OLD ENGLISH **MOTAN*, VARIABLE-FORCE MODALITY, AND THE PRESUPPOSITION OF INEVITABLE ACTUALIZATION

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Old English **motan* and Middle English **moten*, the ancestors of modern *must*, are commonly described as ambiguous between a possibility and a necessity reading. I argue instead that in the Alfredian Old English prose, **motan* was a nonambiguous 'variable-force' modal, with the modal force different from both possibility and necessity. I propose that **motan*'s variable-force effect was due to the presupposition of a collapse between possibility and necessity. Informally, *motan*(*p*) presupposed 'if *p* gets a chance to actualize, it will'. I then trace the development of **motan* into a modal genuinely ambiguous between necessity and possibility in Early Middle English.*

Keywords: **motan*, Old English, modality, semantic change, variable force

The ancestor of the present-day English (PDE) necessity modal *must*, the Old English (OE) modal **motan*, was not a necessity modal. Historical linguists commonly describe OE **motan* and Middle English (ME) **moten* as ambiguous between a possibility and a necessity reading.[1] When they try to identify which modal force OE **motan* or ME **moten* had in individual examples in the historical texts, they usually conclude either that the possibility reading fits but the necessity one does not, or vice versa. Possibility is believed to have been predominant in Early OE, and necessity to have become the predominant meaning of the modal at some point during the ME period. It is only by the late fifteenth–early sixteenth centuries that ME **moten*/Early Modern English *must* becomes the pure necessity modal that it is today. I propose a different account of the early historic stages of the semantic evolution of **motan*/**moten*/*must*. On the basis of a primary analy-

* The project reported in this article has greatly benefited from discussions with Cleo Condoravdi, Antonette diPaolo Healey, Daniel Donoghue, Regine Eckardt, Kai von Fintel, Olga Fischer, Martin Hackl, Irene Heim, Sabine Iatridou, Natasha Korotkova, Ian MacDougall, Lisa Matthewson, Paul Portner, Katrina Przyjemski, Donca Steriade, Sali Tagliamonte, and Elizabeth Traugott. For advice on and data from Norse, Finno-Baltic, and Baltic languages, I am very grateful to Peter Arkadiev, Anna Daugavet, Johannes Dellert, Atle Grønn, Andres Karjus, and Lauri Karttunen. Some parts of this work were presented at the University of Ottawa, Georgetown University, Rutgers University, NYU, at the workshop Systematic Semantic Change at UT Austin, at SALT at UC Santa Cruz, the University of Amsterdam, ZAS in Berlin, and Carnegie Mellon University. The work enormously benefited from the comments made there. I am very grateful for the help and comments that I received from the editor and two anonymous referees. Needless to say, all remaining mistakes are mine only.

Without the York-Toronto-Helsinki Parsed Corpus of Old English prose (YCOE) and the Penn Parsed Corpus of Early Middle English (PPCEME), it would have been close to impossible to create the samples used in this article. The extensive commentary to *Boethius* in Godden & Irvine 2009 was of great help in identifying the correspondences between the Latin original and the OE translation for that book.

An earlier version of this work appeared as Chapter 4 of my dissertation, written at MIT and advised by Kai von Fintel, Irene Heim, and Sabine Iatridou. I gratefully acknowledge the support of the institution and all the help I received from my advisors. The article was finished when I was a postdoctoral fellow of the Alexander von Humboldt Foundation, whose support I also note with gratitude.

[1] The asterisk with **motan* and **moten* indicates that these particular forms are reconstructed from the known stem and inflectional ending but were not observed directly: there are no instances of the infinitive of the modal in either OE or ME.

The orthography of OE and ME shows significant variation, and I use the following convention throughout the article. When referring to OE and ME lexemes, I use the primary dictionary form from Bosworth & Toller 1898 and *MED* (2002), respectively. However, when citing a particular form from a specific example, I use the same orthography as in the example. Thus, for example, in the main text I write *weorþ* for the lexeme, but *wyrðne* when referring to the instance of that same word in example 7.

sis of Early OE **motan* in the Alfredian prose, I argue that around the late ninth century it was an unambiguous modal with a meaning different from either that of (plain) possibility or that of (plain) necessity. Instead, it was an instance of what may be descriptively called VARIABLE-FORCE MODALITY. In the recent formal-semantic research, starting from Rullmann et al. 2008, that term has been introduced to refer to modals that are unambiguous in the source language but, due to the lack of a perfect correlate in languages like English, are sometimes rendered in translation by possibility modals and other times by necessity modals. (The term *variable force* thus may be somewhat misleading: it carries no assumption that the modal force truly varies. On the contrary, the term is reserved for modals that show no lexical ambiguity.)

Variable-force modality of different subkinds has recently been described in several languages of the North-American Pacific Northwest, namely St'át'imcets (Rullmann et al. 2008), Gitksan (Peterson 2010), and Nez Perce (Deal 2011). The meaning I propose for Alfredian OE **motan*, however, is different from any of those proposed for the Pacific Northwest modals. I argue that in the Alfredian prose, a statement of the form *motan*(*p*) (i) asserted that situation *p* is an open possibility and (ii) presupposed that if *p* is an open possibility, then that possibility will get actualized. Later in the article, the terms used in this informal definition are made formal and precise within a framework based on Condoravdi 2002.

I first review the literature on the semantics of OE **motan* and ME **moten* (§1), and then describe the distribution of Alfredian OE **motan* in a subset of the Alfredian prose (namely, Gregory's *Cura pastoralis*, Boethius's *Consolatio philosophiæ*, and Augustine's *Soliloquies*) and propose a new analysis of the semantics of the modal (§2). I argue that Alfredian **motan* was unambiguous, and I derive the variable-force effect from the presupposition that causes a collapse of possibility and necessity. In §3, I contrast the Alfredian OE distribution of **motan* with that of its descendant, Early ME **moten*. The latter is no longer variable-force, but is truly ambiguous between necessity and possibility. Section 4 compares Alfredian variable-force **motan* to the variable-force modals of the Pacific Northwest, namely in St'át'imcets, Gitksan, and Nez Perce, and concludes that empirically, the Alfredian OE modal was a different creature. Three further phenomena that require semantic components similar to the ones used in my analysis for **motan* are discussed in §5: (i) actuality entailments of root modalities, (ii) 'either-or' entailments of ability modals, and (iii) possibility-necessity-ambiguous 'get'-based modals around the Baltic Sea (using data from Norwegian, Swedish, Finnish, and Estonian). It turns out that in all three cases these similar semantic components are put together rather differently than in the semantics of Alfredian **motan*. Section 6 concludes.

1. EARLIER ACCOUNTS OF THE SEMANTICS OF OE **motan* AND ME **moten*. The *Oxford English Dictionary* (*OED*; 2002) lists OE **motan* under *mote*$^{v.1}$ with 'possibility or permission' as the first meaning and 'necessity or obligation' as the second. For both meanings, the oldest *OED* examples are from *Beowulf* (*Beo*), one of the earliest OE texts of substantial length.[2]

[2] I aim to minimize by-morpheme glosses, and thus gloss with word forms of modern English whenever possible. For modals other than **motan* I provide the modern descendant of the modal in the gloss, even though in many cases the modern modal is no longer capable of expressing the meaning conveyed by its OE ancestor. In translations, I aim to keep the structure of the sentence close to that of the original OE example, rather than provide a smooth PDE translation. I leave **motan* untranslated, in order not to smuggle in my analysis.

The following abbreviations are used in glosses throughout the article: ALL: allative, CIRC: circumfix, CN: common noun connective, DAT: dative, DET: determiner, EPIS: epistemic, ESS: essive, FUT: future, GEN: geni-

(1) Listed under *OED* sense 1, 'expressing possibility or permission':
Gif he us geunnan wile, þæt we hine swa godne gretan **moton**.
if he us grant will that we him so good greet mot.PRS.PL
'If he will grant to us that we **moton** greet him, the good one.' (*Beo*:347)

(2) Listed under *OED* sense 2, 'expressing necessity or obligation':
Londrihtes **mot** þære mægburge monna æghwylc idel
of.landright mot.PRS.IND.3SG of.that kin of.men each idle
hweorfan.
wander
'Every man of that kin **mot** wander without the rights of the rightful residents.' (*Beo*:2886)

It is easy to see the logic that is behind the *OED*'s characterization of 1 as an example where **motan* conveys possibility (which, in the logical tradition, is marked with ◊ below), and of 2 as one where it conveys necessity (marked □). If we substitute *moton* in 1 with modern ◊-modal *may* or *can*, the example makes sense, but if we use *have to* or *must*, the result does not sound very natural.

(3) a. ^{OK}'If he will grant to us that we **may**/**can** greet him'
b. *'If he will grant to us that we **must**/**have to** greet him'

But if we apply the same substitutions to *mot* in 2, the pattern is the opposite, as seen in 4: the passage from which this sentence is taken describes a disastrous situation after the death of Beowulf, with many terrible things for 'that kin' that have just become inevitable. In that context, simply 'being able' to wander without rights is clearly not what the speaker is talking about.

(4) a. *'Every man of that kin **may**/**can** wander without the rights of the rightful residents.'
b. ^{OK}'Every man of that kin **must**/**has to** wander without the rights of the rightful residents.'

Viewed from the perspective of the modern English modal system, the meanings of **motan* in 1 and 2 may appear irreconcilably different: it looks like the modal is lexically ambiguous between ◊ and □. This ambiguity analysis is expressed by the *OED*, other historical dictionaries of English, and most scholarly works on the subject as well. For example, the standard OE dictionary Bosworth & Toller 1898 lists 'to be allowed, may, mote' as sense I for OE **motan*, and 'to be obliged, must' as sense II.[3] (A smaller number of examples is listed under sense II than under sense I both in the original dictionary and in its supplement, Toller 1921, which indicates in part the authors' judgment as to which meaning was more frequent.) The *Middle English Dictionary* (*MED*; 2002) lists a wide range of both possibility and necessity senses for ME **moten*, but the number of necessity examples recorded in the *MED* for this later period is greater that that of possibility examples. Moreover, there are very few possibility examples from the fifteenth century recorded in the *MED*.

The near-consensus view on the semantics of OE **motan* and ME **moten* is thus as follows: (i) in OE, **motan* was predominantly a possibility modal; (ii) at some point it

tive, ILL: illative, IMPF: imperfect, IND: indicative, INE: inessive, INF: infinitive, PAT: patientive, PL: plural, PROSP: prospective, PRS: present, PST: past, PTCP: participle, PTV: partitive, SBJ: subject, SBJV: subjunctive, SG: singular.

[3] The modern *Dictionary of Old English* (*DOE*; 2007), which is to eventually replace Bosworth & Toller 1898 as the new standard dictionary, is currently in progress, and the entry on **motan* was not yet in the works at the time of preparation of this article.

started to have necessity uses as well (most researchers argue that it already happens in the earliest OE texts; see also the position of the *OED* (2002) regarding 2 from *Beowulf*); (iii) from around the tenth century, the percentage of necessity uses grew slowly but steadily, so that by the end of the ME period in the fifteenth century, possibility uses became very marginal, and they disappeared completely in the sixteenth century.

The above description in terms of the relative frequency of possibility vs. necessity readings presupposes that each instance of the modal belongs to one of the two categories. For instance, Ono (1958) studies the ratio of possibility uses to necessity uses of **motan* starting from *Beowulf* through *Ancrene Wisse* to Chaucer and Malory. In *Beowulf*, Ono finds thirty-one instances of possibility **motan*, one instance of necessity **motan*, namely example 2, and one 'doubtful' use for which Ono could not decide which interpretation makes better sense. Thirteenth-century *Ancrene Wisse* is the earliest text considered by Ono where, according to him, necessity uses become more numerous than possibility uses. In late-fourteenth-century Chaucer, Ono finds the necessity meaning in 84% of all instances of ME **moten*, and in late-fifteenth-century *The tale of King Arthur*, by Sir Thomas Malory, he finds no possibility uses at all.

Tellier (1962) paints a very similar picture. Having examined the poetry of *Beowulf*, *Andreas*, *Judith*, and *Elene* and the prose of roughly the first half of King Alfred's *Cura pastoralis*, Tellier argues that in Early OE the sense of necessity for **motan* is 'rarissime et exceptionnel par rapport au sens de *pouvoir*' ('very rare and exceptional in comparison with the meaning of possibility'). Tellier describes the primary meaning of **motan* in this period as that of possibility created by 'circumstances, fate, or divine grace'. Tracking the further development of **motan*, Tellier argues that in the tenth century, the modal 'develops an ambiguity', with the necessity sense becoming 'well attested'. For the (late entries of the) *Peterborough Chronicle* (twelfth century), Tellier argues that the majority of uses are still possibility ones, but in *Ancrene Wisse* (thirteenth century), the possibility sense 'se fixe dans des propositions où cette signification ne risque pas d'être ambiguë' ('gets restricted to the propositions where its semantic import does not run the danger of being ambiguous'). The two types of contexts in *Ancrene Wisse* where there is no such risk, according to Tellier, are complements of verbs of asking, and prayers to God. Regarding the language of Geoffrey Chaucer's *Canterbury Tales*, Tellier argues that the possibility sense of **moten* is similarly restricted to several particular environments, namely to matrix wishes, complements of verbs of asking, and the collocation *mot as wel*. Finally, in Malory's fifteenth-century works, Tellier does not find any examples of **moten* conveying possibility, just as the extensive study of Malory's language by Visser (1946) did not.

Most other studies either address the semantics of **motan* during a shorter period (e.g. Solo 1977 or Goossens 1987) or contain more general descriptions of the semantic evolution of **motan*/**moten* (e.g. Visser 1963–1973:§1689, §1693, Warner 1993:Ch. 7, Traugott & Dasher 2002:Ch. 3). They generally support the picture sketched above. This is not to say that there are no disagreements, such as about the interpretation of individual examples or about the precise timing of particular developments. For instance, Solo (1977) argues, against the more popular position, that before the year 1000, the sense of necessity/obligation for **motan* is hardly attested. But on the whole, there is a wide consensus about the general lines of the development.

It is important for the argument I am going to make, however, that, side by side with this general analysis, there are also numerous statements in the cited literature that suggest a more nuanced semantics for the modal than that of pure necessity or pure possibility. A more complex view is explicitly and extensively advocated for by Standop (1957), who proposes that in addition to the meaning of possibility, and perhaps that of

necessity,[4] OE **motan* also had a third meaning, which he paraphrases as 'mir ist vergönnt, mir wird zuteil' (p. 69), 'mir est bestimmt' (p. 75), 'mir ist zugemessen' (p. 169) ('it is granted to me, it is bestowed upon me', 'it is determined for me', 'it is measured out for me', respectively). Standop argues that the meanings of possibility and necessity in the case of **motan* both developed from the initial general meaning that combined possibility and necessity into an 'Einheit' ('unit'), where 'Rechte und Pflichten' ('rights and duties') coincide. Other informal characterizations of Standop's third meaning for **motan* include: 'expression of human dependence (*Ausdruck menschlicher Abhängigkeit*)' (Standop's p. 68), 'it is destined (*beschieden*)' (pp. 70, 78), 'what is measured out (*gescrifan*) by fate (*wyrd*)' (p. 77). Standop argues that even though 'no dictionary gives [it]', his third meaning 'falls into one's eyes' as soon as one notices how the distribution of **motan* differs from that of any other modal (p. 68). Standop writes that 'die Belege sind so zahlreich—vor allem weil viele nach unserer Deutung in neuem Licht erscheinen—, daß man nur recht wahllos einige Beispiele herausgreifen kann'[5] (1957:70). Once my formal analysis of Alfredian **motan* is defined in the next section, I return to Standop's characterizations of his 'third reading'.

Some of the later scholars also acknowledge the complexity of the meaning that OE **motan* conveyed. Visser (1963–1973:1794), citing Standop, mentions paraphrases for **motan* such as 'Fate has allotted to me to do this' (Standop's third meaning) and 'Fate has granted me the freedom to do this' (the possibility/permission meaning), and writes that 'all these shades of meaning may have been present in OE *mote*'. Warner (1993: 160) briefly suggests that Standop's meaning could still have been present in the Alfredian-prose Gregory's *Dialogues*, translated into OE by Wærferth in the late ninth/early tenth centuries, and in Wulfstan's Homilies from the early eleventh century.[6] Solo (1977:231), not mentioning Standop's work, writes in the conclusion of his paper: 'In none of these instances, except, perhaps, in very late Old English prose, does the verb [i.e. **motan—IY*] signify necessity or obligation in and of itself, although THE CONTEXTS in which it appears at times IMPLY NECESSITY OR DUTY AS WELL AS PERMISSION' (emphasis mine).

In my analysis of **motan* in the Alfredian prose, I capture those intuitions formally by assigning to the modal a 'variable-force' meaning that asserts openness of a possibility, and at the same time presupposes that if that possibility gets a chance to be actualized, it will. My proposal differs from the proposals from the historical literature cited above in two respects: first, I restrict its scope to a particular, relatively narrow time period and to a particular genre of texts; second, for that time period and for the corpus of texts considered, I argue that rather than having a range of different available readings, **motan* was an unambiguous modal.

2. ALFREDIAN **motan* AS A VARIABLE-FORCE MODAL. My conclusion that **motan* in the Alfredian prose was an unambiguous variable-force modal with a particular semantics is based on the examination of all seventy-two instances of **motan* in three books: the prose translations into OE of Gregory's *Cura pastoralis* (*CP*), Boethius's *Consolatio philosophiæ* (*Bo*), and Augustine's *Soliloquies* (*Sol*). All three books in the main

[4] It is hard to interpret Standop's position on the presence of the necessity sense in OE. On the one hand, he says on pp. 169–70 that OE **motan* lacked the meaning of pure, abstract necessity. On the other, on pp. 75–76 he calls the meaning of abstract necessity 'rare' rather than completely absent and provides an example where *motan* 'ist fast normales *müssen*' ('is an almost normal *müssen*').

[5] 'Examples are so numerous—mainly because our interpretation sheds new light on many—that one can quite indiscriminately pick out some.'

[6] However, for the particular example from Wulfstan that is provided by Warner, Standop's meaning is hardly appropriate.

sample are translations from Latin, but made with such freedom that they may be considered independent texts. Those texts form a part of the corpus of 'Alfredian prose', after King Alfred the Great, who in the late ninth century initiated an impressive program of translation from Latin into the Anglo-Saxon vernacular. The three books chosen are as good a shot at a dialectally and temporally consistent data set as possible: *Bo* and *Sol* were most likely translated into OE by the same person; moreover, the translators of Alfredian books, presumably, were from relatively close circles. There are linguistic differences between *Bo* and *Sol* on the one hand and *CP* on the other, but I did not detect any differences with regard to the use of **motan*. The online appendix to this article features all OE examples from this sample, together with their philological translations and the original Latin passages for *CP* and *Bo*.[7]

2.1. EXAMPLES MOTIVATING THE ANALYSIS. Examples 5–11 illustrate the pattern common for all instances of **motan* in the selected Alfredian books *Bo*, *Sol*, and *CP*: the context surrounding the examples is always such that if it is POSSIBLE for the argument situation of the modal to actualize, it is assumed in the context that it will INEVITABLY do so.

Specifically, in 5, if it becomes possible for the person involved to live on, he will, of course, continue to live.

(5) Ac se se ðe unwærlice ðone wuda hiewð, & sua his freond ofsliehð,
but that that which unwarily that wood hews & so his friend slays
him bið nidðearf ðæt he fleo to ðara ðreora burga
to.him is necessary that he flee.SBJV to those.GEN three.GEN city.GEN
anre, ðæt on sumere ðara weorðe genered, ðæt he
one.DAT that in some of.those become.SBJV saved that he
mote libban;
motan.PRS.SBJV.3SG live
'But he who unwarily hews wood and by that slays his friend, it is necessary for him that he flee to one of those three cities, so that he be saved in one of them, so that he **mote** live.' (*CP*:21.167.15)

In 6, it is assumed that given the possibility, people would indeed do what they want, and then be judged according to what they chose to do.

(6) He sealde swiðe fæste gife and swiðe fæste æ mid þære gife ælcum
he gave very firm gift and very firm law with that gift every.DAT
menn [oð] his ende. þæt is se frydom þæt ðe mon
man.DAT until his end that is the freedom that man
mot don þæt he wile, and þæt is sio æ þæt [he]
motan.PRS.IND.3SG do what he wants.to and that is the law that he
gilt ælcum be his gewyrhtum, ægþe ge on þisse worulde ge on
pays to.each by his works both and in this world and in
þære toweardan, swa god swa yfel swaðer he deð.
that future.one or good or evil whichever he does
'He [= God] gave to every man until his end a very firm gift and a very firm law with that gift. The gift is the freedom that one **mot** do what he wants to, and that law is the law that God pays to each one according to his works, both in this world and in the future world, be it good or evil that he does.' (*Bo*:41.142.11)

[7] The online appendices can be accessed at http://muse.jhu.edu/article/628200/pdf.

In 7, if God makes it possible for the speaker to see them, then obviously the speaker would use that chance.

(7) and gedo me þæs wyrðne þæt ic þe **mote** geseon.
and make me that.GEN worthy that I you motan.PRS.SBJV.1SG see
'and make me worthy of it that I **mote** see you.' (*Sol*:1.55.23)

In 8, the soul in question, having been removed from the earthly things, really does not have much choice but to make use of the heavenly things.

(8) Heo forseohð þonne ealle ðas eorðlican þing and fagenað þæs þæt
she despises then all these earthly things and rejoices that.GEN that
heo **mot** brucan þæs heofonlican [siððan] heo bið
she motan.PRS.IND make.use that heavenly.one since she is
abrogden from þam eorðlican.
removed from that earthly.one
'At that time she [= a soul] despises all these earthly things and rejoices that she **mot** make use of the heavenly things after she is removed from the earthly ones.' (*Bo*:18.45.28)

In 9, if the addressee grants the speaker permission, then the speaker clearly would follow up by actually investigating the addressee's degree of resolve.

(9) **Mot** ic nu cunnian hwon þin fæstrædnesse þæt ic þanon
motan.PRS.IND.1SG I now test a.little your resolution that I thence
ongiton mæge hwonan ic þin tilian scyle and hu?
learn can whence I you tend.to shall and how
'**Mot** I now test your resolution a little so that I could learn from what side I should be curing you and how?' (*Bo*:5.12.12)

In a different rhetorical construction in 10, the speaker expects that if the addressee is granted an opportunity to determine what is more worthy of punishment, they would actually determine that, so the speaker uses an irrealis conditional to indirectly ask for the addressee's opinion.

(10) Gif þu nu deman **mostest**, hwæþerne woldest þu deman
if you now to.judge motan.PST.IND.2SG which.of.two would you judge
wites wyrþran, þe [þone þe þone unscyldgan]
of.punishment worthier the that.ACC which the innocent
witnode, þe ðone þe þæt wite þolode.
tormented the that.ACC which that torment suffered
'If you **mostest** pass a judgment, which would you find worthier of punishment: the one who tormented the innocent, or the one who suffered the torment?' (*Bo*:38.122.28)

In 11, we first learn that a particular group of people is always weeping, and then we are told how this happens: they weep, and after that they make it possible for them to weep again. As we now know from the beginning of the passage that they are always weeping, it follows that each subsequent weeping is not just possible, but in fact will actually happen.

(11) Hwæt, se ðonne ne recð hwæðer he clæne sie, [ðe ne sie],
why! that.one then not cares whether he clean is.SBJV or not is.SBJV
se ðe æfter ðære hreowsunga hine ryhtlice & clænlice
that.one that after their repentance him rightly & cleanly
nyle gehealdan: ealne weg hi hi ðweað, & ne beoð hie
not.wants.to keep all way they them wash & not are they

næfre clæne, ðeah hi ealneg wepen; ealneg hi wepað, &
never clean though they always weep.SBJV always they weep &
æfter ðæm wope hi gewyrceað ðæt hi **moton** eft
after the weeping they obtain that they motan.PRS.PL again
wepan.
weep
'Why, then he does not care whether he is clean or not, he who does not want to hold himself in proper ways and clean: always they are washing, and they are never clean, even though they are always weeping; always they are weeping, and after the weeping they make it so that they **moton** weep again.' (*CP*:54.421.14)

The examples above represent a wide range of syntactic environments in which **motan* occurs in Early OE: a purpose clause in 5 and 11; a complement clause of noun *freodom* 'freedom' in 6, of adjective *weorþ* 'worthy' in 7, and of verb *fægnian* 'to rejoice' in 8; a matrix question in 9; and the antecedent of a conditional in 10. Despite the syntactic differences, for all cases it is in the discursive common ground that the argument situation of the modal will be actualized if such a possibility opens. On one extreme, in 11 this conditional presupposition is supported by the context because the preceding sentence directly asserts its consequent ('they are always weeping'). On the other extreme, in 9 the assumption is accepted in the common ground because of the general rules of conversation, which are not explicitly discussed anywhere in the text (the speaker only asks whether a given speech act by her is okay to perform), so the conclusion that she would ask the question if allowed to follows from the pragmatics of the situation. But in most cases, it is the world knowledge together with the linguistic context of the modal that supports the assumption of inevitable actualization.

The remarkable fact is that not just 5–11 but all instances of **motan* in the Alfredian sample occur in contexts that support this assumption. Other modals, in contrast, need not appear only in such contexts. Consider *magan* 'may' in 12: it is clear from the context that both being among people and teaching them, and not being among people and therefore not helping them to get better, are metaphysically and circumstantially possible. The future of such a situation depends on the will of the individual and can go either way. Compare this with, for instance, 7: 'make me worthy to **motan** see you', where the situation is such that its elements conspire to determine that if a person would have the chance to see God, that person would inevitably use that chance.

(12) ðonne beoð hie sua monegum scyldum scyldige sua hie manegra
then are they as many sins guilty as they of.many
unðeawa gestiran **meahton** mid hiora larum & bisenum, gif hi
vices correct may.PST with their teachings & examples if they
ongemong monnum beon wolden.
among people to.be will.PST
'Then they [= those who could teach, but avoid it for their own ease] are guilty of as many sins as there are men whose vices they **could** correct, if they would choose to be among people.' (*CP*:5.45.20)

Note that it is not just **motan* that appears in the contexts supporting the inevitability presupposition: other modals can also do so. This is similar to how the modals' distributions often overlap with respect to other semantic properties. For instance, in PDE, *may* is restricted to expressing permission and epistemic possibility, and to some extent, circumstantial/metaphysical possibility. But permission and circumstantial/metaphysical

possibility may also be expressed by *can*, and epistemic possibility by *might*. Similarly, even though Alfredian **motan* is exclusively found in contexts where inevitable actualization is presupposed, it is not to be expected that no other modal could appear in such a context.[8]

If we assume, as in the standard analysis, that Alfredian **motan* was ambiguous between possibility and necessity, that does not predict that it would be restricted to contexts where inevitable actualization is presupposed. In my analysis below, I take Alfredian **motan* to directly presuppose inevitable actualization. First, this explains its restricted distribution; second, this presuppositional analysis actually predicts the 'variable-force effect' without any need to assume ambiguity. Under my analysis, each instance of **motan* simultaneously signals open possibility (by its assertive part) and inevitability (by the presuppositional part). Depending on which part the translator chooses to stress, we can get either possibility or necessity translational correlates. For example, in 13 Henry Sweet rendered **motan* using necessity modal *have to*, while H. W. Norman chose possibility *might*, but in the end both translations convey a very similar overall message.

(13) a. Hu mæg he ðonne beon butan gitsunge, ðonne he sceal ymb
how may he then be without avarice when he has.to about
monigra monna are ðencan, gif he nolde ða ða he
many men's property think if he would.not when he
moste ymb his anes?
motan.SG.PST.SBJV about his only (*CP*:9.57.19)

b. Translation by Sweet (1871): 'How can he be without covetousness when he has to consult the interests of many, if formerly he would not avoid it when he **had** to consult his own interests alone?'

c. Translation by H. W. Norman, printed in Giles et al. 1858: 'How can he be without covetousness when he must think about many men's sustenance, if he would not when he **might** think about his own alone?'

2.2. VARIABLE-FORCE ANALYSIS OF **motan*: INFORMAL AND FORMAL VERSIONS. I argue that Alfredian **motan* was not ambiguous between possibility and necessity, but had a 'third-type', variable-force meaning that can be imprecisely rendered by either. I first lay out the proposal and then discuss how it compares to other plausible accounts of the data. Informally, the meaning for **motan* that I propose is as follows.

(14) VARIABLE-FORCE ANALYSIS OF **motan* (informal, preliminary): *motan*(*p*) asserts that *p* is an open possibility and presupposes that if *p* is given a chance to actualize, it will.

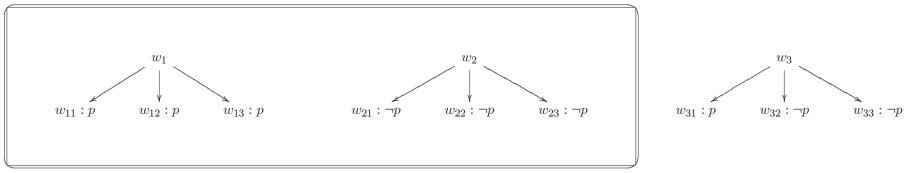
The crucial part of the meaning in 14 is not the assertion, but the presupposition. Because of the presupposition, **motan* may only be used in a limited set of contexts where the actual future is taken to be predetermined one way or the other, though before the

[8] Some semantic theories utilize principles such as MAXIMIZE PRESUPPOSITION (see Heim 1991, Schlenker 2012), which requires that given a choice between a lexical item with presupposition *p* and another lexical item without it, the first one should be used in a context that supports *p*. One may then worry that if we adopt the presuppositional analysis for **motan* that I propose below, given 'maximize presupposition', this would predict precisely the absence of other modals from the contexts where the presupposition of inevitable actualization is satisfied. However, this principle does not actually affect our case: the semantic differences between modals in OE are not restricted to the presence of the relevant presupposition. All things NOT being equal, 'maximize presupposition' does not apply: speakers may choose a presupposition-less modal because they find another of its semantic features most fitting the context.

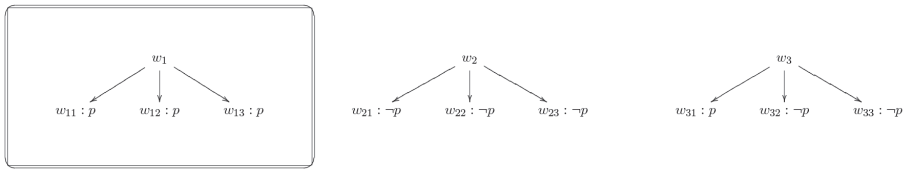
assertion is made, the context may provide no information about which way the future will turn out.

One example of a context set that supports the presupposition is given in 15: it contains worlds that will develop into p-worlds (w_1), and those that will develop into $\neg p$-worlds (w_2). What is notably absent from the context set are worlds where it is not predetermined whether p or $\neg p$ will actualize (w_3). In such a context, asserting that it is possible for the current world to develop into a p-world symmetrically entails a necessity assertion saying that it is necessary for the current world to develop so. If the presupposition is met, possibility and necessity collapse together, and no scalar relation emerges between the two. Therefore we can call the presupposition of inevitable actualization the COLLAPSE PRESUPPOSITION. The variable-force, unambiguous analysis that crucially uses this presupposition may be called the COLLAPSE VARIABLE FORCE analysis.

(15) a. Context set supporting the presupposition of *motan*(p):



b. Context set after the assertion of *motan*(p) is accepted:



Given such semantics, we expect that neither possibility nor necessity modals of modern English would be perfect translation correlates of **motan*. In particular, **motan* does not belong to a scale of modal strength as modern English modals do. If we say *can*(p), this triggers the implicature that *must*(p) is false. But under my analysis of **motan*, no such implicatures are to arise in Alfredian OE: when the presupposition is met, there is no longer a distinction between possibility and necessity assertions.

Thus analyzed, **motan* is a part of the class of variable-force modals, together with several others, recently described by semantic fieldwork studies on several languages of the North-American Pacific Northwest. All modals in the class share the same feature: they are not ambiguous between possibility and necessity within the language, but are translated by the speakers into modern English sometimes as possibility, other times as necessity modals. Such surface similarity does not, however, imply underlying semantic identity, and the label VARIABLE-FORCE MODALITY is purely descriptive. In fact, the variable-force modals of St'át'imcets (Rullmann et al. 2008), Gitksan (Peterson 2010, Matthewson 2013), and Nez Perce (Deal 2011) all have different distributions and have received several different analyses in the literature. The distribution of Alfredian **motan* is different yet, and therefore the analysis for it that is formulated to fit the OE data is very different from the previous variable-force analyses in the literature. I compare both the distributions of and the analyses for other variable-force modals and **motan* in §4.

Let me now turn to the formal rendering of 14. I deal with the presupposition first and with the assertion second. The presupposition of inevitability of the (yet unknown) outcome is captured using the metaphysical accessibility relation R_{met}. For a world w_1,

R_{met} determines the set of METAPHYSICAL ALTERNATIVES of w_1. These metaphysical alternatives are defined as the worlds that share with w_1 all of its history up to the time of evaluation. (In this and many other details of the semantics, I use the formalization proposed by Condoravdi (2002).) A proposition p is METAPHYSICALLY NECESSARY relative to w_1 if all ways in which w_1 may develop in the future would make p true. Similarly, p is METAPHYSICALLY POSSIBLE at w_1 iff some of w_1's continuations are p-worlds. (Note that metaphysical possibilities and necessities are sensitive to the world of evaluation. What would amount to the metaphysical of everyday discourse would emerge if we fix our actual world as the world of evaluation.) In the informal definition in 14, by 'p gets a chance to actualize', I intend to say that p is a metaphysical possibility, and by 'p will actualize', I mean that p is a metaphysical necessity. Thus the collapse of $\Diamond$ and $\Box$ that the presupposition is meant to derive is specifically the collapse of metaphysical possibility and necessity (as opposed to, for example, a collapse of permission and obligation). In symbols, the informal version of the presupposition is $\Diamond p \rightarrow \Box p$.[9]

The formal version of the presupposition needs to be more complex than just $\Diamond p \rightarrow \Box p$, though. Most propositions p would be true at one time in the future from the evaluation moment, and false at another time. If we make the presuppositional semantics insensitive to time, then each world could be both a p and a $\neg p$ world. This is not how the intuition represented in the diagram in 15 works: the intuition is that if a world is a p-world, it cannot then become a $\neg p$-world, and vice versa. Now, if we consider again the examples in 5–11 and 13 above, we can note the following pattern. If p is an eventive proposition, as in 7 or 9, then each world will either feature a p-situation at some point or not. So p would divide all worlds into two classes: one where a p-event happens, and another where it never occurs. (One can make a case that only a certain bounded period after the evaluation time is relevant for the statement made, so that p would have to not happen only up to a certain point; it should be clear how to modify the semantics below accordingly.) With stative ps, things are different: if we look at examples like 5 or 13 where **motan* takes a stative argument, we can see that the relevant time frame (i.e. for the situation of going on living in 5, and the situation of looking after one's own profit in 13) is the moment of evaluation plus the immediately following time period. Now, a person x living at the time of evaluation and for some time after will die eventually, so if p is *live*(x), both p and $\neg p$ will be true at different time periods in the same world. But if we only consider the moment of evaluation plus a time interval immediately following it, each world will be classified as either a p-world or a $\neg p$-world, just as we want it.

Now we can define the formal version of the presupposition, using the framework of Condoravdi 2002.

(16) $[\![motan]\!]^{w,t}(p)$ presupposes that
$(\exists w'\colon R_{met}(w, w', t) \wedge AT(p, w', [t, \infty))) \rightarrow (\forall w'\colon R_{met}(w, w', t) \rightarrow AT(p, w', [t, \infty)))$
In which:
(i) p is a property of events;
(ii) $R_{met}(w, w', t)$ holds iff w and w' are identical up until time t; and

[9] I was able to settle on this particular variant of the analysis, featuring specifically the metaphysical accessibility relation in the presupposition of **motan*, thanks to a discussion with Katrina Przyjemski. In addition to plain-metaphysical, one might argue that the presupposition could be circumstantial ('if the currently relevant facts make p possible, they also make p necessary') and, as a referee notes, that it might also be metaphysical with a stereotypical ordering source ('if under the normal course of events, p would get a chance to actualize in w, then normally it would actualize in w').

(iii) a. for a stative p, $AT(p, w', [t, \infty))$ holds iff there is a p-situation the running time of which includes t;[10]
b. for an eventive p, $AT(p, w', [t, \infty))$ holds iff there is a p-situation whose running time is included in interval $[t, \infty)$.

Let us now turn to the assertion of *motan*(p). If the presupposition of **motan* is about metaphysical possibility collapsed with metaphysical necessity, for the assertion it is harder to establish the exact modal flavor. The two candidates are circumstantial/metaphysical and deontic modal flavors. (I discuss the choice between circumstantial and metaphysical shortly, for now just noting that they are often so close that there are current debates as to which modern English examples feature which; see e.g. Abusch (2012), who disagrees with Condoravdi's (2002) characterizations.) Some examples, from the modern point of view at least, seem to favor a deontic interpretation: for example, 9 may be interpreted as featuring a request for permission, and a deontic analysis could be appropriate in examples such as 5 or 10. Other examples, however, would hardly be compatible with a deontic interpretation (for instance, 11), while favoring circumstantial/metaphysical readings. But in the Alfredian sample considered, I did not find examples that would be compatible with only one of the two analyses.[11] The Alfredian data do not allow us to determine whether Alfredian **motan* made deontic, metaphysical, or circumstantial assertive contributions, or a combination thereof. By contrast, there are already instances of **motan* that are almost undoubtedly deontic in Ælfric (late tenth century), as is discussed in §3.

For concreteness, I assume as the baseline analysis that *motan*(p) asserted metaphysical possibility. Combined with the metaphysical assertion, as in 17, the presupposition of inevitable actualization in 16 entails that p will happen, and moreover that p was inevitable—a reading matching the informal analysis in 14.

(17) $[\![motan]\!]^{w,t}(p)$ asserts that $\exists w'$: $R_{met}(w, w', t) \wedge AT(p, w', [t, \infty))$,
where $R_{met}(w, w', t)$ holds iff w and w' are identical up until time t.

But what if **motan*'s assertion was circumstantial or deontic in some cases? For the circumstantial case, the first thing to note is that there is no case where **motan* would assert circumstantial possibility WITHOUT THE REALISTIC RESTRICTION on the modal base. A circumstantial accessibility relation determines a set of worlds where some facts

[10] This is where my semantics differs from the one given by Condoravdi (2002:70, ex. 19). In Condoravdi's semantics, for stative *p*s, $AT(p, w', [t, \infty))$ holds iff p's running time intersects with $[t, \infty)$. The difference is that on my semantics above, t is included in the p-interval, while on Condoravdi's original semantics, it does not have to be. For an epistemic sentence like *Mary might be in London*, Condoravdi derives a meaning that is true if it is compatible with the relevant knowledge that Mary will be in London at some point in the future. With my definition of *AT*, *Mary might be in London* can only be true if it is not ruled out by evidence that Mary is in London NOW. I conjecture that the new semantics might be better across the board, as long as one allows for silent temporal arguments supplied by the context that may sometimes shift t to some relevant moment. For example, if we had been talking about a workshop to be held in London next June, *Mary might be in London* could effectively mean *Mary might be in London at the time of the workshop*.

Regardless of how this is resolved for modern English, there is no evidence of such forward-shifting for stative arguments of **motan* in Alfredian OE. But for our purposes here, it is crucial that the evaluation moment t be included in the p-interval. Without this, we will not derive that the metaphysical necessity of p entails the metaphysical impossibility of $\neg p$.

[11] The case of 9, one of the examples that favor the deontic interpretation the most, illustrates the difficulty well. From the modern English point of view, it may feel natural to find the deontic flavor in that question. But Alfredian *mot* in 9 is a rendering of Latin *pateris*, with the primary sense 'to be open'. The Latin word may also convey 'to be accessible, attainable, allowable', but the deontic flavor is secondary to the metaphysical/circumstantial one. Of course, the Latin correspondent does not rule out the possibility that the OE translator could have intended a deontic interpretation for the modal. But the correspondence makes it less likely.

and circumstances relevant in the evaluation world are true. Realistic relations additionally require that the actual world be accessible; in other words, they require that the facts used were all actual facts of the current world. In everyday speech, we are rarely interested in circumstantial backgrounds not restricted to be realistic: in practical situations, we usually discuss what can ACTUALLY happen, and to reason about that, we need to start with true premises. A case where we might want to use a nonrealistic circumstantial relation is when we discuss whether somebody who started from potentially faulty premises nevertheless used sound reasoning in their argument. There are no cases of this kind among the Alfredian OE instances of **motan*. Our choice is thus not simply between metaphysical and circumstantial, but rather between metaphysical and realistic circumstantial flavors.

The difference between those two flavors is subtle. For metaphysical relations, all facts whatsoever about the world are factored in. For realistic circumstantial relations, only a subset of actual facts is used. But of course, speakers are not omniscient, so they can never know all of the facts about the world. When they are using a metaphysical modal relation rather than a realistic circumstantial one, this is mainly a matter of presentation. Using metaphysical modality implies pretending that you are omniscient, while using realistic circumstantial modality does not involve this pretense. Thus, if we ask speakers to provide reasons why they find a modal statement true, there can be differences between metaphysical and realistic circumstantial modals: for a metaphysical modal, speakers may say 'Well, *p* is possible because that's how the world is', whereas for a realistic circumstantial, they could instead point to a specific set of facts that supports the possibility that *p*. But we cannot ask speakers of OE what they think. From what may be found in the Alfredian texts I examined, a metaphysical analysis seems to me more plausible if one has to choose one for all instances of **motan*, but that is a matter of judgment. A very similar analysis, where both the presupposition in 16 and the assertion in 17 are reformulated using realistic circumstantial relations, also fits the data reasonably well.

What about a deontic-possibility assertion? Consider again one of the examples that in principle allow for a deontic interpretation.

(5) 'But he who unwarily hews wood and by that slays his friend, it is necessary for him that he flee to one of those three cities, so that he be saved in one of them, so that he **mote** live.' (*CP*:21.167.15)

IF we assume that *mote* in 5 asserts a deontic possibility, it is clear from the context that whether the person in question will live hangs entirely on that permission. If there is such permission, he will live; if not, he will die. A similar intuition holds for other potentially deontic cases. To capture this, I suggest the following formal analysis for the cases where one would like to see a deontic assertion. In general, permission does not imply metaphysical possibility: I may be permitted (= not forbidden) to photograph a dinosaur, but that does not make it possible. But Alfredian **motan* is not used to describe permissions of this sort. I propose that if **motan* could have a deontic assertion, it came with a further presupposition tying the deontic assertion to the metaphysical presupposition, as in 16: that permission implies metaphysical possibility, or, in symbols, $\Diamond_{deon}p \rightarrow \Diamond_{met}p$. The overall semantics is then derived as follows.

(18) (i) Presupposition 1 (= 16): The metaphysically accessible worlds are either all *p* or all $\neg p$.
(ii) Presupposition 2: $\Diamond_{deon}p \rightarrow \Diamond_{met}p$
(iii) Assertion: $\Diamond_{deon}p$
(iv) Consequence: $\Diamond_{met}p \wedge \Box_{met}p$

In other words, with the additional presupposition $\Diamond_{deon}p \rightarrow \Diamond_{met}p$, we derive metaphysical necessity as a consequence of deontic possibility.

To sum up, I proposed three possible analyses for the assertive component of Alfredian **motan*: (i) the baseline metaphysical analysis; (ii) its very close variant with a realistic circumstantial accessibility relation; and (iii) the permission analysis with the additional presupposition that $\Diamond_{deon}p \rightarrow \Diamond_{met}p$. All three analyses predict the specific variable-force effect that we observed for **motan*: sentences featuring it convey both the openness of the relevant possibility and also the inevitability of its actualization if it is given a chance.

The proposed analyses may be viewed as formally approximating some of the intuitions reported by Standop (1957) regarding his third reading for OE **motan*. Indeed, when the presupposition in 16 is met, possibility and necessity collapse together, forming an 'Einheit'. The presupposition itself would be satisfied in particular in those contexts where some future has already been determined, measured out, granted by some higher force, be it Fate or God. The presupposition in 16 describes a situation where it is destined what will happen, and it is the assertion (be it metaphysical, circumstantial, or deontic) that tells us what that destined future will be.

However, my proposal is not a mere formalization of Standop's ideas. In particular, none of the three analyses for assertion suggested above makes 'rights and duties coincide' (one of Standop's informal characterizations of his 'third meaning', not supported with a specific example like some of the others). Similarly, it is not required in my proposal that the force determining the future would always be of a higher nature, as Standop writes—thus under Standop's informal analysis, examples like 9 or 11 would have to be analyzed as instances of some regular possibility or necessity meaning, since in them it is the human will that makes the outcomes inevitable. In the analysis here, both are captured.

Moreover, there is a particular type of example for which our analyses all make the same correct prediction, while Standop's informal analysis does not: examples with negation. There are about twenty examples in my Alfredian sample that feature a clausemate or higher negation. All of them convey the meaning of impossibility; see 19.[12]

(19) Eala hu yfele me doð mænege woruldmenn mid þæm þæt ic ne
alas how evil me do many world.men so.that I not
mot wealdan minra agenra [þeawa].
motan.PRS.IND.3SG follow my own customs
'Alas, how evilly I am treated by many worldly people, so that I **mot** not (= it is impossible for me to) follow my own customs.' (*Bo*:7.17.23)

With the 'collapse' presupposition in 16, this is in fact expected, regardless of the relative scope of the modal and the negation: if $\Diamond p \leftrightarrow \Box p$, then $\Diamond\neg p \rightarrow \Box\neg p$, and $\Box\neg p = \neg\Diamond p$. (For the metaphysical and realistic circumstantial cases, this goes through directly; for the deontic case, the same additional presupposition $\Diamond_{deon} \rightarrow \Diamond_{met}$ is used.) But if we simply add negation to Standop's informal paraphrases, this would not neces-

[12] Moreover, this pattern of interaction with negation seems to hold across **motan*'s cognates in other early Germanic varieties: Breitbaerth (2011), studying the relative scope of modals and negation in Old Saxon (= Old Low German), finds that all sixteen examples in her corpus convey impossibility, just like the Alfredian OE examples. However, see the discussion of later OE and Early ME in §3: with changes in the semantics of **motan*/**moten*, the previously unobserved $\Diamond\neg p$ meaning, distinct from $\neg\Diamond p$, becomes available. Similarly, in some of the Dutch dialects, *moeten*, a cognate of OE **motan*, scopes under negation, as does Standard German *müssen*.

sarily result in an impossibility reading: for example, if p has not been determined for me, this does not mean that $\neg p$ was determined instead. The ◊-□ collapse presupposition in 16 is crucial for deriving the determinedness of the future.

2.3. COLLAPSE VARIABLE-FORCE ANALYSIS VS. ITS COMPETITORS FROM THE HISTORICAL LITERATURE. It is useful to compare the analysis here based on the collapse presupposition in 16 with several analyses for OE **motan* from the historical literature. The analyses considered are: (i) the ◊-□ ambiguity analysis, (ii) the unambiguous ◊ analysis, and (iii) the 'periphrastic subjunctive' analysis. The arguments for my analysis and against these three (and, indeed, any possible others) often have to be subtle: since we are dealing with a limited-size corpus of historical texts, we cannot directly test semantic hypotheses by asking for speakers' opinions about test cases specifically constructed to tease apart different analyses. Instead, we have to rely on 'soft' arguments based on statistical considerations and historical credibility. That said, historical linguistics can go a great distance using only such 'soft' arguments, and historical semantics is no exception.

The ambiguity analysis, by far the most popular in the literature, has several flaws. First, it fails to predict that **motan* would only appear in contexts where inevitable actualization is assumed. Second, when we are dealing with a truly ambiguous item, then at least some of its contexts would feature cues for disambiguation. This is not what we find, and it is significant for the following reason: in §3 we will see that when a modal is truly ambiguous between ◊ and □—as the Early ME descendant of **motan* turns out to be—then the context often quite clearly disambiguates it. The lack of such disambiguation evidence in Alfredian OE, along with the presence of cases like 13 where expert translators use different translation equivalents for **motan*, is thus evidence against the ambiguity analysis. To sum up, the ambiguity analysis provides little insight into the empirical distribution of Alfredian **motan*, while also being not particularly convincing because of the lack of disambiguation cues in the texts.

The possibility analysis, as suggested by Solo (1977), is harder to show to be inferior to the collapse variable-force analysis. After all, in my analysis the assertion of the modal IS a possibility assertion. So the difference between the generic ◊ analysis and the one proposed here is in the fact that my analysis crucially employs the collapse presupposition in 16. There are two kinds of arguments showing that the analysis here is better.

The first kind is based on statistical considerations. For example, without the presupposition, it becomes hard to explain why it is only **motan* that is restricted to such a particular kind of contexts in Alfredian OE. Other modals do not have similar restrictions. Of course, it could be a statistical fluke that all seventy-two examples of **motan* in the sample just happened to be this way. However, it should also be noted that **motan* is a very rare modal: compare its seventy-two instances in the corpus to the c. 1,000 instances of *magan* (> modern *may*) and the c. 700 instances of **sculan* (> modern *shall*, a deontic and circumstantial necessity modal of choice in Alfredian OE, and arguably with some futurate meanings as well). The presuppositional nature of **motan* helps to explain this difference in frequency, but for the possibility analysis the difference is harder to make sense of.

Another similar piece of evidence comes from participation in scalar relations with other modals. In modern English, possibility and necessity modals form dual pairs where □ creates a strictly stronger statement than ◊ does. For example, in *You may take this exam. In fact, you have to*, *have to* in the second clause strengthens the assertion made with *may* in the first. Similarly, in Alfredian OE we easily find cases where possibility *magan* enters into such relationships with necessity **sculan*. For example, 20 is an instance of the scalar pattern *Not only can*(p)*, but also have.to*(p).

(20) hi beoð swa geþwæra þætte no þæt an þæt hi **magon** geferan beon, ac þy furðor þæt heora furðum nan buton oðrum beon **ne mæg**, ac a **sceal** þæt wiðerwearde gemetgian.
'they (= fire and water, and sea and land) are so harmonious that not only **can** they be companions, but moreover that **none** of them **can** be without each other, but they always **have to** on the contrary restrain each other.'

No such examples where **sculan* would strengthen **motan* are present in our Alfredian sample. Now, this is not exactly a killer argument: as I noted above, *magan* is one order of magnitude more frequent than **motan*, so it could in principle be that the absence of scalar patterns with **motan* is a sheer accident. But other things being equal, a theory for which this fact is not an accident is to be preferred. For the variable-force theory of **motan*, it is indeed no accident: because of the presupposition, **motan* under this analsis is predicted not to be able to form scales with other modals; compare the scheme in 21. And absence of scalar patterns with **motan* is exactly what we see in the data.

(21) Alfredian OE

	ability	circ+met	future	deontic
◊	*magan*	*magan*	—	nonmodal
□	—	*sculan*	Ø/*sculan*	*sculan*

	circ+met/deontic
◊ + collapse presup.	*motan*

The second type of argument comes from historical and typological observations. Suppose for a moment that **motan* was indeed a regular ◊ modal. We know of many regular possibility modals in a wide range of languages with long recorded histories. But they do not just turn into □ modals as they develop. At the same time, it is not only **motan* that developed into a necessity modal, but all of its Germanic cognates as well. Now, if there was something semantically special about that common-Germanic word—for example, presuppositional variable-force semantics—then we can explain why its descendants had such similar trajectories of semantic change. But if **motan* was a plain possibility modal, and so were all of its Germanic cognates, then we have to assume that the same very rare event of a ◊ turning into a □ happened independently to a set of cognates across many Germanic languages. In historical linguistics, such an explanation is to be rejected, unless there is very strong evidence for parallel independent development, of which there is none in the case of **motan*.

Taken together, the arguments of statistical plausibility and historical consistency, I believe, provide sufficient support for the presuppositional variable-force theory of **motan* over the theory that says it was an unambiguous possibility modal.

Finally, let us consider the 'periphrastic subjunctive' theory. To my knowledge, it has not been invoked specifically to account for the special properties of **motan*, but it is a frequent enough theory of the semantics of OE (and ME) modals to merit some discussion. The periphrastic subjunctive theory states that modals did not actually have independent semantic content (at least in some uses). Instead, they were analytical substitutes for the inflectional subjunctive, which has been slowly but monotonously dying out since OE. For modern English, an example of a 'periphrastic subjunctive' would be *should* in sentences such as *It is essential that we should hire her*, on one of its readings.

It should be stressed that there are considerations that make this theory not completely implausible: in a number of constructions, modals did indeed replace the earlier inflectional subjunctive as it was lost. For example, *Long live the king!* is one of the few fossils in PDE that preserve the earlier subjunctive of matrix wishes; they later gradually started to be expressed first with (the ancestors of) *must*, and then with (the ancestors of) *may*.

Despite the initial plausibility, Ogawa (1989) convincingly argues against this sort of analysis for OE modals in general. Ogawa demonstrates quantitatively that various modals had in OE very clearly defined distributions that at least in some cases call for semantic explanations. Moreover, one of the clearest signs that the modals did not simply replace the subjunctive is the fact that they sometimes appeared with indicative inflections, but other times bore subjunctive morphology themselves. In particular, **motan* has unambiguous subjunctive morphology in 5 and 7, and unambiguous indicative morphology in, for example, 8 and 9.[13] Thus the periphrastic subjunctive theory is just not a plausible analysis for OE modals.[14]

Finally, one more theory deserves some attention, though it has not to my knowledge ever been discussed in the literature. It would be along the following lines: **motan* was not a genuine modal, but rather a sentential modifier that marked its argument situation as good or desirable. I know of two reasons why this theory should be taken seriously, though neither of them applies directly to the Alfredian sample that I use as my primary source in this work. First, as Ogawa (1989:Ch. 4.5) shows, **motan* was used under verbs of asking and requesting to mark situations where the requester and the beneficiary of the request (usually the embedded subject) were the same person. If **motan* could convey the meaning of desirability, this feature of its distribution would follow. Second, in the laws of Alfred and Ine, representing earlier and crucially much more formulaic OE prose than the Alfredian translations, **motan*, **sculan*, and the inflectional subjunctive are used almost interchangeably, but the argument situations of **motan* always involve something beneficial for the subject—for example, 'to swear (one's innocence)'—and never involve bad things like 'to pay a fine' or 'to forfeit one's property', as happens with the subjunctive and **sculan*. Again, if **motan* conveyed the desirability of its argument situation for the subject, that is exactly what we would expect. However, for Alfredian OE translations specifically, it is clear that such an analysis fails. Many examples of **motan* in *CP*, *Bo*, and *Sol* indeed involve something good, such as continuing to live in 5 or getting to see God in 7. But there are also examples where the argument situation is clearly undesirable for the subject, such as the weeping in 11. The example in 2 from Beowulf can also hardly be taken to feature a desirable argument situation.

Summing up, none of the arguments for the presuppositional variable-force theory of **motan* is decisive on its own. But they all point in the same direction, and taken together make it very probable that my variable-force theory, or something fairly close to

[13] Note that forms such as *moton* in 11 are morphologically ambiguous. Though textbooks would give *moton* for the present indicative plural form, and *moten* for the corresponding subjunctive—which is in principle correct diachronically—the vowels of such unstressed syllables were heavily reduced and generally exhibit great variation in spelling in various manuscripts. Without carefully investigating the orthography of a given manuscript and reconstructing the morphological situation represented by it, one cannot assume that the spelling *moton* unambiguously signaled indicative. One should be especially careful given the fact that the leveling of the *-on*/*-en* endings seems to have been more rapid in preterite-presents such as **motan* than in other verbs; see Kitson 1992:66. See also Mitchell 1985:§22 on the 'confusion' between *en*/*on* in general. In contrast to that, the difference between *mot* and *mote* is a reliable indicator of a morphological difference, as the distinction between the zero and *-e* endings survived into the ME period.

[14] A referee asks about the following theoretical possibility: what would we get if we say that *motan* in *motan*(*p*) signaled 'that *p* is an argument of a higher deontic or circumstantial modal operator'? As far as I can see, such a 'modal concord' analysis does not give us much by itself. The distribution of **motan* is highly peculiar and needs to be explained. Since the appearance of **motan* does not correlate with any particular syntactic environment (see 5–11), the higher operator would have to be assumed to be covert. And it does not help us if we blame a mysterious higher covert operator for the semantic properties of **motan*'s contexts: we still need to explain the peculiarities.

it, is true for Alfredian OE. None of the theories suggested in the earlier historical literature comes closer to accounting for the actual distribution of the modal.

3. From collapse variable force to true ◊-□ ambiguity in early ME. Though Alfredian OE **motan* can be rendered with either possibility or necessity modern modals, there is no sign of true ambiguity in the OE data. But when we turn to Early ME **moten*, we find a very different picture. My analysis of ME **moten* is based on data from *Ancrene Wisse*, an early-thirteenth-century manual for anchoresses touching upon both spiritual and practical matters. That book, immensely popular at the time, is one of our best sources for Early ME, written in the so-called 'AB language', a dialect written in the West Midlands of England.[15] In this text, some of the c. sixty instances of **moten* are clear □ uses, while some others feature possibility or at least nonnecessity. The Early ME modal is thus truly ambiguous in the source language. In this section, I briefly discuss the Early ME distribution and outline possible paths of semantic development that could have led from Alfredian variable force to the ambiguity of AB-language **moten*.

In about half of the examples from *Ancrene Wisse* (*AW*), **moten* conveys the meaning of circumstantial necessity. This type of use is illustrated in 22, with two instances of **moten*. For the first instance, owning a cow does not just create a possibility to think about the cow's fodder: it necessitates such thinking. For the second instance, the conditional antecedent in the second sentence in 22 talks about the case when the anchoress really has no other practical options but to have a cow—after all, if she had such options, then the preceding discussion about choosing not to have a cow would apply. Thus in both instances, we have a normal necessity reading: there is no collapse of possibility and necessity as in Alfredian OE, and no other kind of variable-force effect.

(22) 'You should have no animal but one cat only. An anchoress who has livestock seems more a housewife, as Martha was, she cannot easily be Mary, Martha's sister, with her tranquillity of heart.'
for þenne **mot** ha þenchen of þe kues foddre <…>
for then moten.PRS.3SG she think of the cow's fodder
'For then she (= the anchoress) **has to** think of the cow's fodder <…>'
Nu þenne, ȝef eani **mot** nedlunge habben hit, loki þet hit
now then if any moten.PRS.3SG necessarily have it see that it.NOM
na mon ne eili ne ne hearmi
no man.ACC not ail not not harm
'Now then if any (anchoress) absolutely **has to** have a cow, at least see to it that the cow does not hurt or ail anyone.' (*AW* 8:90–99)

But even though circumstantial-□ uses as in 22 are the most common for **moten* in *Ancrene Wisse*, some instances of the modal do not allow a necessity interpretation. A particularly clear case involves the use of **moten* in prayers, as in 23.[16]

[15] The edition used was Millett 2005. I checked my interpretation of the ME examples with the glosses in Hasenfratz 2000.

[16] There may be different opinions regarding the exact meaning of the modal in contexts like 23. But in PDE, necessity modals cannot be used in such contexts, and possibility *may* is used instead. Moreover, as **moten* gradually turned into an exclusively necessity modal in Late Middle and Early Modern English, it was ousted from such wishes/prayers (cf. §1692, §1680–81 of Visser 1963–1973). This fact shows that whatever particular meaning the modal had in such constructions, it was crucial for it to be able to have nonnecessity semantics in order to appear in them.

(23) I þe wurðgunge, Iesu Crist, of þine tweolf apostles, þet Ich
in the honor Jesus Christ of your twelve apostles that I
mote oueral folhin hare lare, þet Ich
motan.PRS.SBJV.1SG everywhere follow their teaching that I
mote habben þurh hare bonen þe tweolf bohes
motan.PRS.SBJV.1SG have through their prayers the twelve branches
þe bloweð of chearite
that blossom with love
'In honor, Jesus Christ, of your twelve apostles, **may** I everywhere follow their teaching, **may** I have through their prayers the twelve branches that blossom with love' (*AW* 1:174–76)

In addition to the meanings of circumstantial necessity and of wishing/praying, **moten** in the AB language could express deontic necessity (of the objective kind, with clear moral overtones) and perhaps teleological necessity (in conditional consequents, where it is hard to tease apart deontic and teleological flavors), and it was also—though very rarely—used in examples that can be connected to the Alfredian collapse variable-force semantics.

One of the cases of the last type is 24. Here, the modal seems to assert the deontic openness of the possibility to change the formal rule according to which anchoresses live. But that permission is explicitly tied to the desire of the anchoresses themselves, so the permission is asserted only for the cases where it would be followed upon. This is very close to how **motan** was used in our Alfredian sample. The difference between Alfredian **motan** and the kind of **moten** we see in 24 is that the former's distribution was entirely tied to this type of context, while for Early ME **moten**, it is just one marginal possibility among many. It is not clear whether **moten** in 24 bears the presupposition of collapse any longer: its occurrence in such a context may be due to inertia of use, rather than to a constraint built into the meaning of this semantic variant of the modal.

(24) ah ȝe ȝet **moten** changin hwen-se ȝe eauer wulleð, þeose for
but you yet moten.PRS.PL change whenever you ever will those for
betere.
better
'But on the contrary you **moten** change those [rules], whenever you want, for the better.' (*AW* 8:5–6)

Thus the overall distribution of **moten** in *Ancrene Wisse* may be summarized as follows. The dominant meanings in this thirteenth-century text are the meanings of circumstantial and deontic necessity. Yet nonnecessity meanings are also present. Importantly, both for prayers/wishes and for ◊-like meanings as in 24, there is a connection to the older distribution of OE **motan**. Matrix wishes and prayers like in 23 still retain the complementizer *þæt*, so the overall combination *þæt* + *motan* may be connected to the same in OE purpose clauses (cf. 5 in §2) and under attitudes like *wilnian* 'desire' (cf. *CP*:58.443.10, ex. 21 in the online appendix). As for possibility-like uses as in 24, it is not clear if they bear anything like the collapse presupposition anymore, but they still occur in contexts where that presupposition would be satisfied.

We thus find clear signs of continuity between Alfredian **motan** and AB-language **moten**. But there is also a crucial difference between them: while Alfredian **motan** could be accounted for using a uniform meaning, **moten** in *Ancrene Wisse* is a clearly ambiguous modal. The ambiguity of Early ME **moten** is unusual in that it involves dominant □ as well as non-□, perhaps ◊, readings. So if we only looked at the two

modals' translation correspondents in modern English, we could have concluded that both of them are 'variable-force modals'. But when we compare them to each other, the difference becomes clear. For example, there are no clear □ instances of **motan* in the Alfredian prose such as we have seen in 22 from *Ancrene Wisse*.

What the comparison between Alfredian **motan* and Early ME **moten* thus shows is that a true variable-force modal of the collapse type may develop into a ◊-□-ambiguous one. Moreover, the particular semantic distribution that we find in *Ancrene Wisse* makes good sense given our semantics for Alfredian **motan* and what we know about semantic change in general. As already noted, wishing and ◊-like uses as in 23 and 24 show certain continuity with the uses of Alfredian **motan*. As for the innovative □ uses, we can sketch reasonable lines of development from the Alfredian collapse variable-force meaning.

The emergence of circumstantial □, the most frequent meaning of **moten* in *Ancrene Wisse*, is quite straightforward given the variable-force analysis for OE. In Alfredian OE, the possibility assertion of **motan* implied necessity given the presupposition. It is well known that semantic reanalysis may lead to conventionalization of inferences and implicatures into the plain meaning of a lexical item. We illustrate where such reanalysis could happen with an example from Wulfstan's Homilies (early eleventh century; *WHom*) in 25.

(25) nu deofol sylf his mægnes **mot** wealdan, & deofles bearn
now devil himself his might motan.PRS.3SG wield & devil's children
swa swiðlice **motan** cristene bregean.
so severely motan.PRS.PL Christians terrify
'… now that the devil himself **mot** wield his power, and the devil's children **motan** terrify Christians so severely.' (*WHom* 5:55–56)[17]

Both instances of **motan* in 25 still fit the Alfredian meaning I proposed in the last section. For example, for the first instance it is claimed that the possibility for the devil to wield his power is open (the assertion of variable-force **motan*), and it is known in the context that if the devil gets a chance to harm humans, he surely will (the presupposition of variable-force **motan*). No opposition between possibility and necessity arises in the context. And yet we can also see the potential for semantic reanalysis in the same example. A reader or hearer of the passage, given the eschatological nature of Wulfstan's text, may take the author to mean that now, when the worst days have come (as Wulfstan believed and extensively argued), it is circumstantially unavoidable that the devil wield his power. In fact, we cannot tell from this example alone which of the two meanings Wulfstan himself intended. The presence of such examples where both the old and the new meaning would fit constitutes a precondition for reanalysis. And in Early ME, we see the later result of such reanalysis: **moten* in 22 cannot be reasonably interpreted using the earlier collapse meaning, but it has to feature the innovative circumstantial-□ meaning.

As for the rise of deontic □, there are two plausible possibilities. First, circumstantial □s often develop into deontic □s (cf. van der Auwera & Plungian 1998, among others). We do not know much about the particular reanalysis mechanisms that are at play in such developments, but they occur often enough. Second, there is a second potential pathway leading to deontic □ more or less directly from collapse variable-force **motan*. It would involve **motan* in conditional consequents. Consider another passage from Wulfstan's Homilies.

[17] I provide homily number and line numbers from the edition of Bethurum 1957.

(26) We **motan** nyde þæt stiðre þolian, gyf we clæne beon sceolan
we motan.PRS.PL necessarily the harder suffer if we clean be shall
þonne se dom cymð, nu we þæne fyrst nabbað þe þa
when the judgment comes now we the period not.have which those
hæfdon þe wiðforan us wæron.
had which before us were
'We **motan** without other options suffer harder, if we were to be clean when the Judgment comes, now that we don't have the time that those who were before us had.' (*WHom* 4:30–33)

In the Alfredian sample, there is only one example out of seventy-two where **motan* occurs in the consequent of an *if*-clause or a *WH-ever* construction (see ex. 51 in the online appendix). But the semantics of such contexts is compatible with the presupposition of collapse: in the worlds to which the conditional clause is taking us, there may be only one way things can be. (In fact, Stalnaker (1981) argues for a type of collapse analysis for *would* in conditional consequents, which is discussed in the next section.) Arguably, in Wulfstan's passage the presupposition is also met: there is only one way that his audience may become clean enough to be saved, and the consequent declares what that way is.

In 26, Wulfstan does not mean that people should seek suffering. In the larger context of the example, he explains that Antichrist is given power by God in order to inflict such suffering on good people that they can then go to heaven. Wulfstan's Homilies were composed at the time of Norman attacks on England, which involved a lot of severe suffering for its inhabitants. Wulfstan apparently attempts to at least rationalize why such tremendous pain is needed. So it is clear from the homily as a whole that 26 does not contain a moral instruction about what people should do. However, if we consider the example in isolation, we can easily substitute **motan* with deontic-□ *ought*: 'If we are to be clean, we *ought* to suffer harder'. So again, we have an example that allows for semantic reanalysis—in this case, reanalysis from a collapse modal to a deontic necessity one.

To determine which of the two potential pathways to deontic □ actually applied, a careful investigation of the primary sources for the critical period is needed. It can also be that both paths were relevant, reinforcing each other—or that there was some other third line of development. But importantly, we already have a plausible scenario for how Alfredian **motan* could have turned into its Early ME descendant. In fact, very few cases of semantic change have received analyses that are better supported by primary evidence than the story for **motan* just told.

The same cannot be said for the theories that try to explain the semantic shift of **motan* starting from the assumption that it was a plain possibility modal rather than a variable-force one. There are two kinds of such analyses. Neither of the two is directly supported by primary textual evidence; both thus constitute logically plausible hypotheses rather than developed theories.

The first analysis is based on conventionalization of implicatures (cf. Traugott 1989) and is generally plausible because such conventionalization is often featured in semantic change. The argument is that the necessity meaning arises from a necessity implicature appearing when permission is granted by a high authority figure such as a queen. The idea is that when the queen permits you to leave, it also becomes necessary for you to do so. But there is no evidence for such subjective deontic-◊ uses of **motan* in early sources. The scenario for the emergence of circumstantial □ presented here is thus better supported by the data.

The second analysis (cf. *OED*, 2002) links the change to negative contexts, using the observation that 'not possible' is equivalent to 'necessarily not'. But in *Ancrene Wisse*, for instance, we find only two(!) instances of negated **moten*, out of c. sixty examples. And even worse, one of those two features the reading 'not necessary' rather than 'necessarily not': *nis nan þet mahe edlutien þet ha ne mot him luuien* 'none is such that can avoid it that she *does not have to* love him [= Christ]' (*AW* 7:229–30). The point of the passage is that no one can avoid loving Christ, and this interpretation can only be generated if the negation within *atlutien* 'avoid' and the negation on the modal cancel each other out. The existence of such ¬ > □ examples casts serious doubt on the theory that relies on □ > ¬ contexts for reanalysis.

Of course, such reanalysis through negative contexts could theoretically have occurred much earlier, so that by the time of *Ancrene Wisse* the new □ meanings were no longer associated with negative contexts and with □ > ¬ scope. But there is currently no spelled-out theory of 'negative reanalysis' that would have said when and through which examples specifically that change would have happened, and how it could have been generalized from negative contexts to positive ones. Moreover, what makes this theory particularly doubtful is the fact that ◊ modals generally have narrow scope with respect to clausemate negation, for reasons yet unknown (cf. van der Auwera 2001). But we do not see them routinely turning into □ modals.

4. Variable-force modality in OE vs. in st'át'imcets, gitksan, and nez perce. It is well known that some constructions in natural languages may be underdetermined between possibility and necessity, like the *have something to say* construction (Fischer 1994:§3.2) or German modal infinitives (van der Auwera & Plungian 1998:§3.3). However, recent semantic fieldwork on St'át'imcets, Gitksan, and Nez Perce has uncovered a group of modals that seem to feature a different kind of 'indeterminacy' between possibility and necessity: while these modals may be rendered into languages like Modern English with both possibility and necessity modals, depending on the context, there seems to be no lexical ambiguity or vagueness involved. In this section, I review the data and analyses formulated for various variable-force modals of St'át'imcets, Gitksan, and Nez Perce and discuss how they compare to the Alfredian OE data and to my presuppositional variable-force analysis.

4.1. Variable force in alfredian OE and the pacific northwest: the empirical picture. Schematically, the shape of the modal system in the three Pacific Northwest languages where variable-force modals have been described can be represented as follows, alongside the same for Alfredian OE, repeated from 21 above.

(27) Alfredian OE

	ability	circ+met	future	deontic
◊	*magan*	*magan*	—	nonmodal
□	—	*sculan*	Ø/*sculan*	*sculan*

	circ+met/deontic
◊ + collapse presup.	*motan*

(28) St'át'imcets (Rullmann et al. 2008)

	deontic	future	various epistemic
◊ □	*ka*	*kelh*	*k'a*; *ku7*; *-an'*

Consultants select □ paraphrases for variable-force modals more often.

(29) Gitksan (Peterson 2010, Matthewson 2013)

	circ	deontic	epistemic
◊	*da'akhlxw*	*anook*	*ima('a)*; *gat*
□	*sgi*		

Consultants select ◊ paraphrases for variable-force modals more often.

(30) Nez Perce (Deal 2011)

	circ + deontic
◊	*o'qa*
□	—

Even though the diagrams above provide, by necessity, very limited information, it is already enough to see that the shapes of modal systems with variable-force modals may vary significantly between languages. In St'át'imcets, all modal expressions are apparently variable force.[18] In Gitksan, variable-force modals occur in the epistemic domain with little competition. In Nez Perce, the variable-force modal (argued by Deal (2011) to be a regular ◊, as discussed below) occupies the circumstantial/deontic meaning domain alone, without other modals. But unlike any of these, in Alfredian OE the variable-force modal **motan* is in the same general domain of deontic-circumstantial-metaphysical modality as non-variable-force **sculan* and *magan*.

If we look closer yet, the Alfredian variable-force pattern of behavior turns out to be very different from those in St'át'imcets and Gitksan. First, there is no inevitability conveyed by the variable-force modals in the latter two. In St'át'imcets, we see the variable-force future marker *kelh* (31). This marker often corresponds to the English simple future *will* but does not have to. In examples like 31, the argument situation of *kelh* is not construed as inevitable, only as potentially possible in the future.

(31) ka-kwís-a kelh ti k'ét'h-a
CIRC-fall-CIRC FUT DET rock-DET
'That stone might drop.' (Rullmann et al. 2008, ex. 19)

Similarly for Gitksan *ima*, where no inevitability is conveyed by the modal in the general case.

(32) [Context: You hear pattering, and you're not entirely sure what it is.]
yugw=imaa/ima'=hl wis
IMPF=EPIS=CN rain
'It might be raining.' (Matthewson 2013, ex. 22)

Another difference between Alfredian OE on the one hand and St'át'imcets and Gitksan on the other concerns the interaction of variable-force modals with negation. As was discussed in §2, Alfredian **motan* always conveys impossibility when combined with negation (cf. 19). But in St'át'imcets and Gitksan, variable-force modals can give rise to 'not necessary' readings.

(19) 'Alas, how evilly I am treated by many worldly people, so that I **mot** not (= it is impossible for me to) follow my own customs.' (*Bo*:7.17.23)

In St'át'imcets, at least the evidential epistemic *k'a* shows both 'necessarily not' and 'possibly not' readings in different examples (Rullmann et al. 2008:§3.6), and variable-force modals *kelh* and *ka* show at least 'possibly not' readings. This differs from Alfredian **motan*. As for Gitksan, the variable-force reportative evidential *kat* scopes uniformly above its clausemate negation (Peterson 2010:66–68, 149–50), producing readings like 'I heard ¬*p*', and never 'I didn't hear that *p*'. But only 'possibly not' readings are provided by Peterson and Matthewson for inferential epistemic *ima* (Peterson 2010:45, Matthewson 2013:§3.1). So again the pattern of interaction with negation is different from that of Alfredian **motan*, for which we only find 'not possible' readings.

[18] Rullmann and colleagues (2008) are a bit more cautious about the epistemic markers *ku7* and *-an'*, but the rest are unequivocally variable force.

Summing up, Alfredian OE and St'át'imcets and Gitksan differ not only in the kind of accessibility relations their variable-force modals can use, but also in whether the modals always convey inevitability (Alfredian **motan* does, while St'át'imcets and Gitksan variable-force modals do not) and how they interact with negation (Alfredian **motan* always gives rise to the impossibility reading, while in St'át'imcets and Gitksan 'possibly not'/'not necessary' readings are also attested, and sometimes are the only ones attested for a given modal).

The variable-force modal *o'qa* of Nez Perce, described by Deal (2011), is much closer to Alfredian **motan*, though not identical to it. First, *o'qa* may use accessibility relations from the same general domain of circumstantial-deontic(-metaphysical) as **motan*. Second, *o'qa* always gives rise to impossibility meanings when combined with clausemate negation. But there is a very important difference: inevitability is not conveyed by Nez Perce *o'qa*, as the sentence in 33 shows. No such examples were found in my Alfredian OE sample ($N = 72$).

(33) pícpic ha-'ac-**o'qa** mét'u wéet'u ha-'ac-o'.
cat 3SBJ-enter-MOD but not 3SBJ-enter-PROSP
'The cat **could** go in, but it won't go in.' (Deal 2011, ex. 7)

The second important difference between *o'qa* and **motan* surfaces when the modal occurs in a conditional antecedent. In Alfredian OE, possibility and necessity collapse in such examples, as was discussed regarding 13. But for Nez Perce, Deal (2011) provides several examples with *o'qa* in the antecedent of a conditional for which her consultants accept a possibility paraphrase, but firmly reject a necessity paraphrase (see 34).

(34) c'alawí 'aac-o'qa, kaa 'aac-o'.
if enter-MOD then enter-PROSP
OK'If I can go in, I will go in.'
*'If I have to go in, I will go in.' (Deal 2011, ex. 59)

Summing up, Alfredian **motan* is empirically very different from the variable-force modals of St'át'imcets and Gitksan, and it is more similar to but still quite different from the variable-force modal *o'qa* of Nez Perce. In none of the three Pacific Northwest languages does a variable-force modal convey a sense of inevitability as Alfredian **motan* does.

4.2. VARIABLE FORCE IN ALFREDIAN OE AND THE PACIFIC NORTHWEST: COMPARISON OF THEORIES. Because of the empirical differences just described, my presuppositional analysis for **motan* does not carry over to the Pacific Northwest variable-force modals: it would derive the inevitability effect, which is not observed for them. In the other direction, earlier analyses do not carry over to OE either. The five analyses of the variable-force effect proposed in the literature, for different languages, are as in 35.

(35) a. □ with narrowing (Rullmann et al. 2008, for St'át'imcets)
b. ◊ with widening (Peterson 2010, for Gitksan)[19]

[19] Both Rullmann et al. 2008 and Peterson 2010 attribute the rise of the variable-force effect to special mechanisms manipulating the quantificational domain of the modal. But there is a crucial theoretical difference between the two approaches. Rullmann and colleagues (2008) use a special apparatus of choice functions applied to sets of worlds to implement the narrowing, while Peterson (2010) proposes to use the standard apparatus of conversational backgrounds by Kratzer (1981) to the same end. As a result, Peterson's treatment of Gitksan's modals ends up being very similar to Kratzer's treatment of German *können*, and his treatment of St'át'imcets modals to Kratzer's treatment of German *müssen*. But empirically, German modals and the modals of Gitksan and St'át'imcets are very different. It is not clear how Peterson's system, which uses the same apparatus for both, can accommodate that fact.

c. upper-end degree modal (≈ 'somewhat probable')
(Kratzer 2012, analysis I, for St'át'imcets)

d. modal with only one accessible world
(Kratzer 2012, analysis II, for no language in particular)

e. regular ◊ without a dual □ (Deal 2011, for Nez Perce)

None of the first three analyses in 35, formulated for St'át'imcets and Gitksan, is designed to derive anything close to either the inevitability effect or the pattern of interaction with negation where the variable-force modal always gives rise to an impossibility reading. But the 'analysis II' of Kratzer (2012) and the analysis based on the absence of a modal dual by Deal (2011) may account for an empirical pattern closer to the one we see in Alfredian OE, and thus are discussed here.

The second variable-force analysis by Kratzer (2012) is the following suggestion (which Kratzer explores without proposing it to be the right analysis for any particular language). Suppose a modal quantifies over a singleton set of worlds. In such a case, there is no distinction between ◊ and □ any more: a collapse occurs. A modal specified as one that only quantifies over singleton sets of worlds would be, using the descriptive term, a variable-force modal. And in fact, Stalnaker (1981) proposes such a collapse analysis for *would* in English counterfactual conditionals, independently from any concerns about variable-force modals of the kind found in the languages of the Pacific Northwest.

My analysis has a lot in common with Kratzer's suggestion: under both of them, possibility and necessity collapse in the set of worlds quantified over. But there are differences, too. First, the way in which the collapse is imposed (namely the presupposition proposed for **motan*) is specific in my theory, and left unspecified in Kratzer's brief suggestion. Second, there is no need to assume that the quantified set is singleton under my analysis, so in a sense the guiding intuition behind my proposal is slightly different from Kratzer's: the possibility-necessity collapse occurs not just because it is impossible to distinguish ◊ and □ in a singleton set of accessible worlds, but as something that also needs to be specifically imposed within the semantics. Modulo those differences, my theory for Alfredian **motan* may be viewed as an elaboration of Kratzer's suggestion.

Turning to the analysis of the variable-force effect proposed for Nez Perce by Deal (2011), in principle it may be applied to Alfredian **motan*, but only if one grants several further assumptions with no empirical basis for them in the OE data. Deal's analysis for Nez Perce variable-force modal *o'qa* makes crucial use of the fact that Nez Perce lacks a modal that could have been *o'qa*'s vanilla-necessity counterpart. *o'qa* has deontic and circumstantial readings (in the same general modal meaning domain as **motan*). In upward-entailing contexts, it behaves similarly to the Gitksan variable-force modals: it may be rendered by consultants into English using both possibility and necessity modals, but possibility translations are generally preferred. However, in downward-entailing contexts (namely under negation, in relative clauses modifying universally quantified noun phrases, and in antecedents of conditionals), *o'qa* appears to unambiguously convey possibility: consultants strongly reject sentences with *o'qa* as translations for English sentences with necessity modals in such environments.

Deal explains this pattern as follows: *o'qa*'s literal meaning is always that of possibility, so it has roughly the same basic semantics as modern English *can* or *may*. The peculiar variable-force pattern observed in upward-entailing contexts, Deal argues, is due to the absence of a stronger necessity dual for that regular possibility modal. In English, a speaker would not use *can* when she can use a stronger *have to*. But if her language does not have a modal with the semantics of *have to*, there would be no reason

for the speaker to not use *can* in upward-entailing contexts. The variable-force effect in such contexts would be simply an epiphenomenon of the shape of the overall modal system of a given language.

So can we apply the same line of reasoning to **motan*? Unlike in Nez Perce, in Alfredian OE there is a modal that would have been a necessity dual for **motan*: the deontic/circumstantial modal **sculan* (> modern *shall*). **sculan* is the pure-necessity modal of choice in both deontic and circumstantial contexts: in 36 **sculan* conveys the meaning of moral obligation, while in 37 **sculan* is a circumstantial □ modal—the context suggests a much stronger force than just deontic necessity, making the action inevitable.

(36) Hu micle suiðor **sculon** we ðonne beon gehiersume ðæm ðe ure
how much more shall we then be obedient to.him who we.GEN
gæsta Fæder bið wið ðæm ðæt we moten libban on
spirits.GEN father is so.that we motan.PRS.PL live on
ecnesse!
eternity
'Then how much more **must** we obey the father of our souls so that we moten live eternally!' (*CP*:36.255.8)

(37) [Preceding context: 'Every person's inner thought desires two things, which are the will and the power. If someone lacks one of those two, then he cannot fulfill anything with just the other.']
Forþam nan nyle onginnan þæt þæt he nele, buton
because none not.wants.to start that which he not.wants.to unless
[nede] **scyle**; and þeah he eall wille, he ne mæg gif
by.necessity shall and though he entirely wants.to he not may if
he þæs þinges anweald næfð.
he that.GEN thing.GEN power not.has
'Because nobody would start what they do not want to (start), unless they **have to** by necessity; and when someone truly wants to (do that), they cannot if they do not have power over that thing.' (*Bo*:36.106.13)

Now, I have noted above that it is hard to establish with certainty which modal flavors the assertion of **motan* may have had in Alfredian OE: it occurs in examples that could be argued to exhibit a meaning from the general range of circumstantial, metaphysical, and deontic, but it seems impossible to establish without doubt whether **motan* definitely had each of those meanings. Given that uncertainty, if we really wanted to stretch Deal's analysis to cover Alfredian **motan*, we could stipulate that **motan* had only metaphysical readings, while **sculan* had only circumstantial and deontic readings, but never metaphysical ones. If so, then **motan* would indeed have no exact necessity dual, and we would be able to apply Deal's account.

But there is no basis in the data for making such a claim: it would be just an ad hoc assumption adopted specifically to make one particular theory work. Moreover, the assumption that there was a complementary distribution between the modal flavors of **sculan* and **motan* is problematic on both historical and typological grounds. On the typological side, modals rarely have such clear-cut complementary distributions. On the historical side, even when a modal does lack a particular modal flavor, it can often acquire it in time if it already can express close modal meanings—and circumstantial modality is close to metaphysical modality, and is known to give rise to deontic readings in language change. So the assumption we would need to adopt to make Deal's theory work, even if true at some point, should have become false quite quickly. That is not

very probable given the fact that **motan*'s cognates in other Germanic languages were special in similar ways, suggesting that the variable-force situation was in place for a relatively long time. The same comparison with other Germanic languages, as already discussed, suggests that **motan* had special semantics, not the regular ◊ semantics: otherwise, it would be strange that only this particular ◊ and all of its relatives in other closely related languages underwent the change into a □ modal.

Finally, we have already discussed in §4.1 that empirically, there are two important differences between **motan* and Nez Perce *o'qa*: first, *o'qa* does not convey inevitability (cf. 33), and second, *o'qa* gives rise to regular possibility readings in conditional antecedents (cf. 34). Given those two differences, it does not look as if there are any benefits in adopting Deal's analysis for Nez Perce to Alfredian OE.

To conclude the comparison of data from, and theories of, the variable-force modals of the Pacific Northwest and Alfredian **motan*, first, the distribution of the Alfredian modal is different from that of any of the Pacific Northwest variable-force modals; second, the presuppositional theory of **motan* should not be applied to St'át'imcets, Gitksan, or Nez Perce, since it would make wrong predictions; third, the earlier accounts of the variable-force effect proposed in the literature do not apply to OE **motan* either.

5. COLLAPSE VARIABLE FORCE AND OTHER CASES OF INEVITABLE ACTUALIZATION SEMANTICS. In this section, I discuss the relations between my collapse variable-force analysis for **motan* and three different areas of modal semantics: (i) actuality entailments, (ii) semantics of ability,[20] and (iii) acquisitive modality in languages spoken around the Baltic Sea. In all three cases, semantic elements are used that are very close to the ones employed here in the analysis of Alfredian **motan*: possibility implying actualization, and setting a course of events without there being any possible alternatives. But the way those components are brought together in the lexical meanings and the particular flavors involved differ in all four cases. This section is thus a brief study of three phenomena that are close enough to collapse variable-force modality that one might try to see if they are the same—but all turn out to be quite different from Alfredian **motan* in the end.

5.1. COLLAPSE VARIABLE FORCE AND ACTUALITY ENTAILMENTS. Recall our collapse semantics for Alfredian **motan*: the presupposition says that all possible developments of the evaluation worlds are either all p or all $\neg p$; the assertion says that some of them are p; it follows that in fact all of them are p. Thus the modal claim entails actualization of p.

This effect is similar on the surface to ACTUALITY ENTAILMENTS of nonepistemic modals; see Hacquard 2009, among others. As argued by Hacquard, actuality entailments arise when a nonepistemic modal appears under perfective aspect. In such a configuration, it is implied that the p that is the argument of the modal has actually occurred.

(38) Pour aller à Londres, Jane **a** **pu** prendre le train.
to go to London Jane has can.PST.PTCP take the train
lit. 'To go to London, Jane was able to take the train.' *but cannot be followed by* ' … but she actually didn't.'

In both the collapse case and the actuality entailment case, the argument situation p of the modal is implied to actualize. However, the conditions under which this happens

[20] I owe the clarification of those two connections to discussions with Paul Portner and Irene Heim and to the comments of a referee.

differ in the two cases. First, actuality entailments arise only in perfective environments, while the effects of collapse variable force do not depend on the tense-aspect form of the modal. Second, modal statements with actuality entailments do not presuppose anything about the context: they may be made regardless of any prior assumptions about the actualization of *p*. So while the end effect is similar in the two cases, the conditions under which it arises are different, and thus the mechanism by which it comes through is likely to be different as well.

5.2. Collapse variable force and ability modals. Ability modals, as in *Mary can swim*, look like possibility modals in many respects. For example, ability markers often serve as circumstantial-◊ markers as well, like English *can* and *be able* do. Moreover, ability modals do not make the scheme $Op(p) \wedge Op(\neg p)$ a contradiction, which makes sense if they are ◊s: in logic, $(\Diamond p) \wedge (\Diamond \neg p)$ is a contingent statement that can be true or false, but $(\Box p) \wedge (\Box \neg p)$ may be true only if there are no accessible worlds whatsoever. Ability *can* behaves as a ◊ in this respect.

(39) Mary can swim (which not everyone can), and of course Mary can [not swim], too (just as virtually every human).

But there are also properties of ability modals that make them not so similar to other ◊s. In particular, they give rise to entailments as in 40. An overview of related phenomena and their treatment in the literature may be found in Portner 2009:§4.4.1; Portner writes that current approaches to such facts 'are alike in combining some sort of existential quantification, corresponding to the idea that the agent chooses an action, and some sort of universal quantification, corresponding to the idea that the action guarantees a certain outcome' (2009:202).

(40) Mary can swim.
⇒ Whenever Mary wants to (and the circumstances are normal), Mary will swim.

The form of the inference in 40 is structurally similar to our presupposition of collapse variable force. Informally, the ability inference says that if an action is enabled by the agent's desires, the action will actualize. The collapse presupposition says that if the action is enabled by the way the world is, it will actualize. The status of the two statements is different: one is entailment, another a presupposition; the nature of the enabling is also different—for ability modals it is the agent's attitude, while for our collapse presupposition it is the way the world objectively is. But the overall schema is similar.

So in the case of both actuality entailments and ability modals, what we are seeing is semantic building blocks similar to those used in the collapse presupposition, but employed differently, to produce different meanings.

5.3. Collapse semantics around the Baltic Sea? In the languages spoken around the Baltic Sea, there exists an areal phenomenon of acquisitive modality; see van der Auwera et al. 2009, among others. Verbs with the basic meaning 'get' in those languages acquired modal meanings as well, and they have been described as sometimes conveying possibility and other times necessity. Such 'get'-modals include: Norwegian *få* (Askedal 2012), Swedish *få* (Viberg 2002, 2012), Finnish *saada* (Kangasniemi 1992, Viberg 2002), Estonian *saama* (Tragel & Habicht 2012), and Latvian *dabūt* (Daugavet 2014), as well as modals in other Finno-Baltic and Baltic languages.

From the descriptions in the secondary literature, it may seem as if some of these 'get'-modals have semantics similar to the semantics of collapse variable force. If this

were the case, data from the Baltic-Sea languages could be used to shed further light on OE **motan*. Consider, for example, what Kangasniemi (1992) writes on Finnish *saada*.

> One motivation for the use of *saada* in expressions of necessity may be the speaker's or writer's pursuit of irony, stating that the actor has the possibility of doing something that he or she does not want to, and moreover, that ALL OTHER POSSIBILITIES ARE EXCLUDED. (Kangasniemi 1992:62, emphasis mine)

And from the following description, it may seem as if there is no real ambiguity in Finnish *saada*.

(41) **Saa-t** lähteä matkalle taivaaseen.
saada-2SG go trip.ALL heaven.ILL
'You **may/have to** set out for your trip to heaven.'

> The interpretation of [41] depend[s] on whether the agent wants to perform the act or not, i.e. whether the addressee of sentence [41] wants to go for a trip to heaven … . Thus sentence [41] could be interpreted as permission in a religious context (which was in fact the case) but as an obligation or a threat in James Bond adventure. (Kangasniemi 1992:322–23)

Kangasniemi's description suggests that *saada*(*p*), at least in this case, simply signals that the future is determined in a particular way, and the choice of a translation equivalent depends on the perception of that determined future as desirable or undesirable. That looks somewhat similar to *motan*(*p*), which according to our analysis entailed the absence of alternatives for *p*.

Viberg (2002:132–33), who at the time apparently was not aware of Kangasniemi's work on Finnish, describes Swedish modal *få* very similarly:

> Which alternative applies is a pragmatic question. … In the following example [42], Obligation is the correct interpretation, and this is also reflected in the English translation. The passage is taken from a novel (P.C. Jersild: *Babels hus* 1985) and describes what happens when someone arrives at a hospital. The presupposition is that someone who feels ill wants to stay at the hospital:

(42) Den som inte är sjuk är följaktligen frisk och **får åka hem** igen.
'The person who is not ill is consequently well and **has to go** back **home**.'

> In the following example [43] taken from the same novel, another patient wants to leave the hospital after an operation. In this case, Permission is the appropriate interpretation, which is reflected in the translation:

(43) Han skulle förmodligen snart **få åka hem**.
'He would presumably **be allowed** [(to) go] **home** soon.'

Again, this explanation seems to feature components similar to the parts of our collapse variable-force analysis. There is a fixed course of events, and the translation equivalent of the modal depends on the perception of that course of events. In OE, we could see that as well: **motan* would be considered a possibility modal when the argument situation was desirable, as in 1 or 5, and a necessity modal when the situation was undesirable, as in 2 and 11. But I argued that in both cases we are dealing with the same semantics that ultimately conveys that there is a single alternative in the metaphysically accessible set of worlds.

So the question is whether Baltic Sea acquisitive modals indeed have collapse variable-force semantics. If they did, we would expect these acquisitive modals not to appear in those cases where their argument *p* is an open possibility (circumstantially, metaphysically, or deontically), but where it is not assumed that *p* would necessarily actualize if it is given a chance. We can test this prediction using both speakers' judgments and naturally produced texts, and it turns out that at least in Norwegian, Swedish, Finnish, and Estonian, 'get'-modals behave differently from Alfredian **motan*.

Imagine that John, an adult host, is explaining to Robin, a child, what she can and cannot do while she is at this house. There are multiple possibilities. She can play in the garden, and she can also watch cartoons in the room. Those are possible (both in the deontic and in the circumstantial/metaphysical sense), but it is not assumed that Robin will necessarily engage in one or another. The presupposition of inevitable actualization thus does not hold. Yet Norwegian *få* (which seems to be deontic) and Estonian *saama* (circumstantial) are good in this context (and Finnish deontic *saada* is good as well).[21]

(44) Estonian *saama*
Sa **saa-d** mängi-da aia-s. Sa **saa-d** ka vaada-ta
you saama-2SG play-INF garden-INE you saama-2SG watch-INF there
seal multika-id
cartoon-PL.PAT
'You have the possibility to play in the garden. You can also watch cartoons over there.'

(45) Norwegian *få*
Du **får** leke i hagen. Du **får** også se tegnefilmer der.
you få play in garden you få also see cartoons there
'You may play in the garden. You may also watch cartoons over there.'

We can also find naturally occurring examples where it is clear that despite the fact that the possibility for *p* is declared to be open, it is not assumed that it would be necessarily used. With Finnish *saada* in 46, it is clearly not presupposed that every teenager will work right after they get the right to. (The rest of the text describes other legal rights and restrictions, such as the age when a person can get a driver's license, etc.) With Swedish *få* in 47, the relatives of immigrants are clearly not legally obliged to take the integration courses.

(46) Finnish *saada*
Si-nä vuon-na, kun nuori täyttä-ä 14 vuot-ta, häne-t saa
that-ESS year-ESS when young fill-3SG 14 year-PTV they.3SG-ACC saada.3SG
otta-a kevye-en työ-hön.
take light-ILL work-ILL
'In the year when the young person gets 14 years, it is allowed to take him into light work.'[22]

(47) Swedish *få*
Anhöriginvandrare får också gå kurs i samhällsorientering
immigrant.relatives få also go course in civic.orientation
'Dependents of immigrants may also take courses in integration into the society.'[23]

Thus, whatever the proper semantics for Baltic Sea acquisitive modals is (and it must be different for different 'get'-modals, at the least because even directly cognate ones may show different sets of modal flavors), that semantics is not the collapse semantics I propose for Alfredian **motan*. This leaves the OE word without direct analogues in living languages for now.

[21] I am grateful for the judgments to Atle Grønn, Andres Karjus, and Lauri Karttunen.

[22] http://www.mll.fi/nuortennetti/koulu_ja_tyo/oikeudet-ja-velvollisuudet/oikeudet-ian-mukaan/

[23] http://www.vartgoteborg.se/prod/sk/vargotnu.nsf/1/ovrigt,anhoriginvandrare_far_ocksa_ga_kurs_i_samhallsorientering

6. CONCLUSION. I have proposed a new analysis of the semantics of **motan* in Alfredian Old English, arguing that it was a nonambiguous variable-force modal. I derived the variable-force effect from the presupposition in 16, which forces possibility and necessity collapse in the set of worlds quantified over by the modal. This type of variable-force effect has not yet been observed, so Alfredian OE makes the typology of possible variable-force modals richer. Apparently there exist very many ways in which a variable-force effect may arise: the variable-force modals of St'át'imcets, Gitksan, Nez Perce, and Alfredian OE, as well as the 'get'-modals of the Baltic-Sea languages, all seem to show important distributional differences.

By the Early ME period, **moten* had turned from a nonambiguous variable-force modal into one ambiguous between various possibility and necessity readings. I have shown, using evidence from Late OE, that the rise of necessity readings for **motan*/**moten* can be explained well if we assume the proposed variable-force semantics for the earlier period.

Comparing the collapse semantics for **motan* with the semantics of (i) actuality entailments, (ii) ability modals, and (iii) Baltic Sea 'get'-modals, we have seen how the semantic components of our meaning may occur in other linguistic constructions, though in different combinations and to a different end. This can be taken as evidence that our collapse semantics is natural, in the sense that it uses elements that are independently needed for the analysis of other natural-language phenomena.

The evidence supporting the new semantics for Alfredian **motan* notwithstanding, could the proposal be wrong after all? As is always the case in empirical sciences, it may. There is plenty of evidence that may in the future falsify the presented theory. First, I have not examined the whole corpus of early and late OE writing, which features quite a number of instances of **motan*. Second, there are data from other early Germanic languages: **motan*'s cognates are relatively widely used in Old Saxon and Old High German surviving texts. Third, German *müssen* was later borrowed by Old Czech and Old Polish, and studying that process could provide additional insights into the semantics of the modal in the Germanic languages. If my proposal is on the right track, one should be able to eventually fit all of these data together within a single general theory. Thus, fortunately, there are many ways in which future research can falsify or further support the variable-force theory of **motan* proposed in the current article.

REFERENCES

ABUSCH, DORIT. 2012. Circumstantial and temporal dependence in counterfactual modals. *Natural Language Semantics* 20.273–97. DOI: 10.1007/s11050-012-9082-5.

ASKEDAL, JOHN OLE. 2012. Norwegian *få* 'get': A survey of its uses in present-day Riksmål/Bokmål. *Linguistics* 50.1289–1331. DOI: 10.1515/ling-2012-0041.

BETHURUM, DOROTHY. 1957. *The homilies of Wulfstan*. Oxford: Clarendon.

BOSWORTH, JOSEPH, and T. NORTHCOTE TOLLER. 1898. *An Anglo-Saxon dictionary*. Oxford: Clarendon.

BREITBARTH, ANNE. 2011. Modality and negation in the history of Low German. *Zeitschrift für Sprachwissenschaft* 30.131–67. DOI: 10.1515/zfsw.2011.007.

CONDORAVDI, CLEO. 2002. Temporal interpretation of modals: Modals for the present and for the past. *The construction of meaning*, ed. by David Beaver, Luis D. Cassillas Martinez, Brandy Z. Clark, and Stefan Kaufmann, 59–82. Stanford, CA: CSLI Publications.

DAUGAVET, ANNA. 2014. Acquisitive modals in Latvian. Paper presented at Chronos 11, Pisa, Italy, June 2014.

DEAL, AMY ROSE. 2011. Modals without scales. *Language* 87.559–85. DOI: 10.1353/lan.2011.0060.

Dictionary of Old English, The (a–g) (*DOE*). 2007. Toronto: University of Toronto. Online: http://www.doe.utoronto.ca/.

FISCHER, OLGA. 1994. The development of quasi-auxiliaries in English and changes in word order. *Neophilologus* 78.137–64. DOI: 10.1007/BF00999959.
GILES ET AL. (eds.) 1858. *The whole works of King Alfred the Great, with preliminary essays illustrative of the history, arts, and manners of the ninth century*. London: Bosworth & Harrison.
GODDEN, MALCOLM, and SUSAN IRVINE. 2009. *The Old English Boethius*. Oxford: Oxford University Press.
GOOSSENS, LOUIS. 1987. Modal tracks: The case of *magan* and *motan*. *Studies in honour of Rene Derolez*, ed. by Anne-Marie Simon-Vanderbergen, 216–36. Gent: Vitgeuer.
HACQUARD, VALENTINE. 2009. On the interaction of aspect and modal auxiliaries. *Linguistics and Philosophy* 32.279–315. DOI: 10.1007/s10988-009-9061-6.
HASENFRATZ, ROBERT (ed.) 2000. *Ancrene Wisse*. Kalamazoo, MI: Medieval Institute Publications. Searchable version provided by TEAMS (The Consortium for the Teaching of the Middle Ages) available online at: http://d.lib.rochester.edu/teams/publication/hasenfratz-ancrene-wisse.
HEIM, IRENE. 1991. Artikel und Definitheit. *Semantik: Ein internationales Handbuch der zeitgenössischen Forschung*, ed. by Arnim von Stechow and Dieter Wunderlich, 487–535. Berlin: De Gruyter.
KANGASNIEMI, HEIKKI. 1992. *Modal expressions in Finnish*. Helsinki: Suomalaisen Kirjallisuuden Seura.
KITSON, PETER. 1992. Old English dialects and the stages of the transition to Middle English. *Folia Linguistica Historica* 11.27–87. DOI: 10.1515/flih.1990.11.1-2.27.
KRATZER, ANGELIKA. 1981. The notional category of modality. *Words, worlds, and context: New approaches in word semantics*, ed. by Hans-Jürgen Eikmeyer and Hannes Rieser, 38–74. Berlin: De Gruyter.
KRATZER, ANGELIKA. 2012. *Modals and conditionals*. Oxford: Oxford University Press.
MATTHEWSON, LISA. 2013. Gitksan modals. *International Journal of American Linguistics* 79.349–94. DOI: 10.1086/670751.
Middle English Dictionary (*MED*). 2002. Ann Arbor: University of Michigan. Online: http://quod.lib.umich.edu/m/med/.
MILLETT, BELLA. 2005. *Ancrene Wisse: A corrected edition of the text in Cambridge, Corpus Christi College, MS 402, with variants from other manuscripts*. Oxford: Oxford University Press. (Drawing on the uncompleted edition by E. J. Dobson, with a glossary and additional notes by Richard Dance.)
MITCHELL, BRUCE. 1985. *Old English syntax*. Oxford: Clarendon.
OGAWA, HIROSHI. 1989. *Old English modal verbs: A syntactical study*. (Anglistica 26.) Copenhagen: Rosenkilde and Bagger.
ONO, SHIGERU. 1958. Some notes on the auxiliary **motan*. *Anglica* 3.64–80.
Oxford English dictionary (*OED*). 2002. 3rd edn. Oxford: Oxford University Press.
PETERSON, TYLER. 2010. *Epistemic modality and evidentiality in Gitksan at the semantics-pragmatics interface*. Vancouver: University of British Columbia dissertation.
PORTNER, PAUL. 2009. *Modality*. Oxford: Oxford University Press.
RULLMANN, HOTZE; LISA MATTHEWSON; and HENRY DAVIS. 2008. Modals as distributive indefinites. *Natural Language Semantics* 16.317–57. DOI: 10.1007/s11050-008-9036-0.
SCHLENKER, PHILIPPE. 2012. *Maximize presupposition* and Gricean reasoning. *Natural Language Semantics* 20.391–429. DOI: 10.1007/s11050-012-9085-2.
SOLO, HARRY JAY. 1977. The meaning of **motan*: A secondary denotation of necessity in Old English? *Neuphilologische Mitteilungen* 78.215–32. Online: http://www.jstor.org/stable/43343133.
STALNAKER, ROBERT. 1981. A defense of conditional excluded middle. *Ifs: Conditionals, belief, decision, chance, and time*, ed. by William Harper, Glenn Pearce, and Robert Stalnaker, 87–104. Dordrecht: D. Reidel.
STANDOP, EWALD. 1957. *Syntax und Semantik der modalen Hilfsverben im Altenglischen* magan, motan, sculan, willan. Bochum-Langendreer: Pöppinghaus.
SWEET, HENRY. 1871. *King Alfred's West-Saxon version of Gregory's Pastoral Care*. (Early English text society 45, 50.) Oxford: Oxford University Press.
TELLIER, ANDRÉ. 1962. *Les verbes perfecto-présents et les auxiliaires de mode en anglais ancien: (viiie s. – xvie s.)*. Paris: Klincksieck.
TOLLER, T. NORTHCOTE. 1921. *An Anglo-Saxon dictionary: Supplement*. Oxford: Oxford University Press.

TRAGEL, ILONA, and KÜLLI HABICHT. 2012. Grammaticalization of Estonian *saama* 'to get'. *Linguistics* 50.1371–1412. DOI: 10.1515/ling-2012-0043.
TRAUGOTT, ELIZABETH CLOSS. 1989. On the rise of epistemic meanings in English: An example of subjectification in semantic change. *Language* 65.31–55. DOI: 10.2307/414841.
TRAUGOTT, ELIZABETH CLOSS, and RICHARD B. DASHER. 2002. *Regularity in semantic change*. (Cambridge studies in linguistics 96.) Cambridge: Cambridge University Press.
VAN DER AUWERA, JOHAN. 2001. On the typology of negative modals. *Perspectives on negation and polarity items*, ed. by Jack Hoeksema, Hotze Rullmann, Víctor Sánchez-Valencia, and Ton van der Wouden, 23–48. Amsterdam: John Benjamins.
VAN DER AUWERA, JOHAN; PETAR KEHAYOV; and ALICE VITTRANT. 2009. Acquisitive modals. *Cross-linguistic studies of tense, aspect, and modality*, ed. by Lotte Hogeweg, Helen de Hoop, and Andrej Malchukov, 271–302. Amsterdam: John Benjamins.
VAN DER AUWERA, JOHAN, and VLADIMIR PLUNGIAN. 1998. Modality's semantic map. *Linguistic Typology* 2.79–124. DOI: 10.1515/lity.1998.2.1.79.
VIBERG, ÅKE. 2002. Polysemy and disambiguation cues across languages: The case of Swedish *få* and English *get*. *Lexis in contrast: Corpus-based approaches*, ed. by Bengt Altenberg and Sylviane Granger, 119–50. Amsterdam: John Benjamins.
VIBERG, ÅKE. 2012. Language-specific meanings in contrast: A corpus-based contrastive study of Swedish *få* 'get'. *Linguistics* 50.1413–61. DOI: 10.1515/ling-2012-0044.
VISSER, FREDERIKUS THEODORUS. 1946. *A syntax of the English language of St. Thomas More*. Louvain: Librarie Universitaire.
VISSER, FREDERIKUS THEODORUS. 1963–1973. *An historical syntax of the English language*. Leiden: E. J. Brill.
WARNER, ANTHONY R. 1993. *English auxiliaries: Structure and history*. Cambridge: Cambridge University Press.

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[Received 26 August 2014;
accepted 29 January 2015]