

Possession and necessity: from individuals to worlds

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This paper investigates the use of possessive morphosyntax for modal necessity, as in (1). Possessive modality (PM) occurs both in languages with a verb *have* (English, German, Spanish, Catalan), and in those expressing possession with *be* (Hindi, Bhatt 1997; Russian, Jung 2011). We claim that PM constructions arise because both possession and necessity express an INCL(usion) relation between two arguments of the same semantic type: possession expresses INCL between two ⟨e⟩-type arguments, while necessity expresses INCL between sets of worlds. This relation arises in two distinct structures: possessive *have* is syntactically transitive, while modal *have* conceals one argument within the modal head.

- (1) a. That cyclist has a helmet. (*poss'n*) b. Cyclists have to obey traffic laws. (*nec.*)

The semantics of clausal possession are not well understood, but one aspect is the part-whole or INCL relation (Aikhenvald, 2013), expressed in the syntax by a transitive head relating two nominal arguments (Boneh and Sichel, 2010; Harley, 1995; Levinson, 2011; Ritter and Rosen, 1997). Just as possession in (2) involves inclusion between individuals, the formal semantics of necessity involve inclusion between sets of worlds. Since Kratzer (1981, 1986), modal constructions are taken to include a *modal operator* (\forall or \exists), which composes first with a *modal base* (a set of accessible worlds), and then with a *proposition* (also a set of worlds). With a universal modal operator, the proposition is true in all accessible worlds—i.e. the set of worlds corresponding to the modal base is included in the set of worlds corresponding to the proposition. Extending *have* to modal necessity requires only reanalysis of an interpretable feature INCL, broadening the arguments it relates from individuals to sets of worlds.

- (2) a. the tree with branches b. coffee with milk

If both possession and necessity are *semantically* transitive, however, why is only possession *syntactically* so? Syntactic transitivity has been argued to be the defining property of possessive *have* (Hoekstra, 1984; Cowper, 1989), but modals, including modal *have* (*to*) are intransitive, with raising syntax (Bhatt, 1997, a.o.). Semantic work often assumes complex structure within modal heads (allowing composition under sisterhood between a modal operator and modal base, e.g.). Syntactic Merge, however, cannot create head-internal structure: a first-merged argument is by definition a syntactic complement. We resolve the mismatch by proposing instead that the head-internal structure of modals consists of two interpretable features, encoding modal force and modal base. Function Application can apply not only to structures created by Merge, but also to heads bearing more than one semantically interpretable feature: the semantic transitivity of modals arises due to their featural, rather than structural, complexity. The morphology can realize either of these features (or both): while English modals primarily express modal force, Matthewson et al. (2006, et seq.) show that modal systems can also primarily express the modal base.

The advantage of this proposal, in contrast to previous approaches to PM (e.g. Bhatt 1997 and Bybee and Pagliuca 1985, who treat PM as expressing the possession or existence of an obligation), is that it directly explains why necessity, but not possibility, is expressed by possessive morphosyntax. For Bhatt, PM expressions assert the existence of an obligation, expressed by a silent necessity operator, making it mysterious why there is no corresponding silent possibility operator. For us, the universal force PM constructions follows from the inclusion semantics of possession.

PM constructions thus shed light not only on the semantics of possession but also on the compositional syntax of modal operators. Our account supports the idea that inclusion is at least part of the semantics of possession, and also explains possible mismatches between syntactic and semantic transitivity.

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