

## Information Structure and the Alignment of Phrasal Features in French Interrogatives

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It is generally accepted that utterances may be partitioned into information that is part of a *background*, in the sense of being shared by interlocutors, and information that is part of a *focus*, in the sense of being presented by the speaker as somehow novel. In French, the extent to which such a partition is reflected in the prosodic signal remains an open question. Jun & Fougeron (2000) showed that the region following a contrastively focused constituent may be marked by deaccentuation in both declaratives and polar interrogatives, while the region associated with contrastively focused material (henceforth the *focal domain*) is realized with a special prosodic contour (*Hf*) characterized by an  $f_0$  peak that is both higher and aligned later than a similar accent in a broad focus context. Féry (2001) further showed that the focal domain is typically phrased separately, while a syntactic subject is typically phrased separately regardless of its focus status. Finally, Dohen & Loevenbruck (2004) showed that the region preceding a focused constituent may be realized by a compression of the pitch range (or *downstepping*) in declaratives. It is not known, however, whether these findings generalize to *wh*-interrogatives, or whether the partitioning of information into background and focus is also marked by other prosodic features.

Through a controlled production experiment, the present study directly addresses the alignment between features of prosodic phrase structure on the one hand, and the left and right edges of focused constituents on the other, within French *wh*- and polar interrogatives. For polar interrogatives, it remains unknown whether the pre-focal domain is associated with specific prosodic features. For *wh*-interrogatives, the prosodic characteristics of both the prefocal and post-focal domains remain largely unknown. Moreover, it is not known whether the focal domain is associated with specialized contours or tonal alignment patterns as is the case for declaratives and polar interrogatives. A default hypothesis is that the alignment of prosody and focus in declaratives extends straightforwardly to both polar and *wh*-interrogatives. One might assume, for example, that there are three basic regions in both polar and *wh*-interrogatives: a focal domain bearing un-downstepped tonal features, a prefocal domain bearing downstepped features, and a post-focal domain that is deaccented. On this view, the offset of downstepping aligns with the left edge of the focus domain, while the onset of deaccenting aligns with the right edge of the focus. Given the above finding that *Hf* may replace other tonal events (e.g., *H<sub>i</sub>* or *H\**), the focal domain is predicted to be characterized by differences in both tonal composition and the phonetic characteristics of specific tonal events (peak timing, excursion, slope).

In order to target the alignment of prosodic phrasal features with the edges of focal domains, the study makes use of the fact that the scope of a focal domain may vary based on the specific type of contrast that is suggested by the context. By fixing the textual properties of the target sentences while varying the associated discourse context, in other words, it is possible to systematically manipulate the position of focal domain edges. In the condition shown in (1), for example, the context indicates a contrast between *orange* and *marron*, thereby predicting that the focal domain in the target (1ii) has a scope only as wide as the adjective (as indicated by brackets).

- (1) i. Je sais qu'Amelie a vendu la valise orange à Jean dans le jardin, mais...  
 ii. ...à qui est-ce que Amelie a vendu la valise [marron] dans le jardin?

In (2), however, the context indicates a contrast between *la caméra* and *la valise marron*, predicting instead that the focal domain in (2ii) is as wide as the direct object NP.

- (2) i. Je sais qu'Amelie a vendu la caméra dans le jardin, mais...  
 ii. ...à qui est-ce que Amelie a vendu [la valise marron] dans le jardin?

Two additional conditions establish focus domains that include the entire VP, as in (3), or the clausal constituent (excluding the prepositional phrase), as in (4).

- (3) i. Je sais qu'Amelie a déjeuné dans le jardin, mais...  
 ii. ...à qui est-ce que Amelie a [vendu la valise marron] dans le jardin?

- (4) i. Je sais qu'il y a du soleil dans le jardin, mais...  
 ii. ...à qui est-ce que [Amelie a vendu la valise marron] dans le jardin?

Contexts like those above were presented as text to four adult native speakers of standard French. The contexts included both *wh*-interrogatives like those above, and polar interrogatives in a closely related set of conditions. Participants were asked to read the sentences aloud using a conversational style, and their productions were recorded. The target clauses were subsequently analyzed by the authors based on a range of prosodic features. An initial analysis coincides with the findings of earlier studies for declaratives and polar interrogatives. Elements of the post-focal domain, for example, are likely to lack tonal features, though this is only a tendency. Elements of the pre-focal domain, by comparison, generally include prominent tonal features. In addition, there is evidence for a specialized tonal feature (c.f. H<sub>f</sub>) associated with the rightmost syllable of the focus domain, which has both a higher and later f<sub>0</sub> peak as compared with phrase final f<sub>0</sub> peaks in other parts of the focal and pre-focal domain. Finally, the elements of the focal domain show a tendency to be phrased together, though this is less likely for subjects that are part of the focal domain.

Further analysis of the collected data will include two broad approaches. On a macroprosodic level, the productions will be analyzed for the distribution of tonal features (i.e., H and L tones associated with pitch accents or phrase edges) across the three domains: pre-focal, focal, and post-focal. In addition, pitch range will be measured both as the absolute value of subsequent f<sub>0</sub> peaks, and as the difference between local maxima and minima. Finally, the tendency for phrase boundaries to either coincide with the edges of focal domains or to occur within the focal domain will be measured. This will be achieved through measurements of syllable coda duration and corroborated with an inspection of the f<sub>0</sub> track. On a microprosodic level, special attention will be given to events occurring at or near the edges of the focus domain. Tonal events (e.g., prominent f<sub>0</sub> peaks) occurring at the left and right edges of the focus domain, for example, will be measured for their temporal alignment characteristics relative to syllable and prosodic phrase edges. In addition, phonetic characteristics of rises (e.g., absolute peak f<sub>0</sub>, excursion, f<sub>0</sub> slope) occurring at the right edge of focus domains will be tested for a correlation with the scope of the focus domain. Finally, the tonal events immediately surrounding the edges of focus domains will be evaluated for the effects of tonal scaling. In other words, we will test for whether the transitions between the various domains are marked by relative differences in peak height between neighboring tonal events, a feature which has previously been attributed to the suppression versus nonsuppression of downstep features (Féry & Truckenbrodt 2005).

The findings of the study serve to establish a baseline dataset for a phenomenon (focus within wh- interrogatives) that has previously received little attention. In addition, they serve to corroborate a set of generalizations that have been developed in association with other utterance types. It would represent a significant theoretical advancement, in other words, if wh- interrogatives are found to pattern closely with both declaratives and polar interrogatives in terms of the overall distribution and scaling of tonal features. Finally, the study explores a wide range of prosodic features which for French have not previously been tested for alignment with categories of information structure.

### **References**

- Dohen, M. & Loevenbruck, H. (2004). Pre-focal rephrasing, focal enhancement and postfocal deaccentuation in French. In *Proceedings of the 8th International Conference on Spoken Language Processing*, 785-788.
- Féry, C. (2001). Intonation of focus in French. In C. Féry & W. Sternefeld (Hrsg). *Audiatur Vox Sapientes. A Festschrift for Arnim von Stechow*. Akademie Verlag. Berlin. 153-181.
- Féry, C., & Truckenbrodt, H. (2005). Sisterhood and tonal scaling. In Horne, M. & van Oostendorf, M. *Boundaries in Intonation*, 223-243.
- Jun, S.-A., & Fougeron, C. (2000). A phonological model of French intonation. In A. Botinis (Ed.), *Intonation: Analysis, modelling and technology*. Boston: Kluwer.