In Situ, Ex Situ and (Non) Echo Questions

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Abstract

In this paper we consider echo and non-echo questions in Greek, realized either ex-situ or in-situ. We show that there are syntactic differences, depending on the position where the wh-phrase is realized, and that non-echo questions involve different types of quantification, namely exhaustive for in-situ and non-exhaustive for ex-situ. On the other hand, echo questions have no quantificational properties. We next provide novel evidence for the prosodic properties of the two types of questions, arguing that irrespectively of the position where the wh-element is realized, there is a distinct prosodic pattern that disambiguates echo from non-echo questions.

1. Introduction

The formation of constituent, or wh-, questions is typically assumed to fall into one of the two patterns, exemplified by English, as in (1a), and Chinese, as in (1b).

(1a) Who did you see?
(1b) Ni kanjian-le shei?
    you see-ASP who
    “Who did you see?”

We would like to thank Joseph Emonds, Maria Giakoumelou, Kleanthes Grohmann, Ianthi-Maria Tsimpi, and the ISTAL 20 participants, for useful comments and discussion. Research for this paper has been supported by the Research Committee of the University of Patras (C. Caratheodory program, Grant number C.581).

1 For a more elaborate discussion on the wh-parameter see, Richards (1997) and Pesetsky (2000) among others.
The English construction in (1a) is characterized as ‘wh-ex situ’, and involves displacement of the argument who from the object position of the verb to the left periphery of the clause. On the other hand, the Chinese construction in (1b) exhibits ‘wh-in situ’ form, on the assumptions that the argument shei has remained in its canonical object position (from Huang 1982: 253, (159)).

In generative grammar terms, wh-elements in English-type languages are displaced via a movement operation (or its equivalent in Minimalism), leaving a variable in the original position of extraction. This variable is bound by the wh-element which is interpreted as an operator (see Chomsky 1977; Katz & Postal 1964; Baker 1970; and Pesetsky 1987, for early discussions). ‘Wh-movement’ takes place in (narrow) syntax, and its output is read off at both PF (displacement, gap) and LF (operator-variable).

The formation of Chinese (1b) has received a number of different accounts. For example, according to Huang (1982) the element shei also moves to the left periphery, but covertly. For Nisigauchi (1990) there is no movement involved, but in-situ quantification by an abstract Question (Q) operator in the left periphery. Another approach argues for feature-movement (Chomsky 1995): what moves is the wh-feature only; thus the wh-element is realized in situ in PF, while the relevant feature appears in the scope position at LF. Finally, for Kayne (1998) all instances of movement are overt, and therefore the wh-in situ moves to the left periphery, followed by massive remnant movement of the rest of the clause to a higher position. In all these approaches shei realizes the variable (see also Cheng 1991), at least at the level of PF. Irrespectively of their differences, the core assumption remains that wh-constructions give rise to an operator-variable chain. Variation arises as to how this chain is realized.

Greek is a typical wh-movement language, like English (see Agouraki 1990; Tsimpli 1990, 1995; Anagnostopoulou 1994; Kotzoglou 2005). It also exhibits wh-in situ, which is typically assumed to be restricted to an echo interpretation (EQ) (Tsimpli 1998), while ex-situ is a true, information seeking question (IQ). Consider the following examples (the echo reading is indicated with capitalizing):

(2a) Pjon idhes?  (IQ)
   who-ACC saw-2SG
   “Who did you see?”

(2b) Idhes PJON?  (EQ)
   saw-2SG who-ACC
   “You saw WHO?”

As (2) shows, both ex-situ and in-situ are possible, but they are associated with different interpretations. IQs are true questions, since they ask for the attribution of a value (out of a set of options) to the wh-element (the variable).
On the other hand, EQs ask for a repetition of a given value. As Carnie (2006: 340) puts it “...echo questions are not requests for new information; instead they are requests for confirmation of something someone has heard”.2

On the basis of (2), it could be argued that different syntactic realizations of the wh-element go along with different interpretations, thus maintaining a one to one (1:1) mapping between syntax and interpretation (and also PF-realization). However, the picture is not so straightforward. As has been argued by Sinopoulou (2009) and Vlachos (2010, 2012), the structure in (3b) may also be interpreted as a true question (IQ). Similarly, we argue that the structure in (3a) may also be interpreted as an echo question (EQ). These patterns are illustrated in (3):

(3a) PJON idhes? (EQ)
    who-ACC saw-2SG
    “WHO did you see?”

(3b) Idhes pjon? (IQ)
    saw-2SG who-ACC
    “You saw who?”

One additional property to be taken into consideration is that the two constructions bear different intonation, depending on whether they are IQ or EQ, which as we will show in this paper holds irrespectively of the in-situ vs. ex-situ realization.

In the light of (2) and (3), Greek exhibits a ‘quadratic’ pattern of form-meaning mapping: wh-ex situ can be IQ or EQ, and the same holds for wh-in situ. Interestingly, English as well, seems to allow for this ‘quadric’ pattern, as opposed to the ‘dyadic’ pattern assumed so far. For example, Pires & Taylor (2007) discuss IQ in-situ constructions in English, while Sobin (2010) comes back to the discussion of EQs, considering ex-situ cases as well.

There are a number of questions that arise at this point. First, what are the differences between the ex-situ and the in-situ counterparts? Second, do these differences arise in narrow syntax or are they computed directly at the interfaces? Third, what are the implications of this (apparent) optionality for grammar? In the present paper, we address these questions and provide novel empirical evidence from the PF-properties of echo and non-echo questions. We argue that there is no one to one correlation between syntax and meaning, and

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2 For more elaboration on various aspects of echo questions, see Bolinger (1978, 1987); Sobin (1978, 1990, 2010); Parker & Pickeral (1985); Ginzburg & Sag (2001); and Fiengo (2007), among others.
that PF also plays a role in disambiguating among different interpretations. In this respect, there is no optionality in the strict sense, and there is no need to encode these differences in narrow syntax. The paper is structured as follows. Section 2 discusses the basic properties of IQs and EQs with respect to their syntax and interpretation. Section 3 provides evidence from PF, based on prosody. Section 4 concludes the discussion.

2. Wh-questions: Syntax and Interpretation

Let us start by considering the question of optionality, which seems to be the case for ex-situ and in-situ, echo and no echo questions. In Minimalism (Chomsky 1995 onwards), Agree is the basic operation between two elements $\alpha$ and $\beta$, with $\alpha$ being the Probe and $\beta$ the Goal. This operation, broadly speaking, involves feature matching between the Probe and the Goal. It is possible for the Probe to bear one more feature, namely the EPP (thus generalizing the Extended Projection Principle), in which case, Agree is followed by copying the Goal and merging it with the Probe (internal Merge). The traditional Movement operation then reduces to the basic operations of Agree and (Internal) Merge, triggered by the EPP feature.

The English wh-construction in (4a) illustrates this mechanism (similar for Greek):

(4a) $\begin{array}{l}
\text{\textit{CP}} \\
\text{Which book } C_{[\text{EPP/wh}]} \text{ did } [\text{TP} \text{ you did } [\varphi \text{ write which book}]]? \\
\end{array}$

The assumption is that $C$ has an uninterpretable wh-feature which agrees with the interpretable wh-feature of the Goal $\text{which book}$; the EPP on $C$ triggers Merge of $\text{which book}$ with $C$, yielding displacement of $\text{which book}$. It can then be assumed that the in-situ construction in (4b) involves Agree, but there is no EPP feature associated with $C$, and therefore no Internal Merge takes place (see for example, Denham 2000, among others):

(4b) $\begin{array}{l}
\text{\textit{CP}} \text{ Op } C_{[\text{wh}]} \text{ [TP You } [\varphi \text{ wrote which book}]]? \quad \text{[non-echo]} \\
\end{array}$

Descriptively then, optionality could be taken to reduce to the optional presence of the EPP feature.

Note though that ‘optionality’ of this sort is attested with echo questions as well (cf., (2b) and (3a)). Can we then claim that the EPP is optional here as well? What is important is the fact that irrespectively of where the wh-phrase is realized, i.e. ex-situ or in-situ, the two basic readings, i.e. non-echo and echo, pertain. So in this respect, displacement driven by the EPP does not alter the core interpretation that is relevant at LF. On the other hand, it has an effect on
PF, as the position where the wh-phrase is realized differs. Let us then assume that the EPP is nothing more but an instruction for lexicalization, and as such not necessarily a syntactic feature. If this is the case, then the fact that the wh-phrase can be realized either in the left periphery (ex-situ) or in-situ does not on its own distinguish between non-echo and echo readings. Instead it is a broader option available not only for wh-phrases, but for other non-wh arguments and adjuncts in a given grammar. For example, while English has a relatively rigid SVO order, Greek further allows for VSO, in a neutral context. In other words, syntax makes available different positions where elements may occur. The relative freedom exhibited across languages relates to PF and is subject to parametric variation. As we will see immediately below, each option, at least in the case of non-echo questions, comes with a certain cost.

2.1. Distribution

We can now focus on the distributional properties of (non-) echo questions, taking our empirical evidence from Greek. First, it has to be mentioned that the in-situ pattern is not restricted to main clauses but is found in embedded contexts as well (we enclose the wh-in situ IQs/EQs in parentheses in order to show that simultaneous manifestation with wh-ex-situ is prohibited):

(5a) Pjos/PJOS [ipan [oti efije (pjos/PJOS)]]?
    who-NOM said-3PL that left-3SG (who-NOM)
    “Who did they say left?”
(5b) Pu/PU [ipan [oti tha pai (pu/PU)]]?
    where said-3PL that will go-3SG (where)
    “Where did they say that s/he will go?”

In (5a) we have a wh-argument, while in (5b) there is a wh-adjunct; both allow for ex- and in-situ with a non-echo and an echo reading in either position.

Notice that wh-in situ (IQs and EQs) in indirect questions, i.e. complements to interrogative verbs like rotao (ask), is possible only to the extent that the (interrogative) complementizer an (if/whether) is present, as shown in (6):

(6) Rotisan [(“an) ipe ti/TI]?
    asked-3PL if said-3SG what-ACC
    “They asked “(if/whether) she said what/WHAT?”

We assume that an is necessary in order to satisfy the selectional requirements of the matrix verb and also to license the wh-in situ by lexicalizing the relevant Q operator.
As has been argued in the literature (Sinopoulou 2009; Vlachos 2010 for Greek), while ex-situ (non-)echo questions obey islands, so extraction is blocked out of certain configurations, in-situ ones do not. This is illustrated in (7) and (8), with an adjunct and a relative clause respectively:

(7a) Efije \[\text{xoris na xeretisi pjon/PJON}\]?
left-3SG without prt greet-3SG who-ACC
“She left without greeting who/WHO?”
(7b) *Pjon/PJON efije \[\text{xoris na xeretisi __}\]?
who-ACC left-3SG without prt greet-3SG
“*Who/WHO did she leave without greeting?”
(8a) Katigilan ton epistimona pu anakalipse pja/PJa usia?
accused-3PL the scientist that discovered-3SG which substance
“They accused the scientist that discovered which/WHICH substance?”
(8b) *Pja/PJa usia katigilan ton epistimona pu anakalispe?”
which substance accused-3PL the scientist that discovered-3SG
“*Which/WHICH substance did they accuse the scientist that discovered?”

Relative and adjunct clauses are classified as strong islands (as opposed to embedded interrogatives which are weak islands). As we observe in the above examples, ungrammaticality arises with the wh-ex situ version in both echo and non-echo questions (for more evidence and discussion see Vlachos 2012).

2.2. Interpretation

Shifting our attention to the interpretation of the constructions at hand, let us start with IQs, while EQs enter the discussion at the end. Consider the two ‘micro-discourses’ (pre-established linguistic environments) in (9), under which only wh-ex situ is felicitous (the sign ‘#’ shows infelicity to context).

(9a) Out-of-the-blue:
Anna, ti jinete (# ti)?
Anna what-ACC is-happening (what)
“Anna, what’s happening?”
(9b) Aggressively non-D-linked:
Pjos sto kalo irthe (# pjos sto kalo)?
who-NOM to-the-good came-3SG (who-NOM to-the-good)
“Who on earth came?”

Data revolving around (9) were first discussed in Sinopoulou (2009).
(9a) shows that \(wh\)-in situ instances may not facilitate ‘out-of-the-blue’ readings, contrary to their \(wh\)-ex situ counterparts. As the name suggests, out-of-the-blue questions do not require a micro-discourse. A similar effect can be observed with \(sto\ kalo\) (on earth) phrases, which attach to the \(wh\)-element (cf., (9b)). As Pesetsky (1987) argues, such phrases are considered to force an ‘aggressively non-D(discourse)-linked’ reading, in that ‘...the appropriate answer is presumed not to figure in previous discourse (p. 111)” (see also den Dikken & Giannakidou 2002, for a more recent discussion).

Out-of-the-blue and aggressively non-D-linked contexts enforce a question-reading where there is no presupposition as to what the value of the \(wh\)-element is. In the literature on the semantics of questions, the term that is used to describe this property of \(wh\)-questions, and will be adopted here, is ‘non-exhaustive quantification’ (see Kartunnen 1977; Groendijk & Stokhof 1984; Heim 1994; and Beck & Rullman 1999, among others). In general terms, we may understand the non-exhaustive quantification of the \(wh\)-ex situ questions in (9) as follows: a satisfactory answer to each of these questions does not rely (and, cannot, after all) on a presupposed set of alternative values from which the \(wh\)-elements may draw; hence, anything goes.

A piece of corroborating evidence for this reasoning may come from (10).

(10a) Who for example was at the party last night?
(10b) \(\text{Pjos}\) \(\text{ja paradhighma itan}\) \(\text{sto parti exthes to vradi}\)?

“Who for example was at the party last night?”

Beck & Rullman (1999) show that a number of linguistic expressions, among them the phrase \textit{for example}, are ‘markers of non-exhaustivity.’ So, the English \(wh\)-ex situ question in (10a) (theirs (90), p. 286), is compatible with this marker, and yields a non-exhaustive reading. This is also the case with the Greek cognate in (10b).

Arguably, a \(wh\)-in situ IQ yields a ‘(strong) exhaustive quantification,’ in that the \(wh\)-element (necessarily) selects a member from a pre-established set of alternative values, entailing the exclusion of the other members of the set. This interpretation sharply contrasts with that of a \(wh\)-ex situ IQ, as becomes clear in (11).

(11a) *\(\text{Itan}\) \(\text{sto parti exthes to vradi pjos}\) \(\text{ja paradhighma}\)?
“Who for example was at the party last night?”

(11b) *\(\text{Ja paradhighma itan}\) \(\text{sto parti exthes to vradi pjos}\)?
“Who for example was at the party last night?”
The in-situ *pjós* (who) in the ungrammatical (11a) is incompatible with the marker of non-exhaustivity *ja paradighma* (for example) (compare with (10b)). (11b) additionally shows that the observed ungrammaticality is due to the incompatible interpretations of the *wh*-in situ and the marker, and has nothing to do with the surface position of the marker *per se*, since the same result obtains even if the marker is fronted (or, is in any other linear arrangement, for that matter).

Now, given that *wh*-in situ IQs are indeed available, the question is what makes them felicitous. In-situ IQs necessarily lean on the presence of a micro-discourse. Consider the dialogue in (12).

(12a) Speaker A:
My father, my mother and I went to the store to buy eggs, milk and coffee.
My mother bought the eggs.

(12b) Speaker B:
*Ke o pateras su aghorase ti?* and the father-NOM yours-CL bought-3SG what-ACC
“And what did your father buy?”

Speaker A describes an event of buying that involves three agents, i.e., the speaker’s father, mother, and the speaker herself, as well as, three entities, i.e., eggs, milk and coffee (cf., (12a)). Speaker B, who is familiarized with both the set of agents and that of entities, by virtue of (12a), may make the *wh*-in situ IQ in (12b). In a strong sense, the value of *ti* (what) must range over the set of entities already present in the micro-discourse (with the exclusion of the ‘eggs’ for obvious reasons).

Keeping a similar mode of exposition, let us turn to echo questions. Consider again the data we have discussed so far, in the context of EQs, as in (13)-(14).

(13) Out-of-the-blue:
# Anna, Ti jinete (TL)?
Anna what-ACC is-happening (what)
Intended echo: “#Anna, WHAT’S happening?”

(14a) Aggressively non-D-linked:
# PJOS STO KALO irthe (PJOS STO KALO)?
who-NOM to-the-good came-3SG (who-NOM to-the-good)
Intended echo: “WHO ON EARTH came?”

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4 The dialogue is first examined in the context of Spanish *wh*-in situ by Uribe-Etxebarria (2002: 222, (14a,b)), and is attributed to Jiménez (1997).
Either ex-situ or in-situ, EQs are infelicitous in out-of-the-blue and aggressively non-D-linked environments, as shown in (13) and (14a) respectively. It follows that EQs, unlike wh-ex situ IQs, do not facilitate ‘non-exhaustive’ readings. This is further verified by the ungrammaticality of EQs with the non-exhaustivity marker *ja paradhighma* (for example) (cf., (14b)). Moreover, the dialogue in (15s) and (15b) shows that a pre-established set of alternative values is not enough to make an EQ felicitous, irrespective of the ex-situ or in-situ form. Therefore, EQs, unlike wh-in situ IQs, do not yield ‘exhaustive’ readings, either.

An EQ is felicitous so long as the value of the wh-element is prominently figured (to be qualified shortly) in the micro-discourse. Witness again the dialogue in (15a), repeated below for convenience, with the continuation given in (15b):

(15a') Speaker A:
   My father, my mother and I went to the store to buy eggs, milk and coffee.
   My mother bought the eggs.

(15b') Speaker B:
   # Ti aghorase o pateras su (TI)?
   what-ACC bought-3SG the father-NOM yours-CL (what-ACC)
   “# Your father bought WHAT?”

In principle, (15a’) makes available a set of values from which a wh-element may draw. These values range over ‘eggs,’ ‘milk’ and ‘coffee,’ but only ‘eggs’ acquires a prominent status among the other members of the set, which are still under ‘negotiation,’ so to speak, since the relevant agents (i.e., ‘father’ and ‘speaker A’) have not been mapped to the corresponding entities (i.e., ‘milk’ and ‘coffee’). The saliency of the ‘eggs’ is what makes the EQ felicitous in (15b’), in that *ti* (what) targets the most prominent value in the micro-discourse.
In other words, $ti$ (what) presupposes no set of alternative values, either non-exhaustively or (strongly) exhaustively, but just a single value, here the ‘eggs’. To say that EQ-contexts do not facilitate sets of alternative values for the wh-elements, amounts to saying that the wh-element lacks quantification in these contexts, since the notion ‘(wh-) quantification’ entails the notion ‘set of values’. For ease of comparison with IQs, we will coin the relevant EQ reading ‘individual’ (borrowing Tsimpli’s 1998 terminology).

To summarize so far, IQs and EQs behave alike with respect to island sensitivity in their ex-situ manifestation, and show island insensitivity in their in-situ manifestation. Ex-situ IQs can be uttered in an out-of-the blue context, and be aggressively non-D-linked. These two properties were used as evidence for the claim that ex-situ wh-phrases (IQs) show non-exhaustive quantification, in the sense that they do not require a presupposed set of alternatives values that will be assigned to the wh-variable. On the other hand, in-situ IQs cannot be out-of-the blue questions and cannot be aggressively non-D-linked. Instead, they always require the availability of a presupposed set of values, and in this respect they are taken to manifest (strong) exhaustive quantification. EQs cannot also be out-of-the blue and aggressively non-D-linked, either in ex-situ or in-situ. Moreover, a presupposed set of alternative values does not suffice, and in this respect, they do not show any kind of exhaustive quantification. At this point we observe the following: the optional realization in-situ or ex-situ may be constrained by syntax (islands) and may affect the quantificational reading of the wh-element. The latter in particular is clearly the case of IQs, and does not seem to hold for EQs (but see Sobin 2010 for English). In other words, we could argue that what looks like optionality comes with a certain cost (syntax and/or interpretation).

Having provided a (brief) discussion of the basic distributional and interpretation properties of the various wh-constructions, we next turn to their prosodic (PF-) properties.

3. The PF-properties of (non-) Echo Questions

Let us next concentrate on the intonation of IQs and EQs. In order to examine the relevant prosodies, we have conducted an experiment that emulated the natural production of the configurations under consideration, in laboratory conditions.\(^5\) Specifically, informants were asked to participate in two pre-constructed written

\(^5\) We are grateful to the 20 research participants from the University of Patras, for the completion of this experiment.
dialogues that facilitated the production of all the four possible configurations, in a context that elicits these structures as naturally as possible. One dialogue was constructed to evoke IQs, and a different dialogue targeted EQs. Each dialogue involved two participants, one of whom was the informant at hand and the other an imaginary interlocutor.

A preliminary, yet crucial result of the experiment is that informants were able to produce casually all the four different utterances. This provides independent evidence in favour of the existence of all the four types of \textit{wh}-questions in Greek. Another result pertains to the intonation contours that each configuration manifests, to which we return shortly, starting from the intonation of IQs, and continuing with that of EQs. The description of the spoken data is implemented through the PRAAT program for speech analysis and synthesis, while for the annotation of the intonation contours, we use GrToBI (i.e., Greek ToBI), as has been modified by Arvaniti & Baltatzani (2005). GrToBI is a tool for annotating the intonation and prosodic structure of spoken instances of Greek, within the autosegmental-metrical framework of intonational phonology established by Pierrehumbert (1980).

Arvaniti (2001) has extensively studied and described the intonation structure of the majority of Greek \textit{wh}-ex situ IQs, as a sequence of L*+H L- !H%. Specifically, L*+H is the pitch accent, L- is the phrase accent, and !H% is the boundary tone. According to Arvaniti, the pitch accent appears on the \textit{wh}-element, at the beginning of the \textit{wh}-question, and is either high (H*), if the utterance starts immediately with a monosyllabic stressed \textit{wh}-word, or rising (L+H), if the beginning of the utterance is another word, which is unstressed and surfaces before the \textit{wh}-element (see also Arvaniti & Ladd 2009, for discussion). Typical instances of the latter are prepositional phrases that head \textit{wh}-words, like \textit{apo pu} (from where), whereby the preposition \textit{apo} (from) phonetically precedes the adverb \textit{pu} (where). The phrase accent is a L- tone, which is realized either phonetically, if there is not enough segmental material, or, on a lexically stressed syllable following the \textit{wh}-element, when the \textit{wh}-question is not a short one. Finally, there is always a rising at the final syllable of the utterance, therefore a H% boundary tone. Arvaniti also argues that in most of the cases, the H boundary tone is not really high, therefore she characterizes it as a down-stepped tone.

With the previous clarifications in mind, consider, first, the intonation structure of the \textit{wh}-ex situ IQ in (16), which has been produced by the informants of the present experiment as in Figure 1.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure1.png}
\end{figure}

(16) Ke \textit{pja} nomizis oti idhe? (wh-ex situ IQ)
and who-ACC think-2SG that saw-3SG
"And who do you think that s/he saw?"

\[ \text{Figure 1: Intonation structure of } \text{\textit{wh}} - \text{ex situ IQ in (16).} \]
The intonation pattern in Figure 1 perfectly agrees with Arvaniti’s pattern. In particular, the pitch accent is also a L*+H (as the rising continues to the next syllable after the stressed one), the phrase accent is a L- which is realized on the next stressed syllable from *pja* (who), and the boundary tone is a !H%, realized on the last syllable of the utterance.

Consider now the intonation contour of the *wh*-in situ counterpart in (17), as illustrated in Figure 2.

(17) *Ke nomizis oti idhe *pja?* (wh-in situ IQ)

“Who do you think that s/he saw?”

As we may observe, the intonation contour of *pja* (who), at the right edge of the utterance, is that of a typical *wh*-ex situ IQ, with this crucial difference though: the same intonation contour that expands over the whole sentence, in the case of the *wh*-ex situ IQ in Figure 2, concentrates on the *wh*-element, vis-à-vis the *wh*-in situ IQ in (17). So, as regards the ‘question’ intonation, (16) manifests a ‘spreading’ melody, so to speak, while (17) a ‘shrinking’ one. Regarding the part of the utterance that precedes *pja* (who) in (17), i.e., *ke nomizis oti idhe* (and you think that he saw), it is reasonable to argue that it constructs as an intermediate intonation phrase with two pitch accents, that is, L*+H & L+H*, and a L- phrase accent (cf., Figure 2). The most important phonetic cue in favour of this hypothesis is the pitch gap of more than 100 Hz between the end of the intonation contour of the preceding part and the beginning of the *wh*-element. It could also be noted that the preceding intermediate intonation phrase presents a typical intonation contour of the pre-focus element.
Turning to the intonation contour of EQs, in comparison with that of IQs, witness the panel in Figure 3, which is the melody of the *wh-ex situ* EQ in (18).

\[(18)\] PJA idhe? (wh-ex situ EQ) who-ACC saw-3SG “He saw WHO?”
The echo question presents a sequence of L° L- H%. The L° is a low plateau pitch accent on the stressed syllable of pja (who), the L- appears as a low plateau on the next stressed syllable (in case there is one), and the intonation contour is completed with a really high H% during the last syllable of the utterance. Crucially, this intonation pattern is clearly distinct from that of the wh-ex situ IQs in (16).

Finally, the wh-in situ EQ counterpart in (19) has the melody in Figure 4.

(19)  
Idhe PJA? (wh-in situ EQ)  
saw-3SG who-ACC  
“S/he saw WHO?”

Interestingly, if we compare the melody of the wh-ex situ EQ in (18), with that of its in situ counterpart in (19), we find a ‘spreading vs. shrinking’ effect, similar to the one we encountered in the case of IQs above. In particular, the ‘spreading’ melody of a typical wh-ex situ EQ (cf., Figure 3) concentrates on the in situ pja (who) in (19). Again, the part that precedes the wh-element manifests as an intermediate intonation phrase. The most important phonetic cue for this assumption is the pitch gap of more than 60 Hz between the end of the intonation contour of the preceding part and the beginning of the wh-element.

What we observe in the above graphs is that IQs and EQs show a spreading contour in their ex-situ realization, and a shrinking one in their in-situ realization.
However, the contour is distinct between IQs and EQs. In short, the same syntactic form (in-situ or ex-situ) corresponds to different contours; thus any ambiguity that may arise in syntax, since the same form may in principle be compatible with two different readings, is resolved at PF.

4. Conclusions

In the present paper we have provided a first account to the differences and similarities between echo and non-echo questions. First, either type of question may exhibit an ex-situ or an in-situ variant. Ex-situ is subject to locality (islands), while this is not the case for in-situ. The latter suggests that this ‘option’ involves binding in the classical sense. At least in the case of non-echo (IQ) questions, we assume that the Q operator in C binds the wh-element in situ, through Agree. The wh-phrase then lexicalizes the position of the variable. In the ex-situ version, the wh-phrase once again agrees with Q in C, while the wh-phrase itself lexicalizes the relevant operator (see also Manzini & Savoia 2011).

In either case, there is an instruction for lexicalization (an alternative way of understanding the EPP, which thus becomes redundant), in one of the two positions of the wh-chain. This idea is quite natural under the assumptions that:

a) nothing, in principle, should block the lexicalization of the relevant positions in a wh-chain, and b) variables may or may not have a lexicalization (see Manzini & Roussou 2011). These two ‘options’ are illustrated in (20) below:

\[(20a) [_{\text{C}} \text{pjon} Q [_{\text{I}} \text{idhes} [_{\text{V}} \text{pjon}]]]? \]
\[ \text{who-ACC \ saw-2SG \ who-ACC} \]
\[ \text{“Who did you see?”} \]

\[(20b) [_{\text{C}} Q [_{\text{I}} \text{idhes} [_{\text{V}} \text{pjon}]]]? \]
\[ \text{saw-2SG \ who-ACC} \]
\[ \text{“Who did you see?”} \]

In either case, Q binds a variable corresponding to the internal argument of the verb in the particular example, forming an Operator-variable chain. Further elaboration of this approach will not be addressed here, due to space limitations (but see Vlachos 2012 for a discussion). Binding in the Greek case escapes locality effect (at least for island configurations). It should be mentioned though that this is not necessary the case of all wh-in situ constructions (see, e.g., Mathieu 1999 for French).

Second, it was shown that the melody of IQs is L*+H (or H*) L- !H%, while that of EQs is L* L- H% (for space limitations, we do not repeat the relevant panels). In the light of this, we maintain that intonation may disambiguate an otherwise ambiguous utterance (see Jespersen [1933]2006; Sportiche 1998),
and suggest, in turn, that PF disambiguates between the two utterances by assigning clearly distinct intonation contours. Of course, this is part of the story, and not the whole story, because, so far, we have said nothing about the relevant interpretational differences between ex-situ and in-situ forms examined in section 2.2. In particular, as we may recall, in non-echo questions (IQ), wh-elements map to non-exhaustive quantification when ex-situ but to exhaustive quantification when in situ IQs. On the other hand, echo questions (EQ) yield no quantification, giving rise to an individual reading. Here, we propose that the observed ‘fluctuation’ in the interpretation of wh-elements is due to how syntactic form affects prosody, and how the latter, in turn, affects meaning. In this respect, the picture that emerges, subject to elaboration in future work, is that LF must be visible to PF and vice versa, as has indeed been argued by Brody (1995), and Vergnaud & Zubizarreta (2005), among others. This of course raises the issue of what ‘narrow syntax’ amounts to. We leave this topic open to future research.
References


