MODALS AND DOUBLE MODALS in the Scandinavian Languages

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0. Introduction

It is sometimes said that the so-called modal verbs cannot be "stacked" in English whereas they can in the Scandinavian languages. This is in fact a simplification. First, there are dialects of English where double modals are allowed. Second, it is not the case that all modals can be stacked in Scandinavian. Nevertheless it is true that the Scandinavian languages, like Danish (Da) and Icelandic (Ic) for instance, differ from standard English with respect to the "stackability" of modals. This can be seen in (1)-(5) (cf. Vikner 1988:9-10; Roberts 1991, section 3.3.2; Thráinsson 1986:243):

1. a. *They shall will build a house.
   b. *De skal ville bygge et hus. (Da)
      'They are said to want to build a house.'
   (Da)

2. Der vil let kunne gå noget galt.
   'It will easily be possible that something goes wrong.'
   (Da)

3. Han skal kunne svømme for at jobbe.
   'He must be able to swim to get the job.'
   (Da)

4. hann kann að kunna að synda.
   'He may know how to swim.' (Ic)

5. Íað mun vilja rigna meðan þú eru þar.
   'It will tend to rain while you are there.'
   (Ic)

If we look at the examples in (1)-(5), we see that in (1) and (4) we have instances of root modals embedded under epistemic modals, in (2) and (5) we have epistemic modals embedded under epistemic modals, and in (3) we have a root modal embedded under a root modal. It is apparently not possible to embed epistemic modals under root modals in the Scandinavian languages:

6. *De vil gerne skulle have tjent en million.
   'They would like to be said to have made a million.'
   (Da)

7. *Hann verður að kunna að kunna að synda.
   'He must to can to can to swim (cf. (4))'
   (Ic)

In addition to this, there are several restrictions on the embeddings on epistemic modals under...
epistemic modals and root modals under root modals (cf. Vikner 1988:9-10) but these seem to vary within Scandinavian.

The purpose of this paper is to explain some of the observed differences between English and Scandinavian modal verbs and certain differences within Scandinavian with respect to the behavior of modal verbs in general and double modals in particular. For reasons of space (not to mention the native languages of the authors) the discussion will concentrate on Danish and Icelandic as representatives of Modern Scandinavian (Mainland Scandinavian (MSC) and Insular Scandinavian (ICS), respectively) but it will contain occasional references to other Scandinavian languages.

The paper is organized as follows: Section 1 is an attempt to give a language-independent definition of modals and an overview of the types of epistemic and root modals found in Danish and Icelandic. Section 2 shows some of the basic syntactic differences between Scandinavian epistemic modals and root modals, since these differences play an important role in determining their "stackability". Section 3 introduces the basic ideas of our analysis in terms of thematic roles and syntactic structure and explains some of the differences between epistemic modals and root modals observed in section 2. Section 4 gives an overview of double modal constructions in Danish and Icelandic, contrasts these with double modal constructions in English dialects and attempts to explain some of the restrictions on double modals in Scandinavian. Section 5 contains a few notes on double modals in Old Norse (or Old Icelandic) and section 6 is the conclusion.

1. The class of modal verbs

1.1 A definition

(Most) English modal verbs have rather obvious morphological, syntactic and semantic properties. These include the following (for "standard" English, cf. for instance Palmer 1986:33-34; McCawley 1988:249-250):

(8) 1. They do not show agreement with 3rd person sg. subjects (they have no -a forms):
   a. *He wills come.
   b. They cannot follow any auxiliary verbs - and (arguably) they have no non-finite forms:
   c. *She hopes to can come tomorrow.
   d. *She has can/could come in the past.
   e. *Cannil swim, I was not afraid of the water.
   f. They express a "modal meaning", typically of two kinds, namely epistemic and root. The epistemic sense "qualifies the truth value of the sentence containing the modal" whereas the root sense expresses "necessity ... obligation, permission, volition, or ability of an agent, which usually, but not necessarily, is expressed by the ... subject of the sentence" (Platzack 1979:44):
   g. It must be five o'clock. (epistemic)
   h. I must pay my taxes. (root)

With the exception of the fourth item here ("modal meaning") most of these criteria would appear to be language-specific. Yet it is perhaps a good starting point to try to determine to what extent something like 1.-3. in (8) holds for comparable verbs in Scandinavian. This is done in (9):

(9) 1. Modal verbs show subject-verb agreement in those Scandinavian languages that have subject-verb agreement in general, i.e. in Faroese (cf. Lockwood 1977:74-76, 144 ff.) and Icelandic, and not in those where the finite verb never shows any kind of agreement with the subject (nor with anything else), i.e. Danish, Norwegian, and Swedish:
   a. Eg mun / Du munt / Vi munum koma. (Ic)
   b. Eg man / To manst / Vi munnu koma. (Fa)
   c. Jeg vil / Du vil / Vi vil komme. (Da)
   d. 'I will / You will / We will come.'

2. There is no general ban on modals following auxiliary verbs in Scandinavian, including other modal verbs as we have seen (see also Platzack 1979:44; ThrSInsson 1986:243, 262; Vikner 1988:6-8):
   a. Bengt har kunnat tala grekiska. (Sw)
   b. Bengt has been able to speak Greek,
   c. Han har villet tjene mange penge. (Da)
   d. He has wanted to earn a lot of money.
   e. Mig hefur viljaQ vanta peninga. (Ic)
   f. 'I have tended to lack money.'
   g. Det b<rfr ha  kunnet  bli  flo  sj^  innen  da. (No)
   h. 'There should have been high tide by then.'

   a. Jeg vil (*at)  gA hjem. (Da)
   b. *Jeg vill (*at)  gA hjem. (Ic)
   c. *Hetta kann (*a<3) fara  ilia. (Ic)
   d. *Hetts kann (*a<3) fara  lilla. (Ic)

It would seem from this that the defining semantic criterion of "modal meaning" in item 4 in (8) is the only criterion that holds both of English and Scandinavian modal verbs. This is not particularly surprising, of course (see also the discussion of German and French modal verbs in Palmer 1986:34 ff. and remarks on German modal verbs in McCawley 1988:250).

It must be admitted that the concept of modal meaning was not defined very carefully above. But on the basis of the preceding discussion, we propose the following tentative "definition" of modal verbs:

(10) Modal verbs are verbs that can have both an epistemic and a root modal sense.

We have already outlined in item 4 in (8) what we mean by "epistemic" and "root" senses of modal verbs and we will return to the issue in section 1.2. As we will see below, however, the definition in (10) is a little too narrow. The reason is that modal verbs as defined in (10) tend to
have particular syntactic properties, although somewhat different depending on the language, as we have seen. Then a verb in a given language may show these particular syntactic properties and yet only have an epistemic modal sense or only a root modal sense. We could then consider such a verb a modal verb in the language in question and claim that it is basically a historical accident that it is only found in one of the two types of modal senses. Thus while the English modal will usually has the epistemic sense of "prediction" and only rather rarely the root sense of "volition" (cf. Coates 1983:25), its historical counterpart wollen in German typically has the root sense of "volition". We will see further examples of this below.

Taking the tentative and informal definition in (10) as our point of departure, we will base the following discussion mainly on the properties of the Danish and Icelandic verbs listed in (11) (cf. Thrainsson (1986) for Icelandic and Vikner (1988) and especially Davidsen-Nielsen (1990:40, passim) for Danish). We do not claim that the list is exhaustive and the glosses are rather misleading since they do not reflect the difference between the epistemic and root senses properly. These distinctions will be clarified in section 1.2:

(11) a. Danish modal verbs:
   ville 'will', skulle 'shall', måtte 'must', kunne 'can', burde 'ought (to)', behøve 'need'

b. Icelandic modal verbs:
   munu 'will', skulu 'shall', mega 'may', vilja 'will', eiga 'ought (to)', þurfa 'need', atla 'intend', geta 'can'

Having established this, we will now outline some of the further properties of Scandinavian modal verbs and the differences between epistemic and root modals in these languages.

1.2 The epistemic and root senses of Scandinavian modal verbs

Numerous attempts have been made to define the concept of modality philosophically or logically. As shown in Palmer (1986), different types of modality seem to play a role in different languages. Although a simple distinction between epistemic and root (or non-epistemic) senses, as outlined above, will be sufficient for our purposes most of the time, we will sometimes need to refer to subclasses of the epistemic and in particular the root modals for the purposes of further clarification. To be able to do so we must give some examples of these subclasses. That is the purpose of this subsection, which is to a large extent based on Davidsen-Nielsen (1990) and Vikner (1988).

The most important subclasses of epistemic and root modals in Scandinavian are shown in the diagram in (12) with some examples of the relevant modal verbs in Danish and Icelandic (adapted from Davidsen-Nielsen 1990:18, 43ff; Coates 1983:5):

We will now illustrate these distinctions further and deal with the epistemic senses first. While this list is a purely descriptive illustration, intended as a basis for the comparison in section 2 and the theoretical account in section 3, it is of some comparative interest since it shows the similarities between Danish and Icelandic (and English) with respect to the semantic (and syntactic) development of cognate verbs in these languages:

(13) Epistemic sense - possibility:

a. Det kan være sandt.
   'It may be true.'

b. Det skulle være nok.
   'It ought to be enough.'

c. Det skulle være nok.
   'It need not be true.'

d. Det må ha været nok.
   'Then it is necessary that it rains a lot.'

(14) Epistemic sense - necessity:

a. Det må have regnet.
   'It must have rained.'

b. Det må ha været nok.
   'It must have been enough.'

c. Det må have regnet.
   'It must have rained.'

d. Det må have regnet.
   'It must have rained.'

e. Det må have regnet.
   'It need not to be true.'

(15) Epistemic sense - probability:

a. Det burde være nok.
   'It ought to be enough.'

b. Det skulle være nok.
   'It need not be true.'
Having given some idea of the semantic possibilities of Danish and Icelandic modals we now turn to some of the syntactic differences between epistemic modals and root modals. In the following sections we will frequently only distinguish between the two major classes, epistemic and root, but the interested reader may want to refer to the more detailed classification just described.

2. Some syntactic differences between epistemic and root modals

2.0 Introduction

In this section we list some of the more obvious syntactic differences between epistemic modals and root modals. It will be seen that many of these differences will follow from a suggestion that goes back at least to Ross (1969), Kiparsky (1970), and Perlmutter (1970), namely that epistemic modals (like raising verbs) do not assign a thematic role to their subject whereas root modals (like control verbs) do. Other differences between and properties of these two types of modal verbs will require a more sophisticated analysis of their argument structure. We will return to those problems in section 3.
2.1 Non-argument subjects

If epistemic modals do not assign a thematic role to their subject whereas root modals do, we might expect the former to occur with expletive subjects, like raising verbs do, whereas the latter might be expected to pattern with control verbs, which do not allow expletive subjects e.g. in English (see also Thrainsson 1986:252-253; Olschläger 1989:77; Davidsen-Nielsen 1990:32-35). These expectations are basically borne out, although the general situation is somewhat more complicated than the simplified discussion in this section would seem to indicate, cf. the continuation of this discussion in section 3.4 below. An

An expletive is possible with raising verbs, as shown in (21):

21 a. Der ser ud til at komme ti studenter til foredraget. (Da)
   *Der prøver at komme ti studenter til foredraget. (Da)
   b. *Dad kuna að hlusta tiu stóðar að fyrirlestrinum. (Ic)
   *Dad vurðast koma tiu stóðar að fyrirlestrinum. (Ic)
   There are only the epistemic readings for the a-examples.

Parallel constructions with modal verbs can only have the epistemic reading and the root reading is just as impossible as the control constructions in (22):

22 a. *Der prøver at komme ti studenter til foredraget. (Da)
   *Der ser ud til at komme ti studenter til foredraget. (Da)
   b. *Dad vurðast koma tiu stóðar að fyrirlestrinum. (Ic)
   *Dad prøvede at regne i går. (Ic)
   There are only the root readings for the a-examples.

Notice that the following structures with the same modal verbs but without an expletive subject have both epistemic and root readings:

23 a. Tiu stóðar kunna að hlusta að fyrirlestrinum. (Ic)
   'Ten students may listen to the talk.'
   (*'Ten students want to come to the talk.')
   b. Tiu stóðar kunna að hlusta að fyrirlestrinum. (Ic)
   'Ten students may listen to the talk.'
   (*'Ten students want to come to the talk.')
   c. *Dad vurðast koma tiu stóðar að fyrirlestrinum. (Ic)
   'There are only the root readings for the a-examples.'

Contrasts similar to those discussed above may be observed with weather det/pað 'it' (cf. Thrainsson 1986). A weather verb can be embedded under an epistemic modal but not under a root modal or a control verb. This is illustrated in (25)-(26) where the a-examples and b-examples can only have the epistemic reading and the c-examples and d-examples (with the control verbs) are ungrammatical (see also Thrainsson 1986):

26 a. Det kan regne i morgen. (Da)
   *Det prøvede at regne i går. (Ic)
   b. *Dad kann að rigna & morgun. (Ic)
   *It may rain tomorrow.' (*'knows/is able to...') (Root impossible)
   c. *Det prøvede at regne i går. (Ic)
   *It tried to rain yesterday (Control verb impossible)
   d. *Dad reyndi að rigna i ger. (Ic)
   *It tried to rain yesterday (Control verb impossible)

Third, a related contrast can be seen in sentences like the ones in (27b), where the subject of the modal is a non-argumental (or quasi-argumental) "idiom chunk" licensed by the infinitival verb embedded under the modal verb (cf. Chomsky 1981:35-37; Thrainsson 1986:252-253). In such cases only the epistemic reading is possible:

27 a. Skærin færast upp í bekkinn. (Ic)
   'This is where the problem is.'
   b. *Dad vurðast færast upp í bekkinn. (Ic)
   'This is where the problem is.'
   (*'This knows to/is able to...') (Root impossible)

28 a. Fanden er lús. (Da)
   'There is something seriously wrong.'
   b. *Darnu hlýtur hundurinn gráfinn. (Ic)
   'There is something seriously wrong.'
   (*'Something is obliged to be wrong.') (Root impossible)

29 a. Der ligger hunden begravet. (Da)
   'This is where the problem is.'
   b. Darnu hlýtur hundurinn gráfinn. (Ic)
   'There must dog-the to lie buried'
   c. *Dad vurðast færast upp í bekkinn. (Ic)
   'There is something seriously wrong.'
   (*'Something is obliged to be wrong.') (Root impossible)

2.2 Quirky subjects

As shown by Thrainsson (1986), epistemic modals can take quirky subjects whereas root modals cannot. Here again the root modals pattern with control verbs. The case of the quirky subject is
determined by the embedded verb (which also assigns thematic role to it). Since Danish does not have any quirky subjects this can only be illustrated by Icelandic examples. First, note that the verbs vanta 'lack' and lika 'like' take Acc. and Dat. subjects, respectively (for arguments for the subjecthood of these NPs see Sigurdsson 1983:204ff, and references cited there):

(30) a. Harald/*Haraldur vantar peninga.  (Ic)
   'Harold/ND* wants lack money(A)
   (intended meaning: Harold wants not to lack money.'
   b. Harald/*Haraldur likar vel i Stuttgart.  (Ic)
   'Harold/ND* likes well in Stuttgart
   (intended meaning: Harold likes it in Stuttgart.)

Now consider the following:

(31) a. Harald vil oft vanta peninga.  (Ic)
   'Harold(A) will frequently lack money
   (intended meaning: Harold frequently tends to lack money, 'Harold tends to be short on money.)
   b. Haraldi aetlar ad lika vel i Stuttgart.  (Ic)
   'Harold(D) intends to like well in Stuttgart
   (intended meaning: Harold intends to like it in Stuttgart.)

As indicated here, these modal verbs can only have the epistemic sense in this context. It is not easy to embed verbs that take quirky subjects under control verbs but whenever that is possible the case of the subject of the control verb must be nominative (as determined by the control verb itself), not quirky:

(32) a. Haraldur/*Harald vonast til að vanta ekki peninga.  (Ic)
   'Harold(N/A*) hopes for to lack not money
   (intended meaning: Harold hopes for to lack not money.)
   b. Haraldur/*Haraldi vonast til að lika vel i Stuttgart.  (Ic)
   'Harold(N/D) hopes for to like well in Stuttgart
   (intended meaning: Harold hopes for to like it in Stuttgart.)

Note, however, that it does not seem possible to get the root sense at all when a verb that takes a quirky subject is embedded under a modal. Thus the following are bad with the subject of the root modal in the nominative:

(33) a. *Haraldur vill vanta ekki peninga.  (Ic)
   'Harold(N) wants lack not money(A)
   (intended meaning: Harold wants not to lack money.'
   b. *Haraldur eltar að lika vel í Stuttgart.  (Ic)
   'Harold(N) intends to like well in Stuttgart
   (intended meaning: Harold intends to like it in Stuttgart.)

2.3 Pseudo-clefts and (pronominal) complements

As discussed by Thráinsson (1986:255) and Vikner (1988:11; see also Davidsen-Nielsen 1990:25ff.), root modals may occur in the so-called pseudo-cleft construction whereas epistemic modals cannot. The sentences in (34) are all fine with the indicated root modal readings:

(34) a. Det eneste han vil er at svara på spørresøllet.  (Da)
   'The only thing he wants is to answer to the question.
   The only thing he wants to (do) is to answer to the question.'
3. Accounting for the facts

3.0 Introduction

In this section we suggest a theoretical account of the Scandinavian modal verbs discussed and show how these proposals account for the facts described above. In section 4 we then demonstrate how our proposals explain the possibility of having double modals in Scandinavian and explain the differences between these and their English (dialectal) counterparts. Some of the observed differences within Scandinavian will also be explained.

3.1 Epistemic modals do not assign a thematic role to their subject

As we have seen, it is fairly obvious that the epistemic modals do not assign a thematic role to their subject (or do not take an external argument). Hence they:

(39) a. Occur freely with non-argument subjects licensed by the embedded infinitival verb, as seen in section 2.1.
    b. Can take quirky subjects (in Icelandic), licensed by the embedded infinitival verb, as seen in section 2.2.

Recall also the difference between epistemic modals and root modals in pseudo-cleft sentences, discussed in section 2.3 above. Let us look at typical pseudo-cleft sentences of the type under discussion:

(40) a. Det eneste som Marie kjøpte [t_i] var klipfisk. (Da)
    b. Han som Marie kjøpte [t_i] var hardfiskur. (Ic)

Schematically, then, we can say that these sentences have the structure in (41) (cf. Vikner 1991b):

(41) X [cp (dp) ] (that) ... t_i ... was Y

where X is the correlate of the relative clause inside the cleft construction (det eneste in (40a) and han in (40b)), t_i is the wh-trace in the relative clause and Y is the focussed constituent of the construction (cf. Thráinnisson 1986:255). What we saw in section 2.3 above was that the complement of root modals could undergo pseudo-clefting (i.e., turn up as Y in a construction like (41)), whereas the complement of epistemic modals could not. Under the standard assumption that wh-traces need Case and verbs that do not assign a thematic role to their subject cannot assign structural Case (Burzio's generalization, cf. Burzio 1986:178-179; see also Chomsky 1986:139), the different behavior of root modals and epistemic modals in pseudo-cleft constructions is just what we would expect if epistemic modals do not assign a thematic role to their subject but root modals do.20

So far we have not yet said anything about the thematic nature of the external argument of root modals, nor even whether it is necessary to assume that all root modals assign a thematic role to their subject. Before we consider these questions it is useful to consider what kind of complement the different types of modal verbs might take. A priori, the possibilities could include at least the following:

(42) CP (= complementizer projection), IP (= inflectional proj.), VP

With the expansion (or explosion) of IP since Pollock (1989), one could add the following (or, rather, substitute them for IP):

(43) AgrP (= agreement proj.), MP (= modal proj.), TP (= tense proj.)

In addition, several linguists have argued for various types of the notion of "small clause" (for some discussions relevant to Icelandic see Sigurðsson 1989 and Sigurjónsdóttir 1989; for a more general comparative discussion of Scandinavian infinitives see Thráinnisson 1993 and Johnson and Vikner 1994). The discussion of the nature of complements of this sort is sometimes said to have to do with whether they are "clausal" or not. Needless to say, it is quite difficult to find empirical arguments to decide between all these different possibilities. So rather than go through the various possibilities in detail here, we will propose particular analyses for the complements of Danish and Icelandic modal verbs here, epistemic and root, and present the arguments that bear on these proposals. We will return to the question in section 4.1 we will then return briefly to the "clausehood" issue.

3.2 Danish modal verbs as raising verbs

The basic choice of complements type is obviously between a raising complement and a control complement, whatever the categorial status of the complement may be. Following Vikner (1988:13 ff.), we will propose that all Danish modal verbs are raising verbs. This implies that the subject of all modals is base-generated in their complement and moved (raised) into subject position. This is straightforward for epistemic medals, of course, since we have already seen ample evidence for the claim that they do not assign a thematic role to their subject. For epistemic skulde 'shall', for instance, this would give a derivation like the following:21

(44) a. [NP e] skal [han_t more sig.]
    b. Han_t skal [t_i more sig.]

"He is said to enjoy himself."

As indicated here, the subject (or, more precisely, the chain (han_t, t_i)) ends up with one thematic role, assigned by the embedded verb more to its subject which is then raised to the subject position of the epistemic modal, which is not assigned a thematic role by the modal. Thus this analysis predicts that we should be able to get various kinds of subjects licensed (or subcategorized for) by the embedded verb raised to the subject position of the epistemic modal, such as the weather-det, non-argument subjects that are parts of downstairs idiom chunks, etc. This is borne out by the facts, as we saw in section 2.1 above.

As the reader will recall, we have claimed that (at least some) root modals assign a thematic role to their subject. How is that compatible with the claim made here that they are
raising verbs? Following Vikner (1988:12), we will argue that they typically assign an "additional" thematic role to their subject. The crucial properties of additional thematic roles are listed in (45):

(45) a. No argument may have more than one additional theta-role.
   b. Each additional theta-role must be assigned to one and only one argument.
   c. An additional theta-role may be assigned to an argument that already has a theta-role.

The first two parts of (45) are similar to the theta-criterion, except that it is not required in (45a) that every argument bear an additional thematic role. But the third part is different in that it states that an argument can carry an additional theta-role in addition to the "normal" one.

Several linguists have proposed thematic roles that are different from the "normal" thematic roles assigned to arguments. Thus Zubizarreta (1982: 41, 123) argues for the existence of thematic roles that are invisible for the theta-criterion. Grimshaw has also discussed argument adjuncts (e.g. 1990:108 ff.) that are licensed by argument structure but not theta-marked like arguments. She argues further that argument-adjuncts (a-adjuncts) are "licensed only by suppressed argument positions, not by syntactically satisfied a-structure positions" (1990:149). This is because "arguments always completely specify all specifiable information, [and hence] they will always be incompatible with any a-adjunct" (ibid.). But since a-adjuncts can be of different types, they can in principle co-occur.

The concept of additional thematic roles suggested here is somewhat reminiscent of these ideas. Note, however, the crucial differences: First, the additional theta-roles can be assigned to arguments already bearing a "regular" thematic role. Second, we are assuming here that additional theta-roles cannot cooccur, possibly because they are not "of different types".

Based on this, then, the derivation in (46) is appropriate for the sentence Han skal more sig with the root sense, and it should be compared to the derivation of the corresponding sentence in the epistemic sense in (44). Note that the additional thematic role is indicated by (\( \theta \)):

(46) a. \( \text{Han} \) skal han, more sig.
    b. Han skal \( \text{t}_1 \) more sig

In (46), then, the subject, or rather the chain (han, \( \text{t}_1 \)), ends up with one regular thematic role (assigned by more to its subject which is raised) and one additional thematic role assigned to the subject position by the root modal itself.

The difference between epistemic and root modals just outlined explains the observed difference in their behavior with respect to non-argument subjects discussed in 2.1, under the standard assumption that non-arguments cannot be assigned thematic roles. Thus if the verb embedded under a root modal has a non-argument subject (an expletive, a weather-if, or a part of an idiom-chunk), this non-argument cannot raise and receive the additional thematic role assigned to the matrix subject position by the root modal, whereas it can be raised to the subject position of an epistemic modal which does not assign any thematic role to its subject. This analysis also explains the pseudo-cleft facts discussed in 2.3 and 3.1, assuming that verbs that assign additional thematic roles can assign Case to their complement just like verbs that assign regular thematic roles.

A control analysis of the root modals would seem to be an obvious alternative to the raising analysis suggested here. Under such an analysis the sentence Han skal more sig would have the following structure in its root sense:

(47) \[ \begin{array}{c}
\text{Han} \\
\text{skal} \\
\text{PRO} \end{array} \quad \begin{array}{c}
\text{more} \\
\text{sig} \\
\end{array} \]

Under this analysis the root modal would assign a regular thematic role to its subject and the embedded infinitival verb would assign a thematic role to its PRO subject. Such an analysis would obviously also account for the facts about non-argument subjects and pseudo-clefting just discussed. But there are further sets of facts which can be explained by the raising analysis and not by the control analysis. Some of these have to do with double modals and they will be discussed in section 4, but we will briefly review some of the other facts here.

First, observe the difference between the following expressions of state (the left hand column) and event (the right hand column) (cf. Vikner 1988:13):

(48) State: Event:

a. Han har tre biler. Han har tre biler.
"He has three cars.
'b he gets three cars".

b. Hun er professor/rig. Hun er professor/rig.
"She is a professor/rich." 'She becomes a professor/rich.'

The intuition is "that the event expressions have all the implications of the state ones plus some more" (ibid.). This could be expressed by saying that the event verbs assign an additional thematic role to their subject. But now recall that according to (45a) above, no argument may have more than one additional thematic role. Hence this analysis predicts that it should be possible to embed the event expressions in (48) under epistemic modal verbs, since they do not assign any thematic role to their subject. But it should not be possible to embed them under root modals that assign an additional thematic role to their subject. This prediction is borne out. As shown in (49)-(50), the state expressions and event expressions in (48) can easily be embedded under epistemic modals (cf. Vikner 1988:15 ff.):

(49) State: Event:

a. Han vil have tre biler i 1995. Han vil have tre biler i 1995.
"He will have three cars in 1995." 'He will have three cars in 1995.'

b. Hun vil vare professor/rig. Hun vil vare professor/rig.
"She will be a professor/rich." 'She becomes a professor/rich.'

It is not possible, on the other hand, to embed the event expressions under these modal verbs in the root sense:
Danish do indeed carry over to epistemic modal verbs in Icelandic. As already explained, such an analysis would explain the facts of section 2.1, where it was shown that non-argument subjects licensed by the downstairs verb can show up in the subject position of an epistemic modal. In addition, a raising analysis of epistemic verbs accounts for the fact that quirky subjects licensed by a verb embedded under an epistemic modal can indeed show up in the subject position of an epistemic modal verb. The relevant facts are illustrated in (55):

\[
\begin{array}{c}
\text{(a) Han vil have tre biler i 1995.} \\
\text{'He wants to have three cars in 1995.'}
\end{array}
\]

\[
\begin{array}{c}
\text{(b) Hun vil blive professor/rig.} \\
\text{'She wants to be a professor/rich.'}
\end{array}
\]

This can be explained if we assume a raising analysis for Danish root modals and that Danish root modals and Danish event expressions of the type under discussion both assign an additional thematic role to their subject. That would mean that the subject of the root modals in (50) would end up with two additional thematic roles when an event expression is embedded under it but not when a state expression is embedded. Hence the sentences in the right hand column are bad whereas the ones in the left hand column (containing state expressions) are good. There is no reason to expect this correlation under a control analysis of the root modals.

Further evidence for the analysis suggested here comes from the Danish blive-passive, exemplified in (51):

\[
\begin{array}{c}
\text{(51) Hun blev arresteret af politiet.} \\
\text{'She was arrested by the police.' (Lit.: 'She became arrested...')}
\end{array}
\]

Since the semantics of the blive-passive is similar to that of the (predicative) blive+ NP/AP exemplified above, it would seem natural to suggest that blive in the blive-passive also assigns an additional thematic role. Such an analysis would predict that it should be possible to embed blive-passives under epistemic modal verbs but not under root modals of the type just discussed, and that is exactly right prediction. (cf. Vikner 1988:15 ff.; Davidsen-Nielsen 1990:21):

\[
\begin{array}{c}
\text{(52) Hun vil blive arresteret af politiet.} \\
\text{'She will be arrested by the police.' (Lit.: 'She will become...')} \\
\text{('She wants to be...')}
\end{array}
\]

The so-called s-passive, on the other hand, is grammatical when embedded under root modals, which can be explained if we assume that the s-passive construction does not assign an additional thematic role to the passive subject:

\[
\begin{array}{c}
\text{(53) Hun vil arresteres af politiet.} \\
\text{she wants be-arrested by police-the}
\end{array}
\]

Thus the difference between the blive-passive and the s-passive when embedded under root modals is expected under a raising analysis of the root modals, like the one suggested here, but not under a control analysis.

3.3 Icelandic modal verbs as raising and control verbs

First, it is clear that the arguments given above for a raising analysis of epistemic modal verbs in Danish do indeed carry over to epistemic modal verbs in Icelandic. As already explained, such an analysis would explain the facts of section 2.1, where it was shown that non-argument subjects licensed by the downstairs verb can show up in the subject position of an epistemic modal. In addition, a raising analysis of epistemic verbs accounts for the fact that quirky subjects licensed by a verb embedded under an epistemic modal can indeed show up in the subject position of an epistemic modal verb. The relevant facts are illustrated in (55):

\[
\begin{array}{c}
\text{(55) a. Han vil have tre biler i 1995.} \\
\text{*Han vil f&sharp;tre biler i 1995.} \\
\text{'He wants to have three cars in 1995.'}
\end{array}
\]

\[
\begin{array}{c}
\text{(b) Hun vil blive professor/rig.} \\
\text{*Hun vil blive professor/rig.} \\
\text{'She wants to be a professor/rich.'}
\end{array}
\]

As indicated here, the downstairs verb vanta 'need, lack' not only assigns a thematic role to its subject but also (quirky or lexical) accusative case.

Further evidence for the analysis suggested here comes from the Danish Wi've-passive, exemplified in (51):

\[
\begin{array}{c}
\text{(51) Hun blev arresteret af politiet.} \\
\text{'She was arrested by the police.' (Lit.: 'She became arrested...')}
\end{array}
\]

Since the semantics of the blive-passive is similar to that of the (predicative) blive+ NP/AP exemplified above, it would seem natural to suggest that blive in the blive-passive also assigns an additional thematic role. Such an analysis would predict that it should be possible to embed blive-passives under epistemic modal verbs but not under root modals of the type just discussed, and that is exactly right prediction. (cf. Vikner 1988:15 ff.; Davidsen-Nielsen 1990:21):

\[
\begin{array}{c}
\text{(52) Hun vil blive arresteret af politiet.} \\
\text{'She will be arrested by the police.' (Lit.: 'She will become...')} \\
\text{('She wants to be...')}
\end{array}
\]

The so-called s-passive, on the other hand, is grammatical when embedded under root modals, which can be explained if we assume that the s-passive construction does not assign an additional thematic role to the passive subject:

\[
\begin{array}{c}
\text{(53) Hun vil arresteres af politiet.} \\
\text{she wants be-arrested by police-the}
\end{array}
\]

Thus the difference between the blive-passive and the s-passive when embedded under root modals is expected under a raising analysis of the root modals, like the one suggested here, but not under a control analysis.

Hence the ECP is not violated in a raising analysis of a grammatical sentence like (57), even if ad is a complementizer:

\[
\begin{array}{c}
\text{(57) Haraldur kann [ad t1 vera bestur] } \\
\text{'Harold may to be best'} \\
\text{('Harold may be best.' i.e. 'It is possible that...')}
\end{array}
\]

We will return to the categorical status of modal complements in Icelandic in section 4.1. It seems, however, that none of the arguments given in section 3.2 for a raising (as
opposed to control) analysis of root modals in Danish can be reproduced for Icelandic. In particular, there is no ban against embedding event expressions under root modals in Icelandic:

   he wants get three cars 1995
   'He wants to get three cars in 1995.'

   b. Hún vill verða professor/ríki.
   she wants become professor/rich
   'She wants to become a professor/rich.'

(59) a. Hann verður að fá þrjá bíla.
   he must to get three cars
   'He must get three cars.'

   b. Hún verður að verða professor/ríki.
   she must to become professor/rich
   'She must become a professor/rich.'

In addition, there is no dichotomy in passive constructions comparable to the Danish blive vs. s-passives. In Icelandic the auxiliary vera 'be' is the normal passive auxiliary, the auxiliary verða 'become' being restricted to expressions with future sense and there is no systematic s-passive as in Danish (or other Mainland Scandinavian languages). But even the passives with verða can be embedded under root modals in Icelandic:

(60) Hann vill endilega verða konin forseti.
   he wants by-all-means become elected president
   'She desperately wants to be elected president.'

Finally, as we will see in section 4, there does not seem to be anything gained from a raising analysis of Icelandic root modal constructions when it comes to explaining restrictions on Icelandic double modals.

The obvious alternative, then, is to assume a control analysis of root modal constructions in Icelandic, as suggested by Thráinsson (1986:260) and Sigurjónsdóttir (1989), for instance. This implies, of course, that root modals assign a regular thematic role to their subject, as illustrated in (61):

(61) a. Lögreglan verður að leysa verkefni.
   the police are perfectly able to solve such problems
   'The police are perfectly able to solve such problems.'

   b. Verkefnið kann vel að vera leyst af lögreglunni.
   such problems can well to be solved by police-the
   'Such problems can well be solved by the police.'

This can be considered an additional argument for analyzing Icelandic root modals as control verbs.

### 3.4 Non-argument subjects revisited

As already mentioned in sections 3.2 and 3.3, the analysis suggested here accounts for why expletive subjects are impossible with root modals, even though they are possible with epistemic modals. Since we have suggested somewhat different analyses for Danish and Icelandic root modals, it is worth looking at this in phenomenon in some detail.

First, consider sentences with control verbs like (22) in section 2.1 above, repeated here for convenience:

(22) a. *Der prøver at komme ti studenter til foredraget.  (Da)
   b. *Dea reyndi að vera leyst af lögreglunni.

Now it should be possible to embed these constructions under a raising verb and get roughly synonymous sentences, whereas no such correlation holds for control verbs, as originally discussed by Chomsky (e.g. 1965:22). Facts of this sort are well known and they have been pointed out in previous discussions of Icelandic (cf. Thráinsson 1979:410):

(63) a. Lögreglan virðist hafa leyst verkefnið.  (raising)
   'The police seems to have solved the problem.'

   b. Verkefnið virðist hafa verða leyst af lögreglunni.
   'The police seems to have been solved by the police.'

(64) a. Lögreglan reyndi að leysa verkefnið.
   'The police tried to solve the problem.'

   b. *Verkefnið reyndi að vera leyst af lögreglunni.
   'The police/the problem-the tried to be solved by police-the'

Now note that if epistemic modals in Icelandic are raising verbs but root modals are control verbs, we would expect them to pattern with the raising constructions and control constructions in (63)-(64), and that is exactly what we find (cf. Thráinsson 1986:254):

(65) a. Lögreglan kann að hafa leyst verkefnið.  (epistemic)
   'The police may have solved the problem.'

   b. Verkefnið kann að vera leyst af lögreglunni.
   'Such problems can well be solved by the police.'

(66) a. Lögreglan kann vel að leysa svona verkefni.
   'The police can well to solve such problems'

   b. *Svona verkefni kunna vel að vera leyst af lögreglunni.
   'Such problems can well to be solved by police-the'

This can be considered an additional argument for analyzing Icelandic root modals as control verbs.
Schematically, we have an underlying structure like (67) (using the Danish words for illustration):

(67) [NP expletive] vil [komme [NP ti studenter]]

The embedded verb *komme* has one theta-role to assign and let us assume it assigns it to the NP *ti studenter* (as it would in an unaccusative analysis of *komme*). The matrix verb *prøve*, on the other hand, cannot assign its theta-role to the semantically empty expletive and it cannot assign it to the NP *ti studenter* either, presumably because it is "too far away" in some sense (and the infinitival verb *komme* intervenes). This works exactly the same way in Icelandic.

Now consider constructions with modal verbs, as in the sentences in (23) in section 2.1, repeated here for convenience:

(23) a. *Der vil komme ti studenter til foredraget.*
   'There will come ten students to the talk.'
   (Epistemic)
   (69) a. *Der kan ti studenter komme til foredraget.*
   'There can come ten students to the talk.'
   (Root)

b. *De kan haust ti studenter til forhilsturin.*
   'There can be heard ten students to talk-the
   *Ten students may listen to the talk.*
   (Epistemic)
   (69) b. *Ia<3 kunna til hlusta tiu studenter a fyrirlesturinn.*
   'Ten students should listen to the talk-the
   *Ten students are able to listven how to listen...'*

As already discussed, only the epistemic readings are possible here and they are straightforwardly accounted for in terms of theta-role assignment (using Danish again for illustration):

(68) [NP expletive] vil [komme [NP ti studenter]]

Here the embedded verb *komme* can again assign its theta-role to the NP *ti studenter* and in the epistemic sense the modal *vil* has no theta-role to assign, so no problem arises. The same is true for the Icelandic modal *kunna* in the epistemic sense.

For the root modals, on the other hand, we have suggested different analyses for Danish and Icelandic. For the root interpretation of the Danish modal *vil* the relevant structure would be the same as in (68). The only difference would be that Danish root modals have an additional theta-role to assign. Since they cannot assign the additional theta-role to a semantically empty expletive, sentences like (23a) cannot have the root sense. But since Icelandic root modals are control verbs, the reason why the root sense is impossible in the Icelandic sentence (23b) is exactly the same as the one given for the control verbs in (22) and (67) above: The root modal cannot assign its thematic role to the semantically empty expletive and it cannot assign it either to the indefinite NP that follows the infinitive verb because it is too far down in the structure.

We are now in a position to see why some constructions with expletive subjects are nevertheless possible with root (and epistemic) modals in Icelandic, though not in Danish:

(69) a. *Der kan ti studenter komme til foredraget.*
   'There may come ten students to the talk.'
   (Epistemic)
   (70) a. *Bengt har kunnet tala grekiska.*
   'Bengt has been able to speak Greek.'
   (Sw)
   b. *Han har villet tjene mange penge.*
   'He has wanted to earn a lot of money.'
   (Da)
   c. *Mig hefur viljað* jafnum peninga.
   'He has wanted to earn an equal number of money.'
   (Ic)
   d. *Det bør ha kunnet bli flo sjé innen da.*
   'It ought have been able to high tide by then.'
   (Mo)

The important point to note here is that (69a) is bad both in the epistemic and in the root sense in Danish whereas (69b) is good in Icelandic in either sense. Hence it does not seem likely that this can be explained on the basis of theta-role assignment. In Vikner (1991a, section 3.1) it is argued that the difference lies in the different licensing possibilities of the (indefinite) NP *ti studenter/*tiu *stúdent* (see also Sigurðsson 1991:351-355 for a discussion of licensing of lexical NPs). The indefinite NP can be licensed by *I* (or some other functional head in a Pollockian framework (cf. Pollock 1989)) in Icelandic, because Icelandic has a rich *I* (and V-to-I movement), but it cannot in Danish because the Danish *I* has no content (cf. the rich agreement system in Icelandic vs. no subject-verb agreement in Danish). In the root sense of (69b) the NP *tiu stúdent* can be assigned theta-role by the matrix verb *kunna*, whereas the matrix verb *kunna* could not assign theta-role to it in (23b) since it was "too far down". In the epistemic reading of (69b) the NP *tiu stúdent* receives its theta-role from the downstairs verb (this being a raising structure) but it is licensed by the matrix verb *kunna*. In the epistemic reading of (23b) the NP *tiu stúdent* receives its theta-role from the embedded infinitival verb too and it is also licensed by it. Such licensing is also possible in Danish, as seen in (23a), whereas licensing by the matrix *I* is not possible in (69a) in Danish so even the epistemic reading is ruled out there.

We see, then, that the discussion in 2.1 was somewhat simplified since there we only considered cases with expletives where the indefinite NP could not possibly be licensed by the finite modal (or control) verb. When the cases are taken into consideration where the modal verb itself is the licenser (via its moving into or through *I*, in the system assumed here), the picture is more complex. Nevertheless, we hope to have shown that all the cases can be accounted for in a way compatible with the analysis proposed in the preceding sections.

4. Double modals in Scandinavian and English

4.1 Differences between English and Scandinavian

First, recall that there are some important differences between English and Scandinavian modal verbs, as mentioned in section 1.1. Thus the modal verbs agree in person and number with the subject, just like any other finite verb, in Icelandic and Faroese, whereas English modal verbs do not take the 3rd person sg. *s* as other verbs do. We repeat examples from section 1.1 for illustration:

(70) a. *Fg mun / Di munt / Hann mun / Við munum koma.*
   (Ic)
   b. *Fg min / Tú mænt / Hann mæn / Við munmu koma.*
   (Fa)

   'I will/ You will / He will / We will come.'

In addition, the modal verbs occur in non-finite forms in the Scandinavian languages whereas they do not in English. Again, we repeat examples from section 1.1:

(71) a. *Bengt har kunnat talja grekiska.*
   'Bengt has been able to speak Greek.'
   (Sw)
   b. *Han har villet tjene mange penge.*
   'He has wanted to earn a lot of money.'
   (Da)
   c. *Mig hefur viljað jafnurum peninga.*
   'He has wanted to earn an equal number of money.'
   (Ic)
   d. *Det bør ha kunnet bli flo sjé innen da.*
   'It ought have been able to high tide by then.'
   (Mo)
It should also be noted that the double modal constructions in Scandinavian are of a very different nature than those that can be found dialectally in English. As implied by our analyses so far, the first modal verb looks like a regular finite verb whereas the second modal in a double modal construction seems to behave like any other non-finite (embedded) verb. Thus while the special status of the English double modal constructions is very evident in question inversion, as shown in (72) (cf. Battistella 1992), only the first modal can precede the subject in direct yes/no questions in Scandinavian, as illustrated in (73)-(74):

(72) a. You might could buy that at Bruno's.
    b. *Might you could buy that at Bruno's?
    c. Could you might buy that at Bruno's?
    d. Might could you buy that at Bruno's?

(73) a. De skal ville bygge et hus.
    'They are said to want to build a house.'
    b. Skal de ville bygge et hus?
    'Are they said to want to build a house?'
    c. *Ville de skal bygge et hus?
    d. *Skal ville de bygge et hus?

(74) a. Hann vedur að kunna að synda,
    'He has to be able to swim.'
    b. Verdur hann að kunna að synda?
    'Must he to can to swim?'
    c. *Kunna hann vedur að (að) synda?
    d. *Verdur að kunna hann að synda?

This indicates that the Scandinavian double modal construction is very different from the dialectal double modals of Modern English.

One question that could be raised here is to what extent modal complements are "clausal" in nature in different languages. In other words, do the two modal verbs belong to different clauses or are they members of the same clause? Is there, for instance, a difference in "clause-hood" between English and Scandinavian modal complements? As the reader has undoubtedly noticed, we have been fairly non-committal about the categorical status of the Scandinavian modal complements discussed here. The main reason for this is that we did not want to complicate the argumentation since most of the arguments we have considered are to some extent independent of the exact phrasal category of these complements and also independent of the framework assumed. But whether or not a given type of complement is considered "clausal" will depend very heavily on the framework chosen. Consider the following partial structures:

(75) a. Comp S
    b. Spec CP C. Spec I

In a framework like (75a), it is fairly clear that a clausal complement would be either S' or S. A VP-complement would not be "clausal" in any sense, as it would not even have a syntactic subject at any stage of the derivation (cf. the controversy on the VP-complement analysis of infinitives exemplified by Andrews (1976) and Koster and May (1982), for instance). If we, on the other hand, assume something like (75b), together with the so-called "VP-Internal Subject Hypothesis", (see e.g. Burton and Grimshaw 1992 and references cited there), the difference between VP and the higher (functional) projections in terms of clausal properties is not as clear as before. More specifically, a raising analysis of modal complements, for instance, does not necessarily imply that they are "more clausal" than a VP under this hypothesis. A partial derivation of a Danish raising modal, consistent with this hypothesis, could look like (76):

(76) ...

Under an analysis like this, the subject of a Danish double modal construction of this type would be base-generated in the lowest SpecVP and assigned a thematic role by the non-modal main verb, raised to SpecVP of the root modal (where it would acquire an additional thematic role (cf. the discussion in 3.2 above)), then raised again to SpecVP of the higher modal (which is epistemic in this case and thus does not assign any thematic role) and then moved to the canonical SpecIP position.

It is frequently assumed that English modal verbs and (other) auxiliaries are base-generated in the I-position in structures like (75b) rather than under a V-node like regular verbs. This is meant to reflect their special status. One could, of course, assume a similar analysis of epistemic modals in Danish. That would mean leaving out the topmost VP in (76) and base-generate skall under I instead of the topmost V. The problem with such an analysis is that modal verbs are just like any other finite verbs in Danish in that they follow adverbs like the negation in embedded clauses, as illustrated in (77):
Hun vil kunne forstå fransk.

'she wants to be able to understand French.'

That would be consistent with its being base generated under I or moved to I in English. But nothing in our analysis indicates that there is any difference in "clausethood" between, say, English modal complements and the complements of Danish epistemic modals.

We have argued elsewhere, on the other hand, that complements of Icelandic control verbs contain more "functional projections" and are in that sense more clausal than the (raising) modal complements in Danish. Thus Johnson & Vikner (1994) argue (as does Vikner 1992) that Icelandic control complements are CPs. Thráinsson (1993), on the other hand, has argued that there is even a difference between complements of regular control verbs and complements of modals in Icelandic, which can be accounted for assuming an expanded IP as in (75c). It would not directly serve our present purposes, however, to go further into the syntactic details of these analyses here. Hence we will instead turn to restrictions on the Scandinavian double modals. We will review these and see which ones can be explained syntactically in terms of the analyses suggested here and which ones must await further investigation.

4.2 Restrictions on double modals in Scandinavian

4.2.1 Root modals under root modals

The analyses outlined in section 3 only make one prediction as to restrictions on double modals in Danish and Icelandic: it should be impossible to embed root modals under root modals in Danish under the raising analysis suggested for these, because of the additional theta-role assigned by Danish root modals and the restriction that a given argument can only carry one additional thematic role. This prediction is borne out in examples like the ones in (78) (cf. Vikner 1988:10):

(78) a. *Han vil tørde gå op i Eiffeltårnet.

'(intended meaning: 'he wants dare go up in Eiffel-Tower-the')

b. *Han må ville gå på indkøb.

'(intended meaning: 'he must want go on shopping')

As pointed out by Vikner (1988:9-10), however, the root modal *kunne* can, be able to' appears to be an exception here in that it can be embedded under other root modals:

(79) a. Han skal kunne syvende for at få jobbet.

'(he must can swim for to get job-the)

'he must be able to swim to get the job.'

This is clearly unexpected, assuming the same analysis for *kunne* as other Danish root modals. But there is actually independent evidence that *kunne* is different from other root modals in Danish. Recall that event expressions with *få* 'get' and *blive* 'become' typically cannot be embedded under Danish root modals, as illustrated in section 3.2 above. This restriction does not hold for the root modal *kunne*, as shown in (80) (cf. Vikner 1988:18):


'(she can get three cars in 1995.)

b. Hun kan blive professor/rig.

'(she can become a professor/rich.)

The verb *kunne* in these examples may have the root sense of permission or ability. It seems therefore that we need a different analysis of the root modal *kunne*. One possibility would be to say that root *kunne* is like epistemic verbs in that it does not assign any theta-role to its subject (cf. Vikner 1988:22-23). That is not entirely satisfactory, however, since root *kunne* patterns with other root modals and not with epistemic modals in the pseudo-cleft construction, as we saw in section 2.3 above. This is also illustrated in (81) (cf. Vikner 1988:11):

(81) a. Det eneste han godt kan er at læne min cykel.

'(the only he well can is to borrow my bicycle)

'One of the things he is allowed to is to borrow my bicycle.'

b. En af de ting han ikke kan er at svømme over Kanalen.

'(one of the things he not can is to swim over the Channel)

'One of the things he is not able to do is to swim across the Channel.'

Another possibility would be to analyze root *kunne* as a control verb, along the lines suggested above for Icelandic root modals. Such an analysis would obviously be compatible with the pseudo-cleft facts in (81) and should not create problems for an account of the double modal constructions in (79) or the event expressions in (80) since no clash of two additional thematic roles would be involved. But such a solution has its problems too, as pointed out in footnote 28.

Although it is not the case that all root modals can be combined with each other in Icelandic, there is no evidence for a pattern like the Danish one just described. Observe the following, for instance, where the root sense seems possible in all cases:

(82) a. Hun vil verstå að fara.

'(she will have to go)

'she wants to have to go.'

b. Hun verður að vilja fara.

'(she must to will go)

'she has to want to go.'

c. Hann og að kunna að kynda.

'(he ought to can to swim)

'he ought to be able to swim.'

d. Hann verður að eiga að gerja eitthvæl.

'(he must to ought to do something)

'he must have to do something.'

Some unacceptable combinations are given in (83) (these are out in the root interpretation, as indicated):

(83) a. ...
4.2.2 Epistemic modals under epistemic modals

Since we have suggested here that epistemic modal verbs are like "regular" raising verbs in not assigning any thematic role to their subject, there is no clear syntactic reason to expect restrictions on double epistemic modals in Scandinavian. Non-modal raising constructions can be embedded under raising verbs in English, Icelandic and Danish, as shown in (85):

(85) a. He seems to be believed to be smart.
   b. He viröist vera talinn vera gáfanur.
   (Ic) he seems to be believed to be smart
   'He seems to be believed to be smart.'
   c. Han ser ud til at forekomme hende at være begavet. (Da)
   she looks out to to seem her to be clever
   'He seems to appear to her to be clever.'

Thus it is not surprising from a syntactic point of view to find epistemic modal verbs embedded under epistemic modals in Icelandic:

(86) a. ßað mun vilja rigna meðan þið eruð þar.
   (Ic) It will want rain while you are there
   'It will tend to rain while you are there.'
   b. Stråkana atlaði að vilja reka á land.
   (Ic) the intended to want drift to land
   'It looked like the boys tended to drift ashore.'

There are, however, restrictions on the embedding of epistemic modal verbs under epistemic modals in Scandinavian. As shown in Vikner (1988:9-10), it seems that epistemic + epistemic combinations are only good if the second verb is kunne:

(87) a. Det må kunne stå på en side.
   (Ic) it must can stand on one page
   'It must be possible to fit it onto one page.'
   b. Der vil let kunne gå noget galt.
   there will easily can go something wrong
   'It will easily be possible that something goes wrong.'

Otherwise double epistemic modals tend to be ungrammatical in Danish:

(88) a. *Han vil skulle have last bogen.
   'He will shall have read book-the'
   (Intended meaning: 'He will be said to have read the book.')
   b. *Han skal ville opføre sig pant.
   'He shall will behave self nicely'
   (Intended meaning: 'He is said to be going to behave.')

We do not have any particular solution to offer under the control analysis of root modals suggested here. But we emphasize that these restrictions are not really unexpected since there are also known to be restrictions on embeddings under "regular" control verbs. Note the examples in (84), for instance:

(84) a. *Han reyndi ad eiga ad synda.
   (Ic) he tried to ought to swim
   'He tried to ought to swim'
   b. *Hun skal ville opføre sig klage.
   (Ic) she ought to must to go
   'She ought to must to go'

Despite this, all combinations of epistemic modal verbs with munu and skulu as the second element seem to be bad:

(90) a. *Mig mun skulu reka & land.
   'He seems to be believed to be smart.'
   b. *t>a³ skal munu rigna.
   (Ic) it shall will rain
   'It is certain that I will tend to drift ashore.'
   c. Han ser ud til at forekomme hende at være begavet. (Da)
   she looks out to to seem her to be clever
   'He seems to appear to her to be clever.'

We have no syntactic explanation to offer for this at present.

4.2.3 Root modals under epistemic modals

There do not seem to be any particular restrictions on embedding root modals under epistemic modals in Scandinavian, and none are expected under our analyses. Thus the following are all fine (cf. Vikner 1988:9):

(91) a. De skal ville bygge et hus.
   (Da) They shall want build a house
   'They are said to want to build a house.'
   b. Bau munu vilja bygge hús.
   (Ic) they will want build house
   'They are said to want to build a house.'
   c. Han vil kunne svømme over Kanalen.
   (Da) he will can swim over Channel
   'He will be able to swim over the Channel.'

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The fact that the judgments seem to vary somewhat between Danish and Icelandic may indicate that the verbs in question do not have exactly the same meaning in the two languages.

5. Double modals in Old Norse

Finally, it would be interesting to study the development of modal verbs in general and double modals in particular in the Scandinavian languages from the common Old Norse language to the present. While we have not undertaken a diachronic analysis of that kind we have studied a collection of double modals from the Icelandic Sagas, provided by Eiríkr Rognvaldsson. The data is drawn from a recent edition of the Sagas (Íslendinga sögur 1983-1986), which will soon be available to linguists and other researchers in a computer accessible form on a CD (cf. Rognvaldsson 1991). The language of the Sagas may be considered to be representative of Old Icelandic prose from the 13th - 14th centuries, depending on individual Sagas and the manuscripts preserved. It is likely that all the Scandinavian languages or dialects were similar at this point with respect to the phenomena under discussion. What follows are just a few remarks on the modals and double modals found in the corpus mentioned above.

First, it should be noted that at least some of the modal verbs appear to have had epistemic sense in Old Icelandic. Note the following, for instance (cf. Rognvaldsson 1991:374 - the name of the Saga in question and a page reference to the edition used is given in parentheses after the gloss):

(94) a. *De vil gerne skulle have tjent en million. (Da)
   They want much shall have made a million
   (Intended meaning: 'They would like to be said to have made a million."

b. *Han bør ville komme i morgen. (Da)
   he ought will come in morning
   (Intended meaning: 'He ought to be coming tomorrow.'

c. *Hann verður að kunna að kunna að syna. (Ic)
   he must to can to can to swim
   (Intended meaning: 'He has to may be able to swim.'

d. *Eg verði að vilja reka £  land. (Ic)
   I must to will drift to land
   (Intended meaning: 'I have to tend to drift ashore.'

This is hardly surprising from a semantic point of view. Since epistemic modals predicate of a whole proposition whereas root modals predicate of one of the arguments (typically the subject) of a proposition, we would not expect root modals to be able to take scope over epistemic modals. But there does not seem to be any structural reason why a raising construction could not in principle be embedded under a control verb. Thus it should be noted in this connection that it is not the case that all raising constructions are unacceptable under control verbs in Danish and Icelandic although some are less than perfect, depending on the semantics of the control verb and the raising construction involved (cf. also Thráinsson 1979:280 ff.):

(93) a. Jeg prøvede at se ud til at være ophidset. (Da)
   I tried to see out for to be excited
   'I tried to seem to be excited.'

b. *Eg reyndi að virðast vera settur. (Ic)
   I tried to seem to be excited
   'I tried to seem (to) be excited.'

c. *Jeg lovede at blive arrestet. (Da)
   I promised to be arrested
   'I promised to be arrested.'

d. *Eg lofði að verða tekkinn fastur. (Ic)
   I promised to be taken fast
   'I promised to be arrested.'

e. Jeg prøvede at blive arrestet. (Da)
   I tried to be arrested
   'I tried to be arrested.'

f. *Eg reyndi að vera tekkinn fastur. (Ic)
   I tried to be taken fast
   'I tried to be arrested.'

g. Jeg håbede at blive arrestet. (Da)
   I hoped to be arrested
   'I hoped to be arrested.'

h. *Eg vonaðist til að verða tekkinn fastur. (Ic)
   I hoped for to be taken fast
   'I hoped to be arrested.'

If we accept Rognvaldsson’s conclusion that "there seems to be no reason for assuming that the status of quirky subjects is different in Old Icelandic than in Modern Icelandic" (1991:377), then we have here a case of a quirky subject of a modal verb and we have seen that this would seem to suggest a raising-type epistemic modal (cf. section 2.2 above). Second, it seems that most of the examples of double modals in the Sagas are instances of root modals embedded under the epistemic modals mun 'will' and skulu 'shall'. As we saw above, the epistemic + root combination is the most common and natural type of double modals in the modern languages and it is possible that the verbs mun and skulu developed epistemic sense earlier than the other modals or are more common in the epistemic sense than other modal verbs. A few representative examples are given in (95):

(95) a. að þu skalt eligi kunna frá tölumund að segja...
   that you shall not can from news to tell
   that you will not be able to tell any news.'
   (Myndla, p. 129)

b. Fleiri munu kunna að höggva stört en þu eim...
   more will can to be big than you alone
   'More people than you will be able to strike great blows.'
   (Myndla, p. 165)
Section 3 suggested a syntactic analysis of the distinction between epistemic and root. According to this analysis, epistemic modals do not assign any thematic roles at all whereas root modals assign a "normal" theta-role in Icelandic and an "additional" theta-role in Danish. In other words, epistemic modals are like raising verbs in both languages, root modals are like control verbs in Icelandic, but root modals in Danish have a status somewhat in-between these two categories: Danish root modals are like control verbs in that they do assign a theta-role, but they are like raising verbs in that an argument which is base-generated as an argument of the embedded main verb is moved into the subject position of the modal verb (where it is then assigned an "additional" theta-role). It was furthermore shown how these proposals could account for a wide range of data concerning not only the phenomena discussed in section 2 but also e.g. the difference between state and event predicates as well as various constructions involving passive main verbs.

We addressed the possible and impossible combinations of two (or more) modals in section 4, and found that a number of facts fall out as expected on the basis of the syntactic properties of the analysis proposed, for others a plausible semantic account suggested itself (such as for the impossibility of embedding epistemic modals under root modals), but some had to be left unaccounted for here. This section discussed some differences between modal combinations in Scandinavian and those found in various dialects of English, e.g. that the second of two modals is always an infinitive in Scandinavian whereas it would seem to be (and behave like) a finite verb in the English construction.

Finally, section 5 gave some examples of modal combinations in Old Norse, the common ancestor of Danish and Icelandic, and we found no reason to assume that the properties of Old Norse differ significantly from the modern languages with respect to combinations of modals.

References

In this paper, we have given an overview of the semantic and syntactic properties of modal verbs in Scandinavian (even if we had to limit ourselves to Danish and Icelandic for the most part).

In the introduction and in section 4, we tried to show in what respects Scandinavian modals differ from their English counterparts, whereas elsewhere in the paper, particularly in section 3, we discussed the respects in which Danish and Icelandic modals differ from each other.

In section 1 we attempted to define the class of modal verbs, and here we found particularly relevant the semantic distinction between epistemic and root readings. In section 2, we discussed some syntactic consequences of this semantic distinction, especially with respect to non-argument subjects, subjects with quirky case, and pseudo-clefts.


Endnotes

1. Palmer (1986:34) also points out that English modal verbs "have no imperatives". If we interpret that statement to mean that sentences with verbal complex beginning with a modal verb cannot be used as imperatives then this is probably also true of Scandinavian modal verbs. But that property is shared with some (other) auxiliaries in Scandinavian:

(a) *Han drukket ølken.* (Dan) or *Hafðu drikkt þjóðinn bengur ég kem afluð.* (Icelandic)

As the gloss indicates, this appears to be true for English have-constructions too.

2. It has been observed that wollen has a more "subjective" meaning than wollen in examples like the following (cf. Östjekskjer 1989:223):

(i) a. Ølken Spells glücklich gewesen sein.
   'It is said that Emil was happy.'

(b) Emil will glücklich gewesen sein.
   'Emil claims that he was happy.'

Hence one could argue that even here wollen does not occur in a "real" epistemic sense, but see also Östjekskjer Jensen (1987:170) for an epistemic-like sense of wollen (necesary): (ii) Kirschmacher ... will allein genossen sein.
   'Cherry brandy must be enjoyed all by itself.'

Although we are trying to stick to the definition in (10) above, this list contains the Danish verb tørde, which is hardly used in epistemic meaning in Modern Danish and the Icelandic verb þurða which probably does not have any root sense. Further "irregularities" will be noted below.

4. This class is sometimes called "subject oriented" since "the source of the modality is the referent of the subject noun phrase" (Davidsen-Nielsen 1990:44).

5. There are, of course, different degrees of probability and these are reflected to some extent in the different epistemic modal in the languages under discussions. See Davidsen-Nielsen (1990:45) for discussion.

6. The label "volition" here is not only meant to cover pure volition like Danish vilte and Icelandic vilja "will, want to" but also "intentional" verbs like Icelandic "intend", English "intend" and "courage" verbs like Danish mirden 'dare'. A more detailed subclassification is irrelevant for our purposes, however.

7. As pointed out in Vikner (1988:86, n.2), the epistemic use of tørde in Danish is archaic but we include it just for the sake of illustration.

8. The difference between Icelandic epistemic skuld in (15b) and hýða in (14b) is rather subtle. The classification here is meant to indicate difference between necessity and very strong probability. Note that the skuld here is pronounced with special emphasis. Dialectically (South-Eastern Iceland) it is also possible to find epistemic unserested skuld which has similar "reportive" meaning as Danish skulde: Han skulde vær skenniltegur 'I think he is said to be interesting.'

9. This is intended as a quote from the Ten Commandments. Usually the "obligation" involved in stafa is much weaker, more of a suggestion in fact. Note also that a promise as in Danish Jeg skulde nøde ætter mig and Icelandic Æg skulde taka til ætter mig 'I shall clean up after myself' is a sort of obligation. What we have here are differences that could be further defined in terms of speech acts (cf. Searle's distinction between directives and commissives (1983:166 and in earlier works)).

10. (19b) and (19c) are not exactly synonymous in Icelandic. (19b) means 'does not know how to' (i.e., he has never learned it) whereas (19c) means 'cannot do it' (which may be a temporary thing). Hence (i) is fine:

(i) 'Joan kann að synda en hann getur ekki að á fána.
   John can to swim but he can not swim now'

(ii) would be true, for instance, if Joan had hurt himself and was unable to swim. (iii), on the other hand, does not make any sense (under the root interpretation of kann) under any circumstances:

(ii) 'Joan kann að synda en hann kann ekki að á fána.
   John can to swim but he can not to swim now
   (would mean: "...know how to swim but does not know how to swim now")

11. The Icelandic cognate þóra is not included here since it does not have an epistemic sense, cf. the definition in (10).

12. Notice that we are here referring to whether an epistemic may be the subject of a raising verb or a modal which has an infinitival complement. It is also possible for raising verbs to have an expletive subject when the complement is a finite clause. This is neither possible for root nor epistemic modal. Thus there is a certain asymmetry between epistemic modals and (other) raising verbs, as illustrated here with Danish examples:

(a) a. Han ser ud til at have sovet.
    (Raising verb w. infinitive)

   b. Han skal have sovet.
    (Epistemic modal w. infinitive)

(b) *Det er sagt (to) have sovet.*
    It is said that he has slept.

(c) *Det er sagt (to) have sovet.*
    It is said that he has slept.

13. For a detailed analysis of expletives and weather juddet in Scandinavian see Vikner (1995, chapter 7). He argues, for instance, that the "weather words" are arguments rather than true expletives. Such differences are not crucial here, nor are the differences in behavior between overt expletives in Icelandic and Mainland Scandinavian discussed in Vikner and references cited there. What matters is that weather words are licensed by weather expressions and can be raised to a position that is not assigned a thematic role.

14. Note that although English promise can be used as an epistemic modal (or at least a raising verb), Danish love and Icelandic lofa 'promise' cannot. Hence these verbs are not considered modal here (cf. also that Danish love takes an infinitival complement with at whereas Danish modal verbs in general do not).

15. Again, the potential distinction between non-arguments and quasi-arguments is not important for our purposes.

16. Note, however, that in all these cases the infinitival "complement" has the infinitival marker at/Að. This is both true in Danish where the complements of modals do not have the infinitival at and in complements of Icelandic modal verbs like vilja 'will' which also do not take infinitival at as a rule. We have no explanation to offer for this phenomenon.

17. In this case and some of the following, (the demonstrative pron.) 'that' might be a more appropriate gloss than (the personal pron.) 'it' for þóra. The same holds for some of the instances below where det is glossed as 'it'. There is no morphological difference between a demonstrative and personal pronoun in the neuter in Icelandic or Danish.
25. Sigurjónsdóttir (1989) assumes that the complementizer properly governs the empty category in sentences like this - and that is why we do not get an ECP violation here.

26. The so-called J. has-to to sell the-car rarely have a passive sense, the more typical senses being anti-causative, reflexive or reciprocal (cf. Anderson 1990; Ottogsson 1986).

27. It should be pointed out that Danish seems to differ from Icelandic here. Thus compare the following examples to (65)-(68), respectively:

(i) a. Politiet ser til at have løst problemet. (raising)
   'The police seems to have solved the problem.'

   b. Problemet ser til at være blevet løst af politiet.
   'The problem seems to have been solved by the police.'

(ii) a. Den eneste der kan redde os nu er Superman. (Da)
   'The only one that can save us now is Superman'

   b. Det eneste som han ikke var forberedt på at skulle prøve for var at du ville dukke op (Da)
   'The only thing he not was prepared for was that you would show up'

21. Since the choice of an AgrP or TP or even CP complement is not really important for our purposes here, we have left the complement unlabeled. For some discussion of Scandinavian infinitival complements see Johnson and Vikner (1994), Thairastad (1993) and references cited there. See also the discussion in section 4.1 below.

22. Interestingly, however, the state-expressions are ambiguous when embedded under the root modal: in addition to the state meaning they can take on the event meaning. If the event meaning follows from the additional thematic role, as suggested in the text, then one would expect the event meaning itself to be incompatible with the root modals, not just the event expression (cf. Vikner 1988:20). We recognize this as a potentially serious problem for our analysis, but we do not know what to do about it. In Swedish, on the other hand, it seems that comparable event expressions are ungrammatical when embedded under root modals so the additional thematic role analysis does not seem to work for such cases in Swedish. But Swedish state expressions take on event interpretations in the same context as their Danish counterparts. Again, some more work must obviously be done if we want to extend our analysis of modals to other Scandinavian languages. We realize that we have only scratched the surface in many respects.

23. As Vikner (1988:23-24) points out, however, it is not entirely clear how to explain the fact that J-passives are ungrammatical with epistemic modals (cf. also Davidsen-Nielsen 1990:21; Skyum-Nielsen 1971:73):

(i) *Hun vill udnyttes til professor, men hun ved det ikke endnu, she will be-appointed professor but she knows it not yet

24. It does not matter here whether we assume that the subject of vanta 'lack' is generated in [Spec, VP] position, like regular subjects, or whether we assume with Sigurjónsson (1989:221 ff.) that it originates in object position and that verbs taking quirky subjects are unaccusative (or erratic). It is obvious that it is the embedded verb that determines the case and the thematic role of the quirky subject, not the epistemic modal verb. Where, when or how the embedded verb does this is immaterial.
29. One could argue, of course, that the Icelandic modals are more "verbal" than their Danish counterparts since they do not only show tense distinctions but also person and number distinctions (cf. Groat 1993), but that is a more general difference between verbs in Icelandic (and to some extent also Faroese) on the one hand and Danish (and Norwegian and Swedish) on the other.

30. We are not considering the V2 effects here since they are irrelevant for the points being made.

31. It is interesting to note that the English modal can/could figures prominently as the second element of many of the attested double modal constructions in Modern English. Note also that although it is sometimes said that epistemic modals must precede all auxiliaries (or aux-like verbs) in Swedish (cf. Platzack 1979:46), sentences like the following are acceptable in Swedish (cf. Thrfinsson 1986:28, n.13):

\begin{equation}
\text{It is-said can happen that airplanes collide in mid air.}
\end{equation}

Note that here too the second modal is kunna 'can'. That it seems that can and its cognates may have some special properties worth investigating in more detail.

32. They do not, however, have a past participle (or supine) form, although it is reported that skulu 'shall' may have a supine dialectally, as evidenced by the example hefdi skulad 'had should' from Northern Iceland, cited by Gudmundsson (1977:323, n.7; see also Rignvaldsson 1983:18, n.11).

33. As Sabine Iatridou has pointed out to us, it would be interesting to investigate the scopal interaction between tense and epistemic vs. root modals (cf. also Iatridou 1990), but such investigations are beyond the scope of this paper.