Marina Benedetti & Chiara Gianollo

2 Modal uses of knowledge verbs in Ancient Greek

Abstract: In Ancient Greek – as in several other languages – knowledge verbs may express, besides epistemic knowledge ('know that'), also performative knowledge ('know how to'), thus getting close to the domain of dynamic modality. This study focuses on the semantic and syntactic behaviour of the Ancient Greek knowledge verbs *epístamai, oîda, gignőskō*, in order to detect the conditions enabling their modal uses (in particular with non-finite complementation patterns) and to explore the hypothesis of an ongoing grammaticalization process. With respect to the first issue, it is argued that the dynamic modal reading appears when the knowledge verb is complemented by a tense-defective infinitival complement, characterized by obligatory subject coreference (control). With respect to the second issue, the coexistence of the epistemic and the modal dynamic value is understood as a stable feature of the language, rather than as a result of achieved grammaticalization. This clearly emerges from the contrast with a functional (raising) modal verb such as *dúnamai* 'can'.

Keywords: Modal verbs, epistemic verbs, non-finite complements, control, raising

1 Introduction: 'know that' and 'know how'

Several languages provide evidence for an interaction between knowledge verbs and the domain of modality. Primarily, a knowledge verb in its fundamental meaning ("know that") conveys an epistemic component (it denotes "a state of knowledge or a process of acquisition of knowledge about a propositional content on the part of an experiencer", Cristofaro 2003: 106). Moreover, in some languages, "know" appears to express a kind of root dynamic modality ("know how", a meaning classed by Cristofaro 2003: 101 under the category of modal predicates), cf. (1a–b):

Acknowledgments: Even though this paper is the outcome of joint work by the authors, for academic purposes the final editing is to be attributed to Marina Benedetti for Sections 1, 2, 3.1, to Chiara Gianollo for Sections 3.2, 4. Both authors are responsible for Section 5.

Marina Benedetti, Università per Stranieri di Siena, e-mail: benedetti@unistrasi.it
Chiara Gianollo, Università di Bologna, e-mail: chiara.gianollo@unibo.it

https://doi.org/10.1515/9783110778380-002

(1) a. *Mary knows **that** she plays the piano extremely well.*
b. *Mary knows **how** to play the piano extremely well.*

This duality of behaviour is observed, for instance, with Latin *scire*, Italian *sapere*, Modern Greek *kséro*, and appears to be a cross-linguistically widespread phenomenon: the Database of Cross-Linguistic Colexifications (Rzymski, Tresoldi *et al.* 2019) lists colexifications of the meanings "know" and "be able" in various language families (besides Indo-European, also Chukotko-Kamchatkan, Nakh-Daghestanian, Nivkh, Sino-Tibetan, Tungusic, Turkic, Uralic).

Also in Ancient Greek, knowledge verbs, besides conveying an epistemic attitude, can receive a dynamic modal reading.[1] In other words, they can act either as expressions of epistemic knowledge (knowledge of propositions) or of performative knowledge (knowledge as ability) (see Tsohatzidis 2012; Torrego 2019 on the linguistic correlates of this conceptual distinction).

Interestingly, the different interpretations are consistently associated with different structural properties. For instance, English *know* needs to be complemented by a *how to*-clause in order to convey a dynamic reading (cf. (1b)). The fact that the dynamic modal reading on the one hand and the epistemic reading on the other hand are associated with different types of complementation seems to hold more generally. Roussou (2010) discusses the fact that in Modern Greek *kséro* 'know' is complemented by an *oti*-clause when it is used as an epistemic attitude report, while it is complemented by a *na*-clause in the dynamic modal reading, cf. (2a–b):

(2) Modern Greek (adapted from Roussou 2010: 582–583)
a. *Ksero* ***oti*** *o* *Janis* *elise* *to* *provlima.*
know.1SG that ART.SG Janis solved.3SG ART.SG problem
'I know that John solved the problem.'
b. *Ksero* ***na*** *aghapao.*
know.1SG how love.1SG
'I know (how) to love.' (lit. '[how] I love')

In some languages the dynamic modal use of knowledge verbs displays syntactic properties of modal auxiliaries, specifically the possibility of selecting a same-subject infinitival complement that is transparent to certain syntactic operations, such as e.g. clitic climbing (on this, cf. Section 3.2). These properties are taken to indi-

1 As observed by la Roi (2020) in a paper focussed on the verb *heurískō* 'find' "there is both Ancient Greek evidence (ἐπίσταμαι [*epístamai*] and οἶδα [*oîda*] as 'know' and 'be able to') and cross-linguistic evidence that knowledge verbs can evolve into verbs of ability" (la Roi 2020: 199).

cate monoclausality ('restructuring' in the generative literature), thus leading to an interpretation of the knowledge verb as an auxiliary-like element.

Historically, this situation can indeed cause reanalysis of the verb's morpho-syntactic and semantic properties: English *can*, for instance, originates from a verb meaning 'know' (*cunnan* 'have knowledge of', 'have the mental or intellectual capability to', 'know how to', Lightfoot 1979: 100; Goossens 1992), cf. (3a–b).

(3) Old English (from Lightfoot 1979: 98–99)

a. Bede, *Ecclesiastical History* II.13
hwæt þær foregange, oððe hwæt þær eftfylge, we
what there precede.3SG or what there come.after.3SG we
ne ***cunnun***.
not know.1PL
'What came before, or what comes after, we do not know.'

b. Bede, *Ecclesiastical History* IV.24
ne ***con*** *ic noht singan.*
not can.1SG I not sing.INF
'I cannot sing.'

The same root (IE **ĝneh*$_3$- 'know') is in both German *kennen* 'know' (originally a causative derivative) and *können* 'can', the latter a result of the same process of reanalysis seen for English.

The path from knowledge verbs to the expression of dynamic modality is well-attested cross-linguistically (Bybee, Perkins and Pagliuca 1994: 187–194; van der Auwera and Plungian 1998: 88–93; Heine and Kuteva 2002: 186; Traugott 2011). Van der Auwera and Plungian (1998: 91) explicitly designate "know" as a *premodal* meaning and identify the first step of its semantic development in the expression of learnt participant-internal possibility; subsequently, an extension of meaning leads to the expression of a more general participant-internal possibility, which can be *learnt / intellectual* or *inherent / physical* (van der Auwera and Plungian 1998: 82).

Dynamic modal meanings express a type of participant-oriented modality (Hengeveld 2004, and references cited there), that is, a generic ability (intrinsic or episodic ability granted by the circumstances), with no implication of actuality (Aijmer 2004). In the literature it is often debated whether dynamic modality is a properly modal meaning (cf. Gisborne 2007; Portner 2009: 197–220 for an overview of the semantic arguments; Roberts and Roussou 2003: 47 for the syntactic ones; on Ancient Greek see Allan 2013). Independently of this debate, from a historical point of view the connection of dynamic meanings with the modality domain is witnessed by the fact that they are often found as the first step of gram-

maticalization clines involving the development of more straightforward modal meanings, such as participant-external possibility, deontic modality and epistemic modality.

As for knowledge verbs specifically, their somehow intermediate semantic status as premodals is mirrored by their morphosyntactic properties, since across languages they can be located at different degrees in the continuum from lexical to functional (auxiliary-like) predicates when they express dynamic modality. Also, they can be more or less conventionalised means to express dynamic modality in a given language: for instance, English *know* can express performative knowledge (knowledge as ability), but it is not its default expression; instead, *can*, which as mentioned is etymologically related to *know*, is a *bona fide* modal verb and represents the default expression for dynamic modality in the language (*Mary can play the piano*).

In our study we focus on the dynamic modal readings of knowledge verbs in Ancient Greek, with the aim of reaching an improved understanding of their conditions of use and of their diachronic status. The questions we address are the following:

(i) What are the semantic and syntactic conditions that enable modal uses of knowledge verbs in Ancient Greek?
(ii) Why do precisely these conditions lead to the emergence of the modal reading?
(iii) Do the modal uses emerge diachronically as a step on a grammaticalization path leading from a lexical verb to a functional (auxiliary-like, modal) verb? Or are they rather a stable feature of the language, to be explained by the co-existence of certain structural prerequisites?

We will deal with question (i) in Section 2, with question (ii) in Section 3, and with question (iii) in Section 4. Section 5 briefly concludes the study, summarising its main findings. In our analysis, we make use of categories defined within the generative theoretical framework, such as the notions of control, raising, and restructuring; however, these categories are employed here for descriptive purposes in such a way that they are compatible with the theoretical assumptions of most other syntactic frameworks (e.g. the treatment of raising within the framework of Cognitive Grammar, or the layered model of the clause in Functional Grammar).

2 The Ancient Greek Data

The Ancient Greek phenomena under discussion can be observed in the behaviour of verbs such as *epístamai*, *oîda,* and *gignőskō*.[2] These verbs occur with a range of finite and non-finite complements, which we describe in what follows in order to detect the structural conditions under which the dynamic modal reading appears.

2.1 Finite complements

Finite complements (introduced by the conjunctions *hóti* or *hōs*),[3] are uniformly associated with an epistemic reading ('know that'). This is illustrated in the passages below, with *epístamai*. The complement and the matrix clause share the same subject in (4a), whereas they have different subjects in (4b).

(4) a. ἐπίστασθε ὅτι ἀπολέεσθε κάκιστα. (Hdt. 3.71.13)
epístasthe hóti apoléesthe kákista
know.2PL.IMP that die.2PL.FUT miserably
'You must all know that you will perish miserably.'

b. ἐπιστάμενος ὅτι τῷ δικαίῳ τὸ ἄδικον πολέμιόν ἐστι. (Hdt. 1.96.8)
epistámenos hóti tôi dikaíōi to ádikon
know.PTCP.NOM that ART.DAT just.DAT ART.NOM unjust.NOM
polémión esti
hostile.NOM be.3SG.PRS
'Knowing that injustice is hostile to justice.'

The same behaviour can be observed with *oîda* and *gignőskō*.

When complemented by finite clauses, knowledge verbs maintain their fundamental non-modal meaning. Therefore, in the following, we shall not dwell upon finite complementation, but will be focused on non-finite complementation patterns, and their relationship with modal (ability) vs. non-modal (epistemic) reading.

2 Data are obtained through the electronic resource TLG from a wide corpus of Archaic and Classical Greek (including the works of Homer, Hesiod, Hymns, Aeschylus, Sophocles, Euripides, Sappho, Theognis, Aesop, Thucydides, and Herodotus). Translations are adapted from those of the Loeb Classical Library.

3 On the contrast between the two complementizers (which does not concern the modal / epistemic contrast of interest here) cf. Cristofaro (1998); Faure (2014); Bentein (2015).

2.2 Non-finite complements

With non-finite complements, the contrast between modal (ability) and non-modal (epistemic) use is essentially associated to the contrast between infinitive and participle.

This is illustrated in (5) and (6) by means of examples with *epístamai.*

(5) πᾶσα γὰρ ἀγαθὴ γυνὴ [...] σωφρονεῖν ἐπίσταται. (E. *Fr*. 909.3 Nauck)
pâsa gar agathē gunē sōphroneîn epístatai
all.NOM in.fact good.NOM wife.NOM be.wise.INF know.3SG.PRS
'Every good wife knows how to be wise.'

(6) a. πρὸς πόλιν δ' ἐπίσταμαι / σθένουσαν ἥκων. (S. *OC.* 733–734)
pros pólin d' epístamai sthénousan hḗkōn
to city.ACC PTCL know.1SG.PRS powerful.ACC come.PTCP.NOM
'I know that I have come to a city that has great power.'
b. τὸν σὸν δὲ παῖδα σωφρονοῦντ' ἐπίσταμαι. (E. *Fr*. 1067.1 Nauck)
ton son de paîda sōphronoûnt' epístamai
ART.ACC your.ACC PTCL son.ACC be.wise.PTCP.ACC know.1SG.PRS
'I know that your son is wise.'

In (5) *epístamai* has the dynamic modal meaning 'be able to' and the complement is a same-subject infinitival clause. By contrast, in (6) *epístamai* has its full lexical meaning 'possess information', 'know that' and the complement clause has a participle: the complement and the matrix clause share the same subject in (6a) and have different subjects in (6b).

Similar patterns can be observed with *oîda* (a perfect form with stative meaning). It has a dynamic modal meaning 'be able to' in (7), with a same-subject infinitive complement, whereas it expresses epistemic knowledge ('know that') in (8a–b), respectively with and without subject coreference between the complement and the matrix clause.

(7) οἶδ' ἐπὶ δεξιά, οἶδ' ἐπ' ἀριστερὰ νωμῆσαι βῶν. (*Il*. 7.238)
oîd' epi dexiá oîd' ep' aristera nōmêsai bôn
know.1SG.PRF to right know.1SG.PRF to left direct.INF shield.ACC
'I know how to wield to right, and how to wield to left my shield.'

(8) a. οὐ γὰρ οἶδα δεσπότας κεκτημένος. (E. *Hec.* 397)
ou gar oîda despótas kektēménos
NEG in.fact know.1SG.PRF masters.ACC get.PTCP.NOM
'In fact I am not aware that I have masters.'

b. τοὺς φιλτάτους γὰρ οἶδα νῷν ὄντας πικρούς. (A. *Ch.* 234)
tous philtátous gar oîda nôin
ART.ACC closest.ACC in.fact know.1SG.PRF us.DAT.DU
óntas pikroús
be.PTCP.ACC hostile.ACC
'In fact I know that our closest kin are bitterly hostile to us both.'

Further evidence of this pattern is offered by *gignőskō,* as shown by the contrast between the infinitive complement in (9) (with an ability reading) and the participial complement in (10a–b) (with an epistemic reading):

(9) γνῷ τρέφειν τὴν γλῶσσαν ἡσυχωτέραν. (S. *Ant*. 1089)
gnôi tréphein tēn glôssan hēsukhōtéran
know.3SG.SBJV keep.INF ART.ACC tongue.ACC quieter.ACC
'Let him learn how to keep his tongue quieter.'

(10) a. ἔγνωκα γὰρ δὴ φωτὸς ἠπατημένη. (S. *Aj*. 807)
égnōka gar dē phōtos ēpatēménē
know.1SG.PRF in.fact PTCL man.GEN deceive.PTCP.PASS.NOM
'I know that I have been deceived by the man.'

b. ἔγνων γάρ μιν [...] οἰωνὸν ἐόντα. (*Od.* 15.532)
égnōn gár min oiōnon eónta
know.1SG.AOR in.fact him.ACC bird.of.omen.ACC be.PTCP.ACC
'For I knew that he was a bird of omen.'

It must be added that the modal use of *gignőskō* is very rare. In our corpus, including more than 1000 occurrences of this verb, the modal dynamic reading is found only in example (9).[4] Its uniqueness is in itself a matter of interest. It shows that we are dealing with a productive pattern: a knowledge verb may occasionally be used in the modal meaning 'be able to'. Remarkably, we have here the same root (**ĝneh$_3$-*) as in English *know*, *can*, etc.

4 Here, the aorist form *gnôi* suggests an ingressive reading, hence 'become able to', 'learn (how) to'; on the ingressive value of aorist forms cf. Napoli (2014).

A further option, which is extremely rare, is the *Accusative and Infinitive* construction, that is, an infinitive complement clause with an expressed subject that takes accusative case. In our corpus, we only find two examples, both with *epístamai* (S. *Ant*. 1092–1094; Hdt. 3.139.16 = ex. (11)) and both with a subject that is not co-referent with the subject of the matrix clause. In this construction, the knowledge verb has its full lexical meaning.

(11) ὁ μὲν δὴ Συλοσῶν ἠπίστατο τοῦτό οἱ ἀπολωλέναι δι᾽ εὐηθίην. (Hdt. 3.139.16)
ho men dē Sulosôn ēpístato toûtó
ART.NOM PTCL PTCL Syloson.NOM know.3SG.IMPF DEM.ACC
hoi apolōlénai di᾽ euēthíēn
him.DAT lose.INF.PASS.PRF because.of good.heartedness.ACC
'Syloson knew that this had been lost to him because of his good nature.'

Given its rarity, we disregard this construction in what follows, noting however that there is an important difference between fuller infinitive clauses with an expressed subject and bare infinitive complements with no expressed subject and obligatory coreference with the subject of the matrix clause.

2.3 Summary of distribution

As emerges from the passages above, there is a correlation between the form of the complement and the semantic value of the main verb.[5] In particular,

a. the *dynamic modal* reading emerges when the complement clause is a same-subject infinitival clause (where the subject is never expressed), that is, what we call a 'bare infinitive';[6]

5 In general, the association between differences in meaning and differences in complementation patterns is quite common in Ancient Greek, and has been repeatedly observed in the literature. For a general overview cf. Cristofaro (2008, 2012); as the author observes, "some predicates can take more than one complement clause type, with a change in the meaning of the sentence" (Cristofaro 2008: 572). This interrelation does not necessarily imply that the meaning of the matrix verb is *determined* by the form of the complement (cf. la Roi 2020).

6 For a similar behaviour of knowledge verbs in Latin, cf. Torrego (2019). As suggested by an anonymous reviewer, this phenomenon, in Greek, may be put in relation with the association between infinitives and non-factivity (cf. Huitink 2009). However, the applicability the notion of (non)factivity to bare infinitives (as opposed to fuller infinitive clauses, to which Huitink 2009 refers) can be questioned, as argued by Benedetti and Gianollo (2022), since they do not express a full proposition.

b. the *non-modal knowledge* meaning emerges with the other kinds of complementation, namely participle complement clauses and finite complement clauses (both with no constraint on subject reference).

A schematic representation of the main contrasts opposing modal and non-modal readings is offered in Table 1:

Table 1: Contrast between the modal and the non-modal reading.

	Knowledge verb	
	Modal ("be able to")	**Non-modal ("know that")**
Complement clause	Infinitive	Participle / Finite complement
Embedded subject	+ Coref. with matrix subj.	± Coref. with matrix subj.
	NOT expressed	± expressed

In the non-modal reading, the lack of any constraint on subject coreference is associated with the fact that the matrix verb and the complement clause represent two distinct events[7] ('I have come to a city that has great power, *and* I know it', ex. (6a); 'your son is wise, *and* I know it', ex. (6b)), with independent temporal reference. By contrast, in the modal reading the matrix verb and the embedded infinitive represent a single event, and the embedded infinitive does not have independent temporal reference (cf. Section 3.2).

With respect to so-called "non-finite" complementation specifically, we observe a fundamental difference between participle and infinitive complements of knowledge verbs. Bare infinitives, in these structures, constitute a defective sentential domain (Pires 2006), in the sense that they do not contain autonomous specifications of certain features (primarily, tense and agreement), hence their subject establishes an obligatory referential dependency with the subject of the matrix verb.[8] Participles, instead, constitute an autonomous sentential domain, in the sense that, thanks to autonomous tense and agreement specifications, they are able to license their own subject, which remains therefore referentially independent from the subject of the matrix verb (cf. Bary and Haug 2011; Goldstein 2016: chapter 7; Benedetti and Gianollo 2020).[9]

7 On the interrelation between argument coreference and event integration cf. Givón (2001: 40 and *passim*), Cristofaro (2003: 117–122).

8 They fall into the class of "dynamic" infinitives; cf., e.g., Rijksbaron (2006: 96–98).

9 The Ancient Greek data raise interesting issues (which we shall not dwell upon here) into the debated notion of finiteness / non-finiteness and its interpretation on morphological or syntac-

3 The dynamic modal construction: Syntactic analysis

In this Section we further explore the nature of the construction which enables the dynamic modal reading. In Section 2 we concluded that, for all the knowledge verbs examined, this construction involves a same-subject infinitival complement, and we preliminarily observed that bare infinitives of this kind can be considered a defective sentential domain. In this Section, we substantiate this claim by examining, on the one hand, the properties of the matrix verb (Section 3.1) and, on the other hand, the properties of the dependent infinitive (Section 3.2). This way, we propose an account for why the dynamic modal reading emerges precisely under these structural conditions.

In what follows, we will focus on the verb *epístamai* for exemplification.

3.1 Argument structure (knowledge verb)

In the pattern *knowledge verb + infinitive* (henceforth *dynamic "know"*), the knowledge verb fully retains its argument structure. Namely, it retains the ability of assigning a semantic role to both the internal (Section 3.1.1) and the external argument (Section 3.1.2).

3.1.1 The semantic role of the internal argument

The ability of *dynamic "know"* to assign a semantic role to the internal argument results from the parallelism between the infinitive and nominal complements. More precisely, the distribution of the infinitive complement shows remarkable affinities with nominal ones, both paradigmatically and syntagmatically.

Paradigmatically, the infinitive can alternate with a noun phrase, as shown in the Homeric passages in (12): depending on the participle of *oîda* (*eidótes / eidóte*), the genitive noun phrase *mákhēs (pásēs)* 'of (all) fight' alternates with the corradical infinitive *mákhesthai* '(to) fight'.

---

tic terms. Important assessments, addressing finiteness with reference both to Greek data and to general aspects, can be found in Joseph (1983). For the recent theoretical debate on finiteness cf. Nikolaeva (2007); Melum Eide (2016); Chamoreau and Estrada-Fernández (2016).

(12) a. ἐὺ εἰδότες ἶφι **μάχεσθαι** (*Il.* 2.720)
eu *eidótes* *îphi* *mákhesthai*
well know.PTCP.NOM.PL forces.INSTR fight.INF
'Well skilled *to fight* mightily'

b. **μάχης** εὖ εἰδότε πάσης (*Il.* 5.11)
mákhēs *eû* *eidóte* *pásēs*
fight.GEN well know.PTCP.NOM.DU all.GEN
'Both well skilled *in all fight*'

Syntagmatically, infinitive and noun phrase may also be coordinated, as shown in (13): here, depending on *epístamai*, the noun phrase *pollous katharmoús* 'many atonements' is conjoined with the infinitives *légein* '(to) speak' and *sigân* '(to) keep silent':

(13) ἐγὼ [...] ἐπίσταμαι / **πολλοὺς καθαρμούς**, καὶ **λέγειν** ὅπου δίκη / **σιγᾶν** θ' ὁμοίως. (A. *Eu.* 276–278)
egō *epístamai* *pollous* *katharmoús* *kai* *légein*
I.NOM know.1SG.PRS many.ACC atonements.ACC and speak.INF
hópou *díkē* *sigân=th'* *homoíōs*
when right.NOM be.silent.INF = and likewise
'I know many atonements, and to speak when it is proper and be silent in turn.'

Interestingly, as shown by (12)–(13), the modal dynamic reading is not exclusive of the infinitive complementation; rather, it represents a potentiality of the governing verb, compatible with both infinitive and noun phrase complements. Depending on *eidóte*, the noun phrase *mákhēs*, similarly to the infinitive *mákhesthai*, refers to an ability (that of performing fights); the same holds for the noun phrase *pollous katharmoús*, coordinated with the infinitive *légein* in (13) and referring to the ability of performing many atonements.

The commonality that noun phrase complements share in this construction is that their semantics allows an ability reading connected to performative knowledge. Note that the ability reading is not restricted to *action* nouns in a narrow sense (as in the case of *mákhēs* 'fight' in (12b), which we chose because it allows an immediate comparison with the inf. *mákhesthai* in (12a)). It also occurs with nouns which would be labelled as *concrete*, such as *aikhmḗ* 'spear' or *tóxon* 'bow'. Depending on *oîda*, these nouns may behave like action nouns ('the use of the spear', 'the

use of the bow'): cf. *aikhmês eu eidős* 'well skilled in [the use of] spear' (*Il.* 15.525), *tóksōn eu eidős* 'well skilled in [the use of] bows' (*Il.* 2.718).[10]

There is an interesting asymmetry between infinitives and noun phrase complements: the latter are not associated exclusively with performative knowledge; e.g., in Pl. *Phd.* 61b, the object noun phrase *múthous tous Aisópou* 'the fables of Aesop', depending on *epístamai* refers to acquaintance knowledge ("knowledge of specific experiences involving persons, entities and events", Torrego 2019: 21) and thus does not produce a modal reading.

The affinity between the infinitive and NP complementation is further confirmed by the fact that the infinitive itself may be substantivised, being preceded by the definite article:[11]

(14) ἄναξ Ἄπολλον, οἶσθα μὲν **τὸ** μὴ ἀδικεῖν. (A. *Eu.* 86)
ánax *Ápollon* *oîstha* *men* *to* *mē* *adikeîn*
lord.VOC Apollo.VOC know.2SG.PRF PTCL ART.ACC NEG do.wrong.INF
'Lord Apollo, you know how to avoid doing wrong.' (lit. 'the not-doing wrong')

3.1.2 The semantic role of the external argument

Dynamic "know" retains the ability of assigning a semantic role to the external argument as well: namely, it imposes a [+animate] restriction on its subject, which is co-referent with the understood subject of the infinitive.

In view of the ability of the knowledge verb to assign a semantic role to the external argument, we shall assume that, when the complement is a bare infinitive, a mechanism of *control* accounts for the same-subject constraint (as seen in Section 2.3, a feature of dynamic as opposed to epistemic "know").[12] Cf. (15=5) where the control relationship between the subject of *epístatai*, i.e. *gunḗ*, and the PRO subject of the infinitive *sōphroneîn* is highlighted:

(15) πᾶσα γὰρ ἀγαθὴ γυνὴ [...] σωφρονεῖν ἐπίσταται. (E. *Fr.* 909.3 Nauck) (= ex.(5))
pâsa *gar* *agathē* *gunē*$_i$ ***(PRO**$_i$**)*** *sōphroneîn* *epístatai*
all.NOM in.fact good.NOM wife.NOM be.wise.INF know.3SG.PRS
'Every good wife knows how to be wise.'

10 For a thorough investigation of nominal complements with knowledge verbs in Latin, cf. Torrego (2019).

11 For an overview of the articular infinitive in Ancient Greek, cf. Fykias (2014).

12 On PRO and control infinitives in Ancient Greek cf., e.g., Joseph (2002); Sevdali (2013). On some debated issues on PRO in Modern Greek cf. Philippaki-Warburton and Catsimali (1999), with references.

For the control relation to obtain, of course, the subject of the embedded predicate must be compatible with the semantic prerequisite that knowledge verbs impose on their subject, namely, it must be [+animate].

3.2 Defective sentential domain (infinitive complement)

In the pattern *knowledge verb + infinitive*, the infinitive complement shows various hallmarks of a defective sentential domain (that is, of being a domain lacking certain features). Defectivity can, in turn, be argued to be responsible for the transparency of the embedded domain with respect to certain operations.

In this construction, the infinitive is defective for tense: in its inflection, we find only aspectual stems (present / aorist), and not forms necessarily carrying temporal values (such as future infinitives).[13]

In our corpus, the present strongly prevails quantitatively over the aorist: depending on *epístamai*, we have 87 present infinitives (from 62 different verbs) and 9 aorist infinitives (from 7 different verbs). Moreover, we found no instances of the same verb lexeme occurring in both present and aorist infinitive: this points to a sort of lexical distribution (rather than to a grammatical opposition).

As is generally assumed, lack of independent temporal reference is a mark of integration between the embedded infinitive and the main verb, which together represent a single event.[14]

A test that can be adopted to determine the defective nature of the embedded domain is the availability of an operation that points to the domain's transparent nature, namely clitic climbing. Clitic climbing takes place when a clitic argument

13 Future infinitives instead occur, expressing temporal values, in subordinate clauses depending, e.g., on verbs of thinking: cf. *oíomai* in *Il.* 3.341 (*kikhḗsesthai dé s' oíō* 'and I think I shall overtake you') and *Il.* 1.204 (*to de kai teléesthai oíō* 'I think this will come to pass') – respectively with and without subject coreference between the matrix verb and the infinitive complement. On the lack of temporal distinctions between present and aorist dynamic infinitives, cf. Rijksbaron (2006: 98, 102–103). By contrast, tense is encoded in the complementation construction of knowledge verbs with participles (which, as observed in Section 2.2, leads to an epistemic value for the knowledge verb). For example the present participle *óntes* and the future participle *kinduneúsontes* depending on the participle *gnóntes* 'knowing' are opposed as present vs. future in Th. 3.28: *gnóntes […] oút' apokōlúein dunatoi óntes, eí t' apomonōthḗsontai tês sumbáseōs, kinduneúsontes* 'realizing that *they are not able* to prevent this and that *they will be in peril* if excluded from the capitulation'.

14 On the interrelation between *event integration* at the semantic level and *clause integration* at the syntactic level cf. Givón (2001: 40; on modality verbs, p. 55); Cristofaro (2003: 111–122); cf. also Noonan ([1985] 2007) on the correlation between dependent time reference and the reduced form of complements, and p. 68 for a specific observation on Ancient Greek infinitives.

of the embedded infinitive is realised in a position connected to the main verb, cf. Italian *lo* 'it' in (16):

(16) Italian
  a. *Francesco **sa** suonare bene il pianoforte.*
     'Francesco knows how to play the piano well.' (= can play the piano well)
  b. *Francesco **sa** suonar**lo** bene.*
  c. *Francesco **lo sa** suonare bene.*
     'Francesco knows how to play it well.'

In (16b) the pronominal object argument of the infinitive is realised next to the infinitive *suonare* 'play', whereas in (16c) it is realised next to the main verb *sa* 'knows' (i.e. within the main clause). Note that this is only possible when the main verb is complemented by a bare infinitive and has the dynamic modal reading. If the infinitive is preceded by the complementiser *di* and the main verb receives the "know that" interpretation, clitic climbing is impossible, as shown in (17):

(17) Italian
  a. *Francesco **sa** di suonar**lo** bene.*
  b. **Francesco **lo sa di** suonare bene.*
     'Francesco knows that he plays it well.'

Clitic climbing is considered to be a sign of the fact that the main verb and the infinitive represent a single syntactic domain, thus allowing for displacement of the clitic argument. This phenomenon, known in the generative syntactic literature as restructuring, is interpreted as a sign of monoclausality (see the discussion in Cinque 2004).

Clitic climbing has been acknowledged to be a diagnostics for monoclausality also in Ancient Greek, showing that some infinitival complements form a single syntactic domain with their selecting verb.[15] However, in our corpus we find only two cases of clitic climbing with knowledge verbs in a dynamic modal reading, both from Homer and both with *epístamai*: *Il.* 16.141–142 (= 19.388–389), shown in (18), and *Il.* 21.320–321:

15 Cf. Goldstein (2016: chapter 8) on infinitive complements and references cited there (especially p. 261 fn. 2); furthermore Janse (2008), with discussion.

(18) τὸ μὲν οὐ δύνατ᾽ ἄλλος Ἀχαιῶν / πάλλειν, ἀλλά **μιν** οἷος ἐπίστατο πῆλαι Ἀχιλλεύς. (*Il.* 16.141–142 = 19.388–389)

to	*men*	*ou*	*dúnat'*	*állos*	*Akhaiôn*	*pállein*
DEM.ACC	PTCL	NEG	can.3SG.IMPF	other.NOM	Achaeans.GEN	wield.INF

allá	***min***	*oîos*	*epístato*	*pêlai*	*Akhilleús*
but	it.ACC	alone.NOM	know.3SG.IMPF	wield.INF	Achilles.NOM

'This (= the spear) no other of the Achaeans could wield, but Achilles alone knew how to wield it.'

In (18), the clitic pronoun *min* 'it' (the spear) is selected as an argument by the infinitive *pêlai* 'wield'; however, it is realised as an element of the matrix clause, in clause-second position (the so-called Wackernagel position). Goldstein (2016) interprets Wackernagel's Law as an interface phenomenon involving both prosodic and syntactic factors. According to Goldstein (2016: 293), the same generalizations on clitic distribution that he formulates for Herodotus apply to Homer as well, *modulo* differences in frequency that he attributes to a difference in literary genre (but not meter *per se*). Namely, pronominal clitics are clausal clitics: they occur in second position (that is, hosted by the first prosodic word) within a specific syntactic domain, represented by the clause (that is, a CP in formal syntactic terms). Hence, cases like (18), where a pronominal clitic occurs in the matrix clause despite being selected semantically by the infinitive, would show that the infinitive is not a full clause, and the main verb and the infinitive represent a single syntactic domain.

However, given the fact that we could retrieve only two instances in our corpus, the argument based on clitic climbing as a diagnostics of structural defectivity remains inconclusive for Ancient Greek.[16]

To conclude this Section, the strong semantic dependency between the matrix and the embedded predicate, which consists in the mechanism of subject control and in the creation of a unitary tense domain, points towards an analysis of dynamic modal uses of knowledge verbs in terms of monoclausality. What enables the dynamic modal reading of knowledge verbs is, thus, the presence of a single event, which is obtained either by means of infinitival complementation or, as we saw in Section 3.1.1, by means of appropriate noun phrase complementation.

16 An anonymous reviewer observes that, based on a preliminary query by means of Dendrosearch (see Keersmaekers *et al.* 2019), clitic climbing appears to be available with Ancient Greek verbs that exhibit an auxiliary-like behavior, such as e.g. *ethélō* 'be willing', *boúlomai* 'will', *méllō* 'be likely'. We are very grateful to the reviewer for useful discussion on this issue.

4 Have Ancient Greek knowledge verbs developed into modal verbs?

4.1 The lexical > functional cline

The syntactic analysis proposed for dynamic "know" in Section 3 coincides with the account provided by Wurmbrand (2004) for so-called lexical restructuring verbs.

Wurmbrand (2004) distinguishes lexical restructuring verbs from functional restructuring verbs on the basis of cross-linguistically observed properties. Functional restructuring verbs (e.g. German *scheinen* 'seem') fall into the class of auxiliaries: they do not possess an argument structure; the arguments are provided by the lexical complement predicate. Functional restructuring verbs are raising verbs (Wurmbrand 1999), in the sense that they do not assign a thematic role to the subject with which they agree in person and number; the subject receives a thematic role from the lexical complement predicate. Lexical restructuring verbs (e.g. German *versuchen* 'try'), instead, are full lexical verbs that retain their argument structure, hence assign a thematic role to their subject and their object. The co-reference with the subject of the infinitival complement is achieved through a mechanism of control.

We can understand the distinction between functional and lexical restructuring verbs as a way to formalise the different degrees that are cross-linguistically observed in the continuum from lexical to functional (auxiliary-like) predicates. Also for Ancient Greek we observe these different degrees in the case of premodal and modal meanings. This raises the diachronic question introduced in Section 1: is dynamic "know" moving along this continuum, that is, is its modal meaning emerging in a process of grammaticalization from a lexical to a functional verb? In other words: has dynamic "know" developed into a modal verb in Ancient Greek?

Grammaticalization clines with modals have been studied especially for the history of English (cf., among others, Traugott 1972; Lightfoot 1979; Bybee, Perkins and Pagliuca 1994; van der Auwera and Plungian 1998; Traugott and Dasher 2002; Roberts and Roussou 2003) and have been connected to semantic, syntactic and morphological changes. However, despite several recurring characteristics, modal verbs form a syntactically heterogeneous class, often also within the same language, thus the answer to the questions above is not straightforward.

For Ancient Greek, we lack clear syntactic diagnostics for modal verbs.[17] Based on cross-linguistic evidence, we take *bona fide* modal verbs to be auxiliary-like ele-

17 But see de la Villa Polo (1989), who proposes some useful syntactic diagnostics to detect the auxiliary status of a class of verbs in Ancient Greek, comprising modal verbs.

ments of the functional lexicon appearing in monoclausal raising structures (that is, functional restructuring verbs in Wurmbrand's 2004 classification). In order to evaluate the status of Ancient Greek dynamic "know" on the lexical > functional grammaticalization cline, in Section 4.2 we compare it with the typical unmarked verb expressing dynamic modality in Ancient Greek, the verb *dúnamai* 'can', which is almost uncontroversially considered a modal verb (cf. Ruiz Yamuza 1997; Kölligan 2021; but *dúnamai*, as well as *epístamai* and *oîda*, is classed among "premodal" predicates by Allan 2013).[18]

4.2 An Ancient Greek modal verb: *dúnamai* 'can'

The behaviour of *dúnamai* shows affinities with that of knowledge verbs in the expression of dynamic modality. Also *dúnamai*, in fact, takes a same-subject infinitival complement, which is not inflected for tense (only present and aorist infinitives occur, without temporal distinction), does not allow an overt subject and allows clitic climbing; cf. (19):

(19) ἡ γῆ ἥδε οὐκ ἡμετέρη ἐστὶ οὐδέ **μιν** δυνησόμεθα ὑποχειρίην ποιήσασθαι. (Hdt. 6.107.17)

hē	*gê*	*hḗde*	*ouk*	*hēmetérē*	*esti*	*oudé*
ART.NOM	land.NOM	this.NOM	NEG	our.NOM	be.3SG.PRS	and.not
min	*dunēsómetha*	*hupokheiríēn*		*poiḗsasthai*		
it.ACC	can.1PL.FUT	subjugated.ACC		make.INF		

'This land is none of ours, nor shall we be able to subdue it.'

In (19), the clitic pronoun *min* 'it' (the land) is selected as an argument by the infinitive *poiḗsasthai*; however, it is realised as an element of the matrix clause, in clause-second position, showing that main verb and infinitival complement represent a single syntactic domain.

By the way, the affinity between *dúnamai* and *epístamai* is already suggested by ancient commentators to Homer: in discussing (20), Aristonikos (Friedländer 1853, *ad loc.*) observes that *epistḗsontai* is used "instead of" *dunḗsontai.*

18 Allan's classification is based on semantic criteria: "premodal" predicates "assign an objective physical or mental property to a participant or his immediate situation" (Allan 2013: 32), whereas "modal" predicates are centered on the speaker's involvement in the conceptualization of the state of affairs.

(20) οὐδέ οἱ ὀστέ’ ἐπιστήσονται Ἀχαιοὶ / ἀλλέξαι. (*Il.* 21.320–321)
oudé hoi osté’ epistḗsontai Akhaioi alléxai
and.not him.DAT bones.ACC know.3PL.FUT Achaeans.NOM collect.INF
‘nor will the Achaeans know how to collect his bones.’

Anyway, the relationship between *dúnamai* and *epístamai* does not imply semantic equivalence. Let us compare the following Homeric passages, with the infinitive *mákhesthai* depending on *epístamai* and *dúnamai* respectively.

(21) νῶι δὲ καί κ’ ἀγαθοῖσιν ἐπισταίμεσθα μάχεσθαι. (*Il.* 13.238)
nôi de kaí k’ agathoîsin epistaímestha mákhesthai
we.NOM.DU PTCL also MOD brave.DAT know.1PL.OPT fight.INF
‘But we two would know well how to do battle even with the brave.’

(22) οὐ γὰρ ἀνὴρ πρόπαν ἦμαρ ἐς ἠέλιον καταδύντα / ἄκμηνος σίτοιο δυνήσεται ἄντα μάχεσθαι. (*Il.* 19.162–163)
ou gar anēr própan êmar es ēélion katadúnta
NEG in.fact man.NOM all.ACC day.ACC to sun.ACC go.down.PTCP.ACC
ákmēnos sítoio dunḗsetai ánta mákhesthai
fasting.NOM food.GEN can.3SG.FUT against fight.INF
‘For there is no man who will be able the whole day long until sunset to fight against the foe, fasting the while from food.’

Epistaímestha mákhesthai in (21) refers to an ability specifically related to some intellectual skills (i.e. it falls into the domain of “learnt / intellectual participant-internal possibility”, a specific subtype of the general “participant-internal possibility”; van der Auwera and Plungian 1998), whereas *ou dunḗsetai mákhesthai* in (22) has no such implication. What is negated in (22) is not someone’s military know-how, but someone’s possibility of fighting (in the specific case, undermined by fasting).[19] *Dúnamai* denotes a generic ability, thus representing the unmarked member in the *dúnamai* ~ *epístamai* opposition.[20]

This recalls the contrast observed, e.g., between French *savoir* and *pouvoir* and commented by van der Auwera and Plungian (1998: 82) to show the difference

19 This contrast is independent from the presence of the negation in (22). If we add a negation in (21), it is the know-how, not its actualization which would be negated. On the frequency of negated *dúnamai* in Homer, cf. Kölligan (2021).

20 *Dúnamai* is not restricted to the encoding of inherent / physical ability; cf., e.g. *trissas d’ ou dúnatai pepitheîn phrénas oud’ apatêsai* (*h.Ven.* 7–8) ‘But there are three [goddesses] whose minds she cannot persuade or outwit’, where the assumption of inherent / physical ability seems unlikely.

between *learnt / intellectual* or *inherent / physical* participant-internal possibility (cf. Section 1):

(23) *Ceux qui ne **savent** ou ne **peuvent** lire [...]* (Grevisse 1980: 800)
'Those who do not know how to read (those that have not learnt it) and those who cannot read (e.g., the blind).'

The semantic component "learnt / intellectual ability" which characterises the modal uses of knowledge verbs is clearly related to the semantic restrictions on the subject's animacy observed above (cf. Section 3.1.2).

In this context, it is interesting to observe that knowledge verbs may lose this requirement during grammaticalization: for instance, in Italian it is possible to find dynamic "know" with an inanimate subject, as in (24).

(24) *Quella era proprio una giornata favolosa, come **sa** essere favolosa solo una giornata primaverile.*
'That was really a beautiful day, as only a spring day can (lit. knows) be.' (CORIS1980_2000_SubCorpus:NARRAT)

However, no comparable cases occur in our Ancient Greek corpus, pointing to the fact that in Ancient Greek dynamic "know" is not as advanced on the grammaticalization cline as in Italian.

Pursuing the comparison between *dúnamai* and dynamic "know" further, we will claim that, besides not being semantically equivalent, the two verbs are not syntactically equivalent either.

As observed in Section 3.1, knowledge verbs in their modal uses have an argument structure, assigning a semantic role to the clause arguments. This property is not shared by *dúnamai*: on the one hand, it does not take object noun phrase complements as an alternative to the infinitive (differently from *epístamai*, cf. Section 3.1.1);[21] on the other hand, it does not impose semantic restrictions on the clausal subject (differently from *epístamai,* cf. Section 3.1.2).

21 An anonymous reviewer rightly points out that object noun phrases with *dúnamai* are indeed possible when they are quantificational (e.g. *Od.* 4.237: *Zeus [...] dúnatai gar hápanta* 'Zeus is indeed capable of everything'). In these cases, it is plausible to assume that these objects are not assigned a semantic role, but serve to measure out the event; hence, as adverbial measure phrases, they do not represent evidence with respect to argument structure. Interestingly, Lightfoot (1979: 101) notes that *can* was the last modal in English to lose the possibility of taking direct objects.

As can be easily shown, with *dúnamai* semantic restrictions on the clausal subject depend on the embedded infinitive. So, when the embedded infinitive is the verb 'see', as in (25), the clausal subject must necessarily be animate:

(25) δοιὼ δ' οὐ δύναμαι ἰδέειν κοσμήτορε λαῶν. (*Il.* 3.236)
doiō d' ou dúnamai idéein kosmḗtore laôn
two.ACC PTCL NEG can.1SG.PRS see.INF marshalers.ACC people.GEN
'But I cannot see two marshalers of armies.'

By contrast, with a verb such as 'bear' (which admits both animate and inanimate subjects), the *dúnamai* construction preserves both possibilities: cf. (26), with an animate subject ('fools') and (27), with an inanimate subject ('ship'):

(26) τὰ μὲν ὣν / οὐ δύνανται νήπιοι κόσμῳ φέρειν. (Pi. *P.* 3.81–82)
ta men ôn ou dúnantai nḗpioi kósmōi phérein
these.ACC PTCL thus NEG can.3PL.PRS fools.NOM grace.DAT bear.INF
'Now fools cannot bear them (= evils) gracefully.'

(27) οὐδὲ φέρειν δύναταί μιν νηῦς εὐεργής. (*h. Bacch.* 18)
oude phérein dúnataí min nēûs euergḗs
and.not bear.INF can.3SG.PRS him.ACC ship.NOM sturdy.NOM
'And our sturdy ship cannot support him.'

Given the absence of thematic restrictions imposed by *dúnamai*, the same-subject constraint with *dúnamai* is best explained through raising (and not control, as in the case of *epístamai*). The subject is selected and receives a thematic role from the embedded infinitive, and agrees in person and number with the modal verb (cf. Section 4.1).

4.3 Summary of comparison

The comparison between *dúnamai* and dynamic "know" leads to the following conclusions.

First, Ancient Greek *dúnamai* can be considered a dynamic modal auxiliary on the basis of semantic and syntactic tests; the relationship with the embedded infinitive can be analysed as a raising construction, in virtue of the absence of argument structure for the main verb. Ancient Greek *dúnamai* falls therefore in the class of functional restructuring verbs.

Secondly, in their ability reading, Ancient Greek knowledge verbs (dynamic "know") conform only in part to the modal pattern: they do not acquire the status of auxiliaries, since they retain their argument structure, as shown by semantic constraints imposed on their subject and by the possibility of taking NP objects. They fall into the class of lexical restructuring verbs, which take part in control constructions with their embedded infinitive.

In this respect, the answer to the question whether dynamic "know" has developed into a modal verb is negative: it has some hallmarks of auxiliary-like verbs, but it is not fully grammaticalised as a modal auxiliary.

5 Conclusions

In this Section we go back to the research questions formulated in Section 1 and we summarise the answers provided by our corpus study:

(i) What are the semantic and syntactic conditions that enable modal uses of knowledge verbs in Ancient Greek?

With respect to this question, we concluded that the dynamic modal reading appears when the knowledge verb is complemented by a tense-defective infinitival complement. In this structure, there is obligatory subject coreference, which we analysed as due to a mechanism of control. We furthermore characterised infinitives in these structures as a defective sentential domain, hence, as a particularly reduced predicative structure, which does not contain autonomous specification of tense and agreement features. This allowed us to address question (ii):

(ii) Why do precisely these conditions lead to the emergence of the modal reading?

Since in Ancient Greek the infinitive complementation of knowledge verbs with a dynamic modal reading is a defective sentential domain, semantically it does not constitute an autonomous predicational domain. This led us to analyse the construction as monoclausal and to conclude that the dynamic modal reading of knowledge verbs emerges when a single event is expressed by the combination of the main and the embedded predicate. This happens with defective infinitives, but also finds interesting correlates in nominal complementation. The structural defectiveness of the complement of knowledge verbs seems to be correlated with dynamic modal readings in a broader cross-linguistic perspective (see e.g. Cinque 2004 for Italian *sapere*; Roussou 2010 for Modern Greek *kséro*). These observations led us to question (iii):

(iii) Do the modal uses emerge diachronically as a step on a diachronic grammaticalization path from a lexical verb to a functional (auxiliary-like) verb? Or are they rather a stable feature of the language, to be explained by the co-existence of certain structural prerequisites?

We concluded that knowledge verbs in a dynamic modal reading retain their argument structure in Ancient Greek, hence they are still lexical verbs. In this, they are different from a modal verb like *dúnamai* 'can', which behaves like an auxiliary, with no autonomous argument structure. The main difference we detected is the presence of control with knowledge verbs, as opposed to raising with functional modal verbs.

On the basis of this conclusion, we believe that there is no ongoing grammaticalization in the case of Ancient Greek knowledge verbs. The verbs are not developing a fully functional variant in the sense of Roberts and Roussou (2003); van Gelderen (2004); Wurmbrand (2004). Our corpus study, comprising Archaic and Classical Greek texts, shows that dynamic readings of knowledge verbs are a diachronically invariant feature of the language in the period we surveyed. The knowledge and the ability value coexist (with different complementation patterns), differently from what is observed in e.g. the diachrony of English with *cunnan* > *can*. Similarly, instead, to the synchrony of English (*know that* vs. *know how*), in Ancient Greek the knowledge and the dynamic modal value are distinguished by the complementation pattern.

Interestingly, this coexistence, associated with different complementation patterns, persists, through lexical discontinuity, into Modern Greek, with *ksérō* 'know that / know how' (on this cf. especially Roussou 2010). Thus, the phenomenon here investigated appears to be a long-term trend in the history of Greek, which survives the loss of the infinitive (Joseph 1983).

References

Aijmer, Karen. 2004. The semantic path from modality to aspect: *Be able to* in a cross-linguistic perspective. In Hans Lindquist & Christian Mair (eds.), *Corpus approaches to grammaticalization in English*, 57–78. Amsterdam: Benjamins.

Allan, Rutger J. 2013. Exploring modality's semantic space. Grammaticalization, subjectification and the case of ὀφείλω [*opheílō*]. *Glotta* 89. 1–46.

van der Auwera, Johan & Vladimir A. Plungian. 1998. Modality's semantic map. *Linguistic Typology* 2. 79–124.

Bary, Corien & Dag T. T. Haug. 2011. Temporal anaphora across and inside sentences: The function of participles. *Semantics and Pragmatics* 4. 1–56.

Benedetti, Marina & Chiara Gianollo. 2020. Criteria for subjecthood and non-canonical subjects in Classical Greek. In Bridget Drinka (ed.), *Historical Linguistics 2017: Selected papers from the 23rd International Conference on Historical Linguistics*, 30–48. Amsterdam: Benjamins.

Benedetti, Marina & Chiara Gianollo. 2022. The role of factivity in Ancient Greek complementation patterns. Presentation at ICAGL – International colloquium of Ancient Greek linguistics, Universidad Autónoma de Madrid, June 17, 2022.

Bentein, Klaas. 2015. Minor complementation patterns in Post-classical Greek (I–VI AD): A sociohistorical analysis of a corpus of documentary papyri. *Symbolae Osloenses* 89(1). 104–147.

Bybee, Joan, Revere Perkins & William Pagliuca. 1994. *The evolution of grammar: Tense, aspect and modality in the languages of the world*. Chicago: University of Chicago Press.

Chamoreau, Claudine & Zarina Estrada-Fernández. 2016. Finiteness and nominalization. An overview. In Claudine Chamoreau & Zarina Estrada-Fernández (eds.), *Finiteness and nominalization*, 1–10. Amsterdam: Benjamins.

Cinque, Guglielmo. 2004. 'Restructuring' and functional structure. In Adriana Belletti (ed.), *Structures and beyond: The cartography of syntactic structures*, vol. 3, 132–191. Oxford: Oxford University Press.

Cristofaro, Sonia. 1998. Grammaticalization and clause linkage strategies: A typological approach with particular reference to Ancient Greek. In Anna Giacalone Ramat & Paul Hopper (eds.), *The limits of grammaticalization*, 59–88. Amsterdam: Benjamins.

Cristofaro, Sonia. 2003. *Subordination*. Oxford: Oxford University Press.

Cristofaro, Sonia. 2008. A constructionist approach to complementation: Evidence from Ancient Greek. *Linguistics* 46. 571–606.

Cristofaro, Sonia. 2012. Participial and infinitival complement sentences in Ancient Greek. In Volker Gast & Holger Diessel (eds.), *Clause linkage in cross-linguistic perspective*, 335–362. Berlin & Boston: De Gruyter Mouton.

Faure, Richard. 2014. Argument clause. In Georgios K. Giannakis (ed.), *Encyclopedia of Ancient Greek language and linguistics online.* Vol. I, 172–178. Leiden & Boston: Brill. [First published online 2013: http://dx.doi.org/10.1163/2214-448X_eagll_COM_00000035].

Friedländer, Ludwig (ed.). 1853. *Aristonici Περὶ σημείων Ἰλιάδος reliquiae emendatiores* [New edition of the surviving parts of Aristonicos' *On the critical signs of* the Iliad]. Göttingen: Dieterich.

Fykias, Ioannis. 2014. Infinitives (Syntax). In Georgios K. Giannakis (ed.), *Encyclopedia of Ancient Greek language and linguistics online*. Vol. II, 229–236. Leiden & Boston: Brill. [First published online 2013: http://dx.doi.org/10.1163/2214-448X_eagll_COM_00000189].

van Gelderen, Elly. 2004. *Grammaticalization as economy*. Amsterdam: Benjamins.

Gisborne, Nikolas. 2007. Dynamic modality. *SKASE Journal of Theoretical Linguistics* 4(2). 44–61.

Givón, Talmy. 2001. *Syntax: An introduction*. Vol II. Amsterdam: Benjamins.

Goldstein, David. 2016. *Classical Greek syntax. Wackernagel's law in Herodotus*. Leiden: Brill.

Goossens, Louis. 1992. CUNNAN, CONNE(N), CAN: The development of a radial category. In Günter Kellermann & Michael D. Morrissey (eds.), *Diachrony within synchrony: Language history and cognition*, 377–384. Frankfurt: Lang.

Grevisse, Maurice. 1980. *Le bon usage. Grammaire française avec des remarques sur la langue française d'aujourd'hui*. 11e édition revue. Paris: Duculot.

Heine, Bernd & Tania Kuteva. 2002. *World lexicon of grammaticalization*. Cambridge: Cambridge University Press.

Hengeveld, Kees. 2004. *Illocution, mood and modality*. In Geert E. Booij, Christian Lehmann, Joachim Mugdan & Stavros Skopeteas (eds.), *Morphologie / Morphology. Ein internationales Handbuch zur*

Flexion und Wortbildung / An international handbook on inflection and word-formation. Vol. 17.2, 1190–1201. Berlin & Boston: De Gruyter Mouton.

Huitink, Luuk. 2009. Pragmatic presupposition and complementation in Classical Greek. In Stéphanie Bakker & Gerry Wakker (eds.), *Discourse cohesion in Ancient Greek*, 21–40. Leiden & Boston: Brill.

Janse, Mark. 2008. Clitic doubling from Ancient to Asia Minor Greek. In Dalina Kallulli & Liliane Tasmowski (eds.), *Clitic doubling in the Balkan languages*, 165–202. Amsterdam: Benjamins.

Joseph, Brian D. 1983. *The synchrony and diachrony of the Balkan infinitive: A study in areal, general, and historical linguistics*. Cambridge: Cambridge University Press.

Joseph, Brian D. 2002. On some control structures in Hellenistic Greek: A comparison with Classical and Modern Greek. *Linguistic Discovery* 1. 1–16.

Keersmaekers, Alek, Wouter Mercelis, Colin Swaelens & Toon Van Hal. 2019. Creating, enriching and valorizing treebanks of Ancient Greek. In *Proceedings of the 18th international workshop on treebanks and linguistic theories (TLT, SyntaxFest 2019)*, 109–117. Paris: Association for Computational Linguistics (ACL).

Kölligan, Daniel. 2021. Getting there? Greek δύναμαι [*dúnamai*] 'be able'. In Georgios K. Giannakis, Luz Conti, Jesús de la Villa & Raquel Fornieles (eds.), *Synchrony and diachrony of Ancient Greek*, 151–161. Berlin & Boston: De Gruyter Mouton.

Lightfoot, David. 1979. *Principles of diachronic syntax*. Cambridge: Cambridge University Press.

Melum Eide, Kristin (ed.). 2016. *Finiteness matters. On finiteness-related phenomena in natural languages*. Amsterdam: Benjamins.

Napoli, Maria. 2014. Aorist. In Georgios K. Giannakis (ed.), *Encyclopedia of Ancient Greek language and linguistics*. Vol. I, 136–137. Leiden & Boston: Brill. [First published online 2013: http://dx.doi.org/10.1163/2214-448X_eagll_SIM_00000415]

Nikolaeva, Irina (ed.). 2007. *Finiteness. Theoretical and empirical foundations*. Oxford: Oxford University Press.

Noonan, Michael. 2007 [1985]. Complementation. In Timothy Shopen (ed.), *Language typology and syntactic description*, Vol II, 52–150. 2nd edn. Cambridge: Cambridge University Press.

Philippaki-Warburton, Irene & Georgia Catsimali. 1999. On control in Greek. In Artemis Alexiadou, Geoffrey Horrocks & Melita Stavrou (eds.), *Studies in Greek syntax*, 153–168. Dordrecht: Kluwer.

Pires, Acrisio. 2006. *The minimalist syntax of defective domains: Gerunds and infinitives*. Amsterdam: Benjamins.

Portner, Paul. 2009. *Modality*. Oxford: Oxford University Press.

Rijksbaron, Albert. 2006. *The syntax and semantics of the verb in Classical Greek*. 3rd edn. Amsterdam: Gieben.

Roberts, Ian & Anna Roussou. 2003. *Syntactic change: A minimalist approach to grammaticalization*. Cambridge: Cambridge University Press.

la Roi, Ezra. 2020. The development of εὑρίσκω [*heurískō*] 'find' as evidence towards a diachronic solution of the matching-problem in Ancient Greek complementation. *Philologia Classica* 15(2). 191–207.

Roussou, Anna. 2010. Selecting complementizers. *Lingua* 120. 582–603.

Ruiz Yamuza, Emilia. 1997. Verbos modales en griego antiguo: δύναμαι [*dúnamai*]. In Francisco Rodríguez Adrados & Alfonso Martínez Díez (eds.), *Actas del IX congreso español de estudios clásicos, Madrid, 27 al 30 de septiembre de 1995*. Vol. II, 227–232. Madrid: Ediciones Clásicas.

Rzymski, Christoph, Tiago Tresoldi *et al*. 2019. *The database of cross-linguistic colexifications, reproducible analysis of cross-linguistic polysemies*. https://clics.clld.org

Sevdali, Christina. 2013. Ancient Greek infinitives and phases. *Syntax* 16(4). 324–361.

Torrego, Esperanza. 2019. The expression of knowledge in Latin: *Cognosco*, *nosco*, *scio*, *nescio* and *ignoro*. In Lidewij van Gils, Caroline Kroon & Rodie Risselada (eds.), *Lemmata linguistica latina*. *Vol. II. Clause and discourse*, 20–47. Berlin & Boston: De Gruyter Mouton.

Traugott, Elizabeth Closs. 1972. *A history of English syntax*. New York: Holt, Rinehart, and Winston.

Traugott, Elizabeth Closs. 2011. Modality from a historical perspective. *Language and Linguistics Compass* 5(6). 381–396.

Traugott, Elizabeth Closs & Richard B. Dasher. 2002. *Regularity in semantic change*. Cambridge: Cambridge University Press.

Tsohatzidis, Savas L. 2012. How to forget that "Know" is factive. *Acta Analytica* 27(4). 449–459.

de la Villa Polo, Jesús. 1989. La identificación de la auxiliaridad verbal en Griego. *Cuadernos de Filología Clásica* 22. 195–208.

Wurmbrand, Susi. 1999. Modal verbs must be raising verbs. In *Proceedings of the 18th West Coast conference on formal linguistics* (WCCFL 18), 599–612. Somerville, MA: Cascadilla Press.

Wurmbrand, Susi. 2004. Two types of restructuring – Lexical vs. functional. *Lingua* 114. 991–1014.