

## Epistemic Modality and Indexicality

**Introduction.** We establish (i.) that the scope of epistemic modals above tense is not syntactic, (ii.) that their so-called speaker-orientedness is an effect of indexicality, and (iii.) that Romance exhibits obligatory indexical-shifting (for simplicity the examples are taken from Romance rather than English because some morphosyntactic constraints obfuscate the facts in the latter; our conclusions are intended to apply to English though). **1. An unnoticed contradiction.** Examining the interaction of Tense, Negation and modals leads to the conclusion that epistemic modals cannot take syntactic scope above Tense, despite appearance to the contrary. The assumption (Butler 2002, Hacquard 2006, Stowell 2004) that epistemic modals take syntactic scope at LF above Tense (Hypothesis (1-a)) leads to a contradiction (for clarity we show this in Italian, where Negation consistently precedes the verbs it modifies, including modals). Suppose that the hypothesis is correct; (i.) the epistemic modal *potere* ‘can’ always scopes below Negation, and (ii.) above Tense ((1-a), see (2)); (iii.) the deontic modal *dovere* ‘must’ always scopes below Tense ((1-b), see (3)) and (iv.) it can scope *above* Negation (4); *potere*<sub>deon</sub> always scopes below Negation (5). So two Negations are needed: one above and one below Tense. Let us grant this; assuming that the relation  $>$ : “takes syntactic scope above” is transitive, we arrive at the hierarchy represented in (6). But we are now in a bind, for epistemic *potere* is expected to be able to take scope above the lower Negation, contrary to fact (7). Transitivity of scope fails; now there is little reason to doubt that syntactic scope itself is a transitive relation, therefore the failure of transitivity must be due to the fact that either the Tense/modal or the Negation/modal relationship (the only two types used in building the hierarchy) is not determined by structure only. There are grounds for suspecting that the Negation/modal scopal relationship (at least the one between the deontic universal modal and Negation) is a structural one: in (8), a subject indefinite can scope between the modal *devoir*<sub>deon</sub> and Negation, indicating that the low scope of Negation is not the effect of some semantic computation (it is indeed tempting to consider *devoir*<sub>deon</sub> as a Neg-raising predicate and endow it with a homogeneity presupposition, following Gajewski 2005: this however doesn’t yield the desired intermediate scope of the indefinite). So analyses which base-generate epistemic modals above Tense or base-generate them below Tense but have them move across it at LF, rest on an untenable contradiction. The apparent scope of epistemic modals above Tense is not syntactic scope (which it is natural to conceive of as a transitive relation). Only one option is left: epistemic modals are base-generated and interpreted below Tense; their apparent wide scope is illusory (Zagona 2009 makes a similar claim, but we provide the first fully articulated and empirically grounded argument to substantiate it). **2. Illustration.** This leads to expect that the modal evaluation time can coincide with the so-called Topic Time argument of T (following Klein’s 1994 terminology). This is indeed what happens: (9) contains an epistemic modal and it can mean that at some moment in the past the speaker’s epistemic alternatives contained worlds in which the President was dead. The modal base cannot be metaphysical in Condoravdi’s (2002) sense (we thus agree with von Stechow & Gilles 2006 and Abusch 2008) since the complement of the modal denotes a settled eventuality; and the sentence doesn’t contain a silent attitude verb responsible for a simultaneous sequence of tense reading (*pace* Hacquard 2006): the presence of a silent attitude leads to expect that a future-in-the-past morphology should be possible, contrary to fact (10). **3. Consequences.** The speaker-orientedness of epistemic modals cannot be an artifact of their *height* (*pace* Butler 2002 a.o.), but is an effect of indexicality. The modal evaluation is normally done w.r.t. the epistemic alternatives of the speaker (11) but **(1.)** when epistemic modals are embedded under an attitude verb, the modal evaluation is done obligatorily w.r.t. the epistemic alternatives of the attitude holder, not of the speaker; the modal evaluation time can be either simultaneous with the Topic Time of the matrix (12) or with the time of the embedded (13). **(2.)** When the modals are placed in a relative clause (14), the epistemic alternatives have to be the speaker’s, whereas the modal evaluation time can coincide either with the matrix or with the embedded TT. **(3.)** Some contexts allow the modal evaluation time to shift (9), but importantly the epistemic alternatives must again be the speaker’s. In sum, the modal evaluation is done w.r.t. the speaker’s Common Ground, unless the modal is embedded under an attitude operator, in which case the center of evaluation shifts obligatorily. Therefore

epistemic modals introduce an indexical element, *viz* the holder of the epistemic alternatives; this indexical can shift, and when it can shift, it must do so. Epistemic modals also introduce a time variable, but it is not an indexical but a bindable variable. The fact that no shift of the indexical occurs outside of the scope of attitude verbs is expected (Schlenker 2003); what is surprising is that the shift is mandatory (Schlenker 2003 does not countenance obligatory shift). Unlike obligatorily shift of all 1<sup>st</sup> person indexicals with Slave *hadi* ‘say’ (Anand & Nevins 2004), the shift described here occurs with all attitude predicates, and doesn’t obey A&N’s (2004) SHIFT TOGETHER CONSTRAINT: in effect, *dans deux jours* is a shiftable temporal indexical, but it need not receive an embedded interpretation in (15). Following A&N (2004) we avail ourselves of both a context parameter and an index parameter; operators overwrite the coordinates of the context parameter with those of the index parameter; we introduce a new coordinate *Ep* (for holder of epistemic alternatives) in order to avoid shifting of 1<sup>st</sup> person indexicals.

- (1) Syntactic Scope Hypothesis:
  - a. Tense takes syntactic scope below epistemic modals.
  - b. Tense takes syntactic scope above root modals.
- (2) Matteo poteva/doveva<sub>epis</sub> essere stanco. (Matteo can/must-IMPF be tired)  
*‘Matteo might/must have been tired.’*
- (3) Matteo poteva/doveva<sub>deon</sub> fumare. (Matteo can/must-IMPF smoke)  
*‘Matteo was allowed/had to smoke.’* Not: *‘Matteo is allowed/required to have smoked.’*
- (4) Matteo non deve<sub>deon</sub> parlare a Sara.  
 Matteo NEG must-PRES talk to Sara  
*‘Matteo mustn’t talk to Sara.’* Or: *‘Matteo doesn’t have to talk to Sara.’*
- (5) Matteo non può<sub>deon</sub> parlare a Sara. (Matteo NEG can-PRES talk to Sara)  
*‘Matteo can’t talk to Sara.’*
- (6) NEG > potere<sub>epis</sub> > T > dovere<sub>deon</sub> > NEG > potere<sub>deon</sub>
- (7) Matteo non può<sub>epis</sub> essere il colpevole. (Matteo NEG can-PRES be the culprit)  
*‘Matteo can’t be the culprit.’* Not: *‘It is possible that Matteo is not the culprit.’*
- (8) (Context: the rules of this card game state that in order to end the game...)  
 Un joueur ne doit<sub>deon</sub> plus avoir de cartes. (*must*<sub>deon</sub> > *some* > NEG)  
 A player NEG must anymore have of cards  
*‘Some player must have no more cards.’*
- (9) (Context: Jack Bauer testifies before a commission; he was in charge of protecting the President, who was abducted; JB is asked to explain why he told the VP that his time had come. The President was eventually released safe and sound.)  
 Le président pouvait/devait<sub>epis</sub> être déjà mort, donc j’ ai appelé le vice-président.  
 The President can/must-IMPF be already dead, so I have called the Vice-President  
*‘It was possible/certain that the President was already dead, so I called the Vice-President.’*
- (10) (Same context...) \*Le président pouvait être déjà mort et le VP serait heureux de l’apprendre. (The President can-IMPF be already dead, and the VP would-be happy to hear it)
- (11) #Il peut<sub>epis</sub> pleuvoir mais je ne le crois pas, c’est l’avis de Jean. (It can-PRES be raining but I don’t believe it, it is Jean’s opinion)
- (12) JB a dit au VP que le président pouvait<sub>epis</sub> être déjà mort. (JB has told the VP that the President can-IMPF be already dead)
- (13) JB a dit à la commission que le président pouvait<sub>epis</sub> être déjà mort. (JB has told the commission that the President can-IMPF be already dead)
- (14) Marc a acheté un terrain qui pouvait<sub>epis</sub> très bien contenir du pétrole #mais moi je ne le pense/pensais pas. (Marc has bought a terrain which can-IMPF contain oil but I don’t/didn’t think so)
- (15) La semaine dernière, le docteur pensait que Marie pouvait très bien être opérée dans deux jours.  
*‘Last week the doctor that Marie might very well be operated upon in two days.’*
- (16)  $\llbracket \text{OP}_{\text{EP}} \alpha \rrbracket^{k,j} = \llbracket \text{OP}_{\text{EP}} \alpha \rrbracket \langle A_k, H_k, Ep_k, t_k, w_k \rangle, \langle A_j, H_j, Ep_j, t_j, w_j \rangle = \llbracket \alpha \rrbracket \langle A_k, H_k, Ep_j, t_k, w_k \rangle, \langle A_j, H_j, Ep_j, t_j, w_j \rangle$