The wh parameter and radical externalization

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1 Introduction

In this paper, I propose that a significant part of linguistic variation is external to (narrow) syntax and in particular that it is reducible to differences in prosodic properties between languages. The logic and the details of my proposal are compatible with the idea that syntax is mainly invariant (Newmeyer 2005; Kandybowicz 2009; Boeckx 2010; Berwick and Chomsky 2011; Boeckx 2011). However, my account leans towards radical externalization in that I do away with “strength” parameters. As I understand it, in Chomsky’s system (Chomsky 2005), some variation is, after all, kept in syntax by way of features (strong or weak), especially for cases such as the wh parameter. Since I abandon such features, my theoretical stance is thus (it seems to me) much closer to that of Boeckx (2012), who claims that syntactic parameters simply do not exist. If “strength parameters” are external to syntax, then they are typological generalizations susceptible of exceptions: they are not categorical (in the traditional sense) but only tendencies, and this is exactly what we find.

As a way of illustration, I take the wh parameter, which traditionally involves “strength”, and show how it can be radically externalized. I concentrate on French and in addition to synchronic evidence I use diachronic evidence to show the influence of prosody on language variation/change. My account is very much in the spirit of Longobardi (2001) who argues that languages do not change internally, but only because of external influences. The difference with my analysis is that UG is not only free of parameters but that it is completely encapsulated: no external influence is possible; external phenomena always remain external phenomena. Like the OV/OV parameter (Chomsky 2000, 2001), the wh parameter is relegated to PF.¹

Section 2 discusses the wh parameter and show how it has been implemented in generative grammar over the years. I include a discussion of Richards (2010), since the present proposal is inspired by his account. I show, however, that my analysis is superior to his. Section 3 shows that prosody and focus are interconnected and that languages that express focus via prosodic phrasing do it in two main ways: 1) culminatively, as in Germanic and (most) Romance languages; or 2) purely demarcatively. Section 4 shows that focus in French can be expressed prosodically and demarcatively via the insertion of boundaries followed by dephrasing and that the language has no lexical stress. With special emphasis on rephrasing/dephrasing and segmental cues, Section 5 shows how wh in situ in French is licensed prosodically providing many examples that show wh in situ phrases in that language create their own prosodic domains. In this section, I also spell out the main typological generalization introduced in this paper, namely that wh in situ languages tend to be languages with no lexical stress that use only prosodic phrasing to mark focus while wh movement languages tend to be languages with lexical stress that use pitch accents to express focus. Section 6 concludes with a set of predictions that my theory makes and with possible extensions of the theory for future research.

2. The wh parameter

There is a long-standing observation in the literature about the distribution of wh questions cross-linguistically: some languages are wh in situ languages (the wh word remains in its argument position) while other languages are wh movement languages (the wh word is dislocated to the left periphery of the clause).² For many years, linguists have tried to give a rationale for this typological division, but unfortunately the results are not conclusive. The
proposals are either not explanatory, and must thus be abandoned, or have recently collapsed in view of certain additional data not originally considered by linguists working on this topic.

Beginning with the ad hoc proposals, let us consider the strong/weak feature proposal introduced by Chomsky (1995). Languages with wh movement are claimed to have a strong feature on C while languages with wh in situ have a weak feature on C. This proposal replaces the Government and Binding popular view that had wh phrases move overtly at S-structure but covertly at LF (Huang 1982, and many others). This particular implementation is no longer valid in minimalism since in this framework the derivation from the Numeration to LF is uniform: there cannot be any movement between Spell-Out and LF. Under the minimalist view, the strong feature on C attracts the wh phrase to Spec-CP while the weak feature on C makes sure that the wh word remains in the argument position.

The problem with this account is that there does not appear to be any connection between strength and actual morphology in the case of wh movement. For example, there is no known special morpheme on C in English (or in other languages, as far as I know) that could be a trigger for wh movement. While proposals that link rich morphology and movement have been more successful in other areas of the grammar (e.g. verb movement, Pollock 1989), it is clearly much more problematic in the case of wh movement.

The EPP version of the strong versus weak parameter does not fare any better (Chomsky 2001). The proposal is that languages with wh movement have an EPP feature under C while wh in situ languages do not. This is simply a stipulation.

Turning now to more explanatory proposals, let us focus on the very popular and very influential Clausal Typing Hypothesis from Cheng (1991; 1997). Cheng’s proposal is that wh in situ languages are languages where Q particles are available and where wh words are simple indefinites (that can be used in all sorts of contexts, not just interrogatives). The Q particle unselectively binds the indefinite, which consequently can remain in situ (see also Nishigaushi 1986; Pesetsky 1987; Nishigaushi 1990; Aoun & Li 1993; Cole & Hermon 1994; Shi 1994; Tsai 1994).

Although this generalization is attractive, it nevertheless collapses in view of recent newly introduced evidence. Through a typological survey of over 500 languages taken from Dryer (2004) and a detailed comparison of Passamaquoddy and Mandarin Chinese, Bruening (2007), for example, shows convincingly that there is no systematic connection between wh-in situ and either property (i.e. the availability of Q particles and wh phrases as simple indefinites, see also Haspelmath 1997). Passamaquoddy uses wh-words as indefinites in all the contexts Chinese does, but it is a robust wh-movement language. In fact, many languages, regardless of whether they are wh-movement or wh in-situ languages, have question particles, and most languages use wh words as indefinites.

French (in particular, its non-standard varieties) is also a major problem for Cheng (1991) because it has wh in situ but no Q particle in wh questions (it nevertheless has a Q particle in the form of est-ce que for yes-no questions). The French problem is addressed in Cheng and Rooryck (2000). However, their claim that wh in situ in French is licensed by the same intonational properties used in yes-no questions does not seem to hold. It turns out that the intonation of a wh movement question is similar to that of declaratives denoting a proposition (Hirst & Di Cristo 1998), and the same goes for wh in situ questions (Wunderli & Braselmann 1980; Wunderli 1982; 1983; Mathieu 2002; Beyssade et al. 2004; Beyssade et al. 2007). In other words, there is no special pitch accent on French wh in situ question words. If one is added, then the sentence is interpreted as an echo question.

A recent experiment by Déprez et al. (2013) also does not confirm the original predictions made by Cheng & Rooryck’s proposal. For the majority of speakers in Déprez et al’s experiment, the wh in situ phrases were perceived to have and were shown to exhibit a sentence-final rising intonation contour; however, when present (and there was a lot of variation), this was not identical to the rising contour exhibited by yes-no questions. As pointed out by Déprez et al, this difference is unexpected, given Cheng and Rooryck’s proposal that the same
intonation morpheme with default yes-no intonation is associated with both yes-no and wh in situ questions.

This does not mean that Cheng & Rooryck’s account has no value; far from it. It has the merits of bringing prosody, and especially intonation, at the forefront of research on French wh in situ and wh in situ in general. This insight is an important one: as I will argue in this article, prosody is key in understanding the licensing of wh in situ, not only in French, but cross-linguistically. In fact, prosodic accounts of French wh in situ have flourished in recent years (Adli 2004; Hamlou 2011) and the claim that wh in situ is licensed prosodically has been a common feature of the literature on focus for many few years (Ladd 1996; Zubizarreta 1998; Kahnemuyipour 2004). The exact nature of the licensing mechanism nevertheless remains an open question. Moreover, to my knowledge, apart from Richards (2010), no attempt to correlate wh in situ with the more general prosodic properties of the language that has wh in situ has been made.

My account is in fact inspired by Richards’s (2010) recent account of wh in situ versus wh movement cross-linguistically. His contribution is a great step forward to our understanding of the licensing of wh in situ and wh movement. Richards (2010) proposes a universal PF well-formedness condition on wh constructions: a wh DP and its corresponding complementizer must phrase together prosodically. When syntax and prosody collaborate to build structures satisfying this condition, wh movement is unnecessary and wh in-situ obtains. When this phrasing cannot be achieved, wh movement becomes obligatory, repositioning the interrogative closer to C for prosodic grouping. Two factors determine whether a wh item can be phrased with its corresponding C independent of movement: 1) whether prosodic boundaries are mapped onto the left or right edges of wh DPs and 2) the position of C. When a wh phrase’s prosodic boundary and corresponding C are on opposite sides of the wh phrase, the required prosodic grouping can be obtained via prosodic rephrasing, allowing for wh in situ. An example of this case would be a language that prosodically marks its DPs’ right edges and positions its complementizers sentence-initially. By contrast, if a wh phrase’s prosodic boundary and its corresponding C fall on the same side of a DP, the requisite phrasing can obtain only if movement to the opposite side of C occurs. An example of this case would be a grammar that prosodically marks the left edge of DP and has initial complementizers. This gives us the following four options. Japanese and Chichewâ (1) and (2) are wh in situ languages while Basque and Tagalog (3) and (4) are wh movement languages (the a. and b. lines are Minor Phrases).

(1) Japanese:  
  a. $[\text{DP}] [\text{whP}] [\text{DP}] V C$
  b. $\text{(    ) (    ) (    )}$
  c. $\text{(    ) (    ) (    )}$

(2) Chichewâ  
  a. $C [\text{DP }] [\text{whP}] [\text{DP}]$
  b. $\text{(    ) (    ) (    )}$
  c. $\text{(    ) (    )}$

(3) Basque:  
  a. $[\text{DP }] [\text{whP}] [\text{DP}] V C$
  b. $\text{(    ) (    ) (    ) (    )}$
  c. $\text{(    ) (    ) (    ) (    )}$

(4) Tagalog:  
  a. $C [\text{DP }] [\text{whP}] [\text{DP}]$
  b. $\text{(    ) (    ) (    )}$
  c. $\text{(    ) (    )}$
Like Richards (2010), I argue that the wh in situ versus wh movement distinction is predictable from independently observable properties of languages. However, my account is not only different, but also has advantages over Richards’, because it captures larger prosodic properties common to all wh in situ languages and it also avoids the pitfalls that a theory such as Richards’ (2010) brings with it.

First, it must be emphasize that Richards’ (2010) account is a prosodic account, but only partly. On his view, it matters where the complementizer is in the structure (left or right). No such requirement is necessary in my theory. My account does not care either whether the boundary is to the left or the right of the DP. In fact, many languages have a boundary to the left \textit{and} the right of DPs (that informational properties affect prosody in addition to syntactic properties has been well-studied since Nespor & Fogel 1986). As I will show, this is certainly the case for focused DPs in French and Bengali. Richards says that it does not matter if, for example in a structure such as (2), there was an extra boundary to the left of the DP, since what is important is that a boundary is present on the other side of the complementizer. Allowing such optionality in the theory, however, has the potential to render the theory unfalsifiable.

Second, according to Richards (2010), DPs and no other maximal projections, are associated with prosodic boundaries. This is controversial, since many other XPs have boundaries (Selkirk 1984).

Third, Richards (2010:195) chooses to ignore matters of focus (while noticing that there is a link in the Hayes and Lahiri (1991) discussion of Bengali about the association between focus and in situ phrases). My account, on the other hand, puts focus at the forefront of the discussion, since it is crucial to our understanding of the facts. It must also be noticed that Richards (2010) focuses on dephrasing (e.g. a left edge complementizer and the right edge of a DP try to form a prosodic domain) whereas there are many cases where rephrasing is the relevant notion: the wh phrase creates a new domain with a boundary to the left and to the right (Bengali, Hayes & Lahiri 1991; French, Féry 2001; and other languages, Büring 2009, see remaining of the present article for examples).

Finally, it seems to me that the theory makes the wrong predictions. It predicts that English (and many other languages like English) are wh in situ languages. This is because in English, complementizers are at the left edge of the sentence but prosodic boundaries of DPs are at the right edge of XPs. It is not clear to me either how the proposal works for Chinese, the most famous wh in situ language, since in that language, complementizers appear at the right edge, and presumably DP boundaries are to the right.

On my account, whether a language is a wh in situ or a wh movement language depends entirely on whether the language associates focus with prosody in a purely demarcative fashion. I propose a typological generalization that sets languages with wh in situ and languages with wh movement apart based on their general prosodic properties, and more specifically to the way they use or not intonation or pitch accents to express focus. I concentrate on French wh in situ (Boeckx 1999; Mathieu 1999; 2002; Zubizarreta 2003; Adli 2004; Mathieu 2004; Hamlaoui 2011) and thus contribute directly to the prosodic literature that already exists on the topic (Adli 2004; Hamlaoui 2011). However, my implementation of the facts and my conclusions are rather different from those found in these papers. In particular, the aim of my contribution is typological: it is meant to go beyond French. Many other languages will be discussed (Chinese, Japanese, Sinhala, Turkish, etc.) and will be shown to share with French crucial intonational properties that set them apart from wh movement languages.

I argue that the key to understanding the licensing of wh in situ in French (and other languages) is to be found in a proper understanding of the way focus is licensed in the language that exhibits wh in situ. I propose that, although CP (complementizer phrase) is universal (it is present in all languages and so is wh scope), variation in question formation, i.e. whether the wh word remains in situ or raises to the left periphery of the clause, is conditioned (directly and indirectly) independently by prosodic factors. The generalization is the following: i) A language tends to be a wh in situ language if prominence/focus can be expressed prosodically and in a
way that is purely demarcative, i.e. without pitch accents and only with prosodic rephrasing/dephrasing and/or segmental cues (such languages tend to have no lexical stress); ii) A language tends to be a wh movement language if prominence/focus can be expressed prosodically and in a fashion that is culminative, i.e. via pitch accents followed by deaccenting (such languages tend to have lexical/flexible stress. This explains why so many tone languages are wh in situ languages: East Asian (e.g. Vietnamese, Thai, Chinese, etc.) and most Bantu languages (Chichewà, Zulu, Kinyarwanda, etc.): these languages have no lexical stress. In diachronic terms, languages can go from i) to ii) or vice versa depending on what happens to the general prosodic system. A case in point is French: a language that went from ii) to i).

The French data are based on the author’s speech, and one other native speaker. In my analysis, I rely on important works in prosody, e.g. Pierrehumbert (1980), Beckman and Pierrehumbert (1986), Hayes and Lahiri (1991), and in particular Féry (2001) and Vaissière (2002). The notation that I use may often be different from what these authors use. The reason why I have developed my own notation is to achieve greater clarity and explicitness.

3. Prosody and focus

In this section, I review how prosody feeds the way focus is licensed. This is in preparation for Section 4 where I discuss French and for Section 5 where I make a correlation between the way focus is licensed in a given language and the position where wh phrases appear in that language. Since wh words are necessarily focused (Culicover & Rochemont 2003), it is natural to discuss focus more generally and the way it is licensed cross-linguistically.

Let me begin by introducing the well-known observation that focus is realized differently cross-linguistically (see Büring 2009 for a comprehensive overview): focus is often said to be marked either syntactically, morphologically or prosodically (some languages use more than one strategy). Languages such as Hungarian (Kenesei 1986) or Italian (Rizzi 1997) manipulate constituent ordering to mark focus while languages as such as Chickasaw (Munro & Willmond 1994) and Wolof (Rialland & Robert 2001) use special focus particles. A third, very common strategy, is prosodic phrasing. It is a matter of debate whether or not focus is always marked prosodically (Szendroi 2001), thus including cases such as Hungarian focus movement. I will leave this matter aside, but some of the results of the present paper show that the use of left and right dislocation as well as clefts in French is indirectly triggered by prosody. This means that focus movement and wh movement might be triggered in Hungarian because of the incapacity for focus and wh elements to be licensed prosodically in situ. Prosody may also turn out to be relevant in languages with focus particles (see the case of Sinhala, Weerasooriya 2011).

Let us focus on prosodic phrasing, leaving aside languages where focus is licensed “syntactically” or “morphologically”. All known languages, as far as we know, have intonation and use prosodic phrasing to express prominence. However, languages differ in the way they realize it, and this is key in understanding why some languages allow wh in situ while some do not.

Prominence at the postlexical level can be marked either: 1) culminatively, as in Germanic and (most) Romance languages; or 2) purely demarcatively, as in Korean and Japanese (Hyman 1978; Beckman 1986; Ladd 1996; Venditti et al. 1996; Jun 2005). In the first case, in order for prominence to be realized, the rhythmically strongest element of a metrical structure must be associated with the Nuclear Pitch Accent (Halle & Vergnaud 1987; Cinque 1993; Zubizarreta 1998). The focused constituent in a sentence is always linked to a stressed syllable in one of the words that make up the focused constituent. In the second case, prosodic phrasing is independent from lexical stress, since the languages in question often have no lexical stress. Prominence is marked when a word (or a group of words) is at a certain location in a prosodic unit (e.g. the beginning or the end): a boundary tone then marks the edge of a prosodic unit and segmental processes are activated.

Section 3.1 concentrates on the culminative strategy whereas Section 3.2 deals with the
demarcative strategy. Section 3.3 summarizes Section 3.

3.1 The culminative strategy
In English, focus is first and foremost realized by pitch accents\textsuperscript{11} and the main sentence accent is usually rightmost, i.e. near the end of the phrase or sentence. In other words, it is the constituent with the last accent. For example, the answer to (5)a in (5)b involves focus on the constituent \textit{a hammer} with lexical stress on the first syllable of \textit{hammer} which means \textit{hammer} becomes culminatively the most prominent of the XPs by receiving main sentence accent.\textsuperscript{12}

(5) a. What did you break the window with?
   b. I broke the window with [a HAMMER]\textsubscript{F}.

However, main sentence accent in English can shift. For example, the question in (6)a receives the answer in (6)b. Here the focused element is \textit{window} and the first syllable of \textit{window} is stressed which means \textit{window} becomes the most prominent of the XPs. The main sentence accent is no longer rightmost. We see the same effect in (7) where contrastive focus is involved. In each case, everything to the right of focus is deaccented (Ladd 1980): pronounced with flat intonation.

(6) a. What did you break with a hammer?
   b. I broke [a WINDOW]\textsubscript{F} with a hammer

(7) a. Did you break a table with your hammer?
   b. No, I broke [a WINDOW]\textsubscript{F} with my hammer.

Main sentence accent can shift yet further left of the sentence. (8) and (9) show that all that is needed in English to focus the subject noun phrase is to shift the stress from the object to the subject and the subject becomes prominent. Prominence is realized via head marking again: as above, the rhythmically strongest element of the metrical structure is culminatively associated to the main sentence accent (other languages that do this are: German, Dutch, Greek, Italian, Spanish, Portuguese and Arabic).

(8) a. Who broke the window with a hammer?
   b. [RICHARD]\textsubscript{F} broke the window with a hammer.

(9) a. Peter just broke the window with a hammer.
   b. No, [RICHARD]\textsubscript{F} broke the window with a hammer.

In English, main sentence accent is not always associated with focus (Ladd 1996). For example, in cases of broad focus main sentence accent may shift depending on the kind of predicate that is used.\textsuperscript{13} This is discussed in detail in Ladd (1996). Transitive verbs favour main sentence accent on the last constituent (10)b; intransitive verbs with inanimate subjects, main sentence stress on the first constituent (the subject) (11)b, intransitive verbs with animate subjects, main sentence stress on the last constituent (the verb) (12)b and generic predicates, main sentence stress on the verb regardless of whether the subject is animate or inanimate (13). I mention these cases because French, as we shall see below, behaves very differently with regard to these data.

(10) a. What happened?
   b. [I broke a window with a HAMMER]\textsubscript{F}.
a. What happened?

b. [The COFFEE machine broke].

(12) a. What happened?

b. [The professor LEFT].

(13) a. [Wood FLOATS].

b. [Penguins SWIM].

In summary, in Germanic and (most) Romance languages focus is expressed by prosodic effects that are organized around prominent pitch accents related to lexical stresses.

3.2 The demarcative strategy

What happens in languages that have no lexical stress? In these languages, there cannot be a direct association between stressed syllables and prominence, since there is no syllable that stands out with regard to pitch accent. Instead, the languages resort to tone variation and other prosodic cues to express focus. For example, languages such as Chichewa and Bengali use the presence of high tones at the edges of phonological phrases in order to make these phonological phrases more salient.

Let us focus first on Bengali, a language with prosodic phrasing that is the object of study of Hayes and Lahiri (1991). Traditionally there are three kinds of tones (Pierrehumbert 1980): 1) pitch accents are tones that get linked to stressed syllables. Formally, they are annotated with an asterisk (H*, L*); 2) phrase accents, notated H−, L− are tones found between the rightmost pitch accent and the final boundary tone; 3) boundary tones, marked H%, L%, are linked to a boundary rather than a syllable, meaning that the pitch target is aligned with the actual edge of a phrase rather than a particular syllable.

However, Hayes and Lahiri (1991) follow Beckman & Pierrehumbert (1986) in analysing the old “phrase accent” as the boundary tone of an Intermediate Phrase (abbreviated iP) and the old “boundary tone” as the boundary tone of the Intonational Phrase abbreviated IP). Hayes and Lahiri (1991) also adopt insights from independent research on phrasing, namely the theory of Prosodic Hierarchy (Selkirk 1980; Nespor & Vogel 1986; Selkirk 1986). This theory is based on evidence from segmental phenomena rather than intonation, but also posits a level of phrasing immediately subordinate to the Intonational Phrase, namely the Phonological Phrase. It is an unsettled issue whether the Intermediate Phrase and the Phonological Phrase are the same thing. With regard to Bengali, Hayes and Lahiri (1991) assume that it is, since the exact same phrases that control juncture effects also appear to control the intonation pattern.

In Bengali, stress always falls on the initial syllable of a word. This rule is inviolable. As pointed out by Hayes and Lahiri (1991:56-57), “stress in Bengali is usually quite weak phonetically, sometimes to the point of being almost inaudible.” It might then be argued, as I will do later for French (see below), that Bengali has no lexical stress. The patterns in (14) show that the tone sequence in the language is L-H (with a L% tone at the end of the IP), with L and H framing the iP. Following the terminology of Truckenbrodt (1995), we can describe Bengali as a non-wrapping language, since the unmarked phrasing is [S] [O] [V]. Bengali uses boundary tones to delimit focus domains. The examples in (14) from Hayes and Lahiri (1991:62) show cases in which all or a part of the phrase raja-r e^cobi-r jonno taka cf. (14) ‘money for the king’s pictures’ is focused. The effect of focus is the creation of a new iP with the insertion of a boundary to the right via the introduction of a H tone. There is a boundary to the left of the focus which they claim is optional (but see Selkirk 2007 for a different view). Hayes and Lahiri (1991) use L* for the left tone of the iP: this is because they consider Bengali a stress language – despite the fact that stress is weak phonetically and completely regular. Because I assume Bengali stress is like French stress, i.e. non-existent, I use a simple L tone. The L% tone at the
far right is a tone associated with the IP (note that, although iP is for “intermediate phrase”, this terminology is not meant to be definite; my arguments are independent from the exact status of intermediate phrases in Bengali and in other languages, see French below).

(14) aj ami raja-r c\(^b\)obi-r jonno taka anlam
today I king’s pictures-GEN for money brought
‘Today I brought money for the king’s pictures’ (Hayes and Lahiri 1991:61)

\[-\]

a. [ aj ami [raja-r c\(^b\)obi-r jonno taka ]\(\text{IP}\) anlam]\(\text{IP}\) ‘money for the king’s pictures’
\[\text{L}\ast \quad \text{H} \quad \text{L}\%\]
b. [ aj ami [raja-r c\(^b\)obi-r jonno ]\(\text{IP}\) taka anlam]\(\text{IP}\) ‘for the king’s pictures’
\[\text{L}\ast \quad \text{H} \quad \text{L}\%\]
c. [ aj ami [raja-r c\(^b\)obi-r]\(\text{IP}\) jonno taka anlam]\(\text{IP}\) ‘the king’s pictures’
\[\text{L}\ast \quad \text{H} \quad \text{L}\%\]
d. [ aj ami [raja-r ]\(\text{IP}\) c\(^b\)obi-r jonno taka anlam]\(\text{IP}\) ‘the king’s’
\[\text{L}\ast \quad \text{H} \quad \text{L}\%\]
e. [ aj ami raja-r [c\(^b\)obi-r ]\(\text{IP}\) jonno taka anlam]\(\text{IP}\) ‘pictures’
\[\text{L}\ast \quad \text{H} \quad \text{L}\%\]
f. [ aj ami raja-r c\(^b\)obi-r [jonno ]\(\text{IP}\) taka anlam]\(\text{IP}\) ‘for’
\[\text{L}\ast \quad \text{H} \quad \text{L}\%\]
g. [ aj ami raja-r c\(^b\)obi-r jonno [taka ]\(\text{IP}\) anlam]\(\text{IP}\) ‘money’
\[\text{L}\ast \quad \text{H} \quad \text{L}\%\]

(Hayes and Lahiri 1991:62)

Féry (2009) argues that many Indo-Aryan and Dravidian languages, including Hindi, Bengali or Bangla, Tamil and Malayalam, show similarities in their prosodic and tonal structure: the intonation structure of phrase languages consists of phrasal tones. In all these languages, the prosodic phrasing, expressed tonally by boundary tones, plays a crucial role in determining the intonation, and lexical stresses and pitch accents, if present at all, are less important than they are for instance in English.

In Chichewâ, and in many other Bantu languages, the influence of focus on phrasing has been well-studied (Kanerva 1990). Chichewâ is a tone language. The basic word order is SVO. The default phrasing at the phonological phrase level is [S] [V Obj1 Obj2 Obl]. Focus is marked by an iP-boundary to its right. If the default phrasing does not provide such a boundary, one is inserted. It is manifested by low falling contours, IP-final lengthening, in particular the IP penultimate syllable becomes longer, and a slight pause is inserted after the focused constituent, as argued by Downing et al. (2004). Compare (15)a with (15)b.

(15) a. What did he hit the house with?
[Anaményá nyüºbá ¨di mwáála]\(\text{IP}\) [V OBJ OBL]
hit house with rock
‘He hit the house with a rock.’
b. What did he hit with a rock?
[Anaményá nyuúmbá] ip [³di mwáála] ip [V OBJ] [OBL]
‘He hit a house with a rock.’
(Kanerva 1990:98)

Like Bengali, Japanese is an SOV language, but unlike Bengali, it shows some wrapping, its unmarked phrasing being [S] [O V]. Insertion of the boundary is to the left. Focus has a variety of effects on prosody in Japanese. First, the F-marked constituent is marked by an increased tonal pitch, even if it is not lexically accented (Deguchi & Kitagawa 2002; Ishihara 2003). Second, focus triggers an intermediate phrase boundary to its left. Third, all IP-boundaries to the right of focus are erased.

3.3 Summary
To summarize Section 2: languages vary in the way they mark focus in the grammar. Some languages (Germanic, most Romance languages) have lexical stress and always link the prominence of the focused constituent to a stressed syllable in which case deaccenting occurs on every constituent to the right of focus (and sometimes to the left). Other languages (Bengali, Chichewâ, Japanese) resort to the insertion of boundaries either to the left or right (or both) of the intonational phrase to mark focus without any pitch accent on a particular syllable. In these languages, everything that is not focussed is dephrased rather than deaccented. While it is true that many languages that use the culminative strategy also make use of the demarcative strategy, the reverse is not true: there are languages that use only the demarcative strategy (in the absence of stress). The generalization that I will be making takes this into account: wh in situ languages tend to be languages that use the demarcative strategy only. “Culminative” languages (e.g. English, Spanish) may or may not allow wh in situ depending on whether and how the demarcative strategy is used (it is sometimes reported that Spanish has wh in situ and even English – while this is possible, it is clear that these languages are not full wh in situ languages, like, say Chinese).

4. Focus in French
French is very different from English in the way it marks focus. It appears that French cannot shift main sentence stress at all. This is shown in (16).

(16) a. Qu’est-ce qui s’est passé?
    ‘What happened?’

b. *[La MACHINE à café est tombée par terre].
    ‘The coffee machine broke.’
    or *La machine à CAFÉ est tombée par terre.

It is also impossible, or at least highly unnatural for most speakers of French, to use (17)b as an answer to a question such as (17)a.

(17) a. Qui a cassé la fenêtre avec un marteau?
    who has broken the window with a hammer
    ‘Who broke the window with a hammer?’
Instead, a French speaker will tend to use a cleft structure instead of (17)b, as in (18) where the second part of the cleft creates its own iP. This effect has been noted by Vaissière (2002) and many other linguists (see also Belletti 2004; 2005; Hamlaoui 2011).

(18) [C'est Richard]; [qui a cassé la fenêtre avec un marteau].

The cleft is a so-called presentational cleft: it does not have the semantics of an English type cleft. It is not presupposed that someone broke the window (a possible answer to the question *Qui a cassé la fenêtre avec un marteau?* could have been *personne* ‘no one’) and *Richard* is not contrastively focused. Presentational clefts are widely used in spoken varieties of French (cf. Sasse 1987:538-539).

The reason why main sentence accent shift is not possible in French and why the language resorts to clefts is because French speakers do not acquire a phonological distinction between stressed and unstressed syllables. This explains why French prosody is so different from English prosody. That French speakers are “stress deaf” is attested in several experimental studies by Emmanuel Dupoux and colleagues (Dupoux et al. 1997; Dupoux et al. 2001; Dupoux et al. 2008). English stress is contrastive (refuse versa refuse) and flexible (so much so that, as we have seen above, a focused word necessarily acquires the stress of the syllable in a lower prosodic group) whereas French “stress” has none of these properties. As pointed out by Féry (2001), the reason why French intonation is often lumped together with the intonation accounts of Germanic and other Romance languages is because French is analysed as having final stress (see, for instance, Mertens 1990; Post 2000). There is indeed always intonational activity at the end of a phonological word or a phonological phrase, but this final activity appears to be a boundary correlate rather than stress per se. I will follow the approach taken by Féry (2001) and Vaissière (2002) that takes seriously the idea that French intonation lacks any kind of stress (Rossi 1980; Beckman 1986), but uses instead demarcative cues at the edge of a phonological word or phrase. This makes French a very interesting language to study because it is the only Romance language where lexical/free stress disappeared (Klausenburger 1970).

The proposition that French is a language without lexical stress is strengthened by the historical literature. French went through a major change in prosody in the later Old and Middle French period (1100-1600): the heavy tonic stress that characterised the earlier period (500-1110) started to crumble (Pope 1934; Kukenheim 1971; Marchello-Nizia 1995). A new tendency to link words closely together began to appear (Hjelmslev 1936-1937; Togeby 1965). In fact, it appears that grammarians noticed that French was a phrase-based rhythm rather than a stress system as early as 1580. Dufter (2010) reports the following quote from Sainliens (1580) found in Livet (1859)14

(19) “...ma tante a disné se prononce ma tanta disné; mon père et ma mère ont soupé se prononce monperetmamerontsoupé. Toutefois, en faisant une légère pause on peut dire: mon père, et ma mère ont soupé. Mais si l’on s’habitue à cette prononciation on comprendra les livres, mais bien peu la conversation des Français.” (Sainliens 1580, in Livet 1859:502)

These differences between Germanic and French have been reflected in the metric system of each language for several centuries. Compare English (20) with French (21). In English, the rhythm is created through the use of stress, alternating between unstressed and
stressed syllables whereas in French there is no such alternation: the most prominent syllable is always the last one in a phonological phrase.

(20) Let me not to the marriage of true minds
Admit impediments. Love is not love
Which alters when it alteration finds
Or bends with the remover to remove. (Shakespeare, Sonnets)

(21) a. Si je la haïssais, je ne la fuirais pas. (Racine, Phèdre)
b. J’ose dire pourtant que je n’ai mérité
Ni cet excès d’honneur, ni cette indignité (Racine, Brit.)

Before 1250, however, some French texts were closer to English metrics than Modern French metrics. Rainsford (2010) shows that the rhythm of octosyllabic in Old French verse was initially strongly iambic (weak-strong). Noyer (2002) reports similar results for Old French. While he admits that no text at any period conforms absolutely to the Iambic Pattern in the sense of classical English verse (Shakespeare, Milton, or even Shelley), in the earliest works, departure from this was fairly limited. Finally, Rainsford (2011) confirms his 2010 findings by looking at caesura: texts which mark the mid-line break in the octosyllable with a stressed syllable are not attested after 1250.

After the loss of the original lexical accent, French stress becomes fixed and develops a system that favors a prominence that regularly falls on the last full vowel of a somewhat larger group, the so-called Groupe rythmique ‘Rhythmic Group’ (Grammont 1933; Costenoble & Armstrong 1934; Dell 1984) or Accent Phrase (Jun & Fougeron 2000). This is notoriously hard to define: with a typical length of three to seven syllables, its size and structure depend not only on semantic and syntactic factors but also on individual speech rate and style. However, generally it corresponds to a L…H contour as in (22).

(22) Le fils de mon voisin a encore cassé une fenêtre avec un caillou.
the son of my neighbour has again broken a window with a stone
‘My neighbour’s son broke a window with a stone again.’

[Le fils] [de mon voisin] [a encore cassé] [une fenêtre] [avec un caillou]
L H L | | | H L | H L | H L | H

French also has an intermediate intonational phrase (iP) (Jun & Fougeron 2000; Michelas & D’Imperio 2009). I will assume that the prosodic phrase is the same as the iP, since the exact same phrases that control juncture effects also appear to control the intonation pattern. The highest level is represented by a full intonational phrase (IP) whose left edge is flanked with a L tone (in declaratives/statements).

The hypothesis entertained here is that French makes use of prosodic phrasing to a much greater extent than Germanic or other Romance languages, because it is the only device that the language has at its disposal in order to realize focus domains: phrasing takes over some of the roles traditionally attributed to pitch accents in the marking of discourse-structural domains. I will show that a focused constituent in French is marked by the insertion of an obligatory H tone at the right edge of a newly formed iP and an optional H tone at the left edge of that iP. The left edge tone was originally used to signal emphasis or insistence and is still used often by TV presenters and politicians. However, the process has become more and more generalized and grammaticalized, losing its emphatic power and is now mainly used to express focus by providing boundaries for phrasing (Féry 2001, Vaissière 2002). In sum, the focused constituent in French is realized in a separate phrase, with its own tonal structure.
The examples in (23), taken from Féry (2001) and originally heard on a programme from the radio station France Culture, are illustrations of the left H tone. As shown by Féry (2001), what has been called “stress” in French is thus highly variable. It is generally possible for function words and schwa to be associated with a high tone. This is not a way to emphasize the function words. Rather the initial rises are to be interpreted as purely delimitative tones. As pointed by Féry (2001), in a model predicting that a certain syllable is lexically stressed and that it will obligatorily get a pitch accent if the word or the larger domain for which it stands is focused, such variation and facts cannot be accounted for. The location of stress, as conceived by most phonologists, is determined by rules, or alternatively by discourse-structural factors, or by both and is largely predictable. None of this holds for French (the capital letters correspond to a H tone).

(23)  a. ... quel est le premier thème scientifique which is the first theme scientific de votre premier livre [DE science fiction]f? of your first book of science fiction
‘What is the first scientific theme that you have chosen in your first science-fiction book?’

b. ça fait partie [D’UNE aventure], il y a it makes part of an adventure there is des gens qui ... people who

‘It is part of an adventure, there are people who...’

c. Ce sont des gens qui n’ont there are people who NE-have [JAMAIS eu la parole]f never had the speech

‘These are people who never could express themselves’

While the left H tone is optional, the right H tone is obligatory to express focus. This prosodic phrasing surfaces with lengthening of the vowel on the last syllable, and sometimes with a short break before and/or after the phrase boundary. Postfocus constituents are generally dephrased, and realized with a rather low and flat intonation, or alternatively with a high and flat intonation until the end of the sentence, where the melody falls. Let me illustrate. (24) is a case of broad focus. I give two structures, because the wrapping of the verb and its objects is flexible in French (it depends on style, speakers, context, etc.). Either the object is grouped with the verb or it is not. Depending on what structure is counted as input, focus will involve breaking an iP into two iPs or simply the prosodic marking via special cues of the focused iP.

(24)  What happened? [V OBJ OBL] or [V OBJ] [OBL]
[Le fils de mon voisin]iP [a cassé la fenêtre avec un caillou]iP
[Le fils de mon voisin]iP [a cassé la fenêtre]iP [avec un caillou]iP
the son of my neighbour has broken the window with a stone

‘My neighbour’s son broke the window with a stone.’

In (25), the focus is on avec un caillou ‘with a stone’. Since there is default phrasing here, there is no possibility to insert a boundary to the right of the focused constituent. This is a problem for most speakers: there are two alternatives. The first alternative is to insert a H tone at the left edge of the constituent. This tone can fall on: 1) avec ‘with’; 2) un ‘a’; or 3) the first syllable of caillou ‘stone’ with a preference for 3), then 1), then 2) in that order. There may also be lengthening of the vowel on the last syllable of caillou. There may also be a short break before the focused constituent. And finally, there may also be dephrasing in that the first two iPs merge.
into one. The second alternative is to use a presentational cleft: *C’est avec un caillou que le fils de mon voisin a cassé la fenêtre* ‘It’s with a stone that my neighbour’s son broke the window.’

(25) What did your neighbour’s son break the window with? [V OBJ] [OBL]

[Le fils de mon voisin]_{IP} [a cassé la fenêtre]_{IP} [avec un caillou]_{IP}

the son of my neighbour has broken the window with a stone

‘My neighbour’s son broke the window WITH A STONE.’

In (26) the focus is on the direct object *une fenêtre* ‘a window’. A H tone is inserted to the right of the focused phrase. There is lengthening of the vowel è in *fenêtre*. There can also be an optional H tone to the left of that focused phrase: either the tone is on *une* ‘a’ or on the first syllable of *fenêtre* ‘window’ with a preference for the second case. When focus is contrastive, the tone can fall on the second syllable of *fenêtre* (with lengthening of è): *Le fils de mon voisin a cassé une fenêtre avec un caillou, pas une porte* ‘My neighbour’s son broke a window with a stone, not a door.’ There might also be a slight pause before *avec un caillou*. The postfocus constituent is dephrased and realized with a low and flat intonation. All these properties are in fact noted by Wunderli (1982; 1983) for different examples.

(26) What did your neighbour’s son break with a stone? [V OBJ] [OBL]

[Le fils de mon voisin]_{IP} [a cassé]_{IP} [une fenêtre]_{IP} [avec un caillou]_{IP}

the son of my neighbour has broken a window with a stone

‘My neighbour’s son broke a WINDOW with a stone.’

In (27), the focus is on *de mon voisin* ‘of my neighbour’. Again, the focused constituent is framed with an obligatory H tone to the right and an optional H tone to the left on either *de* ‘of’, *mon* ‘my’ or the first syllable of *voisin* neighbour (with a preference for the latter). There is lengthening of the nasal vowel of the last syllable of *voisin*. There can also be a short break after the focused constituent and the postfocus is dephrased and pronounced with a flat and low intonation until the end of the sentence.
Who’s son broke a window with a stone?

‘My NEIGHBOUR’s son broke a window with a stone.’

There is independent evidence from segmental processes that focused phrases in French create their own phonological phrase. As shown by Féry (2003), while obstruent voicing assimilation and nasal-obstruent simplification regularly take place inside a prosodic domain of the size of a phonological phrase, when a boundary is created from the presence of narrow focus, these processes are blocked across iP boundaries.

In obstruent voicing assimilation, an obstruent in the coda of a syllable assimilates in voicing to the obstruent in the onset of the following syllable. This process takes place inside words (as in anecdote /kd/ → [gd] ‘anecdote’; abstract /bs/ → [ps] ‘abstract’), as well as across word boundaries as long as the words involved are included in the same iP. An expression like rêve[v] terrifiant ‘terrifying dream’ is pronounced rêve[f] because [t] in terrifiant is voiceless and causes devoicing of the preceding voiced fricative [v] of rêve. Other examples are: bec de gaz ‘gas tap’ where /kd/ becomes [gd]; loupe grossissante ‘magnifying glass’ where /pg/ becomes [bg]; onze francs ‘eleven francs’ where /zf/ becomes [sf] (all examples from Féry 2003).

Nasal-obstruent simplification is the process by which a sequence of nasal vowel-obstruent-consonant is simplified into the sequence nasal vowel-nasal consonant-consonant. The medial obstruent is changed into the nasal consonant corresponding in place of articulation. For example, the sequence [ãgm] in an expression like langue maternelle ‘mother tongue’ is pronounced [ãŋm] (see also Dell 1986 for this phenomenon). Other examples are: vingt-deux ‘twenty-two’ where /ɛ̃td/ becomes [ɛ̃nd]; dinde de Noël ‘Christmas turkey’ where /ɛ̃td/ becomes [ɛ̃nd] (examples from Féry 2003).

When a focused constituent introduces an iP boundary at its left edge, and a new iP is formed neither obstruent voicing assimilation nor nasal-obstruent simplification are possible.

In (28) b, de gaz ‘of gas’ is focused and separate phonologically from the preceding phonological phrase and bec de gaz is pronounced with [kd] rather than [gd].

In (29) b, vingt-deux ‘twenty two’ is pronounced [ɛ̃td] and not [ɛ̃nd].
We find exactly the same effects if it is *bec* ‘beak’ in (28) and *vingt* in (29) that are focused. This is shown in (30) and (31) respectively. In the following examples, *bec de gaz* is pronounced with [kd] rather than [gd] and *vingt-deux* ‘twenty two’ is pronounced [ɛ̃d] rather than [ɛ̃nd].

(30) a. Tu parles d’une queue d’oiseau?
*you speak of-a tail of-bird*
‘Are you talking of a bird’s tail?’
*no I speak of-a tap of-bird*
‘No, I am talking of a bird’s BEAK.’

(31) a. Tu as pris trente-deux bouteilles de vin?
*you have taken thirty-two bottles of wine*
‘Did you take thirty-two bottles of wine?’
*no, I-of.it have taken twenty two*
‘No, I took TWENTY-two.

To summarize Section 4: because it has no lexical stress, French resorts to tone variation in order to express focus. These tones are not associated with particular stressed syllables, but their position varies greatly. Their sole function is to delimit the edges of phrases arising through the interaction of syntax, phonology and focus structure. This state of affairs is a direct consequence of the loss of lexical accent in the later period of Old French. Moreover, special segmental processes are triggered when a constituent or a word is focused. These processes are very clear and shed light on the prosodic properties of focus in French.

5. Focus on wh in situ
In this section, I concentrate on wh in situ and show that wh in situ languages are languages that use prosodic phrasing rather than pitch accents to express focus. French is a case in point. As was argued in §4, French has no lexical stress and uses prosodic phrasing to mark focus. In this section, I propose that French also uses prosodic phrasing to mark wh in situ. For example in the following questions, the object wh word is set apart from the rest of the sentence prosodically. It has an H tone at the right edge of the wh phrase and an optional H tone at the left edge. Whether an H tone is selected at the left edge depends very much on the speaker or the context. The final lengthening and/or tonal activity are not indicative of stress or accent, but are best analysed as suprasegmental correlates of phrasing as in Section 3. There is also a slight pause after the wh phrase setting off the following iP apart from the rest of the sentence (the following questions can also be echo questions in which case the tone at the IP level is H% rather than L%; normal focus is marked by L% at the IP level).

(32) Il a demandé quoi aux passants?
*he has asked what to-the passers-by*
‘What did ask the passers-by?’

```
(H)
L     H     L     H      L%
```
Interestingly, French wh in situ phrases tend to require material to their right. I want to argue that this is because a clear demarcation (to the left and the right) is preferable/required. This explains why, it seems to me, speakers rearrange the default word order for objects and adjuncts. For example, we would expect the in situ question in (36)b rather than the one in (36)a for the answer in (36), since comment ‘how’ is an adjunct and au rendez-vous a quasi-argument, but (36)a is the most natural.
We see the same effects with *quand* ‘when’ in (37). (37)b is much better than (37)a.

(37) Il est arrivé à la fête à deux heures du matin. ‘He arrived at the party at two in the morning.’

Generally, it appears that French wh in situ phrases are likely to surface with post wh material. This is a preference and is not obligatory, since simple questions such as *Tu vas où?* ‘where are you going’ and *Tu fais quoi?* ‘what are you doing?’ are also very common in speech.

(38) Tu fais quoi ce soir? ‘What are you doing to tonight?’

(39) Tu vas où comme ça? ‘Where are you going like this?’

Prosodic constraints might also explain why in situ question in French are much better with pronouns than with full noun phrases. For example, (40)a is much more natural than (40)b. In order to express the proposition in (40)b, movement of the wh phrase is preferred, as in (40)c.
This may explain why French has wh movement alongside wh in situ: wh movement occurs for prosodic reasons as the result of a kind of rhythmic constraint. Wh phrases in situ in French do not like to be at the very right edge of an utterance if that utterance contains too many iPs or the relevant iPs are too large. This is dependent on context and speakers. This may also explain why there is so much variation in acceptability judgements for wh in situ in the literature, especially with regard to embedded clauses. There is a group of researchers that claims that wh in situ is unavailable in complement clauses introduced by a complementizer (Mathieu 1999; Bošković 2000; Cheng & Rooryck 2000; Boeckx 2000), and another group that disagrees and that finds sentences such as (41) acceptable (Obenauer 1994; Starke 2001; Adli 2006; Baunaz 2008; Shlonsky to appear).

Of course there are other factors that decide whether a wh word should be fronted or not: some pragmatic (Mathieu 2004), some semantic (Butler & Mathieu 2004). Let us now turn to segmental evidence that shows French wh in situ phrases create their own iPs. For example, the question corresponding to (42)a is (42)b: de quoi is focused just like de gaz. In this case, it is not possible in either (42)a or (42)b for obstruent voicing assimilation to apply: [kd], but not *[gd]. When de gaz is not focused [gd] is possible. We find the same effect in (43): neither the sequence patte de droite or patte de quoi can be pronounced [dd]. Instead, it is pronounced [td]. When de droite is not focused, [dd] is possible.

Turning now to nasal-obstruent simplification, if someone says (44)a and someone else asks ‘what kind of turkey did you eat?’, it is not possible for nasal-obstruent simplification to apply.
(44) a. J’ai mangé une dinde | [de Noel]<sub>F</sub>.
   ‘I ate a CHRISTMAS turkey (rather than, say, an Easter turkey).’

b. Tu as mangé une dinde | [de quoi]<sub>F</sub>?
   ‘What (kind of) turkey did you eat?’

These were examples of demarcative cues at the left edge of the French wh in situ phrases.

Let us now turn to the evidence for demarcative cues at the right edge of the French wh in situ phrases. In (45) and (46), we see that the narrowly focused part of the wh phrase creates its own prosodic domain and that consequently neither obstruent voicing assimilation (45)a nor nasal-obstruent simplification (46)a are possible.

(45) a. Tu parles de [quel sac]<sub>F</sub> | de caramels?
   ‘Which caramels’ bag are you talking about?’

b. Je parle du sien.
   ‘I’m talking about his.’

(46) a. Tu parles de [quelle dinde]<sub>F</sub> | de Noel ?
   ‘Which Christmas’ turkey are you talking about?’

b. Celle qu’il a préparée plus tôt.
   ‘The one that he prepared earlier.’

We see that in French the prosodic phrasing mechanism used for focus in declaratives is also used in wh in situ questions. This is not a coincidence: wh words are necessarily focused. That a language should use the same prosodic strategy to express focus in declaratives and in questions is only natural. What is interesting is that all the languages that use prosodic phrasing rather than pitch accents are also wh in situ languages. This is where I introduce the main generalization of this paper. Bengali (47), Chichewâ (48), Turkish (49), Inuktitut (50), Persian (51), Armenian (52), Japanese, Chinese, Korean are all wh in situ languages and they have a prosodic system that does not use pitch accents. Languages such as Japanese, Korean, French are all languages with regular/no stress that use prosodic phrasing to express focus and they are all wh in situ languages. In the following languages, the wh word is the most prominent in the sentence (Ladd 1996). In other words, prominence is realized in situ.

(47) Ram kake dekhlo?
   Ram who saw
   ‘Who did Ram see?’ (Ladd 1996:227)

(48) Kodi anyani á misala a-ku-chi-pwány-a chiyáni ? (Chichewâ)
   Q 2-baboons 2assoc 4-madness 2SM-pres-smash-fv what
   ‘What are the mad baboons smashing?’ (Mchombo 2004: 45)

(49) Tamer kim-I gör-düi?
   Tamer-NOM who-ACC see-PAST.3SG
   ‘Who did Tamer see?’ (İşever 2009: 105)
Of those languages above that are tone languages it is non-controversial to say that they lack lexical stress and pitch accents. For languages such as Turkish, Persian, Armenian, etc. it is more controversial.\textsuperscript{18} However, although most descriptions of the Turkish accentual system use the term ‘stress’ and although many researchers consider Turkish to be a stress-accent language, (Kaisse 1986; Barker 1989; Inkelas 1999) many do not (Underhill 1976; Lewis 1985; Underhill 1986; Levi 2005). “Lexical stress” in Turkish is like French “lexical stress” in that it is completely regular and non-contrastive. Armenian and Persian are also languages where stress is always predictable – it always falls on the last syllable (unless it contains \[\text{[əә]}\], in which case it falls on the penultimate one). There are exceptions in Persian too in the case of verbal prefixes. But as argued by Kahnemuyipour (2009) these can be shown to enter the combination as phonological words with their own stress (on the last/unique syllable).

The generalization so far is that stress languages are wh movement languages while non-stress languages are wh in situ languages. Non-stress languages include those that have no stress or lexical tones. What these languages do is use prosodic phrasing in order to mark focus. This is the only strategy for focus since it is not possible to link a particular stressed syllable to the most prominent phrase. We thus find that wh in situ is dependent mainly on prosody, and to syntax only indirectly. The movement alternative in languages like English is also dependent on prosody alone but perhaps more indirectly in that movement is triggered because the wh in situ option is not made available by the prosody. Of course, moved wh phrases may or may not receive an accent depending on the language. Whereas in English it appears that it does not (for reasons that escape me; but see Engdahl 2006 for special contexts), in other languages nuclear accent falls on the moved wh word: Romanian, Hungarian and Greek (all examples from Ladd 1996:227).

\begin{itemize}
  \item a. UNDE mergi? ‘Where are you going?’ (Romanian)
  \item b. CĂȚI bani ai ? ‘How much money do you have ?’
  \item c. CÂND a plecat? ‘When did it leave?’
\end{itemize}
d. CINE a chemat? ‘Who called?’

(57) a. KI az? ‘Who is that?’ (Hungarian)
b. MIT vettél ‘What did you buy?’
c. MILYEN volt a vacsora? ‘How was the dinner?’

(58) a. PU ine? ‘Where is it?’ (Greek)
b. JIATI efije? ‘Why did she leave?’
c. TI idhes? ‘What did you see?’

Before I conclude Section 5, let me say a word about Mandarin Chinese and about optional wh movement. In Mandarin Chinese every syllable has a lexical tone (with the possible exception of ‘neutral tone’ syllables). Thus, there are of course no pitch accents. However, it is not clear that there are boundary tones. What Chinese uses instead to express focus is variations in the local pitch range in which lexical tones are realized. Following Fleming (2008), focused words have expanded pitch range. Focus is also marked by duration apparently (word is longer when narrowly focused, compared to neutral/non-focused realizations). Finally, post-focus words are lowered and have compressed pitch range (Xu 2011). Pre-focus and final focus have ‘neutral’ pitch ranges.

The use of duration and variation in the local pitch range is best seen in cases where question particles are optional. The particle ne is used for wh questions while ma is used for yes-no questions, but not always. When ne and ma are not pronounced, the sentence may then be ambiguous. For example, shui has two possible meanings, ‘who’ and ‘anyone’, and in (59)a and (59)b shui only has one reading, ‘who’ and ‘anyone’ respectively. (59)c has two possible readings because of the lexical ambiguity of the wh-word shui and the absence of the particle. The ambiguity can be resolved by extending the pitch range on the wh-word as well as its duration and by compressing the pitch range of the post-focus words (Garding 1987; Xu 1999).

(59) a. shui lài-le ne ?
   who come-ASP Q
   ‘Who is coming?’
b. shui lài-le ma ?
   anyone come-ASP Q
   ‘Is there anyone coming?’
c. shui lài-le ?
   who/anyone come-ASP
   ‘Who is coming?/Is there anyone coming?’ (Hu 2002:403)

Finally, let me address the optionality issue. French, like many other wh in situ languages allows wh movement as well. Why should this be tolerated? There are many different answers that one could propose, from the idea that competitive grammars are involved (Kroch 2001) to the idea that the wh movement option in these languages is not equivalent to the wh movement found in compulsory wh movement languages (e.g. for Cheng 1991 most wh movement configurations in wh in situ languages are clefts). However, it is my understanding that most languages that allow wh in situ also allow wh movement, including languages like Chinese (Hoh & Chiang 1990). This type of movement can be seen as a kind of scrambling. There are in fact known differences in terms of information structure between the wh in situ option and the wh movement alternative (see Chang 1997, Mathieu 2004, Pires and Taylor 2007, Hamlaoui 2010).
6. Conclusion

In this paper, I argued that French is a wh in situ language because of its inherent prosodic properties and in particular because of the way focus is realized in the language. More generally, I argued that, whereas wh movement languages tend to use pitch accents followed by deaccenting to express focus, wh in situ languages tend to use prosodic phrasing. The first group of languages usually has lexical stress whereas the second one does not. In other words, the option to move or not to move in a given language is constrained by the limits imposed by the phonology of the language. Variation is thus not part of syntax but completely external to it.

The theoretical underpinnings of my approach to the wh in situ/wh movement distinction is that a large part of variation should be removed from syntax completely. In particular, the option to move or not to move (including A'-movement) is constrained by the limits imposed by the phonology of the language. This is compatible with the idea that UG is invariant: much of variation is reducible to external factors (Newmeyer 2005; Kandybowicz 2009; Boeckx 2010, Berwick & Chomsky 2011). However, what I propose is radical externalization. As I understand it, in Chomsky’s system, some variation is kept in syntax by way of features (Chomsky 2005), especially for cases such as the wh “parameter”. My theoretical stance is thus closer to that of Boeckx (2012) who claims that parameters simply do not exist. If the wh “parameter” is external to syntax, then it is a typological generalization susceptible of exceptions: it is not a categorical/classical parameter, but only a tendency. This does not imply that languages will differ “without limit and in unpredictable ways” (to use the often-quoted formulation of Joos (1957)): the null hypothesis is that typological variation is still highly constrained and not completely wild, which means there is still a lot of work to do for syntacticians (the end of syntax is thus definitely not upon us). Much work, of course, also remains to be completed if we want a proper understanding of how classical parameters other than the wh parameter can be said to be reducible to external properties of syntax.

The account makes certain predictions. First, if suprasegmental/post-lexical properties are responsible for the licensing of wh in situ, then it is predicted that there will be a lot of variation across speakers with regard to the distribution of wh in situ in French. This is exactly what we find (e.g. example (41) above). This is because realization of prominence via prosodic phrasing is variable: it varies according to the utterance, the speaker, the style of the speaker and/or the speed of the utterance. It is also important to note that, since it is focused, the prosodic modulation of a wh in situ phrase in French may have an effect on its interpretation (Baunaz 2008). This may be why speakers disagree about the grammaticality of certain sentences.

Second, if wh in situ in French is purely prosodic and thus external to syntax, then it is predicted that wh in situ will be acquired early by children in the language. This is exactly what we find. This is because the prosodic characteristics of a language are the first phonetic features that are acquired by a child and also French children know very early on that French has no lexical stress and thus that focus is not realized by pitch accent (Dupoux et al. 1997; Dupoux et al. 2001; Dupoux et al. 2008). Experimental work indicates that French-speaking children prefer the wh-in situ in the early stages despite its lower frequency in their input (Hoh & Chiang 1990; Zuckerman & Hulk 2001; Jakubowicz 2004; Hamann 2006; Jakubowicz & Strik 2008).

Third, prosody will be involved in many other areas of the grammar. While word order with respect to the verb and its object is usually considered a PF phenomenon (Chomsky 2001), it appears that its distribution is not completely free. It is dependent instead on prosody. Nespor et al. (2008) argue that depending on whether the language is OV or VO, complements are realized differently. Their prosodic realization depends on their position in the phrase: initial complements are realized mainly through higher intensity as well as higher pitch while final complements are mainly realized with increased duration. They find this pattern across languages – in Turkish (complement-head order) and in French (head-complement order) – and within a single language (German, both orders are possible). Finally, the difference between
languages that have pre-nominal or post-nominal adjectives may be reducible to prosody as well: in French, adjectives are focused and marked demarcatively (they receive main stress in situ, as it were). In English adjectives are also focused, but marked culminatively (they receive pitch accents).

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1 There may of course remain “lexical” parameters: that English has NPs after the verb to phone someone whereas French has PPs téléphoner à quelqu’un is not variation that is prosodic in nature (see Barrie & Mathieu, this volume for the idea that an important part of variation found in noun incorporation constructions cross-linguistically has to do with selection).

2 Wh movement is always to the left, and does not appear to proceed to the right (Kayne 1994).

3 The Clause Typing Hypothesis (Cheng 1991:22): “Every clause needs to be typed. In the case of typing a WH-question, either a WH-particle is in C0 is used or else the Fronting of a WH-word to the Spec of C0 is used, thereby typing a clause through C0 through Spec-Head Agreement.”

4 See also Hagstrom (1998); Miyagawa (2001) for the idea that the wh in situ word does not need to move, since by moving to C the Q particle has already satisfied the relevant feature on C.

5 West Greenlandic, Swahili, Maori, and Tuvaluan are all in situ languages that have no question particles; yes-no or wh.

6 Echo questions are not real questions in the sense that they do not ask for new information: they do not form an operator-variable structure.
“an in situ question word will to some degree be accentually prominent” (Ladd 1996:170-171).

On the other hand, note that the wh-in-situ in (167) bears NS. This indicates that a wh-in-situ is licensed prosodically (rather than in terms of feature checking).

(167) (I wonder) who ate what?"

8 Intonation here is used in a narrow sense. Intonation can be defined in a broad sense or in a narrow sense. In the broad sense, it includes factors such as word stress, tone and quantity all related to the lexical identity of words. In the narrow sense, it excludes such factors and refers to suprallexical, postlexical, non-lexical characteristics. Call this intonation proper. So of course English has that kind of intonation too, but what English does is that since it cannot license wh in situ prosodically, it licenses it syntactically.

9 A question is an operator/variable structure that asks for new information and new information is what focus is about.

10 A Western Muskogean language.

11 The literature does not deny Germanic and (most) Romance languages use tonal variation and duration to mark focus to some extent. The idea is that these languages use pitch accents predominantly.

12 Of course, because lexical stress in English is not fixed, it may fall on syllables other than the first one, i.e. on the second or third syllable as in Who did you hire? I hired a [photographer]; or What did you take? I took a [photograph].

13 Broad focus is the case where all the parts of the sentence are given equal prominence. The cases in (10) and (11) were cases of narrow focus. For the difference between narrow and broad focus, see (Ladd 1980).

14 ‘Ma tante a disné is pronounced ma tanta disné; mon père et ma mère ont sougé is pronounced monperetmamereontsoupé. In fact, one can also say, making a small pause: mon père, et ma mère ont sougé. But if one gets accustomed to that pronunciation, one will understand books, but hardly the conversation of Frenchmen.’ Quote and translation found in Dufter (2010).

15 Whether it is equivalent to a Major Phrase (Selkirk 1986) or a Phonological Phrase (Nespor & Vogel 1986) remains to be established.

16 Note that the processes I am describing are optional phenomena.

17 Their application vs. blocking is not categorical, but applies gradiently, to a greater or lesser degree. Also, as shown by Féry (2003), there is another process, liaison, that applies nearly as often across iP boundaries as inside iP's and is thus to be analyzed as an IP-bounded (Intonation Phrase-bounded) process.

18 As pointed out by a reviewer, there is an additional problem for the Tokyo dialect of Japanese, the basis of the standard dialect, since the language has word-level prominence and uses pitch accents. Tokyo Japanese has a lexical distinction between accented and unaccented words, and accented words are stressed on a given syllable. Thus Japanese is not at the same level as tone languages, where there is no sense of stress, or French, where stress is a phrasal property. Japanese is different from Germanic or Romance languages in that not all words need receive stress in a given syllable, as most words are actually lexically unaccented, but it is different from tone languages or French.

19 Exceptions appear to be Vietnamese and Cham. More work is needed on those two languages.

20 It contains universal principles such as argument structure, phrase structure, c-command, scope, etc. These universal principles are not parameterizable.