

Possession and necessity: From individuals to worlds

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Abstract

This paper investigates the use of possessive morphosyntax to express modal necessity, as in the English use of *have to*. We claim that possessive modality constructions arise because both possession and necessity express a relation of inclusion between two arguments of the same semantic type: possession involves a relation of inclusion between two ⟨e⟩-type arguments, while necessity involves inclusion between sets of worlds. Differences between the two arise from their different syntax: possessive *have* expresses possession via syntactic transitivity, while modals conceal one argument within the modal head. The similarities and differences are captured within a realizational approach to morphology, in which vocabulary items like *have* and *must* are inserted to spell out structures consisting of formal features. The proposal is then extended from *have*-possession languages such as English to *be*-possession languages, focusing on possessive modality in Hindi-Urdu and Bengali. We argue that the possessive/modal head can be “applicative-like,” licensing oblique case on an argument that raises to its specifier.

This account explains why possessive morphosyntax is uniformly used to express modal necessity, and not other modal meanings: the universal force of elements like *have (to)* follows from the inclusion relation expressed by possession. Possessive modality thus sheds light not only on the semantics of possession but also on the compositional syntax of modal operators.

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1. Introduction

In a variety of languages modal necessity can be expressed with the same morphosyntax used to express predicative possession. This is true not only for *have*-possession languages like English, Spanish, and German, as in (1), but also apparently for *be*-possession languages like Hindi and Bengali, as in (2).

- (1) a. The children have to do their homework now. [English]
b. Juan tiene que comer esta manzana.
Juan has that eat-inf this-f apple
'Juan has to eat this apple.' [Spanish]

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- c. Der Hans hat rechtzeitig in Wien anzukommen
 the Hans has in-time in Vienna to-arrive
 ‘Hans has to arrive in Vienna in time.’ [German: Bhatt, 1997:(6)]
- (2) a. John-ko seb khaa-naa hai
 John-DAT apple eat-GER be.PRES
 ‘John has to eat the apple.’ [Hindi-Urdu: Bhatt, 1997:(8)]
- b. Ghor-ṭa-ke porijkar korte ho-be
 room-DEF-DAT clean do-INF be-FUT
 ‘The room has to become clean.’ [Bengali: Neil Banerjee p.c.]

We argue in this paper that the use of possessive morphosyntax to express modal necessity—which we refer to as *possessive modality*—reveals something about the syntactic representation of both predicative possession and necessity. Specifically, we argue that this morphosyntactic repurposing is best explained in terms of a semantic relation common to both possession and necessity. This common relation—which we argue should be represented syntactically as a feature—provides the basis for a common morphology. It also provides a new source of evidence for the semantic analysis of possession. Considerable work has been done on the formal semantics of modality, certainly in comparison with possession; our analysis requires that whatever relation is expressed by possession, it must closely resemble a relation involved in the composition of modal necessity.

One proposal that has been made for possession is that it expresses a relation of inclusion or containment in which the possessor includes the possessee, most obvious in sentences describing part-whole relations. We show that this analysis of possession can explain the extension to necessity: while possession involves inclusion between individuals, modal necessity involves the same relation between sets of worlds.

We thus propose that modal uses of possessive morphosyntax, of the types seen in (1) and (2), result from two changes. The first is a broadening of the semantic interpretation of a morphosemantic feature expressing inclusion, which we call *INCL*. This feature originally encodes a possession relation between individuals, but applied to sets of worlds it encodes modal necessity. The second change is that a feature contributing a modal base (*ROOT*, *EPIST*, etc.) is optionally added to the head hosting *INCL*. The result is a shift from a fully transitive structure (possessive *have*) to a raising structure (modal *have*).

Central to this account is a realizational view of morphology in which the syntax manipulates formal features and vocabulary items are inserted post-syntactically, as in Distributed Morphology (DM: Halle and Marantz, 1993, 1994). Auxiliary verbs like *have* and *be*, as well as modals like *must* and *may*, are represented in the syntax solely in terms of formal features. They differ from more “lexical” verbs (e.g. *dance*), whose syntax includes an additional root element (which in DM is associated with richer Encyclopedic knowledge). What this means is that the meanings expressed by functional elements, including auxiliary verbs, derive entirely from the interpretable formal features they spell out. Further following the assumptions of realizational morphology, functional vocabulary items can be underspecified, so that a single vocabulary item can spell out more than one featural representation. As we will see, the English vocabulary item *have* spells out not only the verbal head involved in predicative possession (*INCL*), but also a more complex verbal head that expresses modal necessity (*INCL + EPIST* OR *INCL + ROOT*).

In section 2, we discuss the possession relation, reviewing the range of meanings associated with possessive *have*. Among these is a relation of inclusion, which we show in section 3 is a relation centrally involved in modal necessity. Section 4 brings possession and modal necessity together, showing how the same features can account for the semantics of both constructions. Then, section 5 provides an account of the syntax of modal *have*, relating it both to the syntax of possessive *have* and to the syntax of true modals like *must*. Finally, in section 6, we extend the account to *be*-possession languages. We show that the differences between possessive modality in *have*- and *be*-possession languages can be understood entirely as a difference in the morphological realization of essentially identical syntactic representations. In other words, the apparently different forms that the construction takes in *have*-possession languages and in *be*-possession languages are superficial, and do not reflect any crosslinguistic difference in the underlying syntax of modality.

2. The syntax and semantics of possession

The semantic analysis of possession faces a persistent challenge from the wide range of interpretations available to possessive verbs like *have*, a range that makes it difficult to choose any single core meaning expressed by possession. Possessive modality constructions, however, offer a new source of evidence for the analysis of possession simpliciter: whatever relation is expressed by possessive *have*, it must be a relation that also holds in modal necessity.

In this section, we begin by reviewing the basic syntax of predicative possession, before addressing the range of meanings available to possessive *have* in English. We identify *inclusion* as a basic meaning of predicative possession; in

section 4 we show that inclusion can form the basis of extension to modal necessity, strengthening the claim that it is the core relation expressed in possession.

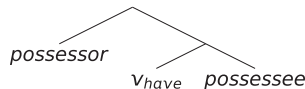
2.1. The syntax of predicative possession

There is a broad consensus in the literature that the syntax of possession involves a functional head that relates two arguments, though the head itself has been identified in a variety of ways. Various authors treat it as prepositional, either locative (Freeze, 1992) or as a version of *with* (Levinson, 2011). Kayne (1993) identifies it as a hybrid D/P head. Others take it to be verbal, implementing it as a flavour of v^0 : Harley (1995) calls it v_{have} , while Ritter and Rosen (1997) call it simply v .

The question of whether the syntactic head at the core of possession is prepositional or verbal is orthogonal to the main focus of this paper. In the case of predicative, or clausal, possession, however, which is our focus here, verbal morphology will ultimately be required, and so either the head in question is itself verbal, or it will need to incorporate into a verbal head. We abstract away from this distinction here, and for concreteness will call the relevant functional head in English v_{have} . Nothing in this paper hinges on whether the head in question might, at a more abstract syntactic level, be better identified as a prepositional element.

This yields a structure as in (3) for predicative possession. The possessor and the possessee are arguments of v_{have} , with the possessor in the specifier position, c-commanding the possessee.

(3) Structure of *have*-possession:



The structure in (3) reflects the common view of *have* as spelling out a basic transitive head: Hoekstra (1984), Cowper (1989), Harley (1995), Ritter and Rosen (1997); among many others. As stated earlier, we claim that on its own, v_{have} expresses a very general relation of inclusion or containment. The external argument—the possessor—is the inclusive or containing member of the relation, and the internal argument—the possessee—is the included or contained member.

Henceforth, we refer to the head that appears in clausal possession and is spelled out by *have* as v_{have} . However, it must always be borne in mind that v_{have} is not the same thing as the Vocabulary Item *have*, which may also spell out other syntactic elements. The central claim of this paper will be that the Vocabulary Item *have* also realizes a v head that occurs in a different syntactic configuration from (3), one that is involved in the composition of modal necessity.

2.2. Interpretations of *have*

The interpretation of *have* is, to a significant extent, contextually determined by the arguments it links, as proposed for example by Cowper (1989).¹ In this section, we propose, however, that when the arguments of *have* provide no pragmatic information to determine the interpretation, the inclusion/part-whole interpretation appears as a default.

When *have* takes a nominal complement that describes an event or a state, the subject may be thematically or pragmatically related to the complement, in a variety of different ways, as can be seen in (4) and (5).

(4) Events:

- a. Dr. Smith had three operations last week. (agent)
- b. That patient had two operations last month. (patient)
- c. Professor Jones has a class this morning. (agent/source)
- d. All of the students have a class on Thursday afternoon. (patient/goal)
- e. Mrs. Astor had a party on Saturday. (agent/host)
- f. The catering company has four parties this evening. (agent/caterer)

¹ For a superficially similar phenomenon, see Grimshaw and Mester (1988) on the Japanese light verb *suru*. In this paper we do not directly discuss causative or experiencer uses of *have*, which resemble modal uses in that the complement of *have* is clearly larger than a single DP. Bjorkman and Cowper (2013) take a somewhat different approach to these other non-possessive uses of *have*, arguing that causative and experiencer interpretations arise due to the presence of a second “shell” of inflectional structure, in which *have* heads a second Voice⁰ or Appl⁰ head.

- (5) States:
- a. Sue has a bad headache. (experiencer)
 - b. Davey had the measles last winter. (experiencer)
 - c. Newt has some very odd beliefs. (believer)
 - d. The company has a new position on that issue. (proponent)

Given a realizational approach to morphology, it is not necessary to provide a lexical item *have* that fully determines this range of interpretations. We can instead simply say that *have* is the morphological realization of a functional head (v_{have}) that encodes an underspecified relation between two arguments.²

When the nominal complement of *have* denotes an individual, again the range of possible interpretations is very wide, as illustrated in (6).

- (6)
- a. Mr. Romney has several houses and many cars. (ownership)
 - b. The university has a farm outside of town. (ownership, abstract part-whole relation)
 - c. I couldn't do my homework because I didn't have my notebook (with me). (physical possession)
 - d. Freddie has two sisters. (inalienable possession)
 - e. The car has a red roof. (part-whole)
 - f. That dog has three legs. (part-whole)
 - g. Katie has a new favourite song. (affinity)

In these cases it is clear that the thematic interpretation of the subject cannot be “inherited” from the complement of v_{have} since individual-denoting nominals lack thematic roles to assign (with the exception of inherently relational nouns like *sister* or *friend*). Here it seems that v_{have} must be the sole source of the formal semantic relation between its two arguments. Whatever that relation is, though, it must still be very minimal, allowing the object argument to make a pragmatic contribution (as discussed in Cowper, 1989).

However minimally specified the relation encoded by v_{have} , it differs in at least one key way from more general relations of predication: its arguments are always asymmetrically related.³ For example, when v_{have} expresses possession, the possessor is always the external argument, and the possessee the internal argument. In this v_{have} contrasts with equative uses of the copula, another “light” or “functional” verb, where the two arguments appear to have a much more symmetric relationship.

The question, then, is exactly what content v_{have} contributes, and how that content is to be represented. Consider the sentences in (7), where both arguments of v_{have} are nonce words.

- (7)
- a. That snarf has two borks.
 - b. That fring had a big shrack.

An informal consultation with several native speakers of English revealed that when the nominals themselves made no pragmatic contribution to the interpretation, the object argument was interpreted as being in a physical part-whole relation with the subject argument.

Though *inclusion* or *part-whole* seems to be a reasonable relation to postulate in the domain of inalienable possession, it may not be immediately obvious that it could form the basis for a broader semantics for predicative possession more generally. It is an open question whether more abstract cases, such as alienable possession and kinship relations, could usefully be seen as involving some kind of inclusion.

One possibility, entirely compatible with our proposals in this paper, is that INCL occurs on v_{have} only in structures corresponding to inalienable or part-whole possession. From this perspective, there would be several “flavours” of v_{have} , distinguished syntactically by the formal features they bear, but all realized post-syntactically as *have*. It would be this INCL-bearing v_{have} that (as we argue below) forms the basis of extension to modal contexts.

A potentially more interesting possibility is that more abstract possession relations, such as alienable possession and kinship relations, can also be usefully seen as involving some kind of inclusion or containment. Though not broadly pursued in the literature, the idea that such relations should indeed be viewed as a kind of inclusion is nonetheless

² This can be compared with Cowper's (1989) earlier proposal that *have* is lexically specified as having two θ -roles to assign, but that these are radically underspecified and can thus inherit any content pragmatically supplied by the event/state nominal.

³ Similar observations have often been made in the typological literature, for possession constructions more broadly, as in Heine (1997) and Stassen (2009), among others.

sometimes expressed in work on possession. A clear statement of this type of intuition can be found, for example, in the following lines from Boneh and Sichel (2010):

“We take Part-Whole to be broader than inalienable possession and to include also social relations and inanimate Part-Whole” (pp. 2–3)

“[T]he complement of the applicative head [=a subset of possessees] can be understood as **falling within the sphere** of the applied argument.” (p. 28, emphasis ours)

The idea of containment within a sphere of influence, expressed in the second of these two quotes, suggests a possible link between inclusion and the notion of *control*, discussed in the context of typological work on possession by authors such as Heine (1997) and Stassen (2009).

It is notable that alienable possession or ownership, sometimes regarded as the canonical instance of possession, is available only with animate or potentially agentive subjects. What it means to be potentially agentive is obviously more than having a particular physical extent in the world, to which literal inclusion could apply. Animacy can instead be viewed in terms of the capacity to influence the world within a particular, pragmatically constrained, domain. What we suggest here is that it is inclusion within this domain that is expressed by alienable possession. Whether this can be extended to accommodate the use of possession in kinship relations (as in (6d)) we leave for future work focusing on semantics of possession.

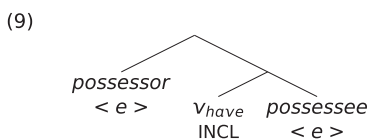
In summary, in this section we have reviewed a range of interpretations available to *have* in its possessive use, and have identified *inclusion* as a plausible core relation across these interpretations. We now turn to the question of how this core semantic relation is syntactically represented.

2.3. The syntactic representation of inclusion

So far we have suggested that the semantic content of the possessive head v_{have} is a relation of inclusion. Here we suggest that this core semantics should be encoded by an interpretable formal feature on v_{have} , a feature we abbreviate as INCL. In this paper we are primarily concerned with the syntactic contexts in which this feature can occur—specifically with the idea that it is this feature that forms the basis of extension to possessive modality. For this reason, we do not provide a detailed semantics for INCL, but we know that it must have the properties listed in (8).

- (8)
- a. It expresses an asymmetric relation between two arguments.
 - b. That relation is highly sensitive to the semantic and pragmatic properties of the arguments themselves.
 - c. Where both arguments denote individuals, the higher argument may be interpreted in a variety of ways; e.g., as (the holder of) a sphere of influence, or as (the creator of) a body of work.
 - d. When the two arguments provide no pragmatic information relevant to the relation between them, the default interpretation is that of a physical part-whole relation.

In predicative possession, the head v_{have} bearing this feature relates two individual-type arguments, as shown in (9).



It is this INCL feature, we assume, that distinguishes v_{have} from other v elements in the functional lexicon. Assuming a realizational approach to morphology, as in DM, a head bearing this feature is spelled out postsyntactically by the vocabulary item *have*.

Very little formal semantic work has been done seeking to unify the broad range of meanings available to possession constructions in natural language. For the purposes of this paper, we set aside several semantic and pragmatic questions, such as what, in formal terms, the various relations expressed by the sentences in (4)–(6) have in common, and exactly how the semantics and pragmatics of the two arguments determine the content of the relation between them.

We focus instead on the idea that the part-whole interpretation for possession, as observed in (7), can form the basis for its extension to other contexts, in particular to modality. The view that possession expresses *inclusion* (at least in part), will be shown to provide a better explanation for the existence of possessive modality constructions than has otherwise been available, with modal uses of INCL developing from its earlier possessive use. Such a move is supported by the history of English *have* constructions. As Visser (1963–73) points out, constructions like (10-c), with a pure necessity meaning,

developed from constructions like (10-b), whose meaning combines possession and necessity, and (10-a), which has only a possessive meaning:

- (10) a. They have no food to eat.
 b. They have several books to read.
 c. They have to read several books.

According to Visser, “the development of this construction [(10c)] from the older constructions [(10a) and (10b)] was very slow. . . [T]here are no examples before about 1200. . . the usage was fairly rare in Middle English and. . . became firmly established in Modern English.” (Visser, 1963–73:section 1401, p. 1478).

At the same time, we make a specific proposal about how a syntactic representation in terms of formal features, particularly a feature *INCL*, can provide the basis for a single morphological realization (as *have*) despite syntactic differences in argument structure and semantic differences in argument type.

3. Necessity as inclusion

We now turn to the question of whether modal necessity can reasonably be treated as deriving from a basic relation of inclusion. If it can, then we can say that both constructions have at their core the same basic semantic relation, which we encode via the interpretable feature *INCL*.

Modal necessity, as well as modal possibility, has long been understood in terms of quantification over sets of possible worlds (Kripke, 1963; Lewis, 1973; Stalnaker, 1975, et seq.). In the case of modal possibility (\diamond), a proposition is true in some relevant possible worlds, while in the case of modal necessity (\square), a proposition is true in all relevant possible worlds. This raises the question of which worlds the modal quantifies over: how is the relevant set of possible worlds determined?

The now-standard view developed by Kratzer (1981, 1991, 2012, et seq.) holds that modals are generalized quantifiers built from three elements: a proposition (*P*), a modal base (*B(w)*), and an ordering source (*O(w)(B(w))*). A proposition denotes the set of worlds in which it is true. The modal base is the set of worlds accessible (epistemically, deontically, dynamically, circumstantially, etc.) from the actual world *w*. Finally, the ordering source is a function that ranks the accessible worlds in the modal base, according to some set of criteria (e.g. the law, the speaker’s preferences, probability, etc.), and returns the set of ‘best’ worlds. For simplicity, we refer to this set of ‘best’ worlds as *BB(w)*—mnemonically, the “best base worlds accessible from *w*”.

Modals are thus functions that take one set of worlds (*BB(w)*) and then another set of worlds (the proposition) and yield a truth value. This makes it possible to restate necessity and possibility in terms of universal and existential quantification, as Kratzer does.

- (11) a. Possibility: **Some** of the worlds in *BB(w)* are also in *P*. \rightarrow
 The set of ‘best’ worlds in the modal base overlaps with the proposition worlds.
 b. Necessity: **All** of the worlds in *BB(w)* are also in *P*. \rightarrow
 The set of ‘best’ worlds in the modal base is a **subset** of the proposition worlds.

For Kratzer the modal base is supplied contextually as part of a conversational background, without any direct syntactic representation. In subsequent work, however, the modal base has sometimes been represented as a pronominal element, as for example in von Stechow and Heim (2011). This representation has not, to our knowledge, been the subject of much explicit argumentation, but it receives support from the fact that the specification of the modal base can involve overt syntactic elements clause-internally, as in the case of *if*-clauses, modelled in Kratzerian semantics as directly restricting the modal base.

If the modal base is indeed represented in the syntax, we have to consider how it composes structurally with both the modal operator and the proposition. Semantically, a modal operator (e.g. *Op_{nec}*) combines first with *BB(w)*, then with a proposition, as shown in (12).

- (12)
-
- ```

graph TD
 Root[] --- Op_nec[Op_nec]
 Root --- P[P]
 Op_nec --- BB_w[BB(w)]
 Op_nec --- ST1[< s, t >]
 BB_w --- ST2[< s, t >]

```

We might think that in English, only the modal operator and the proposition are realized overtly, while *BB(w)* remains silent. There is an intuition, however, that in English a specific modal auxiliary like *must* or *can* carries information not only



about modal force but also about the modal base.<sup>4</sup> Were we to adopt a lexicalist view of syntax and semantics, this intuition would be wholly incompatible with the view that the modal operator and  $BB(w)$  are represented separately in the syntax, and composed in the semantics. Under a realizational view of morphology, however, a single vocabulary item can spell out a non-atomic structure created in the syntax (cf. Marantz, 1997); this type of approach allows us to say that vocabulary items like *must* and *can* spell out syntactically complex constituents. This is done by saying that not just the modal operator, but rather the constituent containing both the modal operator and  $BB(w)$ , is spelled out by the modal auxiliary.

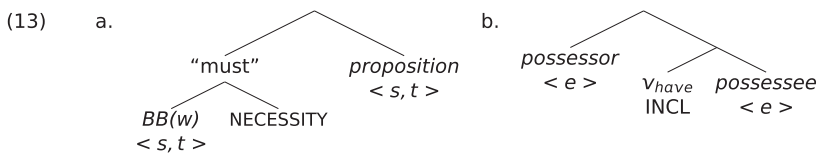
Note, though, that from a morphosyntactic perspective,  $BB(w)$  and  $Op_{nec}$  compose within a single head,<sup>5</sup> while the proposition  $P$  is the syntactic complement of the modal. Semantically, however,  $BB(w)$  is the first argument of the modal operator, and  $P$  is the second argument.

Essentially, then, modal operators express a relation between two sets of worlds. They combine first with  $BB(w)$ , and then with a proposition. With modal necessity,  $BB(w)$  is a *subset* of the proposition worlds. In terms of semantic composition, this is precisely the relation of inclusion discussed above for predicative possession.<sup>6</sup>

#### 4. Connecting possession to necessity

We argued in section 2 that the default meaning of possessive  $v_{have}$  is that the first, or internal argument (possessee) is *included* in the second, or external argument (possessor). In section 3, we discussed the standard formal treatment of modal necessity, which similarly proposes that the first semantic argument of the modal operator (the set of ‘best’ worlds in the modal base) is *included* in (i.e. a subset of) the second argument (the proposition).

It is this semantic similarity that forms the basis of the extension from possession to necessity in possessive modality. Despite these parallels, however, there are nonetheless significant structural differences between the syntax of predicative possession on the one hand and the syntax of modals on the other. A modal like *must* is syntactically intransitive: its first semantic argument composes head-internally, from the perspective of syntax, as in (13a). In contrast, possessive *have* is syntactically transitive: here, the first semantic composition occurs between the head and the syntactic complement, as in (13b) (repeated from (9)).



There is also a significant semantic difference between the two constructions: even if we understand both possession and necessity in terms of a relation of inclusion, the two involve arguments of different syntactic types, sets of worlds in (13a), and individuals in (13b).

It is the similarities between possession and necessity that make an extension from one to the other possible in the first place—and as is common in cases of grammaticalization, the extension is in the direction of relating arguments of a more complex type (von Stechow, 1998). But it is their differences that explain why not all languages automatically extend possessive morphosyntax to express modal necessity. Because their structures are not identical, a broadening of the contexts in which a feature such as INCL can occur, and the types of arguments it can relate, is necessary.<sup>7</sup>

<sup>4</sup> For example, sociolinguistic work by Tagliamonte and D’Arcy (2007) demonstrates that in 21st-Century colloquial Canadian English, *must* and *may* are used only epistemically—they are not used with deontic modal bases. *Can* retains both dynamic and epistemic uses, but the epistemic use is now restricted to negated clauses.

<sup>5</sup> The status of  $BB(w)$  and  $Op_{nec}$  as a single head is necessary to capture the fact that  $P$  behaves syntactically as the complement of the modal head. This is the case not only in English (where modals are functional elements in  $T^0$  or a similar position), but also in languages where modals are main verbs that embed the proposition as a complement clause. Viewing them as a single head is also necessary if heads are the units to which vocabulary insertion applies, as standardly assumed in Distributed Morphology (though not, e.g., in the realizational theory of Nanosyntax: Starke, 2010).

<sup>6</sup> A reviewer observes that one crucial difference between the part-whole relation of inclusion in possession and the subset relation found in Kratzerian necessity is that the latter is reflexive, while the former clearly is not. The relation required for necessity could, as far as we can tell, be expressed instead as a proper subset, a relation that (like part-whole) is irreflexive.

<sup>7</sup> The idea that a single relation can semantically relate arguments of different types can be traced in formal semantics at least to the treatment of coordination in Partee and Rooth (1983); a more recent proposal in a related area of quantification can be found in Ebert and Hinterwimmer (2010).

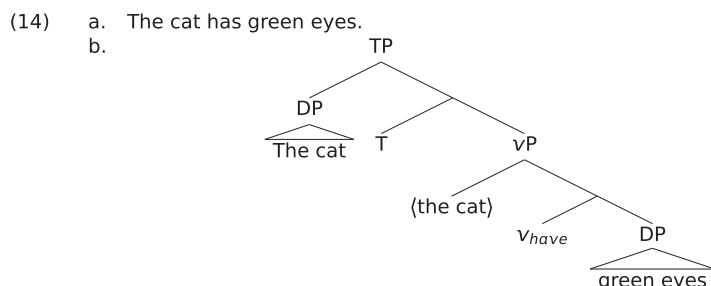
In the next section we look more closely at the syntax of both possession and necessity structures realized in English with *have*, in order to identify more clearly what extension of INCL can explain the use of *have* in modal contexts.

## 5. The syntax of modal *have*

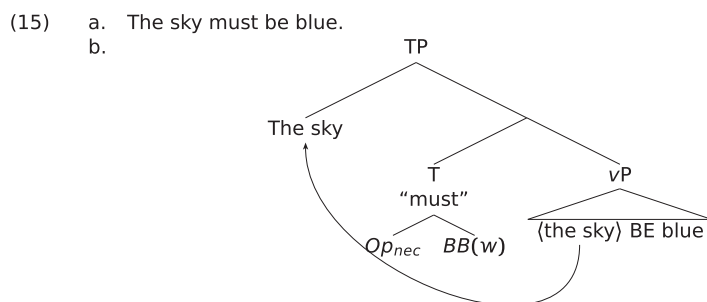
So far, we have argued that there are similarities between the compositional semantics of possession and that of modal necessity, and that these similarities form the basis of extension from possession to necessity. What remains is to account for the syntax of modal *have* sentences, deriving it from the same structure as their semantics.

### 5.1. From the syntax of *have* to the semantics of *must*

We begin with the syntax of possessive *have*. Assuming that *have* realizes a functional verbal head  $v_{have}$ , a sentence like (14a) has the syntactic structure shown in (14b).<sup>8</sup>



A sentence with a true modal, by contrast, has a structure like that in (15b).<sup>9</sup>



These structures illustrate the syntactic difference described in section 4: the first argument of possessive *have* is a syntactic complement, while the first (semantic) argument of a true modal composes head-internally.

Let us now consider the syntactic structure of (16).

(16) The sky has to be blue (when we film this scene).

What is the syntactic structure that underlies this type of sentence? Were we to simply map the first and second semantic arguments from (15b) onto the syntax of possessive  $v_{have}$ , we would arrive at the structure in (17a). The most plausible

<sup>8</sup> To simplify the relevant structures, we omit projections that would intervene between T and  $v$ , e.g. Asp.

<sup>9</sup> We assume a raising structure for both epistemic and deontic modals. Though it is sometimes claimed that deontic/root modals involve control (i.e. that they have thematic subjects), consider the following types of examples:

- (i) a. There must be an answer by 5 PM.  
b. Dinner must be ready when we return. (instructions to a cook)

The availability of expletive subjects of deontic modals, and of a surface subject distinct from the holder of an obligation, show that the subject of a deontic modal is not the thematic holder of the obligation, arguing in favour of a universal raising analysis of modal subjects. See also Wurmbrand (2003) and Hall (2002) for further discussion of the raising analysis of modals like *must*. The same reasoning applies to modal *have* as well as to *must*, as observed by Bhatt (1997).



realizations of such a structure are given in (17b) and (17c); in neither case is the result a grammatical sentence of English.

- (17) a.
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- ```

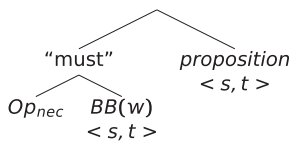
graph TD
    vP --> TP["TP = PROPOSITION"]
    vP --> v_have["v_have"]
    vP --> BBw["BB(w)"]
    TP --> sky["The sky"]
    TP --> BE["BE"]
    TP --> blue["blue"]
    v_have --> has["has"]
  
```
- b. *The sky (to) be blue has.
c. *For the sky to be blue has.

Clearly the brute-force approach of combining the syntactic structure of possession with the semantic arguments of a modal operator is not the way forward. Let us therefore take a different tack, and try to model the syntax of modal *have* more directly on the syntax of *must*.

Specifically, suppose that as with *must*, the first step of semantic composition for modal *have* occurs head-internally. This would allow the second semantic argument, the proposition, to occur as the complement of v_{have} (i.e. as its first syntactic argument).

This move is promising from the perspective of accounting for the syntax of modal *have*, but it requires some further consideration of how, from a syntactic perspective, the first argument of a modal operator— $BB(w)$ —can compose head-internally, assuming the compositional semantic structure in (18).

- (18) The compositional semantic structure of modals:



Compositional theories assume that the input to semantics is the structure built by syntax, and within Minimalist theory syntactic structures are built via the operation Merge. But (external) Merge cannot create complex structures within a head: heads are instead the smallest unit to which Merge applies.

If all semantic composition depends on syntactic structure, and if complex syntactic structures are created by an operation such as Merge (as in Minimalist theory), the structure in (18) presents a puzzle. By definition, the first element that undergoes Merge with a head is the head's complement; there is no way for (external) Merge to create heads with internal structural complexity.¹⁰

How, then, could semantic composition take place inside a head, given Minimalist assumptions about syntactic structure building? At least two options present themselves. First, a complex head could be the result of head movement, and thus result from the combination of what entered the syntax as two distinct, semantically atomic, heads. Second, if we take seriously the idea that interpretable syntactic features are subject to literal semantic interpretation at LF, then the presence of multiple interpretable features on a single head could give rise to semantic complexity even in the absence of concordant syntactic head-internal structure.

Under the first approach, $BB(w)$ would merge as the head of a lower projection, and undergo head movement to adjoin to the modal operator.¹¹ Though this would provide a syntactic way to derive a structure such as (18), there is no evidence that modal operators enter the derivation separately from the modal base. The modal base in English is not realized separately from the modal operator, and its only semantic import is the set of worlds denoted by the head, $BB(w)$. Crosslinguistically, we have found no evidence for two separate syntactic heads in modal constructions in any single language, one corresponding to the modal base and the other to modal force. Such evidence might come in the form of a language in which modals consistently correspond to two separate morphemes, or indeed two words, realized separately in the clausal spine. If modal meanings were necessarily generated as two separate heads, it should surprise us that they are so universally realized as a single unit.

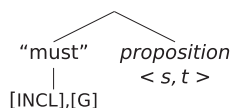
In the absence of such evidence, we prefer a simpler structure with a single syntactic head. We therefore pursue the second option, whereby modals involve head-internal semantic composition by virtue of bearing multiple

¹⁰ If we accept this conclusion, we are led eventually to an extreme version of the cartographic hypothesis, so that in a given representation each head is associated with exactly one semantically interpretable feature (cf. Cinque and Rizzi, 2008).

¹¹ This assumes that head movement can have semantic consequences, contra Chomsky (2001) but following much subsequent work, including Lechner (2006, 2007), Hartman (2010), and Iatridou and Zeijlstra (2010), among others.

interpretable formal features. From this perspective, the semantic compositional structure in (18) is better represented syntactically along the lines in (19), with G standing in for a feature that will be interpreted as providing $BB(w)$:

(19) The syntactic representation of modals:



Once we assume that multiple interpretable—and thus interpreted—features can occur on a single head, we have to consider how those features can semantically compose with one another. Two bottom-up modes of composition suggest themselves: multiple features on a head could each compose in turn with the head's complement, or multiple features could compose first with one another, with the output of that composition applying to the head's complement. We adopt the latter view, at least in the case of modality, so that the features that represent $BB(w)$ and Op_{nec} in the syntax compose with each other before composing with the complement of the modal head.

This general approach to the composition of features within heads is in line with much recent work in which interpretable syntactic features define systematic semantic contrasts within a particular category (Harley and Ritter, 2002; Béjar, 2003; Harbour, 2007; Cowper, 2005, 2011, a.o.). Indeed, from a Minimalist perspective, a syntactic head is simply a collection of formal features, and so its interpretation can only be the product of the feature or features from which it is composed. Independent of theory-internal considerations, there is precedent for the idea that an argument of a head can be supplied within that head. A proposal of this kind can be seen in the influential analysis of passive constructions by Baker et al. (1989), who argue that the external argument in passive clauses is directly saturated by the passive morpheme *-en* itself.¹² From a realizational perspective, there is no sense in which the morpheme *-en* occurs in the syntactic derivation, or could saturate an argument, but Baker et al.'s proposal can be expressed in realizational terms by saying that the external argument of a transitive predicate can be saturated by the [PASSIVE] feature of a *v* or Voice head. That feature both semantically saturates an argument and is spelled out as passive morphology.

The components of modal meanings, like the feature systems characterizing domains like voice, tense, person, number, and definiteness, can be fruitfully decomposed into multiple interpretable features. Across natural languages, modal systems track at least two dimensions of meaning: modal force (possibility and necessity), and modal flavour (epistemic, deontic, circumstantial, etc.). The morphosyntactic expression of modality can be sensitive to either of these dimensions: Matthewson et al. (2005) argue that while the vocabulary items spelling out modal heads in languages like English are primarily distinguished by modal force (i.e. *must* uniformly expresses necessity, while *may* uniformly expresses possibility), the corresponding vocabulary items in St'át'imcets are instead distinguished by modal type, as illustrated in (20) and (21). Any given modal particle in St'át'imcets is compatible with both necessity and possibility readings.

(20) Epistemic¹³ modality, either necessity or possibility: [Matthewson et al., 2005:3]

a. t'ak k'a tu7 kents7á ku míxalh
go.along EVID then DEICTIC DET bear
'A bear must have gone by around here.'

b. wa7 k'a séna7 qwenúxw
IMPF EVID CF sick
'He may be sick.' (Context: Maybe that's why he's not here.)

(21) Deontic modal, either necessity or possibility: [Matthewson et al., 2005:3]

a. wa7 ka s-lep' i k'un7-a ku pála7 máqa7
IMPF DEON STV-bury DET.PL fish.egg-DET DET one snow
'The eggs have to stay in the ground for a year.'

¹² This contrasts with simple intransitives, for example inchoatives, which have no syntactically-introduced external argument. Baker et al. use this to account for the fact that passives are interpreted with an "implicit agent" (e.g. *The ship was sunk (by pirates).*), while inchoatives are incompatible with syntactically represented agents (e.g. *The ship sank (*by pirates).*).

¹³ The relevant morphemes are glossed as "evidentials", but Matthewson et al. (2005) argue that many evidential systems should be understood instead in terms of epistemic modality.

- b. lán-lhkacw ka áts's-en ti kwtámts-sw-a
 already-2SG.SUBJ DEON see-TR DET husband-2SG.POSS-DET
 'You must/can/may see your husband now.'

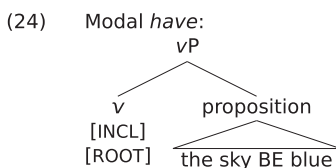
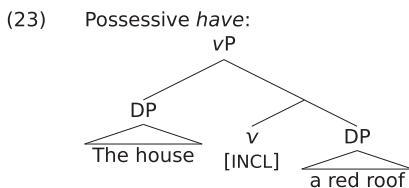
The different alignments of English and St'át'imcets modal vocabulary items are illustrated in (22), from [Matthewson et al. \(2005:12\)](#).

- (22) a. English:
- | | epistemic | deontic | circumstantial | future |
|--------|-----------|-------------|----------------|--------------|
| strong | | <i>must</i> | | <i>will</i> |
| weak | | <i>can</i> | | <i>might</i> |
- b. St'át'imcets:
- | | epistemic | deontic/irrealis | circumstantial | future |
|--------|------------|------------------|----------------|-------------|
| strong | | | – | <i>kelh</i> |
| weak | <i>k'a</i> | <i>ka</i> | <i>ka-a</i> | |

We discuss this type of morphosyntactic variation because it supports the view that modal meanings are syntactically represented in terms of two cross-classifying formal features, one corresponding to the (ordered) modal base and the other to the modal force.

We use the familiar terms NECESSITY and POSSIBILITY as the values for a modal force feature. On the Kratzerian approach, NECESSITY would be interpreted as x includes y , where x is the set of P-worlds, and y is $BB(w)$. POSSIBILITY, not discussed further here, would be interpreted as x overlaps with y .¹⁴

This featural account permits a straightforward account of the syntax of modal *have*. Compare the structures in (23) and (24). (In (24) the feature [ROOT] appears for the purposes of illustration, but note that modal *have* can occur with either root or epistemic interpretations.)



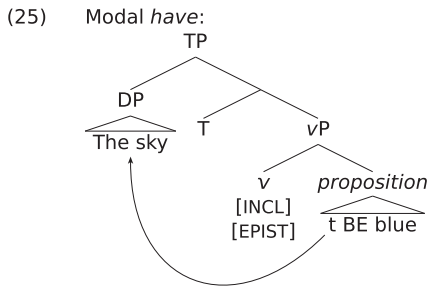
In (23), v carries the feature INCL and takes two syntactic arguments denoting individuals. The external argument (*the house*) includes the internal argument as a subpart (*a red roof*).

In contrast, in (24), v has no syntactic external argument, and its syntactic complement is a non-finite clause rather than a DP. Both of these differences are accounted for by the presence of the modal type feature—in this case [ROOT] on v . This feature provides $BB(w)$, the set of best deontically accessible worlds in the modal base. Since interpretable features on a single head compose with each other before the result composes with the syntactic complement, the composition of [ROOT] and [INCL] happens first. This saturates the internal argument position of INCL, giving a monadic predicate requiring a second argument denoting a set of worlds. The clausal complement of v supplies this second argument, saturating the argument structure of v and precluding the possibility of a syntactic external argument.¹⁵

¹⁴ The features shown here are placeholders; it remains to be shown, for example, whether the distinction between necessity and possibility is best represented by the presence or absence of a single privative feature, two values of a binary feature, or two equipollent monovalent features ([Cowper and Hall, 2015](#)). It is also not clear exactly how many features are required to represent the various modal types, or indeed how many modal types are required.

¹⁵ We assume that the propositional argument is nonfinite for whatever reason the complements of other modals in English are non-finite. This may be linked to the relation between modality and deixis, as in the feature system of [Cowper \(2005\)](#).

Just as with the non-finite complements of verbs like *seem*, the subject of the proposition will raise to the matrix clause for reasons of Case, yielding the structure in (25):



5.2. Interim summary

We have used a formal feature *INCL*, semantically interpreted as expressing a relation of inclusion, and morphologically realized as a verb *have*, to account for the use of possessive morphosyntax to express modal necessity. Initially, *INCL* occurs as the sole interpretable feature on a *v* head, and is semantically restricted to take only individual-type arguments. From this initial state, two changes are necessary for the development of possessive modality. First, the semantic interpretation of *INCL* must broaden to allow it to relate other (higher) types of arguments, not only individuals but also sets of worlds. Second, *INCL* must be able to co-occur on *v* with a second feature, a modal base feature whose semantic interpretation provides $BB(w)$.¹⁶ When both *INCL* and this modal base feature are present, *INCL* takes two arguments of type $\langle s, t \rangle$; i.e., sets of worlds. The first argument, $BB(w)$, is provided by the new feature on v_{have} , and the syntactic complement provides the second argument.

Despite changes in the semantic interpretation of *INCL*, and in the syntactic contexts in which it occurs, the morphological realization of this feature remains constant, via a Vocabulary Item along the lines of (26). Underspecification of Vocabulary Items ensures that (26) will apply even if other features (e.g. those supplying the modal base) co-occur with *INCL* on *v*.

(26) v [*INCL*] \leftrightarrow [hæv]

The modal use of *have* arises directly from the extended semantic content of the feature *INCL*. This proposal contrasts with those of [Bhatt \(1997\)](#) and [Cattaneo \(2009\)](#), in which modal *have* expresses the possession or existence of an obligation, but the actual semantics of obligation arise from the presence of a covert modal operator. In the next section we consider this alternative account of possessive modality constructions, and argue against it directly.

5.3. Against possession of obligation

Previous work on possessive modality constructions, especially [Bhatt \(1997\)](#) and [Cattaneo \(2009\)](#), has treated sentences like (27a) along the lines of either (27b) or (27c). Setting aside some technical details, *have* expresses only the possession or existence of a proposition; the semantics of obligation or necessity come from a covert necessity operator in the complement of *have*.

- (27) a. John has [to eat an apple.]
 b. John has an obligation [to eat an apple.]
 c. There is an obligation [for John to eat an apple.]

[Bhatt \(1997\)](#) projects this covert operator in a structure adapted from [Kayne \(1993\)](#). The details of this structure are not relevant here: the key feature of Bhatt's analysis is that an unpronounced modal head *Mod* occurs below the head realized as *have* (a copular head *Be* to which a nominal/prepositional head has incorporated).

¹⁶ Since v_{have} is still used in ordinary predicative possession, we assume that this modal force feature is optional.

This approach to possessive modality raises two questions. First, if the modal interpretations of *have* arise from a covert modal operator, why is it always a necessity (rather than possibility) modal? Second, given the plausible universality of covert modal operators, why do all languages not exhibit a modal use of their possessive morphosyntax?

Bhatt's answer to the first of these questions is that the modal operator found in non-finite clauses is universally a necessity operator, not only in possessive modality but in other contexts as well. This proposal is further developed in Bhatt (2006), who argues that the same range of modal readings are available to subject reduced relatives and non-finite complements of BE, as in (28a-c), and that these are always necessity readings.

- (28) a. John is [to read a book.]
 b. The book is [to be read for tomorrow.]
 c. The book [to be read for tomorrow] is kept on the lectern. (cf. Bhatt, 2006:16)

If a covert necessity operator is always available in non-finite clauses, we might ask why necessity readings fail to arise in the non-finite complements of canonical raising verbs, such as *seem* and *appear to*. Perhaps more seriously, though, if the necessity reading for both (28a-b) and (27a) is due to a silent modal in the non-finite clause, why does modal *have* occur at all? Setting aside their modal uses, the distinction between *have* and *be* is attributed to both structural and semantic differences between the clauses in which they occur. The use of *have* in (29a) reflects a different relation between the two arguments than the use of *be* in (29b):

- (29) a. Allison has a good friend.
 b. Allison is a good friend.

Why, then, is *have* necessary in (27a)? If the semantics of necessity are due to a covert modal operator, then there is no need for *have* from the point of view of interpretation. And given the grammaticality of (28a), there can be no need for *have* in order to license either the subject or the non-finite complement.¹⁷ In following Kayne's (1993) analysis of possession, Bhatt adopts the view that *have* results from the syntax of copular *be* with some additional nominal/prepositional element. Given this, it is necessary to explain what syntactic or semantic role is played by that nominal or prepositional element, in order for its presence to be possible—but given the other features of Bhatt's analysis of possessive modality, it is unclear what additional role it could play.

The second question raised by Bhatt's account is why possessive modality constructions do not exist in all languages that allow non-finite embedded clauses. Precisely because his account attributes no modal semantics to *have* in possessive modality, it seems to predict that the use of possessive morphosyntax to express necessity should be essentially automatic, as opposed to a common but by no means universal parametric possibility.

The account developed in this paper provides a more satisfactory answer to both questions, by attributing the modal meaning of sentences like (27a) directly to the head realized by *have*. We predict the absence of possibility readings, because necessity is the automatic result of applying the feature INCL to sets of worlds. We also leave room for a role to be played by language change, by recognizing that the extension from possession to necessity requires a change in the types of arguments that can be related by INCL.

We do not deny a possible role for a covert modal operator in sentences like those in (28). What we mean to suggest here is that the presence of a possessive verb *have* requires further explanation, and that this explanation should be judged in part on its success in unifying necessity with the other uses of *have*. Though in one sense Bhatt does entirely unify possessive modality with possession *simpliciter*, he does this by reducing modal possession to an abstract case of predicative possession, an approach that in some ways only deepens the mystery surrounding the breadth of interpretations available to possessive syntax, rather than shedding light on its modal uses. The approach we have adopted here provides a more elegant unification of possessive modality with the other uses of *have* catalogued in section 2, by probing the interpretive featural content underlying syntactic possession.

By attributing a contentful semantics to *have* (or rather, to the syntactic head it realizes), it is possible to use possessive modality to illuminate the semantics of possession more generally, a domain of meaning that has remained persistently obscure to semantic analysis in both linguistic and philosophical traditions. To the extent that the resulting unification is successful, it provides indirect support for the idea that possession and necessity both involve an abstract semantic relation of inclusion.

¹⁷ The subject is not thematically introduced by *have*: Bhatt explicitly argues that the matrix subject originates within the non-finite clause, and raises for reasons of licensing.

6. Extension to BE-possession

So far, we have considered only possessive modality in English. Our account can be extended fairly straightforwardly to other languages that express possession with a verb like *have*, and in this section we show that the account also provides an elegant treatment of possessive modality in at least one class of languages that express possession with a copular verb, including Hindi-Urdu and Bengali. These languages were also discussed by [Bhatt \(1997\)](#), along with Gujarati and Sindhi.

Consider the examples in (30) and (31):

- (30) a. John-ko sirdard hai
 John-DAT headache be.PRES
 ‘John has a headache.’
 b. John-ko seb khaa-naa hai
 John-DAT apple eat-GER be.PRES
 ‘John has to eat the apple.’

[Hindi-Urdu: [Bhatt, 1997:\(8\)](#)]

- (31) a. Amar bondhu-r akṭa boi aatḥe
 my friend-GEN one book be.PRES
 ‘My friend has a book.’
 b. Amar bondhu-ke je-te ho-be
 my friend-DAT go-INF be-FUT
 ‘My friend has to leave.’

[Bengali: Neil Banerjee p.c.]

The (a) sentences in each example are straightforward possession constructions, with the oblique (dative or genitive) nominal expressing the possessor and the unmarked nominal the possessum. The (b) sentences express obligation, and are superficially very similar to the possessive constructions in (a). We argue that they are indeed cases of possessive modality, and that they can be accounted for in a fashion similar to the account of modal *have* presented above.¹⁸

In Indo-Aryan languages like Hindi-Urdu and Bengali, as in other *be*-possession languages, predicative possession is expressed with a copular verb whose subject is an oblique-marked possessor. In Hindi-Urdu the specific oblique marking on the possessor is determined by the “flavour” of possession involved, as shown in (32).

- (32) a. DAT (-ko) = “Experiencer” possession
 Ram ko bukhaar/sirdard/cancer hai
 Ram DAT fever/headache/cancer be.PRES
 ‘Ram has fever/a headache/cancer.’
 b. GEN (ke) = Inalienable possession (body parts, family members)
 Ram kii do bet.iyāā hai
 Ram GEN.F two daughters be.PRES
 ‘Ram has two daughters.’
 c. GEN+LOC (ke-paas) = Alienable possession,
 Ram ke-paas ek kitaab kitaab hai
 Ram GEN+LOC one book/every book be.PRES
 ‘Ram has a book.’

¹⁸ [Jung \(2011\)](#) suggests that Russian—another *be*-possession language—also exhibits possessive modality, based on examples such as the following. On this basis she argues for a unification with English modal *have*.

- (i) Začem mne bylo tam ostavat'sja?
 Why me-DAT be.PAST.N.SG there stay.INF
 ‘Why was I supposed to stay there?’

[Russian: [Jung, 2011:105\(17\)](#)]

Elsewhere this type of sentence in Russian has been discussed as a “dative infinitive” construction ([Moore and Perlmutter, 2000](#); [Sigurðsson, 2002](#); [Fleisher, 2006](#)). Unlike the possessive modality cases discussed here, it is unclear that this is a true modal necessity construction. [Moore and Perlmutter \(2000\)](#) gloss its meaning as “it is in the cards that X”; [Igor Yanovich \(p.c.\)](#) similarly suggests that examples like (i) would be better translated as “What good is it for me to stay there?”. For this reason we do not further consider Russian data here.

- d. “in” (-*mē*) = Possession of properties (Bhatt calls this simply “possession”)
 Ram *mē* pratibhaa hai
 Ram in talent be.PRES
 ‘Ram has talent’

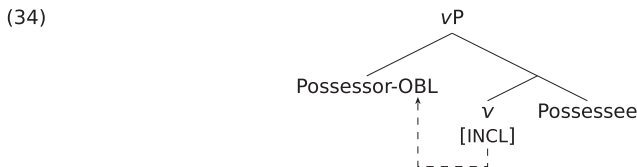
[Bhatt, 1997:(42)]

The structure that we claim involves possessive modality, illustrated in (30b) above and in (33), exhibits dative case on the subject. This is the case used for “experiencer possession”, as in (32a).

- (33) a. Ram-ko phal khaa-naa hai/thaa
 Ram-DAT fruit eat-GER be.PRES/be.PAST
 ‘Ram has/had to eat the fruit.’
 b. Tim-ko davaai pii-nii hai
 Tim-DAT medicine.F drink-GER.F be.PRES
 ‘Tim has to drink medicine.’

[Bhatt, 1997:(20, 27a)]

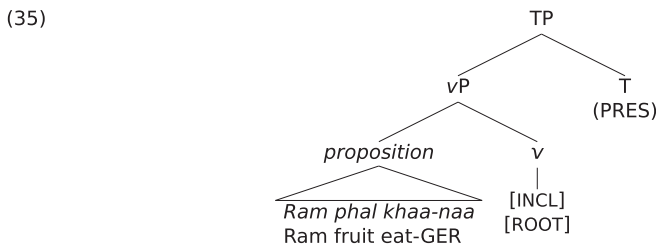
Let us now turn to how our account of possessive modality with *have* can be extended to account for these cases, beginning as before with predicative possession. We propose the structure shown in (34), very similar to the one proposed earlier for possessive *have*, for predicative possession in both Hindi-Urdu and Bengali.¹⁹



Here, a light verb v_{poss} , bearing the feature INCL, takes the possessee as a complement and the possessor as a specifier, as before. The differences between v_{poss} and v_{have} are that v_{poss} also assigns oblique case to the DP in its specifier, and that in Hindi-Urdu v_{poss} does not trigger a more specific realization of v , rather being spelled out by the ordinary copular verb. v_{poss} is thus essentially an applicative head, introducing an argument and licensing it via oblique case, as in the analysis of predicative possession in Myler (2013, 2014).

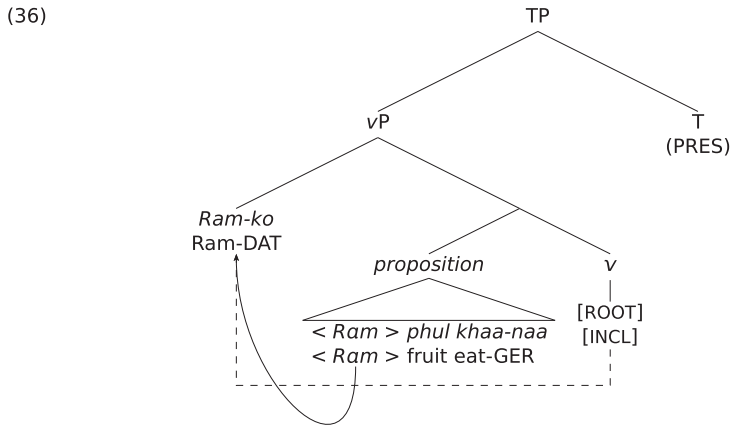
The extension from predicative possession to possessive modality is the same here as proposed for modal *have*, consisting of two changes: the INCL feature of v broadens semantically, so as to relate not only individuals but also sets of worlds; and in addition, v_{poss} comes to be able to bear a feature expressing the modal base (i.e. ROOT or EPIST), and this allows the first argument of INCL to be saturated within the v_{poss} head itself.

The underlying structure for (33)a would therefore be as in (35), with (modal) ROOT and INCL features on v , and a non-finite proposition as the syntactic complement of v .



The central difference between the English v_{have} and the Hindi-Urdu v_{poss} remains, in that v_{poss} assigns oblique case to its specifier, and does not have a special realization as a possessive verb like *have*. In (35), the subject of the nonfinite clause is thus attracted to the specifier of v_{poss} , and receives dative case, as shown in (36).

¹⁹ This similarity is not novel: since at least Freeze (1992), it has been usual to assume that BE-possession and HAVE-possession reflect the same underlying syntax.



While this account treats v_{poss} as applicative-like in the sense that it assigns oblique case to a DP in its specifier, in this case that DP arrives in the specifier via Raising rather than external Merge. Under this analysis, possessive modality clauses in Hindi-Urdu must therefore be raising constructions. Bhatt (1997) provides several arguments that sentences like (33) are indeed derived via raising, rather than having the subject base-generated in the matrix clause, as in dative experiencer constructions.

The first argument has to do with meaning: the subject of the possessive modality construction need not be the direct bearer of the obligation. This is illustrated for Bengali in (37), where clearly it is not the obligation of the room to clean itself. A raising analysis more clearly captures the fact that the matrix subject is thematically related only to the embedded clause, and does not serve as the modal correspondent of an experiencer.

- (37) Ghor-ṭa-ke porijkar korte ho-be
 room-DEF-DAT clean do-INF be-FUT
 “The room has to become clean.”

[Bengali: Neil Banerjee p.c.]

The second argument is syntactic, and has to do with the case that surfaces on the subject. In Hindi-Urdu, promoted subjects, such as the subjects of passive and unaccusative clauses, can surface with (null) absolutive case marking. They cannot be marked with the ergative *-ne* (Mohanani, 1994), as shown in (38).

- (38) Ram(*-ne) giraa.
 Ram(*-ERG) fall.PERF
 “Ram fell hard.”

[Mohanani, 1994:71]

When an unaccusative verb occurs in a possessive modality context, the matrix subject can bear dative case, as in (37) above. However, it can also be unmarked, as shown in (39). This would be completely unexpected if the DP had merged as a matrix “experiencer”, but can be accounted for if it moved to its surface position from within the embedded clause:

- (39) yeh tehniī kaṭ-nii hai
 this branch.FEM be.cut-GER.FEM be.PRES
 ‘This branch had/has to be cut.’

[Bhatt, 1997:(24b-i)]

The third argument is a classic “no extra DP” argument for raising (Soames and Perlmutter, 1979:416). The embedded clause in this construction is a gerund, and gerunds in other contexts permit overt genitive subjects. However, an overt genitive subject is completely impossible in possessive modality contexts, as shown in (40).

- (40) *Roumi-ko [Leela-ka seb khaa-naa] hai
 Roumi-DAT Leela-GEN apple eat-GER be.PRES
 Intended: ‘Roumi has an obligation that Leela eat the apple.’

[Bhatt, 1997:(21)]

This follows automatically if the matrix subject raises from the position occupied by the genitive in (40).

The final issue to be settled in extending our account of possessive modality with *have* to possessive modality with the copula in Hindi-Urdu and Bengali has to do with the oblique case that appears on the matrix subject. In Hindi-Urdu, we

must account for the fact that with possessive modality, the subject is marked with dative rather than with any of the other cases that can mark possessors. As dative is one of the cases that can appear on possessors in Hindi-Urdu, however, this reduces to the question of why different “flavours” of possession trigger different subject marking.

In Bengali, by contrast, accounting for subject case in modal possession seems more difficult, at least at first. Ordinary possessors in Bengali are consistently genitive, as shown in (41a). In contrast, the subject in possessive modality is consistently dative, as in (41b).²⁰ This systematic morphological difference between predicative possession and possessive modality might appear to cast doubt on the proposal that the latter arises from the same structure as the former.

(41) Bengali:

a. Possession: Subject marked with genitive

Amar bondhu-r aḳta boi aaṭhe
my friend-GEN one book be.PRES
'My friend has a book.'

b. Possessive modality: Subject marked with dative (genitive dispreferred).

Amar bondhu-ke je-te ho-be
my friend-DAT GO-INF be-FUT
'My friend has to leave.'

[Bengali: Neil Banerjee p.c.]

We claim that the solution to this problem is to be found in the fact that the subjects of overt modals are uniformly marked with dative in both Hindi-Urdu and Bengali, as shown in (42) and (43).

(42) Hindi-Urdu: Modal *chahiye* 'should'

Ram-ko seb khaa-naa chahiye thaa
Ram-DAT fruit eat-GER should be.PAST
'Ram should have eaten the apple.'

[Bhatt, 1997:(27b)]

(43) Bengali: Modal *uṭfit* 'should'

Ghor-ṭa-ke porij̣kar korta uṭfit
room-DEF-DAT clean do.VERBAL.NOUN should
'The room should become clean.'

[Bengali: Neil Banerjee p.c.]

This consistency suggests that the case assigned to the subject of the applicative *v* may depend on a property that the modal light verb shares with the true modals, rather than on a property that originated with the possessive light verb. Recall that the extension of the possessive head to modal necessity involves the addition of a second formal feature, whose semantic interpretation supplies the modal base (i.e. *ROOT*, *EPIST*). The same feature also occurs on true modals, as discussed above for English *must*. We suggest that it is this feature that controls the assignment of dative case, both with overt modals and with possessive modality. In both (41b) and (43), then, it is the modal base feature that triggers the assignment of dative case to the subject.

The morphosyntactic conditioning of case assignment we propose for Bengali is given in (44). The more specific statement in (a) takes precedence when it is applicable; i.e., when a modal base feature is present. In the absence of a modal base feature, the more general statement in (b) applies, marking the subject as genitive.

(44) a. $V[INCL][ROOT/EPIST] \rightarrow DAT$
b. $V[INCL] \rightarrow GEN$

For Hindi-Urdu, where the case on possessors is dependent on the type of possession relation expressed, we assume that the representation of possession is more highly specified than in Bengali, or in English. Given the framework we have adopted here, it is natural to assume that the different flavours of possession are encoded in terms of formal features, and that these features contribute to determining the case of the possessor.

The differences between *have*-possession languages like English and *be*-possession languages like Bengali and Hindi-Urdu, as regards predicative possession and possessive modality, are thus primarily morphological. In English, the presence of *INCL* on a light verb determines the realization of the head itself, not the case assigned to its specifier, while the

²⁰ Bhatt (1997) reports that Bengali possessive modals such as (40b) optionally involve genitive case on the subject. Neil Banerjee (p.c.) reports that though genitive case is not ungrammatical, dative case is strongly preferred in his variety of Bengali.

modal base feature has no morphological effect. In Bengali, both the inclusion feature and the modal base feature affect the case assigned to the specifier of the light verb, while the light verb itself is consistently realized as the default copula.

7. Conclusion and discussion

We began with the observation that the morphosyntax of possession is often used to express modality. This is particularly interesting to those working on constructions containing *have*, because the modal *have to* construction is often set aside in attempts to unify the constructions in which *have* appears. The core of our proposal is that possessive modality reflects an underlying semantic similarity between possession and necessity: a relation of inclusion between two arguments, syntactically encoded by a formal feature INCL.

This formal feature makes an extension from possession to necessity possible, but still requires two significant changes. The first is in the semantic type of the arguments related by INCL: possession involves two arguments of type $\langle e \rangle$, while modal necessity requires INCL to relate sets of worlds. The second is the structure in which INCL composes with its first argument: in possession this argument is a syntactic complement, while in necessity it can only be a second interpretable feature on a head, whose interpretation supplies the modal base.

Unifying modal *have* with possession in terms of INCL naturally explains why possessive modality always expresses necessity, rather than possibility. Under our account, when INCL is applied to sets of worlds, the semantics of modal necessity arise automatically. We are also able to explain why not all languages have possessive modality constructions, even if they have a robust predicative possession construction. On our account, there is a semantic difference between possessive and modal light verbs, whether the light verb is realized by a verb like *have* or by an ordinary copula: they take arguments of different semantic types, and arrange those arguments differently in the syntax. Possession therefore does not automatically extend to modality; there remains a role for language change to play.

If our account is correct, it suggests a new source of evidence for work on grammatical systems of possession: the ways that possessive morphosyntax is extended in a given language should help to reveal the formal properties underlying possession in that language. In particular, the analysis in this paper makes a number of predictions for the distribution of possessive modality across languages. Such constructions should only arise in languages where possession expresses a relation of inclusion, and where that relation is expressed by a head whose complement is the possessee and whose specifier is a possessor; if there are languages with the reverse relation (as proposed, for example, in Freeze, 1992), we do not predict that possessive modality constructions will arise in those languages. By identifying inclusion as the basis for extension in possessive modality, we also predict that in languages that distinguish alienable from inalienable possession, it will be only inalienable possession (literal part-whole) that extends in possessive modality. Finally, our analysis does not predict that nominal possession (e.g. *my book*) will extend to express necessity, a prediction that appears to be borne out.

The range of crosslinguistic variation in possessive modality is yet to be fully determined, but the proposals developed here predict clear interactions between the structure of predicative possession and the availability of possessive modality. If these predictions are borne out, then the central claim of this paper—that the existence of possessive modality sheds light on both the semantics of possession and the syntactic composition of modality—receives further support.

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