentence is filtered out by filter (4).
The distribution of quoi thus provides support for the hypothesis of Groos & van Riemsdijk (1979) that wh-phrases heading free relatives occur in COMP.[8]

6. Conclusion

In this article, we showed that the distributional properties of quoi bear on several theoretical issues, concerning the LF status of the ECP, the nature of proper government, the functioning of LF rules, and the position of wh words heading free relatives.
The exclusion of quoi exhaustively dominated by a tensed COMP can be implemented by means of filter (4).[9] The succes of the theoretical framework we adopt is measured by the explanatory power of the (relevant parts of) the theoretical framework: besides (4) nothing further needs to be stipulated.
The exclusion of quoi in subject position at S-structure is explained in the following way: quoi in subject position at S-structure must move in COMP in LF by wh-raising. The ECP applies to the output of wh-raising. Movement to COMP in LF, however, does not create proper government configurations (supporting thus the same conclusion AHS reach based on their treatment of superiority facts).
Movement out of subject position in LF will therefore be ruled out by the ECP. The analysis thus supports the distinction between the LF rules of wh-raising (movement to COMP) and QR (adjunction to S), AHS argue in favor of. It furthermore provides a simple and strong argument in favor of the hypothesis that the ECP applies at LF, as argued by Kayne (1981) and Rizzi (1980). This is a welcome result given the subtlety of grammatical judgments on which their arguments were based. The analysis shed new light upon what constitutes proper government of the subject trace: we argued proper government can in fact only be created at S-structure by means of the percolation rule (18), which allows the COMP to become a derived governor.This in fact leads to new ways of looking at the problem that government from COMP constitutes cross-linguistically. In some languages, like Italian (Rizzi, 1980) or Vata (Koopman 1981), proper government from COMP is never possible.[10] In terms of our analysis this fact can be expressed in a simple way: both Italian and Vata lack the percolation rule (18).

The analysis we presented forces the analysis of such grammatical forms as qui est parti to be qui_i e_i est parti at S-structure and argues thus against prohibiting string vacuous rule application as has been proposed for example in George (1980).
We finally showed that the distribution of quoi provides support for Groos & van Riemsdijk's (1979) hypothesis that wh-words heading free relatives occur in COMP.

FOOTNOTES

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1. Quoi is excluded if exhaustively dominated by a Tensed COMP, rightly predicting the occurrence of quoi with pied-piped material in COMP such as (1b) and (i), drawn from Hirchbühler (1978):

(i) [[$_{COMP}$ $_{NP}$[quoi que tu n'aimes pas]] Pierre a-t-il acheté]]

2. We assume the general framework as outlined in Chomsky (1981).

3. Quoi cannot appear in a tensed COMP independently of the interpretation of the sentence as a general or as an echo question.

4. These examples have been suggested to me by J.R. Vergnaud.

5. D.Sportiche suggests the following sentences in which nominative quoi lands in a [-Tense] COMP:

(i) ?? Qui_i dire qui e_i est arrivé
(ii) ?? $Quoi_i$ dire qui e_i est arrivé

These examples have a marginal status, due to the (near) impossibility of a wh-word originating in a tensed clause landing in a COMP which dominates an infinitival sentence (crossing from a + to a - Tense COMP). These examples show again that there is no contrast between (i) and (ii).

6. We adopt the following definition for government (Aoun & Sportiche 1981):

government: α governs β iff if φ a maximal projection, then φ dominates α iff φ dominates β .

7. Note that this rules out in principle that that deletion or the que → qui rule would apply in LF.

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8. Lexical complementizers cannot appear in free relatives. Groos & van Riemsdijk (1979) explain this fact by appealing to the doubly filled COMP filter. However, data on Québec French, a language which allows doubly filled COMPs, show their analysis cannot be maintained. In Québec French it is possible to find direct or indirect questions containing doubly filled COMP (i). It is however not possible to find free relatives containing a complementizer(ii):

(i)a. Qui que tu aimes
Who that you love

b. Je me demande qui que tu aimes

(ii) * J'ai vu qui que tu aimes
I saw who that you love

In Koopman (forthc) the following account is presented for the ungrammaticality of (ii): in order to account for the matching effect in free relatives, the COMP must be accessible for government from the outside. The COMP can become accessible for government iff it bears an index, which it can acquire by means of rule (18). Thus, (ii) is ruled out because the presence of the complementizer tizer blocks the indexing of COMP, in exactly the same way the presence of the complementizer blocks the COMP from becoming a proper governor for a trace in subject position. The(numerous) consequences of this analysis will be explored in Koopman (forthc)

9. Québec French differs only minimally from standard French in this respect. Within Québec French there seem to exist two dialects with respect to quoi.
a) In one dialect, filter (4) has been generalized to all tensed COMPs (i.e those containing the complementizer and those without the overt presence of the complementizer) (cf C Lefebvre (1982))
b) In the other dialect, filter (4) is as in French.

Dialect 1	Dialect 11
* quoi que tu fais	Quoi que tu fais
* Je me demande quoi que tu fais.	Je me demande quoi que tu fais

10.This fact seems to hold only in languages which have a syntactic rule of wh-movement. Chinese, for example, lacks a syntactic rule of wh-movement (wh-words occur in-situ), and no ECP violations seem to occur. (cf Huang,1980). A possible correlate could be wh-raising as movement to COMP (French), or as adjonction to S (like QR) in Chinese.

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