
Modal Verbs Must Be Raising Verbs

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1 Introduction

This paper argues that modal constructions are represented by a raising structure rather than a control structure. In particular, we challenge the claim that the epistemic vs. root distinction correlates with a raising vs. control structure.

The basic epistemic/root distinction is illustrated in (1): epistemic modal statements express necessity or possibility relative to some state of knowledge or beliefs; root (sometimes also referred to as deontic) modal statements express forces like permission, obligation etc. relative to some normative system.¹ The sentence in (1)a is typically interpreted epistemically; (1)b, on the other hand, is typically interpreted deontically.

- (1) a. John must be the murderer
(in view of the available evidence ...) *epistemic preferred*
- b. According to FBI regulations, FBI agents must wear suits
(in view of what the law provides ...) *root/deontic preferred*

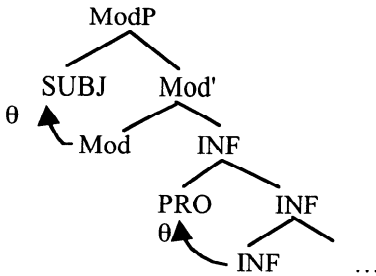
These different classes of modal interpretations have been correlated with different syntactic structures. Ross (1969) for instance assumes that root modals are transitive (i.e., assign two theta-roles—an internal theta-role for the infinitive and a subject theta-role), whereas epistemic modals

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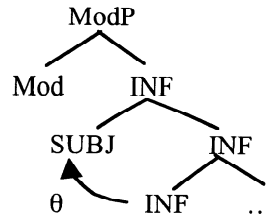
¹ These two classes of interpretations involve a number of subclasses that will not be distinguished here since it will not affect the arguments made in the paper. For detailed discussions see Palmer (1986), Brennan (1993), and references therein.

are intransitive (i.e., they assign only a theta-role to the infinitive). Similarly, Roberts (1985) following Zubizarreta (1982) argues that epistemic modals do not assign a subject theta-role, but deontic modals assign a(n adjunct) theta role to the surface subject. Assuming a (strong) version of the *Theta Criterion* (as formulated in Chomsky 1981:36) that specifies a one-to-one relation between arguments and theta-roles, root modals under these premises have to be represented by a structure such as (2)a. Since the modal and the lower verb each assign a subject theta-role, two syntactic arguments have to be present—the surface subject and a silent infinitival subject (e.g., PRO). In a raising structure such as (2)b, on the other hand, only one subject theta-role is assigned, and hence, only one argument is present in syntax.

(2) a. Control



b. Raising



We will argue here that a control vs. raising structure for root vs. epistemic modal statements is unmotivated. Rather, the syntactic properties of modal constructions indicate that root as well as epistemic modals are represented by a structure such as (2)b. In particular, we will show that i) the subject in a modal construction starts out as an argument of the lower predicate (i.e., theta and case properties of the subject are determined only by the lower verb and not the modal; section 2); ii) the subject in root modal constructions can be interpreted below the modal (section 3); and iii) root modals do not assign a subject theta-role (section 4).

2 The subject starts out in the lower predicate

2.1 Expletive subjects

The first argument for the structure in (2)b comes from expletive subjects in *there*-insertion contexts. As illustrated in (3), modal constructions are compatible with expletive subjects. Importantly, all the examples involve root

interpretations (see also Brennan 1993, McGinnis 1993, Warner 1993: 16 for (3)a, Kulick 1998).²

- (3) a. There may be singing but no dancing on my premises
 b. There can be a party as long as it's not too loud
 c. There must be a solution to this problem on my desk, tomorrow morning!
 d. There will be no complaints when we go to Aunt Cassandra's!

Since the subject (i.e., the associate of *there*) appears inside the infinitival complement, these examples strongly favor a raising analysis for modal constructions (that is, root as well as epistemic modals) over a control analysis.

2.2 Case in Icelandic

The second argument is drawn from the case of subjects in Icelandic modal constructions. The unmarked case for Icelandic subjects is nominative. However, certain verbs require a non-nominative (quirky case marked) subject: the verb *lack* can only occur with an accusative subject, the verb *like* requires a dative subject (cf. (4); examples (4)-(6) except (5)c from Thráinsson & Vikner 1995: 60)

- (4) a. Harald / *Haraldur vantar peninga
 Harold-ACC / *Harold-NOM lacks money
 'Harold lacks money'
 b. Haraldi / *Haraldur líkar vel í Stuttgart
 Harold-DAT / *Harold-NOM likes well in Stuttgart
 'Harold likes it in Stuttgart'

When verbs that require quirky case marked subjects are embedded in a control construction, the case of the matrix subject is determined by the higher verb—i.e., the verb the subject is associated with. Thus, if the higher verb is not a quirky case assigner as in (5), the subject is realized with nominative.³ In raising constructions, on the other hand, the subject is only associated with the lower predicate, and hence case is determined by the lower verb (cf. (5)c; if the lower verb is not a quirky case assigner, the subject shows up with nominative).

- (5) a. Haraldur / *Harald vonast til að vanta ekki peninga
 Harold-NOM / *Harold-ACC hopes for to lack not money
 'Harold hopes not to lack money'

² Dynamic modality has to be set aside here (see Brennan 1993, Hackl 1998).

³ Although not visible on PRO, Sigurðsson (1991) provides evidence that quirky case is retained on the embedded subject. He shows that floating quantifiers associated with PRO show up with quirky case (i.e., the case the embedded verb would assign to an overt subject).

- b. Haraldur / *Haraldi vonast til að líka vel í Stuttgart
 Harold-NOM / *Harold-DAT hopes for to like well in Stuttg.
 ‘Harold hopes to like it in Stuttgart’
- c. Harald virðist vanta ekki peninga
 Harold-ACC seems lack not money
 ‘Harold seems not to lack money’

Icelandic, thus provides a way to distinguish between raising and control constructions—if quirky case is retained, the construction involves raising, if the subject shows the case that the higher verb assigns, the construction involves control. As we will see momentarily, modal constructions retain quirky case, and hence involve a raising structure.

When verbs requiring quirky case marked subjects are embedded under a modal (cf. (6)), the subject has to show up with quirky case and nominative is ungrammatical (but again, if the lower verb does not require a quirky case marked subject, the subject shows up with nominative).

- (6) a. Harald / *Haraldur vill vanta peninga
 Harold-ACC / *Harold-NOM will lack money
 ‘Harold tends to lack money’
- b. Haraldi / *Haraldur ætlar að líka vel í Stuttgart
 Harold-DAT / *Harold-NOM intends to like well in Stuttgart
 ‘It looks like Harold will like it in Stuttgart’

Thráinsson & Vikner (1995) claim that the examples in (6) allow only epistemic readings. However, we believe that this effect is caused by the unnaturalness of a deontic interpretation in these examples. If the context is constructed in a way that favors a root/deontic reading as in (7), the examples are grammatical and again, only quirky case is possible for the subject (examples from Ólafur P. Jonsson, Ásta Sveinsdóttir p.c.).⁴

- (7) a. Haraldi / *Haraldur verður að líka hamborgarar
 Harold-DAT / *Harold-NOM must to like hamburgers
 ‘Harold must like hamburgers’ (in order to be accepted by his new American in-laws)
- b. Umsækjandann verður að vanta peninga
 The-applicant-ACC must to lack money
 ‘The applicant must lack money’ (in order to apply for this grant)

Assuming that quirky case is not assigned structurally but rather determined idiosyncratically by certain predicates, Icelandic provides strong

⁴ It is noteworthy that some speakers accept a nominative subject with the verb *seem* in (5)c. However, as indicated in the text, nominative is clearly impossible in modal constructions. Thus, while the verb *seem* could be seen either as a control verb or a raising verb (as for instance in Italian), modal constructions unambiguously qualify as raising constructions.

support for the claim that in epistemic as well as root modal constructions, the surface subject is associated with the lower verb at some point in the derivation. The assignment of quirky case in (7) follows straightforwardly from a raising structure for modal constructions since the surface subject starts out as the subject of the lower predicate and as such can be assigned quirky case. Under a control structure for modal constructions, the Icelandic case pattern (especially the contrast between (5) and (7)) is not expected.

2.3 Passive in modal constructions

Modal constructions display two basic properties with respect to passive. First, passive of modal verbs is impossible (cf. (8)a for English and German). Second, the main predicate can be passivized (cf. (8)b).

- (8) a. *weil der Kaviar essen gemußt / gekonnt wurde
 since the caviar eat must-PART / can-PART was
 *‘since the caviar was musted/canned to eat’
 ‘since somebody had to eat/can the caviar’
- b. weil der Kaviar gegessen werden muß/darf/soll
 since [*the caviar*]-NOM eaten become must/may/should
 ‘since the caviar must/may/should be eaten’

We will discuss these two properties in turn in the following subsections, and we will conclude that a raising structure for modal statements is superior in accounting for this fact.

2.3.1 Prohibition against passive of modals

Let us start with a short description of passive in German, as it will allow us to draw some conclusion about the prohibition against passive of modal verbs. In German, transitive and intransitive (unergative) predicates can be passivized (cf. (9)a,b respectively), however, unaccusative predicates cannot be passivized (cf. (9)c).

- (9) a. Er wurde am Tatort gesehen
 He was at-the crime-scene seen
 ‘He was seen at the crime scene’
- b. Es wurde getanzt
 it was danced
 *‘It was danced’
- c. *Es wurde (rechtzeitig) angekommen
 It was (on time) arrived
 *‘It was arrived’

The generalization about German passive thus is that passive is possible iff the predicate has an underlying external argument. This generaliza-

tion extends to verbs that combine with infinitival complements: while passive of unergative verbs like *try*, *decide* etc. is possible (cf. (10)a), passive of raising verbs is blocked (cf. (10)b). Since raising verbs do not have an (underlying) external argument and hence by definition are unaccusatives, it is expected that passive is blocked in raising contexts.

- (10) a. Es wurde zu tanzen versucht/beschlossen
 It was to dance tried/decided
 'It was tried/decided to dance' (=Somebody tried/decided to dance)
- b. *Es wurde (zu) tanzen geschienen
 It was (to) dance seemed
 *'It was seemed to dance'

Assuming as proposed here that modals are raising verbs, the prohibition against passivization of modal verbs follows straightforwardly—since modals do not project an external argument, they do not allow passive. In order to maintain a control analysis for modal constructions, one would have to assume that modals are unaccusatives that take an internal argument which controls an embedded PRO subject (and which ends up as the surface subject). However, this analysis would not extend to the *there*-insertion cases and the case properties of Icelandic subjects in modal constructions. Furthermore, we will see in the next section that this analysis cannot be maintained for structures involving passive under modals.

2.3.2 Passive under modals

Turning to the second property with respect to passive in modal constructions, consider the following well-known contrast. While control contexts such as (11)b block passivization of the embedded object, the same construction is possible with raising verbs and modals (cf. (11)a,c).

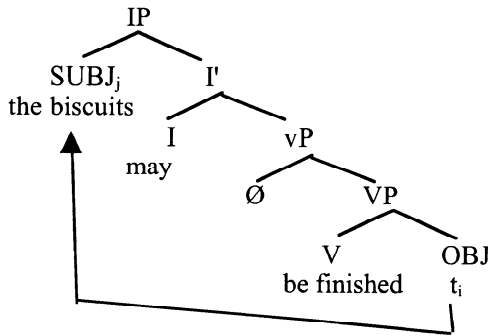
- (11) a. The biscuits seem to have been finished by Paul
 b. *The biscuits tried/decided to be finished by Paul
 c. The biscuits may be finished by Paul (Warner 1993)

The general explanation for the ungrammaticality of (11)b is that verbs like *try*, *decide* etc. establish a thematic relation with an agentive external argument. If this relation is not met as in (11)b which involves an inanimate subject, the construction is illformed. Since no such effect arises with raising verbs the assumption that raising verbs do not specify a subject theta-role is supported. If, as proposed here, modal verbs are raising verbs, we predict that there is no thematic relation between the modal and the subject, and hence no thematic restrictions are imposed on the subject.⁵

⁵ Similar effects have been noted for the compatibility of modal verbs (root and epistemic) with weather-*it* subjects (see for instance Hackl 1998).

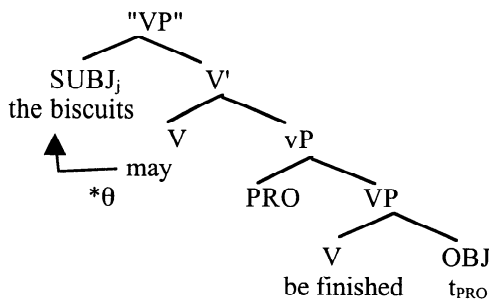
Turning to the structure of examples such as (11)c (note again that (11)c involves a root interpretation), a raising analysis is straightforward. As illustrated in (12), the surface subject starts out as the embedded object since it is assigned a theta-role by the lower verb. Passivization of the lower predicate causes the object to move to the surface subject position (here for convenience SpecIP, however nothing hinges on it) where it is assigned nominative. Since no other arguments are present (the underlying subject is suppressed or expressed as an adjunct due to passive), this movement is consistent with standard locality constraints.

(12) *Passive under modals: raising structure*



As noted in the previous section, one could in principle assume that modal verbs are unaccusatives taking an internal argument which controls an embedded PRO subject. Examples such as (11)c would then be represented as in (13).

(13) *Passive under modals: control structure*



The major problem for the structure in (13), however, is that the surface subject is clearly not selected by the modal (neither as an external nor an internal argument). Thematically, the surface subject is only related to the lower predicate (i.e., it is the theme of *finish*, but certainly *the biscuits* are

in no permission, obligation etc. relation). A structure such as (13) thus faces two major problems. First, it has to be explained how the surface subject can be projected as part of the higher predicate if it is not an argument of this predicate. Second, the structure in (13) constitutes a violation of the theta criterion since there are two arguments (the subject and PRO) but only one theta-role. In order to save the structure in (13), one would thus have to give up the theta criterion. However, this would then also mean that the original motivation for a control structure for (root) modal constructions disappears.

To conclude, both properties discussed in this section—the prohibition against passivization of modal verbs and the possibility of passivizing the embedded object in modal constructions—support the claim that modals involve a raising structure rather than a control structure.

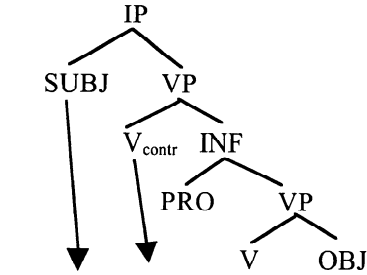
3 Scope properties of subjects in modal constructions

Going back to May (1977, 1985), it has been known that control and raising structures differ with respect to the following scope property. Raising constructions but not control constructions allow an interpretation in which the subject takes narrow scope with respect to the matrix verb. In examples like (14)a the subject could take higher scope, yielding an interpretation like *There is somebody from N.Y., and it is likely that he will win the lottery*; or the subject could take lower scope, yielding the interpretation *It is likely that somebody from N.Y. will win the lottery* (the latter is more natural in an unmarked context). Importantly, no such effect is found in control contexts such as (14)b.

- (14) a. Someone from New York is likely to win in the lottery
 b. Someone from New York tried/promised to win in the lottery

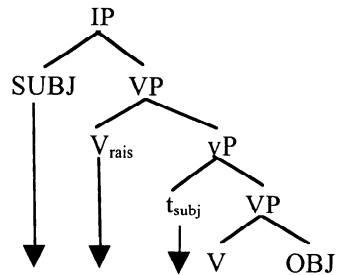
As has been argued by many authors, this contrast is due to the availability of a lower position for the subject at LF in raising constructions but not in control constructions (for the discussion here, it is not relevant what the actual mechanism of the lower scope reading is; for various approaches, see May 1977, 1985, Lebeaux 1994, Bobaljik 1998, Fox 1998, 1999, Sauerland 1998 among many others). Simplified structures are given in (15).

(15) a. Control



LF: SUBJ >> VERB

b. Raising



SUBJ >> VERB >> SUBJ

Turning now to modal constructions, a raising structure for modal constructions as in (2)b or (15)b thus makes the prediction that—like in *seem*-type raising structures—two positions are available in which the subject can be interpreted. The scope ambiguity extends straightforwardly to epistemic modal contexts as illustrated in (16). If the subject is interpreted in the higher position, it takes scope over the modal and we get the interpretation in (16)b. The (pragmatically) more natural interpretation, however, is the interpretation in (16)a in which the subject takes lower scope.

(16) Somebody from New York must have won in the lottery

- a. In view of the evidence available it is necessarily the case that somebody from N.Y. won the lottery
- b. There is somebody from N.Y. and in view of the evidence available it is necessarily the case that he won the lottery

What is important for the discussion here, however, is that the same ambiguity is found with root modals. As is illustrated in (17), root modal contexts are ambiguous—the subject can take scope over or under the modal. Like in *seem*-type raising constructions, context and knowledge of the world favor different readings. In (17)a, the wide scope reading for the subject in (17)a.ii is less marked, since ski races are generally won by one person only. In (17)b, on the other hand, the lower scope reading for the subject in (17)b.i is less marked, since for a country to win the most gold medals does not require that specific racers win the medals.

- (17) a. Two Austrian skiers must win the next race (in order for either of them to win the World Cup)
- i. #It is necessary that two Austrians win the next race
 - ii. There are two Austrians and for each of them it is necessary to win the next
- b. An Austrians must win the next race (in order for Austria to have the most gold medals)
- i. It is necessary that an Austrian (whoever it is) win the next race
 - ii. ^(#)There is an Austrian and it is necessary that he win the next race

Assuming a raising structure for modal constructions, the ambiguity in (17) is readily accounted for. To maintain a control structure as in (2)a or (15)a, it would have to be assumed that modal verbs start out in the VP (an assumption that seems to be motivated neither by the semantic nor the morphosyntactic properties of modal verbs; see Brennan 1993) and move to a functional position that is higher than the base position of the subject. While this approach could account for the ambiguity in (17), we will see below that it cannot be extended to account for the scope relations inside the infinitive.

A further test to distinguish control from raising constructions is provided by the scope relation between the embedded object and the matrix subject. Since the situation is less clear in English (cf. fn. 6), we will restrict the discussion to German. In raising constructions but not in control constructions, the embedded object can take scope over the surface subject. Thus, sentences involving the raising verb *seem* as in (18)a are ambiguous between a wide scope reading and a narrow scope reading of the universal quantifier. In (18)b, on the other hand, only a narrow scope reading for the embedded object is available.⁶

- (18) a. Ein Professor scheint jeden Studenten zu betreuen
 Some professor seems every student to supervise
 'Some professor seems to supervise every student'
- b. Ein Professor versprach jeden Studenten zu betreuen
 Some professor promised every student to supervise
 'Some professor promised to supervise every student'

⁶ The situation seems to be more complex in English. Hornstein (1995: 156, 1998) claims that in the examples below, (a) contrasts with (b,c) in that only the former allows a wide scope reading for the universal quantifier (i.e., long-distance QR is impossible in control constructions). However, since the judgements are controversial they do not seem to allow us to draw any firm conclusions.

- a. Someone seemed to attend every class
- b. Someone persuaded John PRO to attend every class
- c. Someone hoped PRO to recite every poem

This contrast is expected under the assumption that only short-distance QR is possible and that two LF-positions are available for the subject in raising constructions (see Fox 1999). In a control construction as in (15)a, the embedded object can take scope over material inside the infinitive, however, it cannot undergo long-distance QR to a position above the matrix subject. In a raising structure, on the other hand, short distance QR can target a position that is higher than the lower position of the subject, hence allowing a wide scope reading of the object.

Returning to the main question of this section—the scope properties in modal constructions, we find again that modal constructions pattern with raising structures rather than with control structures. That is, in examples like (19), both a narrow scope (cf. (19)a) and a wide scope reading (cf. (19)b) for the embedded object are available.⁷

- (19) Gemäß Universitätsbestimmungen muß mindestens ein Professor jeden Studenten betreuen
 ‘According to university regulations, at least one professor must supervise every student’
- a. University regulations require that there is at least one professor who supervises every student
 - b. University regulations require that every student is supervised by at least one professor

The contrast between the unambiguous (18)b and the ambiguous (18)a and (19) is expected under a raising structure for modal constructions. However, it seems less obvious how this contrast could be derived if modal constructions were represented by a control structure.

To conclude, assuming that modal constructions are represented by a raising structure and hence involve two possible LF-positions for the subject accounts naturally for the scopal interactions found between the modal and the subject as well as the embedded object and the subject.

4 Against subjects of modal verbs

In this section, we will investigate the original motivation for a control structure—the claim that (certain) modal verbs assign a theta role to the subject. While it seems quite uncontroversial that epistemic modals do not assign a theta-role to the surface subject, the question of whether root modals establish a thematic relation with the subject is less uncontroversial. We will argue that modals never assign a theta role to the subject but that

⁷ We ignore for the discussion here various other readings that result from scope interactions between the subject and the modal.

the apparent thematic relation between the subject and a (root) modal in certain contexts is purely contextual.⁸

The claim that root modals do not assign a subject theta role is supported by a number of constructions. Two such cases—expletive subjects as in *there*-insertion contexts and passive under modals—have already been discussed in section 2. Relevant examples are repeated in (20)a,b. However, as has been pointed out by several authors, there are other root modal constructions that clearly do not involve a thematic relation between the subject and a root modal. Some examples are reproduced in (20)c,d.

- (20) a. There can be a party as long as it's not too loud
 b. The biscuits may be finished by Paul (Warner 1993)
 c. An opening hand must contain thirteen points (Newmeyer 1975)
 d. Icicles may hang from the eavestroughs (McGinnis 1993)

Thus, to account for examples such as the ones in (20), it has to be assumed that if modals ever assign a theta role to the subject they do so optionally. The contexts in which (intuitively) the subject does appear to be in a thematic relation with the modal are modal constructions that involve what has been called a *directed deontic* interpretation (see Barbiers 1995). In examples like (21)a, John is in an obligation relation, or in (21)b, Mary is in a permission relation.

- (21) a. John must go to Alaska
 b. Mary can/may go to Alaska

The question, however, is whether these relations (obligation, permission etc.) are theta-roles. Note first that modal forces do not have to be directed towards the subject (see Barbiers 1995, McGinnis 1993). In examples like (22), the unmarked interpretation is an interpretation in which the modal force is not applied to the subject of the sentence but rather to some other person salient in discourse. Thus, (22)c for instance can be paraphrased as *Somebody* (determined contextually) *has the obligation to bring about a situation such that the old man falls down the stairs*.

- (22) a. The traitor must die
 b. John must be home when the murder happens
 c. The old man must fall down the stairs and it must look like an accident
 d. Your children may play in the garden but they cannot go into the barn

Although disfavored in some contexts, non-directed interpretations are in fact available in most modal constructions. The availability of non-directed 'interpretations' shows that roles/functions like 'obligee' or 'per-

⁸ This section is somewhat preliminary; a more elaborate discussion is to be found in Wurmbrand (in prep.).

misse' etc. do not have to coincide with a specific syntactic argument in the sentence. In other words, the determination of these roles cannot be seen as a mapping between theta roles and syntactic arguments. Rather, these roles are assigned contextually (as part of the conversational background; cf. Kratzer 1991). Under this view, it is then not surprising that different contexts yield different 'interpretations'.

5 Conclusion

In this paper, we summarized and provided further arguments for the claim that root and epistemic modal constructions are represented by a raising structure. We have shown i) that the thematic and case properties of the subject in modal constructions are determined only by the lower verb and not the modal; ii) that the subject in modal constructions can be interpreted below the modal; and iii) that modals do not assign a subject theta-role but that certain apparent thematic relations result from a rich contextual component of modal statements. All these properties are expected and straightforwardly accounted for if the subject in a modal construction starts out as an argument of the lower predicate—i.e., if modal constructions involve a raising structure rather than a control structure.

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