

## Dual focus in French, German and Mandarin

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The present paper studies the prosodic encoding of sentences with dual focus—i.e. sentences that answer interrogative sentences with two *wh*-phrases—in French (16 speakers, 448 sentences), German (6 speakers, 960 sentences) and Mandarin (5 speakers, 400 sentences), that is, a phrase language, an intonation language and a tone language. Following Krifka (2008), we take *focus* to be the part of a sentence that introduces alternatives, which are relevant for the interpretation of linguistic expressions. We conducted three laboratory production experiments for which native speakers read similar sentences in four contexts: all-new/broad focus, first focus, second/final focus and dual focus. We also varied the prosodic length of the target constituents; i.e. short and long. In French, both foci were post-verbal (see examples in (1) and (2)), and in German and Mandarin, the first focus was initial (on the subject) while the second was final (on an object or on an adjunct). In each of the three languages investigated, F0 and duration were measured on all relevant regions in all sentences, i.e. on the pre- and post-focus material and of course on the focus itself. Statistical analyses were performed to examine the role of information structure and length on prosodic realization. Although the experiments were not originally conceived for direct comparison, and the region of interest for French is the post-verbal region (the place where post-focal compression may or may not apply), sentences containing dual focus are interesting from the perspective of expectations about prosodic structure: they elicit a conflict between the need to include the entire sentence in a single intonation phrase—with one nuclear stress—and the need to realize two foci—each with their own nuclear accent—and thus to divide the sentences in two intonation phrases (see Kabagema-Bilan, López-Jiménez & Truckenbrodt, 2011 for an explicit formulation of the conflict). The three languages investigated resolve the conflict in different ways. Figures are averaged with the help of ProsodyPro (Xu) in Praat.

In French, the F0 contour does not change as much as in the other languages depending on the context, see Figure 1 for an example. We can see pitch compression in the first focus case and boundary tones (and an increase in the number of breaks) before a focused constituent. These results point to the importance of phrasing in this language. Prosodic phrases do not change, but their tonal pattern can change. Speaker variation is important in this language.

In German, three strategies could be identified: the first focus was realized with either a rising or with a falling contour, depending on the length of the sentence. The second focus was always realized with a falling pitch accent. In the short sentences, 75.5% of the first focus was realized as a rising contour. A realization with a rising tone resembles the one with a single final focus, and one intonation phrase. This pattern was also predominant in the all-new context. In the long sentences, 67% of the first focus accents in dual-focus pattern had a falling contour, a contour that was not found in other contexts (initial focus, final focus, all-new context). In dual focus, post-focal compression was clearly present after the first focus. Moreover, in the falling contour cases, the first i-phrase ended with a boundary tone or not. When it did (two-phrase pattern), the sentences corresponded to a division of the sentence into two intonation phrases, i.e. with a phrase boundary after the first focus. When no boundary tone was present (two-peak pattern), a recursive prosodic structure must be assumed, distinct from both the realization with one i-phrase and the one with 2 i-phrases, see Figure 2.

In Mandarin, there was an increase in F0 and word duration in both foci, and this to almost the same degree as their initial and final focus counterparts respectively. This happened both in the long and in the short sentences. The word following the first focus did not differ from its neutral and final focus counterparts in F0 and duration. Thus, no prosodic boundary was inserted after the first focus and the two foci were realized in one intonational phrase (contra Kabagema-Bilan et al. 2011 who only looked at short sentences).

From a theoretical perspective, the results in all three languages imply that Culminativity is violable. Moreover focus assignment and phrasing are largely independent of each other. All three languages use different strategies for the expression of a dual focus, which always differ from a combination of an initial and a final focus.

The conclusion is that different types of languages differ as how they use prosody for expressing information structure, even though some phonetic results may resemble each other. We will show how the type of language is influencing the prosodic structure in the three languages.

### Examples of sentences for French

(1) Short object/short adjunct:

Bernadette a présenté son collègue à leur rival.

*'Bernadette introduced her colleague to their rival.'*

Questions:

a. All-new: Qu'est-ce qui s'est passé?

*'What happened?'*

b. Initial focus: Qui est-ce que Bernadette a présenté à leur rival?

*'Who did Bernadette introduce to their rival?'*

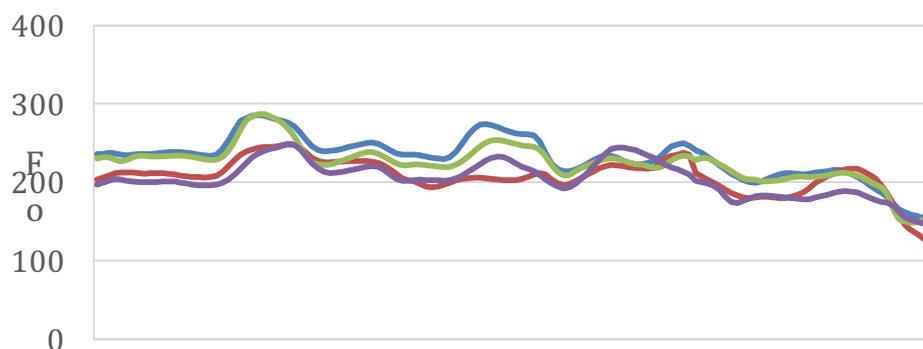
c. Final focus: Comment est-ce que Bernadette a présenté son collègue?

*'To whom did Bernadette introduce her colleague?'*

d. Dual focus: Qui est-ce que Bernadette a présenté et à qui?

*'Who did Bernadette introduce and to whom?'*

Figure 1: Average contours of sentence (1) in four contexts: Blue: All-new, Purple: IF, Green: FF, Red: DF

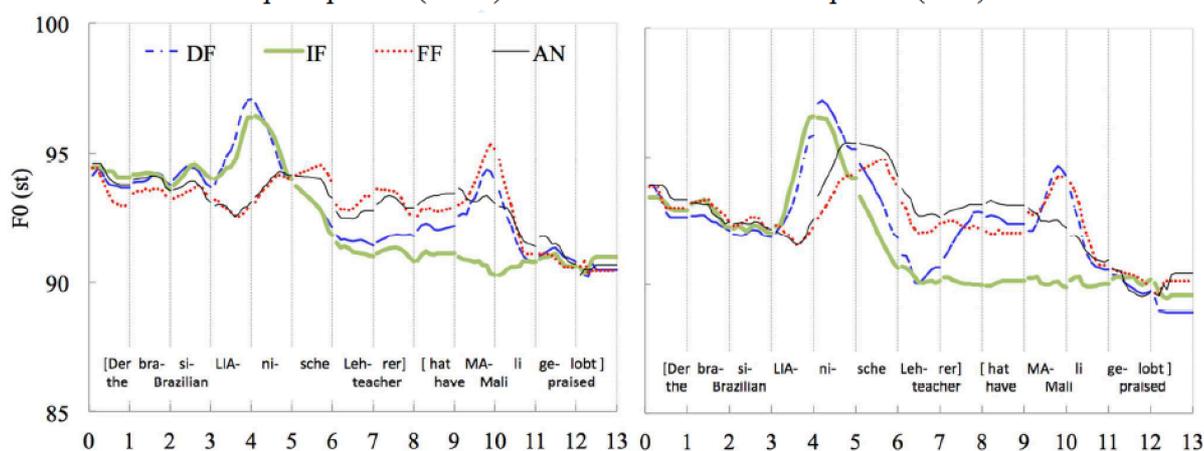


Ber na dette a pré sen té son col lègue à leur ri val.

Figure 2: German two-peak and two-phrase realizations

Two-peak pattern (N=10)

Two-phrase (N=2)



Kabagema-Bilan, Elena, Beatriz López-Jiménez & Hubert Truckenbrodt (2011) Multiple focus in Mandarin Chinese. *Lingua* 121: 1890-1905.

Krifka, Manfred (2008) Basic Notions of Information Structure. *Acta Linguistica Hungarica* 55: 243-276.

Eady, S. J., W. E. Cooper, G. V. Klouda, P. R. Mueller, & D. W. Lotts (1986) Acoustical characterization of sentential focus: narrow vs. broad and single vs. dual focus environments. *Language and Speech*: 233-250.