French questioning declaratives: a corpus study

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Abstract

French has three types of root polar questions: with *est-ce-que*, with an inverted clitic, or with a declarative clause. We provide semantic and pragmatic properties that set questioning declarative clauses (Q-decl) apart from the two other types, showing that their content is a proposition (like with ordinary declaratives) rather than a question. We provide data from a radio talk show, which illustrate their use in conversation, in comparison with that of interrogatives. They are not regular queries but constitute an appeal to the addressee to endorse the proposition. Using logistic regression models, we point out which factors favor the use of Q-decl over the other types.

1. Introduction

It is usually said that French has three types of clauses that are used for expressing yes-no root questions (Borillo 1978, Mosegaard-Hansen 2001, Marandin 2005). They are illustrated in (1).

(1) a. Est-ce que Paul sera là ?
    'will Paul be there'
  b. Paul sera-t-il là ?
  c. Paul sera là ?

In (1a), the clause is introduced by the interrogative complementizer *est ce que* ; (1b) is characterized by the presence of a verbal suffix identical to the subject clitic ; the syntactic form of (1c) is identical to that of a declarative clause. It is also usually said that (1c) can be distinguished from an asserted declarative clause by a rising intonation. However, we will leave intonation aside, because the correlation between rising / falling intonation and clause type is not one-to-one. Although most declarative clauses used fro questioning have a rising intonation, this is not true of all, and some such clauses must be recognized on a contextual basis (Mosegaard-Hansen 2001, Beyssade-Marandin 2006).

Some languages do not distinguish between root declaratives and interrogatives on a syntactic basis, while others do. In some, the form used for polar interrogatives is also found in other constructions (this is the case in English, for instance, the subject auxiliary construction being part of a number of constructions, such as conditionals, Fillmore 1999), while a form dedicated for interrogatives is found in other languages. French distinguishes formally between root declaratives and interrogatives, while at the same time using declaratives to ask yes-no questions, and uses both a form dedicated to interrogatives (the complementizer *est-ce que*) and a form also found in different constructions (the verb with a verbal suffix appears in conditionals, with certain initial adverbs etc.). Hence the three forms in (1): the interrogative with *est-ce-que* (est-ce-que-cl) (1a), the inverted clause (inv-cl) (1b), and the declarative clause with a questioning use (Q-decl-cl) (1c).

When different forms are found with similar uses, the natural question is to ask whether they differ, and how. Following Ginzburg and Sag 2000, we distinguish between the semantic type of the clause and its illocutionary import, and, more generally, its uses. Thus,

– *declarative, interrogative* refer to syntactic forms and properties;
– *proposition* and *question* are the semantic types (or content) of declaratives and interrogatives, respectively;
- *assertion, query* refer to the speech act. A speech act is typically (but only typically) associated with a clause type (form + content). *Est-ce-que-cl*, *inv-cl* and *Q-decl-cl* are constructions, that is, associations of syntactic, semantic and pragmatic properties.

The plurality of forms in (1) thus raises two different questions: (i) do the forms in (1) differ semantically? More precisely, is the content of a Q-decl-cl a proposition (as expected from its form) or a question (which would be in keeping with what is presented as its use)? (ii) does a Q-decl-cl have the same uses as the interrogatives in (1a,b)? The first question has been raised for English (Gunlogson 2003, Šafářová 2007). Although she does not clearly distinguish between content and use, Gunlogson's proposal includes the idea that the content of a Q-decl-cl is a proposition. The second question is raised for English by the same authors (in particular), but crucially for French by Mosegaard-Hansen (2001). For Gunlogson, it is the intonation

which is responsible for allowing the use of a proposition as if it were a question (hence the term rising declarative); crucially, intonation removes the speaker's commitment which is necessary for an assertion. Šafářová (2007) is specially interested in characterizing the contexts appropriate for Q-decl-cl. She proposes three types of contexts (↑ indicates rising intonation, and S the speaker):

– Speaker and addressee are not previously committed to the content of the clause: questions based on contextual evidence (*You're leaving for vacation today* ↑) or try-out statements (S1. *John has to leave early.* S2. *He'll miss the party then* ↑)

– Utterances associated with Speaker's commitment only, whether they introduce new information (*You remember X?),* or check the addressee's approval (S1. *How did you like the movie?* S2. *I thought it was good* ↑)

– Previous addressee only is committed (reprise or echo questions) (S1. *That copier is broken* S2. *It is* ↑ *Thanks, I'll use a different one*).

Mosegaard-Hansen (M-H) is also mainly concerned with interactional factors favoring one or the other of the three forms in (1). She proposes that two factors are crucial in the choice of a Q-decl-cl, the accessibility of information, and the participation structure of the dialogical situation. The first factor is that Q-decl-cl tend to be about events that are known to the addressee and not to the speaker, while the interrogatives in (1a,b) tend to be about other types of events (e.g. known to both speaker and addressee, to all participants, or on topics known to be disputable). The second factor is that a simple structure favors Q-decl-cl over (1a,b), where a structure is as simple as possible if the roles of speaker and person responsible for the content of the utterance are endorsed by the same person, and similarly for the addressee and audience.

We address both issues. First, we show that the semantic type of Q-decl-cl is a proposition rather than a question. Second, on the basis of previous observations as well as on our intuitions, we make some hypotheses about the illocutionary import of Q-decl-cl. As suggested in M-H (2001), and worked out in Beyssade & Marandin (2006), Farkas & Bruce (2010), Ginzburg (2012), we assume that speech acts are analyzed along two dimensions: the call on addressee (the uptake that the utterance projects for the addressee) and the commitment of the speaker. We test those hypotheses on a corpus (EPAC, Bazillon *et al.* 2011), with quantitative observations, which we check with a statistical model. This corpus is a radio talk show, between a host, callers and experts who answer the callers' questions. We show that the content of a Q-declarative is indeed a proposition (like that of an ordinary declarative). In addition, its use is neither that of an ordinary declarative, nor exactly that of a query. In fact, the speaker hands the content of the clause over to the addressee in order for him/her to take responsibility.

2. French questioning declaratives are propositional

We show that Q-declaratives are indeed declaratives, that is, their content is a proposition rather than a question (like interrogatives). We illustrate our points with attested data, in particular from our corpus.

2.1. Use of the predicate *question*

A Q-declarative is not natural for elaborating the noun *question* (Gunlogson 2003). Examples (2) and (3) propose sentences with an *est-ce-que*-cl and an inv-cl. Q-declaratives cannot be substituted for the interrogatives here. Note that the interrogative clause is the complement of the identity verb; it has the form of a root interrogative because it is used a a quote.

(2) a. mais **la question fondamentale est** : **est-ce qu'** on peut faire des élections libres aujourd'hui, accessibles à tout le monde ? (EPAC file 0813)
'but the fundamental question is, is it possible to organize free elections nowadays, open to everybody'
   b. #la question fondamentale est : on peut faire des élections libres aujourd'hui ?

(3) a. **ma question c'est** euh l'enseignement des langues **importe-t-il** à l'éducation nationale ? (EPAC file 0902)
'my question, it is euh is language teaching important for the ministry of Education ?'
   b. #ma question c'est euh l'enseignement des langues importe à l'éducation nationale ?

However, the interpretation of such data is not completely straightforward: the noun *question* itself can refer to the act as well as the content

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of the clause, and can also be the equivalent of 'issue'.

2.2. Polarity subjunctive

Some predicates (verbs of communication, propositional attitudes), which select indicative complement clauses, may, in certain non positive environments, interrogatives among them, take a subjunctive clause. We illustrate the fact with an inverted verb (mood alternation is possible, but less frequent, with *est-ce que,* Huot 1986). On the other hand, Q-declaratives do not license the subjunctive.

(4) a. Vous n'avez pas peur de la mort. Et moi, croyez-vous que je la crains$_{IND}$/craigne$_{SUBJ}$? 'You are not afraid of death. Do you think that I am afraid of it? (J. d'Ormesson, *Le bonheur à San Miniato*, 1987, p. 225)
    b. Vous n'avez pas peur de la mort. Et moi, vous croyez que je la crains$_{IND}$/*craigne$_{SUBJ}$?

Broadly, in a semantico-pragmatic approach, the subjunctive mood is motivated in contexts where the interpretation requires taking into account alternative situations (to the one described in the sentence) (Farkas 1992, Godard 2012). An interrogative or a negated belief verb creates such an environment, hence the subjunctive in (4a). The fact that Q-declaratives do not license the subjunctive in the complement of such verbs indicates that their interpretation does not create alternative situations, as interrogatives do.

2.3. Coordination with a *wh-* question

It is difficult to conjoin Q-declaratives with *wh*-questions, while this is completely natural with interrogatives (1a,b).

(5) a. **Que** pensent-ils et **est-ce qu'ils** continuent à faire aveuglément confiance au gouvernement de Georges Bush ? (EPAC file 0813)
'what do they think and do they continue to have full confidence in GB's government '
    b. *Que pensent-ils et ils continuent à faire aveuglément confiance au gouvernement de Georges Bush ?
 (6) a. **pourquoi** reçoit-on cet avis **et doit-on** le rajouter aux revenus imposables ? (EPAC file 0326)
'why do we receive this notice and must we add it to our taxable income'

    b. *Pourquoi reçoit-on cet avis et on doit le rajouter aux revenus imposables ?

This is an indication that the content of Q-declaratives is of a different type from that of interrogatives (1a,b), given the general constraint on symmetrical coordination (with *et*), which requires that the conjuncts be of the same semantic type. If Q-declaratives denoted questions, they should be amenable to coordination with other questions.

2.4. Expression of speaker's attitude

Q-declaratives are compatible with expressions of the speaker's epistemic attitude towards the content of the clause. In particular, they are compatible with markers expressing degrees of certainty, for instance *je crois*, *je présume*, *peut-être*, which are not felicitous in interrogatives (Gunlogson 2003).

(7) a. Xavier dans l'Isère en ligne. Vous êtes médecin aussi je crois ? (EPAC file 0325)
'X. from Isère on the phone. You are also a doctor, I think ?'
    b. *Est-ce que vous êtes médecin aussi je crois ?

(8) a. Et ça s'appelle un CLIS sur les initiales, je présume ? (EPAC file 0902)
'It is called a CLIS on the initials, I suppose ?'
    b. *Est-ce que ça s'appelle un CLIS sur les initiales je présume ?

(10) a. beaucoup de questions là-dessus ; on va commencer peut-être avec Étienne Boisserie ? (EPAC file 0402)
'many question on this topic. We'll start maybe with EB ?')
    b. *Est-ce qu'on va commencer peut-être avec Etienne Boisserie ?

We may conjecture that the speaker's orientation towards querying requires a complete lack of certainty. In this respect, Q-declaratives are closer to assertions than to queries, since modifiers expressing the speaker's uncertainty are natural in declaratives.

2.5. Tags

Q-declaratives are compatible with question tags (*oui, non, hein, c'est ça, n'est-ce pas*), which are impossible with interrogatives (Beyssade & Marandin 2006).

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(11) a. C'est une question de fond quand même euh, **hein** ? (EPAC file 0920)
'but it's a fundamental question really, no ?'

    b. *Est-ce que c'est une question de fond quand même, hein ?

(12) a. [le seul moyen de trouver du travail en Irak] c'est euh dans les services de sécurité, **non** ? (EPAC file 0813)
'The only way to find work in Irak, it's euh to work for security, no?'

    b*Est-ce que le seul moyen de trouver du travail en Irak , c'est dans les services de sécurité, non ?

A plausible interpretation of this contrast is to say that a tag takes as its argument the content of the sentence it modifies, which must be of type proposition.

3. The use of Q-declaratives and interrogatives: observations and hypotheses

3.1. Presentation of the corpus

The first quantitative study available (to our knowledge) is that of M-H (2001). It is based on a mixed corpus (4h35' of recording) comprising everyday dialogues, radio talk shows and one school examination (note that alternative questions and rhetorical questions have been included, which we exclude). Q-declaratives outnumber the two other constructions (see Table 1). But, as the author herself stresses, the genre is a decisive factor: the distribution in radio debates is more balanced. This suggests that the type of activity or the type of move is relevant in the choice of one of the constructions.

	Q-decl-cl	Est-ce-que-cl	Inv-cl	total
In the whole corpus	204 (83%)	36 (14%)	7 (2%)	247
In radio debates	31 (61,5%)	16 (28%)	6 (10,5%)	53

Table1. Distribution of the 3 forms in M-H

Here we use the EPAC corpus Bazillon *et al.* (2011) which is to our knowledge the only existing French corpus annotated for question types. It consists of transcriptions of 35 sessions of a popular daily radio talk show *Le téléphone sonne* (France Inter) which

corresponds to a 20h's recording in 2005, each session lasting about 45 minutes, with a single host, a dozen of experts and a dozen of callers. Callers ask questions over the Internet or the phone about an issue of general concern (tax systems, war in Iraq, etc.), the host reads them or gives the floor to the caller, then he asks experts to elaborate on the topic. Interrogatives have been identified and annotated by the authors: 546 root polar questions have been identified, including Q-declaratives, excluding alternative and rhetorical questions. The distribution of the three constructions is almost even in the corpus (Table 2).

est-ce-q-cl	inv-cl	Q-decl-cl	Total
214 (39%)	154 (28%)	178 (31%)	546

Table2. Distribution of the 3 forms in EPAC

We randomly extracted 17 sessions (10 jours), comprising 258 root polar questions, and studied them for several parameters.

3.2. Frequency and register

It is often said that the three forms in (1) differ in frequency and register: Q-declaratives would be the most frequent in everyday conversations, and would, more generally, belong to an informal register, while est-ce-que-cl and inv-cl would belong to a formal register. However, as shown by M-H, all three forms can co-occur within the same setting. They may well differ regarding some aspect of the context, notably whether the speech is planned or not. We compare the numbers according to the role of the speaker in the conversation (host, caller, expert).

3.3. Speech act

Given that the content of a Q-declarative is a proposition, if the speaker were committed to it, the utterance would simply correspond to an assertion. But this is not the case. Responses with factive adjectives (*Génial*, 'great') are appropriate for assertions, but not for queries (15a,b) or Q-declaratives. Assuming that these adjectives require the content to be part of the set of facts in the common ground (Fernàndez & Ginzburg 2002), if the speaker is not committed to the content of the Q-declarative, the addressee cannot treat it as belonging to the common ground.

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(13) a. S1   Il va neiger demain.
         'it is going to snow tomorrow'
     S2   Super / Génial. ('great')
   b. S1   Est-ce qu'il va neiger demain ?
         'Is it going to snow tomorrow?'
     S2   #Super / #Génial.
   c. S1   Il va neiger demain ?
     S2   #Super / #Génial.

Note that these responses are appropriate if the Q-decl-cl is interpreted as an indirect proposal (which implies speaker's commitment):

(14)   S1 Je fais des lasagnes pour ce soir ?
         'I'll make lasagna to-night ?'
     S2   Super. ('great')

If the speaker is not committed to the proposition, then the call on addressee must resemble that of a query. Since queries require an explicit response, we compare the numbers of reactions to the different forms. We also look at the kind of response, since a negative response is more natural with an interrogative than with a declarative.

3.4. Relations between participants

As shown by M-H, Q-decl-cl are favored when the addressee is more authoritative on the topic than the speaker. This goes well with the lack of speaker's commitment to the proposition: the speaker appeals to the addressee to take responsibility for the proposition. We look at the number of subjects in the 2nd person, and the presence of a vocative, comparing again Q-decl-cl and the other forms.

Appeal to the addressee is unsufficient to characterize the speaker's attitude. The proposition seems to be presented in such a way that the speaker is invited to agree. To test the hypothesis, we look at the proportion of confirmations and rejections to Q-decl-cl, as well as to the proportion of question tags.

This hypothesis is supported by the fact that Q-declaratives are difficult outside conversational exchanges, as in written questionnaires, where the participants are unknown to each other (the interrogatives belong to free indirect speech, hence the form of a direct root interrogative, with a subject corresponding to the one who asks the question).

(15) a. [about filling tax forms] il faut cocher avec soin les cases relatives au temps de travail: est-ce qu'on est en temps plein ? est-ce qu'on est à temps partiel ? (EPAC file 0326)
'you have to carefully fill the boxes concerning the duration of your employment: do you have a full time job? do you have a part time job?'
   b. il faut cocher avec soin les cases relatives au temps de travail: #on est à temps plein ? # on est à temps partiel ?

3.5. Role in conversation

Conversational roles of queries are diverse: topic generation, topic shift, conversation management (giving turns, questioning about who or where the speaker is, whether one hears or understands the question). In our corpus, the main roles for Q-decl are conversation management and topic management.

Q-declaratives may refer to the ongoing conversation more easily than the other types. With epistemic and communication verbs (15a), they may have a null object interpreted as referring to the content just uttered (as in *Tu vois ?* 'You see', *Tu comprends* ? 'you understand'). They are mostly in the present tense, but with modal verbs, they may be in the imperfect (with 2d person subject), for queries referring to the ongoing conversation (15b):

(15)a.   Host to expert: vous confirmez, monsieur Doudrich ? (EPAC file 0920)
'You confirm, Mr D. ?'
   b . Host: Aude Hapiot, vous vouliez ajouter un commentaire ? (EPAC file 0402)
'A.H., you wanted to add a comment ?'

When used to monitor the cooperation between participants, they may be used as checking or reprise queries, and, more generally, to prevent conversation lapses. In our corpus, the host uses Q-decl to introduce the participants (16), to check their attention and readiness to take the floor (17), (15b), to propose the floor to a participant (mainly the experts) (18). They also serve to make explicit who is speaking to the (absent) audience.

(16)   Host to caller : vous êtes je crois à Issy-les Moulineaux Fatiha ? bonsoir !
Caller : oui bonsoir
'you are in I-l-M, I think Fatiha? Good evening' – 'yes, good evening'

(17)   Host to expert [on the phone]: vous avez entendu la question de Xavier ? vous l'avez compris ? (EPAC file 0813)

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'you heard X's question? You understood it?'

(18) Host to expert : Élisabeth Dupoirier, vous êtes euh (), vous partagez cette analyse?
'E. D., you are euh you agree with this analysis?

Q-declaratives in (17) should be compared with (19a,b): when there is a real trouble on the line, and hence the possibility of an unplanned situation, the host systematically uses inv-cl or est-ce-que. On the other hand, when everything is under control and routinely unfolding, he uses Q-declaratives. As for (18), the host gives the floor by anticipating the expert's opinion about the topic. He uses interrogatives when he anticipates the expert might disagree with the caller's or his own opinion or orientation (19c).

(19) a. Host to caller: Frédéric ne nous entend pas. Frédéric, est-ce que vous m'entendez bien là, Frédéric ? Frédéric ? non, visiblement il ne nous entend pas (EPAC file0825)
'F. does not hear us. F. , do you hear me F. ? F.? no, clearly, he does not hear us'
        b. Host to caller: êtes-vous toujours là, madame ? non, elle n'est plus là (EPAC file0326)
'are you still there, madame ? no, she is no longer connected'
        c. Host to expert: est-ce qu'on peut en dire un mot ? […] monsieur Dubois ?
[no answer] (EPAC file 0920) 'can we say a few words about it, Mr D.'

Q-declaratives may also be used for topic management. The formulaic *Tu sais, Tu as vu ce qui est arrivé à X* (you know, you've seen what happened to X…) are used to introduce a new topic by a speaker who pretends that the addressee is already informed. In our corpus, the host uses Q-declaratives to reformulate a question (20), to reprise an assertion literally or quasi literally (21), or to refocus on the current discourse topic. Dislocated constructions (left (20) and right dislocation (21)) are typically used in the last case:

(20) Host: **votre question** Stéphane en fait c'est sur les prix tout simplement ?
Caller: sur les prix, sur la qualité aussi (EPAC file 0816)

'your question, S., it concerns really just prices?' '– it's about prices, about quality too'

(21) [about a new cancer hot line] Host: il est d'ores et déjà opérationnel **ce numéro** ?
'it's already operational, this number?'
    Expert: oui il est ouvert depuis lundi (EPAC file 0325)
'yes, it's been in operation since Monday'

We annotate our corpus with two variables: conversation management (yes/no) and dislocation (yes/no) for topic management.

4. Usage properties of the Q-Declaratives
As it stands, the EPAC corpus is already annotated for a question type variable **Q-type** whose values are (Est-ce, Decl, Inv-cl) and a speaker identity variable **SpkI** being an enumeration of the 90 different speakers. As can be seen from a first observation of the data, the overall distribution of question type is roughly uniform (see Table 2, Figure 1).
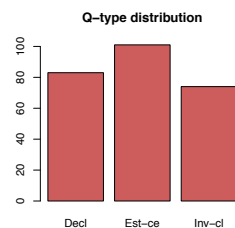

Figure 1: Q-decl distribution

We further annotated the data with variables identified to be of interest for our study. These are :
- **SpkS,** indicates the status of the speaker in dialogue (Host, Caller, Expert).
- **Subj**, the person of the subject (2nd, other)[1]
- **Voc**, the absence or presence of a vocative (yes,no)
- **Disl**, the absence or presence of a dislocated phrase (yes,no).
- **Polarity** of the clause (+, -)
- **Tense**, the clause tense (present, other)
- **ConvM**, the conversational management role (yes,no)
- **Question tags** such as *non, oui, hein, c'est ça…*(yes,no)
- **Resp**, encodes the answer type (confirmation, rejection, no-answer)

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[1] 2nd person subjects are mostly polite *vous*.

We also took into consideration a variable which is a potential cause of some idiosyncratic random variation, that is the speaker identity **SpkI** (since we have 90 different speakers).

In order to identify the properties specific to the Q-declaratives, we fit three mixed effect logistic regression models, one for each type of clause and then compare the significant factors for each model. Each such model attempts to predict a binary variable given all the above mentioned predictors on the full dataset.

4.1 The statistical models

The Q-declarative model attempts to predict the positive outcomes of a binary variable Q_decl (yes,no) given the vector of variables **X** including all the above mentioned predictors.

We first observe that **SpkS=Caller** is a categorical predictor for declarative questions since no Caller ever utters a Q-decl-cl as outlined in Table 3:

	SpkS=Caller	SpkS=Expert	SpkS=Host
Q-decl=yes	0	7	76
Q-decl=no	90	29	56

Table 3: Joint distribution of Q-decl and SpkS

To avoid numerical instability, we therefore recoded the tri-valued **SpkS** variable as a two valued **SpkS'** variable (Host, Other).

Another perfect predictor is the question tag variable, which is only found in Q-decl (Table 4). As a consequence we did not include it in our models.

	Q-tag=no	Q-tag=yes
Q-decl=no	175	0
Q-decl=yes	66	17

Table 4: Joint distribution of Q-decl and Q-tag

All the remaining variables are set as fixed effects except the variable **SpkI** set as random effect, yielding the model :

$$P(Q\_decl = yes \mid \mathbf{X}) = \frac{e^{\alpha + SpkI_i + \beta\mathbf{X}}}{1 + e^{\alpha + SpkI_i + \beta\mathbf{X}}}$$

The full model is then reduced by model comparison where we can remove the polarity, subject, vocative and tense variables (likelihood ratio test : χ^2 p-val=0.24). The

random effect has an almost null variance and is removed as well[2].

		Estimate	Std. Err	z value	Pr(>|z|)	
(Intercept)		-0.1965	0.3462	-0.568	0.5702	
speaker	= Host	2.5212	0.4950	-5.093	3.52e-07	***
conv.mgt	= yes	2.0396	0.4570	4.463	8.07e-06	***
Resp	= rej	-1.1996	0.5206	-2.304	0.0212	*
Resp	= none	-1.2657	0.4887	-2.590	0.0096	**
Disloc	= yes	1.4462	0.6552	2.207	0.0273	*

Model 1**:** Q-Declaratives model

The goodness of fit of the model is satisfactory (accuracy = 84%).

Five out of six remaining effects are significant. First, as shown in Table 3 and Figure 2, the speaker status reveals that the host status clearly favors the use of Q-decl while callers and experts rarely use them:
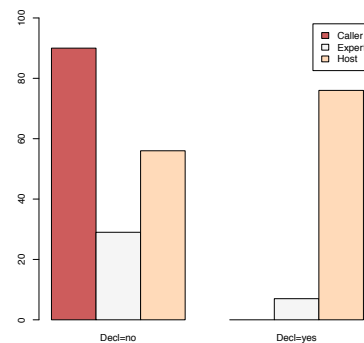

Figure 2: Q-declaratives given **SpkS**

The use of Q-declaratives is also favored by contexts of conversation management as shown in Figure 3 where we can see that more than the half of Q-declaratives are uttered in contexts of conversation management:
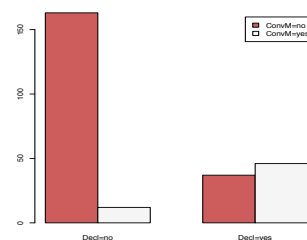

Figure 3 : Q-declaratives given conversation management

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[2] We do not have enough data to get proper convergence when fitting a model with all possible interactions among all variables. However we get proper convergence when fitting model 1 augmented with all interactions of order 2. It turns out than none of them are significant. The model with interactions can indeed be reduced back to model 1 without interactions (likelihood ratio test : χ^2 p-val=0.41).

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As one might have expected, conversation management and speaker status are strongly associated variables, as shown in Table 5 where we can see that the Host is largely responsible for managing the conversation.

	SpkS=Host	SpkS=Other
ConvM = No	81	119
ConvM = Yes	51	7

Table 5**:** Non independence of **ConvM** and **SpkS** variables ($\chi^2 = 5.187\ 10^{-10}$)

Third, regarding responses, we see in Figure 4 that a Q-decl strongly favors a confirmation answer whereas other types don't.
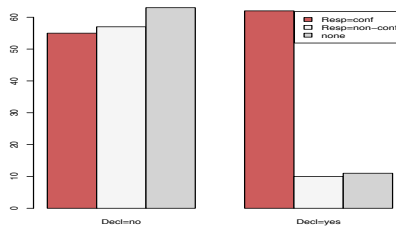

Figure 4: Q-declaratives given Response types

Regarding dislocations, matters are less clear. Although the variable is significant and cannot be removed from the model (likelihood ratio test : χ^2 p=0.02), the only thing we can observe is that the proportion of dislocations in the context of Q-decl is approximately twice the proportion of dislocations in the context of an interrogative clause as shown in Table 6:

	Disl=no	Disl=yes
Decl=no	166	9
Decl=yes	74	9

Table 6: Joint distribution of Dislocation and Declarative variables

In order to contrast the use of Q-decl with other types of questions, we also fitted two additional models, one for *Est-ce que*-cl and another one for Inv-cl.
We used a similar model and protocol to predict the *Est-ce que*-cl on the same data set using as fixed effect predictors the same variables as above and the Speaker Identity as a random effect:

$$P(Est-ce-que = yes\,|\,\mathbf{X}) = \frac{e^{\alpha + SpkI_i + \beta\mathbf{X}}}{1 + e^{\alpha + SpkI_i + \beta\mathbf{X}}}$$

We also reduce the full model by removing the non significant factors : polarity, vocative,

conv.management, dislocation, tag and tense variables (likelihood ratio test, $\chi^2 = 0.16$).

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	-3.7594	0.7773	-4.837	1.32e-06 ***
speaker = Host	-1.4150	0.5892	2.401	0.016333 *
subject =2	-1.8603	0.5642	3.297	0.000977***
Resp=rej	0.4009	0.4263	0.940	0.346997
Resp=none	1.6056	0.4125	3.893	9.91e-05 ***

Model 2: Est-ce que-clause

Finally, our third model amounts to predict a binary *inv-cl* variable on the same data set with the same protocol:

$$P(inv-cl = yes\,|\,\mathbf{X}) = \frac{e^{\alpha + SpkI_i + \beta\mathbf{X}}}{1 + e^{\alpha + SpkI_i + \beta\mathbf{X}}}$$

By model reduction, we remove the speaker, polarity, vocative, answer and tag variables (likelihood ratio test, $\chi^2 = 0.37$).

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	-0.6916	1.1981	-0.577	0.56375
Conv.mgmt= yes	-1.0792	0.5973	-1.807	0.07079 .
Dislocation= yes	-3.7507	2.2490	-1.668	0.09537 .
Resp = rej	1.2634	0.5427	2.328	0.01992 *
Resp = none	0.2708	0.5738	0.472	0.63693
Tense = pres	2.1575	0.8483	2.543	0.01098 *

Model 3: Inv-clause

4.2 Synthesis
In order to identify the characteristic properties of Q-decl, we contrast our different models. In Table 7, we cross each factor with each clause type. Cells are ticked with + (respectively -) when the factor is significant with a positive (respectively negative) coefficient for the question type and with (×) when not significant[3].

	Q-DECL	EST-CE QUE	INV-CL
SpkS=Host	+	-	×
ConvM	+	×	-
Resp=rej	-	+	+
Resp=none	-	+	×
Disl=yes	+	×	-
Q-tag=yes	+	×	×
Subj=2	×	-	×
Tense=pres	×	×	+

Table 7**:** A comparison of the 3 models

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[3] Although it is a categorical predictor not included in the actual models, we have also included for completeness the question tag variable in the table.

The main observation is that a Q-decl is mainly used in context of conversation management by the Host speaker (Figure 5 and Figure 6), which can be explained since the corpus is a multiparty conversation with certain speakers over the phone: the host is assigning turns, questioning about who or where the addressee is, whether he or she hears or understands the question etc. Q-decl are primarily used for conversation management (57% of the time).
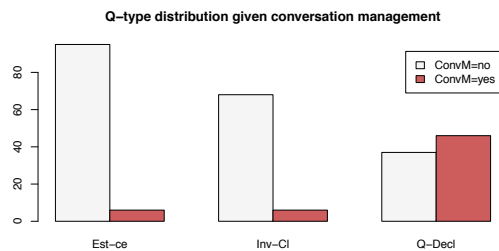

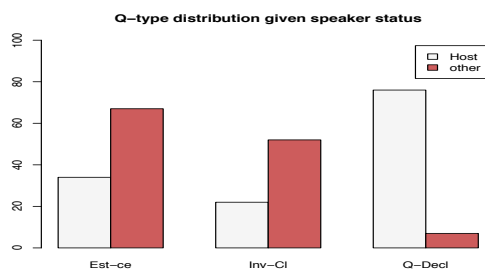Figure 5: clause-type distribution given conversation management

Figure 6: clause-type distribution given **SpkS**

As we have already seen in Table 4, the Q-declarative is the only clause type which is used with question tags.

Q-decl mostly receive a confirmation response (74%) while other types exhibit a more balanced distribution : 28% confirmative responses for est-ce-que-cl, 35 % for inv-cl.

Responses with *oui, non, si* ('yes', 'no') are appropriate both after assertions and after queries. But assertions differ from queries because they do not require an explicit response, viz. an answer or a reply related to the issue raised by the query (although some sort of reaction, possibly non linguistic, seems to be needed). In this respect, Q-declaratives resemble queries: they require an explicit response. In our corpus, 85% of Q-declaratives receive an explicit response.

Confirmation responses are not favored with est-ce-que and inv-cl. While lack of response and rejective response are both factors of est-ce-que and inv-cl models, the lack of an explicit response is only significant with est-ce-que, and rejective response is only significant with inv-cl.
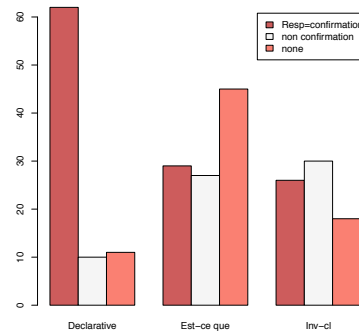

Figure 7: clause-type distribution given Response

4.3. Further explorations
There are two variables for which we expected to get some effects which cannot be observed by our models. The Vocative variable is the first of them. Although it never plays a significant role for predicting a given type of question independently of the others. Nevertheless, the distribution of the vocative variable is strongly dependent on the clause type as can be seen in Figure 9:
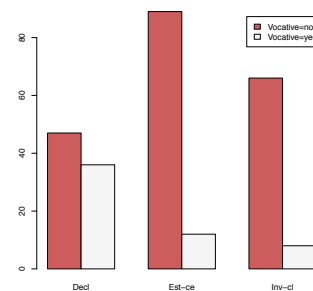

Figure 9: Q-type distribution given Vocative

Proportionally, vocatives are indeed used more in Q-Decl than in other types. This is not a matter of chance, a chi square test of independence between the two binary variables Decl(+,-) and Vocative(+,-) reveals a true association (χ^2; p-val=1.58 10^{-8}).
The other variable that does not show up immediately is the 2d person subject which is more present in proportion in Q-decl than in

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other types as shown up by Figure 10. Again there is a strong association between the Decl(+,-) and 2nd person(+,-) variables (χ^2; p-val=3.69 10^{-10}).
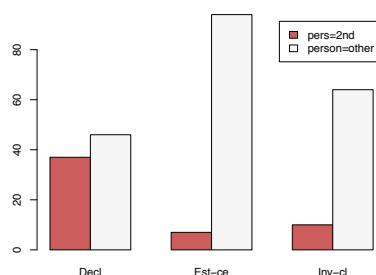
Figure 10: Q-type given 2d pers Subject

The type of response may be associated with the clause polarity. Cooper & Ginzburg 2011 claimed on the basis of a corpus study (BNC) that positive questions tend to be answered positively and negative ones negatively. It is true that our Q-decl are most of the time positive clauses. However, clause polarity did not appear as significant among our types, nor did we find an association between polarity and clause type (Table 8, ($\chi^2 = 0.12$).

	Q-decl	Est-ce que	inv-cl
Polarity=+	78	74	56
Polarity=-	5	27	18

Table 8 : Polarity given clause type

Conclusion

 We have shown that, semantically, Q-declaratives are bona fide declaratives (their content is a proposition). Pragmatically, we compare the properties of the three different forms in a radio talk show. The main features that emerge are the following: Q-decl like queries, and unlike assertions, are followed by an explicit response, and they tend to be confirmed. They have two main roles: conversation management and topic management.

It remains to be seen whether these properties hold in other situations. While the first might be correlated (in part) with the status of the speaker who uses them (the host), we expect the second property to be more general. In future work, prosody should be taken into consideration and might provide further distinctions among our 3 types.

Another open question is how our results may extend to other languages (such as Hebrew or modern Greek) which also have more than one type of polar questions, among them Q-declaratives.

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