French Modal Ellipsis And Anaphora: Testing The Epistemic Restriction

Modals like English *must* or French *devoir* can express (i) a deontic meaning, where something is required by law (e.g. "As a citizen, you **must** pay taxes") or (ii) an epistemic meaning, marking that the speaker draws an inference based on evidence ("You yawn a lot, you **must** be tired.") MODAL ELLIPSIS describes a type of ellipsis where a modal verb is overt, but its complement elided, as in (1a). In French, the same meaning can be expressed by adding a clitic, *le*, as in (1b). FRENCH MODAL ELLIPSIS (FME) (1a), and FRENCH MODAL ANAPHORA (FMA) (1b), have been claimed to be grammatical only under a root interpretation of the modal *devoir* 'must' but ungrammatical under an epistemic interpretation ([1-4]; see [5] for English). This adds to many well-known differences between epistemic and root modals in their interactions with subject, tense, aspect, negation [5], yet it is much less understood.

(1) a. Hugo **doit** faire du sport   et Olga **doit** [faire du sport] aussi.   (FME)
     b. Hugo **doit** faire du sport   et Olga le **doit** [faire du sport] aussi. (FMA)

   'Hugo must exercise   and Olga (it) must too.'

The main goal of our experiment is to determine whether the contrast reported in the literature is valid, in order to inform the debates about what grounds the difference between root and epistemic modals. Previous descriptions in French [1-4] are only based on uncontrolled judgments, and lack experimental support. A second goal is to inform the debate about the status of the clitic *le* in French in constructions such as (1b). There are two main analyses, that make different predictions: [4] derives the epistemic/root asymmetry in FME/FMA from a structural difference in complement size: epistemic *devoir* is a raising verb (TP) and deontic *devoir* a control verb (CP). [4] predicts a strong difference in acceptability between epistemic and root FME\FMA—with no difference between (1a)/(1b). In contrast, [6] derives flavor from the modal's relativization to a speech/attitude event (epistemic) or a VP-event (deontic). [6] does not predict a difference between epistemic and root FME/FMA. To test the hypothesis that, in French, epistemic FME/FMA is impossible, whereas root FME/FMA is licensed, we ran an Acceptability Judgment task to assess those judgments in a more controlled setting.

Methods. Experiments were implemented online using PCIbex [7]. The task was an acceptability judgement task, where French participants read a short context followed by a sentence and were asked to assess its acceptability based on the context, by picking between *naturelle* 'natural' and *étrange* 'strange'. Examples are given in **Fig1**. Test items consisted of a context favoring either deontic (cf. **Fig1-i**) or epistemic interpretation (cf. **Fig1-ii**), followed by a modal sentence. We used identical sentences across deontic and epistemic, only varying the preceding context. We created a list of 12 different sentences. We ran three versions of the experiment: one testing FME constructions ((1a), illustrated in **Fig1-i/ii**), one testing FMA (1b), and one baseline (testing simple sentences with no ellipsis). For the baseline, contexts involved only one character (e.g., "Hugo has back issues. His doctor told him to be more active. Hugo must exercise"). The baseline allows us to control for the felicity of *devoir* in epistemic vs root contexts— which is crucial to interpret potential differences between flavors. Fillers involved quantity expressions whose acceptability depends on the context, and crucially required participants to read the preceding context.
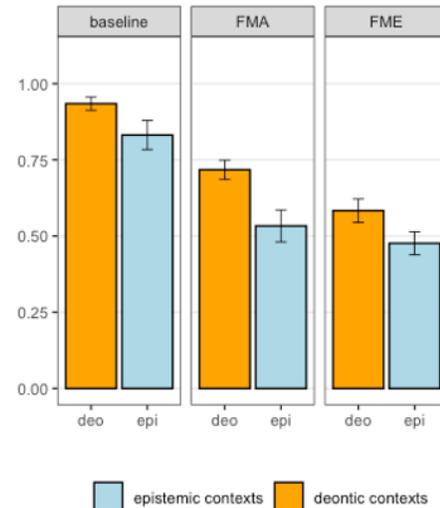

Figure 1. Experimental trials (FME experiment)

Fig1-i. Deontic context

Hugo a des problèmes de dos.
Olga a mal aux genoux.
Leur médecin leur a recommandé d'être plus actifs.

Hugo doit faire du sport et Olga doit aussi.

Comment trouvez-vous la phrase en gras dans cette situation ?

| étrange | naturelle |

Hugo has back problems. Olga has knee pain. Their doctor recommended that they be more active.

Fig1-ii. Epistemic context

Alex est assis dans un café face à son ordi.
Annie est assise à côté de lui devant son propre ordinateur.
On a l'impression qu'ils sont tous les deux très absorbés.

Alex doit travailler et Annie doit aussi.

Comment trouvez-vous la phrase en gras dans cette situation ?

| étrange | naturelle |

Alex is sitting in a café in front of his laptop. Annie is sitting next to him in front of her own computer. They both seem completely absorbed in what they are doing.

Conditions. Flavor (epistemic vs. deontic) was tested within subjects. We manipulated flavor by block: each participant saw either epistemic contexts first then deontic ones or deo-then-epi. Overall, participants had 12 sentences to judge per block: 6 test cases and 6 fillers (3 acceptable, 3 unacceptable). Sentence-Type (FME/FMA/no ellipsis) and BlockOrder (epi-then-deo vs. deo-then-epi) were tested between subjects. **Procedure**. After instructions and four practice trials, participants complete two blocks of 12 trials, presented in randomized order. The design ensured that one participant never saw a sentence twice (i.e., with its deontic and with its epistemic context). The design and analyses were preregistered on OSF (link).

Figure 2. Proportion of 'natural' responses in epi (blue) vs. deo contexts (orange) depending on Sentence Type (n=213participants).

Predictions. According to [4], the acceptability of FMA and FME should be degraded when presented in contexts favoring epistemic readings (relativized to the baseline).

Participants. 217 French native participants were recruited on Prolific (108 F, 106 H, 2NB; mean age: FME: 34.7yrs; FMA: 35.1yrs; Baseline: 35.1yrs; age range: 18—70). 4 participants were excluded for low accuracy on fillers (<75%) (1.8%). We therefore report results for 213 participants (FME: 70; FMA: 71; Baseline: 71). **Fig2** summarizes the mean of answers 'naturelle' (vs. 'étrange') in each Flavor condition by experiment.

Analyses. To analyze participants' responses, we fitted a generalized linear mixed-effects model with a maximal random effect structure [8]. The dependent variable was Answer (binomial, 'naturelle' coded as 1, 'étrange' coded as 0, with Flavor (epi/deo) and SentenceType (FME/FMA/baseline) and their interaction as fixed effects. Random effects included Item and Subject by Flavor. To evaluate the contribution of the interaction, we compared the full model with a reduced model. Result of the likelihood-ratio test testing the interaction is not significant (χ^2(2)=4.06, p=0.13). Posthoc tests using emmeans [9] indicate a main effect of Flavor (root being overall more acceptable than epi, β=1.19, SE=0.15, z=8.0, p<.0001***) and of SentenceType, with higher acceptability for the baseline, but no difference between FMA and FME (FME vs Baseline: β=2.9, SE=0.34, z=8.5, p<.0001***; FMA vs baseline: β=2.2, SE=0.34, z=8.5, p<.0001***; FME vs FMA: β=0.67, SE= 0.32, z=2.2, p=0.077). Interestingly, post-hoc analyses indicate that when restricting the analyses to the first block, the FlavorxSentenceType interaction is significant (result of the LRT: χ^2(2)=7.1, p=0.0297*). For FME and the baseline, the difference between epi and root is not significant, but it is for FMA (see Table 1).

Table 1. Proportion 'natural' answers by Flavor, Sentence-Type and Block.

	block 1 (6 sentences)		block 2 (6 sentences)	
	deo	epi	deo	epi
baseline	94%	88%	93%	78%
FMA	74%	48%	70%	58%
FME	53%	55%	64%	41%

Discussion. We show that epistemic FME/FMA is possible, which contradicts [4]'s strong claim that FME and FMA are agrammatical under epistemic readings. Note that we did not expect the difference found between epi and root in our baseline experiment, since *devoir* does not exhibit an intrinsic flavor bias that could explain the difference. Corpus data from [10] show a roughly 60-40% split between epistemic and root uses. Further analyses show that it is partly due to one of our 12 sentences, where acceptability in epi was much lower. Our overall results show no difference between FME and FMA conditions. The latter is consistent with [4] recent work on French clitic *le*. However, Block 1, taken alone, shows a significant effect on flavor only for FMA. This result deserves more careful analysis as it may contribute to the discussion around the nature of *le*.

References: [1] Busquets & Denis, 2001. [2] Dagnac, 2010. [3] Authier, 2011. [4] Authier, 2025. [5] McDowell, 1987. [6] Hacquard, 2011. [7] PCIbex. [8] Barr et al., 2013. [9] Lenth, 2024. [10] Dieuleveut, 2023.