Have to and the Scope of Modality

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1. Overview

A common pattern across languages is for a single set of modal expressions to express both root and epistemic modality. This is clearly seen in the case of English modal auxiliaries:

1. You must leave.

2. You must be crazy.

Over the years, linguists have taken a number of syntactic approaches to distinguishing homophonous root and epistemic modals. On one approach, root modals and epistemic modals differ only in their syntactic scope at LF (Cinque 1999, Brennan 1997, Butler 2003, among others). On another, root modals are treated as control predicates, while epistemic modals are treated as raising predicates (Jackendoff 1972, Ross 1969). Both of these approaches are meant to account for (among other things) the fact that epistemic modals take scope over subjects, while root modals do not.

This paper will use the behavior of modal *have* as evidence for an alternate syntactic strategy for deriving the different subject scopes of epistemic and root modals: I will show that subjects of epistemic and root *have* take variable scope positions at LF, while the modality encoded by *have* itself takes scope in a single, low position: Subjects of epistemic *have* constructions take scope below *have* at LF, while subjects of root *have* constructions take scope above it.

This paper is structured as follows. First, I will outline the syntactic and semantic behavior of modal *have*, and show that it takes scope in the same low position on both its epistemic and root readings. Next, I will propose a syntactic structure that will account for both readings of modal *have*. Finally, I will present evidence supporting this proposed structure.

2. The Distribution of Modal *Have*

Bhatt (1997) notes a crosslinguistic link between possession and obligation. Languages that use *have* to express possession also use it to express obligation:

3. I have to study.

4. Tengo que trabajar.
    have-1s.pres to work
    "I have to work." (Spanish)

English *have to* is generally treated as a typical expression of modal necessity. However, it differs from other necessity modals in a number of previously unnoted ways. For one, it takes scope under negation, while other necessity modals (such as *must*) take scope over negation:

5. You must not look in that file.   (NEC>NEG)

6   Nobody must say anything.   (NEC>NEG)

7. You don't have to look in that file.   (NEG>NEC)

8. Nobody has to say anything.   (NEG>NEC)

In other languages with modal *have*, negation likewise takes scope over modality:

9. No tengo que estudiar.
    no have.1s. pres. to study
    "I don't have to study."   (Spanish)   (NEG >NEC)

A number of other contexts show that modal *have*, on both its root and epistemic readings, takes low scope, both syntactically and semantically.
First, modality takes scope below negation in *have to* constructions even when they express epistemic modality:

10. The murder didn't have to take place in the study. It could have happened in the garage.
    (NEG>NEC)

Second, *have to* can receive both epistemic and root readings when embedded under modal auxiliaries:

11. The suspect must have to be six feet tall, if these are his shoes.

12. Pam must have to work tonight. She's not home yet.

Both epistemic and root *have to* can appear under modals of epistemic possibility (13-14), as well as epistemic necessity (11-12):

13. The suspect may have to be six feet tall, if these are his shoes.

14. Pam may have to work tonight. She'll call us when she finds out.

These data show that epistemic modality can be expressed more than once in the same proposition, and thus must be able to be licensed in multiple positions.
Both root and epistemic *have to* can participate in VP-ellipsis constructions:

15. Sondra has to study for finals, and Russ does (have to study for finals) too.

16. Sondra has to be mad about these rumors, and Russ does (have to be mad about these rumors) too.

In contrast, modal auxiliaries cannot be gapped by VP ellipsis:

17. *Sondra must study for finals, and Russ does, too.

Thus, both root and epistemic modal *have* surface syntactically—and take scope semantically—in VP. This brings into question recent proposals (Cinque 1999, Butler 2003) that different modality types are licensed in separate, dedicated functional projections.

3. The Syntactic Derivation of Modal *Have*

The syntactic structure of *have to* constructions must reflect facts previously noted: *Have* surfaces below modal auxiliaries, and modality in *have to* constructions takes scope under negation.

Following Freeze (1992), Kayne (1993) and Bhatt (1997), I propose that modal *have* arises from the incorporation of a preposition-like complementizer into *be*:

18. [$_{VP}$ [$_V$ [C/P] [$_v$BE]]   [$_{CP}$ t $_{C/P}$ [$_{TP}$ to [$_{VP}$ V]]]]

Diverging from Bhatt's (1997) analysis of *have to*, I propose that modality is contributed by the preposition itself, rather than by movement of *have* to a higher modal projection. I take this complementizer to be a covert version of *for*, which behaves both as a complementizer and preposition, and introduces nonfinite (and typically irrealis) clauses.

The possibility of prepositions encoding modality is supported by constructions in which they introduce intensional contexts and propositional attitudes:

19. We're moving [$_{PP}$ towards a world without cancer].
20. Sondra is [$_{PP}$ at the end of her rope].

Crosslinguistic evidence comes from San Lucas Quaiviní Zapotec, an Otomanguean language of Mexico, which uses a copula combined with a borrowed Spanish preposition (*pahr,* from Spanish *para*) and a complement clause with irrealis mood to express root modality.

21. Nàa   pahr y-tòo'oh Gye'eihlly ca'rr.
    NEUT.be for IRR-sell Mike car
    "Mike has to sell the car."   San Lucas Quiaviní Zapotec: Lee 2006

Bhatt (1997) notes that many languages that use forms of *be*, rather than *have*, to express possession also use *be* to express obligation:

22. Ram-er ek-ta boi aachhe.
    Ram-GEN one-CL book be.PRS
    "Ram has a book."   Gujarati: Bhatt 1997

23. Ram-er Dili je-te ho-be.
    Ram-GEN Delhi go-inf be-fut
    "Ram has to go to Delhi."   Gujarati: Bhatt 1997

 Mahajan (1992) proposes that languages that use possessive *be* are those in which the preposition incorporated into *have* is blocked syntactically from incorporating into the copula. This forces languages with possessive *be* to realize possession with both a copula and an overt preposition. In Hindi, the preposition surfaces as a case marker on the possessor:

24. Siita-kii do bɛhne hɛ̃.
    Sita-GEN two sisters be-PRES.PL.
    "Sita has two sisters."   Hindi: Mahajan 1992

SLQ Zapotec, however, has a separate word for possessive *have*.

25. R-a'p-a' bèe'cw.
    HAB-have-1s. dog
    "I have a dog."

The fact that SLQ Zapotec has both a lexical form for *have* and a modal expression involving *be* combined with a borrowed preposition suggests that the latter is a transitional case of a preposition combining with a copula to express obligation. (The fact that the preposition *pahr* has not morphologically incorporated into the copula may be due to its being a borrowed form, and thus a

relatively recent addition to the language.) This construction suggests that the preposition involved in the modal construction is distinct from that of the possessive construction.

Thus, modality in modal *have* constructions is generated low in the syntactic structure. Moreover, it stays low in syntactic structure. English *have to* constructions behave like lexical, rather than auxiliary *have*:

26. Do we have to stay here?

27. *Have we to stay here?

Thus, the modal preposition incorporated into *have* takes scope within the VP headed by *have*. This is consistent with its narrow scope with regard to negation, and the possibility of it co-occurring with modal auxiliaries.

The previous section showed that modal *have* takes scope in the same position on both its root and epistemic readings. This suggests that the modal preposition incorporated into the copula to derive modal *have* may encode either type of modality.

If this is so, it suggests that root and epistemic modality are not syntactic or semantic primitives. This in turn raises the question of how to derive the differences between root and epistemic readings of modal *have*. The next section addresses this issue.

4. Deriving Epistemic and Root Modal Scope

Epistemic modals have been argued to take scope higher than root modals. Much of the motivation for this has been purely semantic: Epistemic modality involves expression of a relation between necessity/possibility and a proposition, while root modality involves a relation between an individual and a necessary or possible event. In many accounts of modality, this has translated into a syntactic distinction: root modals are thought to be syntactically lower and take scope under subjects (putting the subject outside the scope of the modal), while epistemic modals are syntactically higher and take scope over subjects (thus, putting the entire proposition under the scope of the modal) (Brennan 1997, Butler 2003, among others) .

Brennan (1997) makes the following argument for this idea. Epistemic modals expressions containing symmetric predicates maintain their truth values when their arguments are switched, while root modal expressions do not:

28. <u>Epistemic:</u>
     Sondra must look like her sister (since they're twins).→
     Sondra's sister must look like her.

29. <u>Root:</u>
     Sondra must look like her sister (for Halloween). –/–>
     Sondra's sister must look like her.

Brennan argues that this difference is due to differences in modal scope. Symmetry holds under epistemic modality because the modal takes scope over the entire proposition. It fails under root modality, however, because the modal only takes scope over the verb and object. Thus, the modal obligation does not hold when the arguments are switched. The difference between epistemic and root modality in these contexts is thus consistent with the view that epistemic modals take scope higher than root modals.

The previous section showed that both epistemic and root *have* take scope in the same position: below other modal auxiliaries and negation. However, modal *have* behaves the same way with regard to Brennan's symmetric predicate test as do other modals:

30. Epistemic:
    Sondra has to look like her sister (since they're twins). →
    Sondra's sister has to look like her.

31. Root:
    Sondra has to look like her sister (for Halloween). –/–>
    Sondra's sister has to look like her.

If Brennan's analysis of this pattern is correct, this suggests that modal *have*, like other modal auxiliaries, takes varying scope with regard to subjects on its epistemic and root readings. How can this be reconciled with the evidence that both root and epistemic *have* take scope in the same syntactic position?

I will propose the following: Consistent with the evidence from the previous section, modal *have* takes scope in the same, low syntactic position on both its epistemic and root readings. Subjects of root and epistemic *have*, however, take LF scope in different positions: Subjects of epistemic *have* constructions take scope in the complement clause (under modal *have*), while subjects of root constructions take scope in the matrix clause (over modal *have*).

In short, the scopal differences between root and epistemic *have* are not due to differences in modal position, but differences in LF subject position.

5. The Subject Scope of Modal *Have*

This section will outline the syntax of subject scope in modal *have* constructions, then provide evidence for the structures proposed.

Following Bhatt (1997), I will assume that modal *have* is a raising predicate, since it allows expletive subjects:

32. It had to have rained last night.

33. There have to be 50 chairs in that room by noon or you're fired.

The fact that modal *have* allows expletive subjects on both its epistemic and root readings (as seen in the preceding examples) shows that epistemic and modal *have* cannot be treated as homophonous raising and control predicates, as has been proposed for other modal auxiliaries (Ross 1969, Jackendoff 1972).

Following the raising analysis of modal *have* and Diesing's (1992) treatment of the possible scope of indefinites, I will assume four potential scope-taking positions for subjects of modal *have*: the specifiers of embedded clause VP and TP, the specifier of matrix TP, and the specifier of matrix CP. These positions are marked with x in the figure below:

34. $[_{CP}$ x $[_{TP}$ x $[_{VP}$ have $[_{CP}$ t $_{c/p}$ $[_{TP}$ x to $[_{VP}$ x verb]]]]]]

Subjects of root *have to* constructions may take scope in any position above *have* at LF. Subjects of epistemic *have to* constructions must take scope in one of the positions below modal *have* at LF.[1]

This proposal makes a number of predictions about the different behavior of subjects in epistemic and root *have to* constructions.

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[1] Wurmbrand and Bobaljik (1999) likewise propose that both root and epistemic modals should be treated as raising predicates; however, their proposal does not make a direct correlation between subject scope and possible modal readings.

5.1 Subject Wh-movement in Epistemic Have *Constructions*

If the preceding account is correct, then subjects of epistemic *have* constructions should not be able to take scope in the matrix clause. Thus, contexts in which wide subject scope is forced—such as subject wh-questions—should be disallowed in epistemic *have* constructions.

At first glance, this prediction appears not to be fully borne out. Subject wh-movement out of modal *have* constructions with unambiguously epistemic readings is allowed, but marked:

35. Pam has to be crazy to like that movie.

36. Who has to be crazy to like that movie?

The wh-question, while grammatical, gets an echo question reading, rather than an unmarked interrogative reading. I will argue that this is fully consistent with the inability of subjects in epistemic *have* constructions to take matrix clause scope.

A well-known feature of echo questions is that they allow wh-expressions inside islands (Parker and Peckeral 1985, among others). This is seen in the following example:

37. You saw the car that belongs to WHO?

This suggests that echo questions do not involve the same movement constraints as do normal wh-questions.

Dayal (1996) (cited in Artstein 2002) proposes that wh-expressions in echo questions are immune to normal wh-movement constraints because they do not raise at LF. Instead, they are bound *in situ* by operators in CP.

If this is so, then the obligatory echo question interpretation of subject wh-questions out of epistemic *have* constructions is consistent with their inability to take matrix clause scope: Subjects of epistemic *have* constructions must take scope under *have* at LF. A subject wh-expression with a normal interrogative reading would have to target the matrix CP in (36) at LF. Thus, the only way to preserve the epistemic reading of (36) is to allow the wh-expression to take LF scope below *have*, and the only way a wh-expression can take scope in this position is by being interpreted as an echo expression.

This constraint against subject wh-movement out of epistemic *have* constructions also surfaces in expressions that allow either root or epistemic readings. such as the following:

38. Pam has to wash the car every Saturday (or her parents won't let her use it).

39. Pam has to wash her car every Saturday (why else is her driveway always covered with suds on Saturdays?).

Subject wh-movement out of this example—with normal question intonation and meaning— allows only the root interpretation of modal *have*:

40. Who has to wash the car every Saturday?   (root only)

41. WHO has to wash the car every Saturday?   (root or epistemic)

This contrast shows that a context where matrix clause scope of the subject is forced allows only a root interpretation (40), while a context where low subject scope is possible allows an epistemic reading (41). (The possible root reading of (41) is due to the fact that the wh-expression may be interpreted at LF in spec, TP of the matrix clause, as well as in the embedded clause.)

The forced echo question readings of subject wh-questions out of epistemic *have* constructions shows that these subjects obligatorily take sccope under modal *have*. Given the evidence in sections 2

and 3 that both epistemic and root *have* take low syntactic and semantic scope, this difference could not be due to different scopal positions for modality in root and epistemic *have* constructions. Rather, it can only be accounted for by different subject scope positions relative to the modal.

5.2 British English Agreement and Modal Have

A British English subject agreement pattern provides morphological evidence for variable subject scope positions in root and epistemic *have* constructions.

British English allows some group-denoting nouns to trigger either singular or plural subject agreement:

42. The Government is/are ruining the country.
    (Sauerland and Elbourne 2002)

Sauerland and Elbourne (2002) note that in raising constructions, group noun subjects triggering plural agreement in British English necessarily take wide scope:

43. A northern team are likely to be in the final. (∃ >likely, *likely > ∃)
    (Sauerland and Elbourne 2002)

They explain the possibility of both singular and plural agreement in (42) and the impossibility of singular agreement in (43) in the following way. British English has two distinct number features that can be defined as either singular or plural: a standard number feature that marks how many nominal entities are being referred to (e.g., one government in (42) and one team in (43); and a second feature, which they call Mereology, which signals if the entity being defined has more than one member. (Thus, the Mereology feature on "a northern team" in (43) is plural.)

Under their analysis, the Mereology feature in British English—which surfaces as plural verbal agreement in (42) and (43)—must be checked by overt syntactic movement into, and LF interpretation in, TP. A crucial point they argue for is that there is no LF reconstruction of DPs: Apparent "reconstructed' readings result when only the phonological, but not syntactic, features of DP are raised at PF. The need for the Mereology feature to be checked by overt movement thus accounts for the absence of a narrrow-scope reading of the indefinite subject in (43): according to their proposal, narrow-scope readings of indefinites in raising constructions result when only their phonological features raise at PF: their syntactic and semantic features, which would trigger Mereology agreement, remain in the embedded clause. (They account for the possibility of singular agreement on (42) with the hypothesis that realization of the plural Mereology feature is optional.)

This British English agreement pattern can serve as a diagnostic for the LF scope of subjects in modal *have* constructions. The previously presented proposal of variable subject scope for epistemic and root *have* constructions makes clear predictions about when plural agreement with group-denoting DPs should be allowed: If subjects of epistemic *have* constructions take scope under *have* and subjects of root *have* constructions take matrix clause scope, then plural agreement with group nouns on *have* will only be allowed in root *have* constructions.

This prediction is borne out. Group noun subjects in epistemic *have to* constructions may not appear with plural agreement:

44. The committee has/*have to have made a decision already.

Plural agreement is grammatical, however, in root *have to* constructions:

45. The committee have/has to make a decision by this afternoon.

This is consistent with the proposal that subjects of epistemic *have* necessarily take low scope, and thus do not trigger Mereology agreement, while subjects of root *have*, which take matrix scope, do

(optionally) trigger agreement. If Sauerland and Elbourne's account of total reconstruction is correct, these agreement facts can only be explained if root *have* subjects take scope higher at PF/LF than do epistemic *have* subjects.

Moreover, the fact that these scopal differences correspond to agreement differences confirms the idea that it is variable subject position, rather than modal position, that is responsible for the difference between root and epistemic readings. Subject agreement is checked by subject movement into a fixed syntactic projection (AgrSP). The possibility of Mereology agreement with root subjects, and the impossibility of such agreement with epistemic subjects, suggests than in the former case, the subject is able to trigger agreement by movement into AgrSP, while in the latter it cannot. These agreement facts cannot be acccounted for if it were the modal, rather than the subject, that varied in LF scope position. Nor could they be accounted for by treating root and epistemic *hav*e as homophonous control and raising structures.

6. Conclusion

This paper has shown that the relative scope of subjects and modality in epistemic and root *have* constructions can only be accounted for if the subjects, rather than the modality encoded by *have*, take variable scope. Moreover, previously proposed accounts for deriving the differences between epistemic and root modals (such as varying modal scope positions and raising/control structures) fail to account for the behavior of modal *have*.

The behavior of modal *have* calls into question proposals that root and epistemic modality are syntactic and semantic primitives, and are licensed in dedicated functional projections (Cinque 1999, Butler 2003, among others). Rather, it suggests that these modality types can be derived compositionally in the syntax (along the lines of Barbiers 1995), and supports Wurmbrand and Bobaljik's (1999) proposal that both root and epistemic modals be treated as raising predicates.

This proposal raises the possibility that the epistemic and root readings of at least some other modals could also be derived by means of variable subject scope. I leave this as an area for future research.

7. Acknowledgements

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