

CHAPTER I

The Greek Verbal System

1.1 Introduction

1.1 Variety and Economy in the Verbal System of Ancient Greek

In learning Ancient Greek, most speakers of modern European languages will be surprised by the richness and complexity of its verbal system. According to a basic analysis, we can distinguish

- three persons (first, second, third);
- three numbers (singular, plural, dual);
- seven ‘tenses’ (present, imperfect, aorist, future, perfect, pluperfect, future perfect);
- four moods (indicative, imperative, subjunctive, optative); and
- three voices (active, middle, passive).

If there were no combinatory restrictions, this would mean that there are 756 functional slots in the paradigm of the finite verb. Effectively the number is somewhat lower because there is no imperfect and pluperfect imperative, subjunctive, or optative, no future and future perfect imperative or subjunctive, and no first-person imperative. Even so, the range of possibilities is impressive and could not be handled if each of the remaining slots were randomly assigned a formal correlate (e.g., in the form of a separate stem/ending construct).

Fortunately this is not the case. Considerable formal economy is achieved in a number of ways. For example, the verbal endings, tasked with encoding person and number, differentiate well between eight out of nine relevant person/number combinations (1sg., 2sg., 3sg., 1pl., 2pl., 3pl., 2du., 3du.; but 1du. = 1pl.), and homonymy is fairly marginal there (e.g., 1sg. = 3pl. -ον in the active voice of thematic imperfects and aorists). But the same ‘sets’ of endings are attached to several different tense/mood stems, as when the (thematic) present, future, and future perfect share one set, and the imperfect and (thematic) aorist another. Similarly, whereas one can functionally distinguish actives, middles, and passives in all tenses, the passive voice is formally distinct

from the middle only in the aorist and future (where it has its own stem, even though voice is otherwise also encoded in the ending). And although there are seven ‘tenses’, there are only five different tense stems for any verb: the present and imperfect and the perfect and pluperfect always share a stem (while using different sets of endings).

Once the principles informing this system are grasped, the learner or user of Ancient Greek ‘only’ has to deal with a manageable range of grammatical formants:

- the verbal endings as exponents of person, number, and voice (as well as imperative mood and perfect ‘tense’);
- the markers of the subjunctive and optative moods;
- the markers of the different ‘tense’ stems.

Without entering into every detail, the following paragraphs (1.2–1.13) will review the main data for each of these groups. Although reference will already be made to related evidence in other Indo-European languages, the aim is not to replicate the existing reference works¹ and to offer an exhaustive sketch of comparative grammar. Instead, the presentation is merely meant to provide general orientation before formulating the questions this study hopes to answer.

1.2–1.6 Verbal Endings

1.2 Overview

As noted in 1.1, the verbal endings convey information about person, number, and voice. In the singular, the first person refers to the speaker (addressor), the second to the listener (addressee), and the third to a person or thing spoken about. In the dual and plural, the first person refers to the speaker and one (dual) or more (plural) others, the second to the listener and one or more others, and the third to two or more persons/things spoken about.

In contrast to the unmarked active voice, the middle voice is characteristically used when the subject is in some way especially involved in, or affected by, the action, for instance as an experiencer or beneficiary.² Where there is no formally separate passive (1.1), this remit includes the subject being a patient.

¹ Such as Chantraine (1961), Rix (1992), Sihler (1995); cf. also Schwyzler (1939), Meier-Brügger (1992a), Duhoux (2000), and works with a more Indo-European focus (e.g., Szemerényi 1996, Meier-Brügger 2002, Beekes 2011).

² See Rijksbaron (2002: 161–3), Allan (2003); cf. also 9.20, with fn. 71.

In purely descriptive terms, we can distinguish not only active vs. middle endings, but also, in each group, thematic vs. athematic and ‘primary’ vs. ‘secondary’ ones. The ‘primary’ endings are used in the indicative of non-past tenses (present, future; also future perfect) and in the subjunctive, the ‘secondary’ endings in the indicative of past tenses (imperfect, aorist; also pluperfect (5.11–5.13)) and in the optative (with exceptions in the 1sg. active). The perfect has its own set of endings in the singular; also (partly) separate are the imperative endings, which we shall leave out of consideration.³

In a diachronic perspective, however, the thematic and athematic endings turn out to be identical except in the 1sg. active; and where the ‘primary’ and ‘secondary’ endings diverge, they do so in a systematic way as the former commonly equal the latter with an added **-i* (‘primary’ **-i*).

Almost all finite verb forms – with rare exceptions in thematic aorist imperatives – have a recessive accent; for reconstructive purposes the accentuation of Greek verbs is therefore uninformative.

1.3 Athematic Endings: Active

The following list presents the athematic endings of the active voice, as found in verbs like φημί ‘say’ or δίδωμι ‘give’, in their classical Attic form. It includes the mostly uncontroversial reconstruction of the endings for later Proto-Indo-European, selected comparanda in other languages that support this reconstruction, and brief notes. Here and elsewhere in this chapter, we shall not consider questions relating to ‘deeper’ reconstruction; these matters will occupy us later (in Chapters 9 and 10).

	<i>‘Primary’</i>	
1sg.	-μι <i>*-mi</i>	Ved. <i>-mi</i> , Hitt. <i>-mi</i> , Lat. <i>-m</i>
2sg.	-ς <i>*-si</i>	Ved. <i>-si</i> , Hitt. <i>-ši</i> , Lat. <i>-s</i>
3sg.	-σι <i>*-ti</i>	Ved. <i>-ti</i> , Hitt. <i>-zi</i> , Lat. <i>-t</i>
1du.	= 1pl. <i>*-ue(s)</i>	Ved. <i>-vah</i> , Lith. <i>-va</i>
2du.	-τον ?	Ved. <i>-tah</i> , Lith. <i>-ta</i>
3du.	-τον ?	Ved. <i>-tah</i> , OCS <i>-tel/-ta</i>
1pl.	-μεν <i>*-me(s)</i>	Ved. <i>-mah</i> , Lith. <i>-me</i> , Lat. <i>-mus</i>
2pl.	-τε <i>*-te</i>	Ved. <i>-tha</i> , Lith. <i>-te</i> , Lat. <i>-tis</i>
3pl.	-(ᾱ)σι <i>*-(e)nti</i>	Ved. <i>-a(n)ti</i> , Hitt. <i>-anzi</i> , Lat. <i>-(u)nt</i>

³ They are active 2sg. *-Ø* (thematic **-e*, sometimes extended as *-θι* (**-dʰi*; cf. Skt. *-(d)hi*), 3sg. *-(ἐ)τω* (**-tōd*; cf. Lat. *-tō*), 2pl. *-(ε)τε* (**-te*; = indicative), 3pl. *-(ό)ντων* (analogical: cf. 3sg. ind. **-ti* : ipv. **-tō(d)* = 3pl. ind. **-nti* : X → X = **-ntō(d)* + added *-v*); and middle 2sg. *-σο* (thematic *-ou* < **-eso*) (**-so*; = indicative), 3sg. *-(ἐ)σθω* (analogical), 2pl. *-(ε)σθε* (**-dʰue*; = indicative), 3pl. *-(ἐ)σθων* (analogical). For more detailed discussion, see Forssman (1985).

'Secondary'

-ν	*-m	Ved. -m, Hitt. -un, Lat. -m	(1)
-ς	*-s	Ved. -h (-s), Hitt. -š, Lat. -s	(2)
-Ø	*-t	Ved. -t, Hitt. -t, Lat. -t (< -d)	(3)
= 1pl.	*-ue	Ved. -va, Lith. -va	(4)
-τον	?	Ved. -tam, Lith. -ta	(5)
-την	?	Ved. -tām, OCS -tel-ta	(6)
-μεν	*-me	Ved. -ma, Lith. -me, Lat. -mus	(7)
-τε	*-te	Ved. -ta, Lith. -te, Lat. -tis	(8)
-(ε)ν	*-(e)nt	Ved. -an, Lat. -(e)nt	(9)

- (1) After consonant, *-m is realised as *-m̥ > -α; cf. e.g. *s*-aorist 1sg. act. -σα < *-s-m̥ (8.2).
- (2) Greek 'primary' -ς is a product of analogy; in stems ending in a vowel, *-Vsi > *-Vhi > *-Vī would have been regular, but since this lacked an overt person marker, the 'secondary' ending was added (and the preceding stem-final diphthong usually eliminated by analogy with the 1sg./3sg.).
- (3) Unassibilated 'primary' -τι is preserved outside Attic-Ionic; cf. also Att. ἔσσι 'is' < *h₁es-ti.
- (4) Lith. -va points to *-uo(s); cf. 10.5, fn. 10, on similar 1pl. forms. On the question of final *-s, cf. below on 1pl. *-me(s).
- (5), (6) On the reconstructive problems posed by the 2du. and 3du. endings, see 10.14, fn. 26.
- (7) In West Greek (Doric) dialects, -μες is found instead of -μεν, and -μεν is probably a dialectal innovation within Greek, based on *-me (10.5, fn. 12). Although the distribution of *-mes : *-me in Indo-Iranian corresponds to that of 'primary' vs. 'secondary' endings, and is so represented above, it is not clear that this was systematically the case already in the proto-language, and that the final *-s is therefore of the same order as 'primary' *-i. Compare the 2pl., and see further 1.6, 5.50, 10.5.
- (8) The aspirate in Vedic 'primary' -tha is an Indo-Iranian innovation; Lat. -tis is from *-tes with *-s after the 1pl.
- (9) The complexity in the 3pl. results from the fact that the athematic ending occurs with ablaut variants depending on paradigmatic patterns, and interparadigmatic analogy (also with thematic paradigms) has further complicated the picture. In root formations, for example, one expects *-ent(i) (6.5–6.6), whereas in the *s*-aorist *-s-nt is regular (8.2). Attic-Ionic 'primary' -σι < *-nti is paralleled by preserved -ντι in other dialects. Where -ᾱσι occurs (e.g., διδῶσι 'they give'), this originates from *(C)nti > *(C)ati → remade *(C)anti (after postvocalic *(V)nti) > Att.-Ion. -ᾱσι. In postvocalic positions, 'secondary' -ν is usually replaced by -σαν in Attic-Ionic (e.g., 3pl. aor. pass. -θη-σαν for -θεν < *-t^hē-nt), following the model of 3pl. ἦσαν 'they were' (itself formed after the *s*-aorist, while *h₁e-h₁s-ent > ἦεν > ἦν was reinterpreted as a 3sg.: 8.2, fn. 11).

1.4 Athematic Endings: Middle

The reconstruction of some of the middle endings is more challenging, even if one merely targets a period when Greek and Indo-Iranian were still developing jointly. In the following list, this is reflected both by the more limited comparative evidence cited and by the brackets/alternatives in certain reconstructions. A more detailed exposition of the problems will follow elsewhere (10.4–10.7, 10.14).

<i>'Primary'</i>			
1sg.	-μαι	*-(m)h ₂ eġ	Ved. -e, Hitt. -h ₂ a(ri)
2sg.	-σαι	*-soġ/*-saġ	Ved. -se, Hitt. -ta(ri/ti)
3sg.	-ται	*-toġ (*-oġ)	Ved. -te (-e), Hitt. -(t)a(ri)
1du.	= 1pl.	?	Ved. -vahe
2du.	-σθον	?	Ved. -āthe
3du.	-σθον	?	Ved. -āte
1pl.	-μεθα	*-med ^b h ₂	Ved. -mahe, Hitt. -u ₂ ašta
2pl.	-σθε	*-(s)d ^b ue	Ved. -dhve, Hitt. -tuma(ri)
3pl.	-νται	*-ntoġ	Ved. -ate, Hitt. -anta(ri)
<i>'Secondary'</i>			
-μην	*-(m)h ₂ (e)	Ved. -i, Hitt. -hat(i)	(1)
-σο	*-so	Ved. -thāh, Av. -sa, Hitt. -tat(i)	(2)
-το	*-to (*-o)	Ved. -ta (-at), Hitt. -(t)at(i)	(3)
= 1pl.	?	Ved. -vahi	(4)
-σθον	?	Ved. -āthām	(5)
-σθην	?	Ved. -ātām	(6)
-μεθα	*-med ^b h ₂	Ved. -mahi, Hitt. -u ₂ aštāt(i)	(7)
-σθε	*-(s)d ^b ue	Ved. -dhvam, Hitt. -tumāt	(8)
-ντο	*-nto	Ved. -ata, Hitt. -antat(i)	(9)

- (1) Att.-Ion. -μην corresponds to -μᾶν in other dialects; in postconsonantal environments this is derivable from an immediate pre-form *-(C)m₂h₂-m whose *-m may be secondarily added. Note that OHitt. -h₂a continues *-h₂e/o-r and therefore suggests a relatively late addition of 'primary' *-i to *-h₂e; -t(i) in the 'secondary' endings has been added within Anatolian.
- (2) The Hittite endings demonstrate that the reconstructions given are at best reliable for Graeco-Aryan; even for this period the seemingly straightforward 'primary' *-soġ, though usually posited, remains uncertain, and the presence of a Vedic 'secondary' ending with a dental as in Hittite is noteworthy (cf. 5.3, 10.14 on *-(s)th₂e as a possible predecessor/competitor of *-so; 5.11 on Ved. -thāh).
- (3) In Greek, *-toġ > -τοῖ is attested in Arcado-Cyprian and Mycenaean; -ται is analogical after the 1sg./2sg. For reconstructive purposes, the Vedic and Hittite variant endings without a dental are of some significance: see 4.34, 4.42, 10.14.

- (4) Given the general parallelism of 1du. and 1pl. forms, one might (internally) reconstruct $*\text{-}\underline{\text{u}}\text{ed}^h\text{h}_2$.
- (5), (6) The evidence is too scarce to allow a meaningful reconstruction; Gr. 2du. -σθον : 2pl. -σθε is clearly analogical to active 2du. -τον : 2pl. -τε, and the distribution of -σθον/-σθην matches that of active -τον/-την.
- (7) The differentiation of 'primary' and 'secondary' endings is an Indo-Iranian innovation (modelled after the 1sg.). Since -μεθα has a poetic by-form -μεσθα and since an internal $*\text{-s-}$ is also seen in Hittite, a parallel existence of $*\text{-med}^h\text{h}_2$ and $*\text{-mesd}^h\text{h}_2$ in the proto-language is conceivable (cf. 10.5).
- (8) On the $*\text{-s-}$ of $*\text{-(s)}d^h\text{ue}$, which may be secondary, see 10.6, fn. 13.
- (9) Like Ved. -atel-ata < $*\text{-}\eta\text{to}(\text{i})$, postconsonantal -αται/-ατο < $*\text{-}\eta\text{to}(\text{i})$ is also found in Greek, notably in the optative and perfect/pluperfect.

1.5 Thematic Endings: Active and Middle

A full list of the thematic endings need not be given since most of them replicate the athematic ones. The main difference consists in the 'thematic vowel' $*\text{-e/o-}$ preceding the ending. In the first person, the thematic vowel appears as $*\text{-o-}$, in the second and third as $*\text{-e-}$; on this distribution, and its possible origins, see further 3.38. Note the loss of intervocalic $*\text{-s-}$ and the subsequent vowel contraction in the 2sg. middle ('primary' $*\text{-e-sai} > \text{-εαι} > \text{-η}$; 'secondary' $*\text{-e-so} > \text{-εο} > \text{-ου}$).

In the 'primary' active singular, the situation is more complex. 1sg. -ω cannot straightforwardly continue a late-PIE ending $*\text{-o-mi}$, but rather points to $*\text{-oH}$ (cf. 10.4). In the 2sg., $*\text{-e-si} > \text{-εσι} > \text{-ει}$ is unproblematic as such, and $*\text{-ei}$ may have been differentiated from the 3sg. by the analogical addition of $*\text{-s}$ as a 2sg. marker ($\rightarrow \text{-ει-s}$). Regarding the 3sg. -ει itself, however, two fundamentally different lines of thought exist. Some scholars analyse this as $*\text{-ei}$, i.e. $*\text{-e}$ with added 'primary' $*\text{-i}$, and see in it a survival from a time when the thematic conjugation had not yet adopted the 3sg. marker $*\text{-t(i)}$.⁴ The advantage of this approach is its phonological simplicity; and as we shall see, there is much to be said for an early PIE thematic 3sg. without $*\text{-t(i)}$ (4.34–4.44). Nevertheless, given the overwhelming evidence for thematic 3sg. $*\text{-e-ti}$ in other branches of Indo-European, including Indo-Iranian which generally matches Greek quite well, another explanation is preferred here. In prevocalic sentence

⁴ See especially Bonfante (1934: 222–3), Pedersen (1938a: 87–8), Ruipérez (1952: 12–13), Lazzeroni (1965: 81–3), Watkins (1969: 121–3), Negri (1974: 361–71), Kortlandt (1979a: 61; 1979b: 37–9; 1997: 134), Erhart (1984: 242–3; 1989: 47), Hart (1990: 448–50). Since the 3sg. pres. $-(\tilde{a})\text{s}$ of Tocharian A probably continues $*\text{-(e)ti}$ (Jasanoff 1987a: 110–11, Ringe 1996: 80), the main supporting evidence from outside Greek would be found in Baltic, with Lith. thematic 3sg. $-\text{a}$ also apparently reflecting an ending without $*\text{-ti}$. However, here too $*\text{-eti}$ has been defended, either by reference to an early i -apocope (Vaillant 1966: 10, Hock 2007) or by a (prosodically conditioned?) generalisation of the 'secondary' ending $*\text{-t}$ (Stang 1942: 230–1; 1966: 410, Mottausch 2003 [2009]: 83–4, Olander 2015: 327).

1.2–1.6 Verbal Endings

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sandhi, Proto-Greek $*-e-ti$ *V-* first became $*-e-t_i$ *V-* > $*-e-t^i$ *V-* in a phonologically regular manner. This variant of the ending was then generalised to all positions. Finally, the loss of final stops affected palatal $*-t^i$ as much as non-palatal $*-t$, except that its palatal feature was retained and reported onto the preceding vowel ($*-e^i$ > $-\epsilon i$).⁵ Accordingly, Greek only superficially diverges from most other Indo-European languages, and the reconstruction of $*-e-t(i)$ need not be questioned.

Act. 'Primary'

1sg.	$-\omega$	$*-oH$	Av. $-\bar{a}(mi)$, Lat. $-\bar{o}$, Lith. $-\bar{u}$
2sg.	$-\epsilon i\varsigma$	$*-e-si$	Ved. $-\bar{a}si$, Hitt. $-\bar{e}ši$, Lat. $-\bar{i}s$
3sg.	$-\epsilon i$	$*-e-ti$	Ved. $-\bar{a}ti$, Hitt. $-\bar{e}zzi$, Lat. $-\bar{i}t$
1pl.	$-\omicron\mu\epsilon\nu$	$*-o-me(s)$	Ved. $-\bar{a}mah$, Lith. $-\bar{a}me$, Lat. $-\bar{i}mus$
etc.			

'Secondary'

$-\omicron\nu$	$*-o-m$	Ved. $-\bar{a}m$, Hitt. $-\bar{a}nun$, OCS $-\bar{o}$	(1)
$-\epsilon\varsigma$	$*-e-s$	Ved. $-\bar{a}h$ ($-\bar{a}s$), Hitt. $-\bar{e}š$, OCS $-\bar{e}$	
$-\epsilon$	$*-e-t$	Ved. $-\bar{a}t$, Hitt. $-\bar{e}t$, OCS $-\bar{e}$	
$-\omicron\mu\epsilon\nu$	$*-o-me$	Ved. $-\bar{a}ma$, OCS $-\bar{o}m\bar{o}$	(2)

- (1) The Vedic 'primary' ending is $-\bar{a}mi$, but OAv. $-\bar{a}$ which is subsequently remade into $-\bar{a}mi$ suggests a similar story for Vedic, and hence PIIr. $*-\bar{o}$ > $*-\bar{a}$. Cf. 10.4, with fn. 3, on a parallel but probably independent process in Anatolian. In Hittite 'secondary' $-\bar{a}nun$, $-\bar{u}n$ is analogically added to $*-om$ > $-\bar{a}n$.
- (2) The issues regarding $-(o)\mu\epsilon\varsigma$ vs. $-(o)\mu\epsilon\nu$, $*-(o)mes$ vs. $*-(o)me$, and $*-(o)mes$ vs. $*-(o)mos$ are parallel to those in the athematic inflection (1.3).

Med. 'Primary'

1sg.	$-\omicron\mu\alpha i$	$*-o-(m)h_2e_i$	Ved. $-\bar{e}$, Hitt. $-\bar{a}h\bar{h}a(ri)$
2sg.	$-\eta$	$*-e-soi/\bar{*}-e-sai$	Ved. $-\bar{a}se$, Hitt. $-\bar{a}ta(ri/ti)$
etc.			

'Secondary'

$-\omicron\mu\eta\nu$	$*-o-(m)h_2(e)$	Ved. $-\bar{e}$, Hitt. $-\bar{a}h\bar{h}at(i)$	(1)
$-\omicron\upsilon$	$*-e-so$	Av. $-\bar{a}h\bar{h}a$, Hitt. $-\bar{a}ttat(i)$	(2)

- (1), (2) The divergences among the attested endings again match those in the athematic conjugation; but note that Hittite generally uses the *o*-variant of the thematic vowel in the mediopassive (4.42, fn. 154).

⁵ For a more detailed account, see Willi (2012a: esp. 266–9) and, independently, Ellsworth (2011), following Kiparsky (1967a) and Cowgill (1985a: 99–101; 2006: 536–9). Similar ideas were already mooted in the nineteenth century (Bopp 1837: 649–50, 652–3, 660, Curtius 1877–80: 1.205–10; cf. Cowgill 2006: 537 n. 3). Other scholars tried to save $*-eti$ by postulating analogical processes pivoting, rather implausibly, around either the 2sg. or the 'secondary' 3sg. endings (Brugman 1878: 173–9; 1903/4: 1904/5: 179–81, Brugmann and Thumb 1913: 397–8, Devoto 1929, Kuryłowicz 1967: 166; 1977: 29–30, Hoenigswald 1986; 1997: 93–5, Bammesberger 1993 [1994]: 13–14); or by assuming an irregular, frequency-conditioned, loss of $*-t$ (Mańczak 1992: 72).

1.6 Perfect Endings

The perfect has its own set of endings not only in Greek, but also in Indo-Iranian; and reflexes of a separate set of PIE perfect endings are observed in other languages too, for instance in the perfect endings of Latin. The comparison of these data shows that Greek has innovated (and regularised) in the 2sg. and throughout the plural, introducing an alphathematic pattern reminiscent of the *s*-aorist (8.2). However, Homeric forms such as ἴδμεν ‘we know’, μέμμεν ‘we are keen’ still show an earlier state of affairs with a truly athematic ending (**uid-me(n)*, **me-mṇ-me(n)*; cf. e.g. Ved. 1pl. perf. *ja-gan-má* ‘we have gone’ for **ja-ga-má* < **g^he-g^hmṇ-mē*). As in the *s*-aorist, the alphathematisation may have been prompted not only by the 1sg. in -α, but also by the phonologically regular development of athematic 1pl. **-me(n)* after heavy bases. Following the generalisation of the singular stem (5.5), a form like **de-dork-me(n)* ‘we look, stare’ would have been realised as **de-dork-mē(n)* > δεδόρκαμεν; and the 2pl. could then be adjusted accordingly (-ατε for athematic **-te*). Similarly, once the inherited 3pl. **-rs* (> **-ar(s)/-as*, depending on sandhi) had been replaced by the more familiar-looking athematic **-nti* (cf. 1.3), the latter also had to develop *a*-vocalism (> **-ati*, whence **-anti* > -ᾱσι by analogy with 3pl. **-nti* in postvocalic contexts).

In the middle voice, the perfect uses the regular athematic ‘primary’ middle endings (1.4). A distinctive perfect inflection can therefore safely be postulated only for the active singular and 3pl. of the late-PIE paradigm, although the 2pl. is suggestive too (cf. below, and see 5.50 for further exploration). The discussion of Hittite comparanda is postponed to 5.3, 5.33, and 5.50.

1sg.	-α	<i>*-h₂e</i>	Ved. -a, OLat. -ai > -ī	(1)
2sg.	-ας	<i>*-th₂e</i>	Ved. -tha, Lat. -(is)tī	(2)
3sg.	-ε	<i>*-e</i>	Ved. -a, OLat. -eit	(3)
1pl.	-(α)μεν	<i>*-me</i>	Ved. -ma, Lat. -imus	(4)
2pl.	-(α)τε	<i>*-te</i> (<i>*-e</i>)	Ved. -a, Lat. -(is)tis	(5)
3pl.	-ᾱσι	<i>*-(e)rs</i>	Ved. -uh, OAv. -ərəš, Lat. -ēre	(6)

- (1) The presence of a laryngeal is indicated by the differential treatment, according to Brugmann’s Law, of 1sg. vs. 3sg. perfect forms in Vedic: the non-lengthening of radical **-o-* in 1sg. *ja-gám-a* ‘I have gone’ < **g^he-g^hóm-h₂e* (≠ 3sg. *ja-gám-a* < **g^he-g^hóm-e*) is regular in a closed syllable. In Latin, ‘primary’ **-i* has been added (since the early perfect had present-tense reference: cf. 5.14–5.23).
- (2) Gr. 2sg. -ας : 1sg. -α follows the *s*-aorist pattern (although 2sg. -(σ)ας is also innovated there: 8.2). A trace of the original ending persists in the synchronically irregular 2sg. perf. οἶσθα < **uoid-th₂e*, whence -(σ)θα was occasionally copied into non-perfect forms (esp. 2sg. impf. ἦσθα ‘you were’ for **ḥs*).

1.7–1.8 Modal Stem Markers

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Whereas the aspirate of Ved. *-tha* is due to the laryngeal, in Greek it may rather be owed to the sibilant preceding the ending. On the element *-is-* in the Latin ending (which again contains ‘primary’ **-i*), cf. 8.20, fn. 87.

- (3) After the addition of ‘primary’ **-i*, Latin **-ei* was recharacterised by adding 3sg. *-t*, and *-eit* > *-it* is still reflected in Plautine scansion; but the classical Latin ending *-it* < OLat. *-ed* continues thematic ‘secondary’ **-et* (1.5; cf. 3.23).
- (4) The ending **-me* is not specific to the perfect (cf. 1.3). Since the perfect originally had present-tense reference, it should be noted that the Vedic ending is *-ma*, not *-mah*; this weakens the idea that the initial function of **-s* in **-mes* was similar to that of ‘primary’ **-i*. In any case, 1pl. perf. **-me* is best regarded as an archaism beside 1pl. pres. **-mes*.
- (5) Ved. *-a* (e.g., *ja-gm-a* ‘you have gone’ < **g^he-g^hm-e*) is so irregular that an archaism is more likely than an innovation;⁶ by contrast, **-te* is as unspecific to the perfect as is 1pl. **-me*.
- (6) On the Greek ending, see above. Ved. *-uh* and OAv. *-ərəš* continue **-ʔs*, whereas Lat. *-ēre* < **-ēri* goes back to **-ers* > **-ēr* with added ‘primary’ **-i*.

1.7–1.8 Modal Stem Markers

1.7 Subjunctive

Whereas the imperative shares the stem of present, aorist, and (rarely) perfect indicatives, but has its own endings (1.2, fn. 3), the subjunctive and optative moods are characterised by adding a modal stem suffix to an indicative stem, followed by the normal non-perfect endings: ‘primary’ ones for the subjunctive, ‘secondary’ ones for the optative (1.2, 1.8; but cf. 4.47, fn. 170, on the subjunctive⁷).

The subjunctive marker in classical Greek regularly appears as a lengthened thematic vowel *-η/ω-* with the same distribution among persons as for the unlengthened *-ε/ο-* of thematic indicatives. In Homeric Greek, however, a healthy number of short-vocalic *-ε/ο-* subjunctives to athematic stems are still attested.⁸ Together with concurrent data in other languages these show that the original subjunctive marker was just **-e/o-*, with long **-ē/ō-* arising in thematic stems from contraction already in the proto-language (**-e-e-* > **-ē-*, **-o-o-* > **-ō-*). Because of its greater distinctiveness, **-ē/ō-* was then transferred from thematic to athematic stems as well. Note that the original

⁶ Weiss (2009: 393) tentatively compares Paelignian *lexe* ‘you have read’ (?) (< **leg-s-e?*). However, it seems unlikely that an underspecified ending such as 2pl. perf. **-e* not only survived as an isolated relic in a perfect paradigm but was even transferred from there into a form with a preceding aorist formant (**-s-*).

⁷ Some subjunctives with ‘secondary’ endings are also found in Greek dialect inscriptions: cf. Schwyzler (1939: 661).

⁸ The Homeric text is normalised in that these short-vowel subjunctives are only attested where a different metrical structure results (Chantraine 1958: 454): thus, e.g., *s*-aor. subj. 1pl. act. *-σομεν* (**-s-o-mes*), 3sg. med. *-σεται* (**-s-e-tai*), but 3sg. act. *-ση* (**-s-ē-ti*), not **-σει* (**-s-e-ti*). Outside the *s*-aorist, examples are rarer, but see, e.g., *ἴ-ο-μεν* ‘let us go’ for *ἴ-ω-μεν* (ind. *ἴ-μεν* ‘we go’).

homology of subjunctives to athematic stems with thematic indicatives extends to the 1sg. act., where the subjunctive ends in $-\omega$, not \dagger -ομι.

Example (thematic φερε/ο- ‘carry’, active voice):

	Indicative		Subjunctive		
1sg.	φέρω	* <i>oH</i>	φέρω	* <i>ōH</i>	Ved. <i>-ā(ni)</i> (1)
2sg.	φέρεις	* <i>e-si</i>	φέρῃς	* <i>ē-s(i)</i>	Ved. <i>-ās(i)</i> , Lat. fut. <i>-ēs</i> (2)
3sg.	φέρει	* <i>e-ti</i>	φέρῃ	* <i>ē-t(i)</i>	Ved. <i>-āt(i)</i> , Lat. fut. <i>-et</i> (3)
1pl.	φέρομεν	* <i>o-me(s)</i>	φέρωμεν	* <i>ō-me(s)</i>	Ved. <i>-āma</i>
2pl.	φέρετε	* <i>e-te</i>	φέρετε	* <i>ē-te</i>	Ved. <i>-ātha</i> , Lat. fut. <i>-ētis</i> (4)
3pl.	φέρουσι	* <i>o-nti</i>	φέρωσι	* <i>ō-nt(i)</i>	Ved. <i>-ān</i> (5)

- (1) The ending *-āni* is an Indo-Iranian innovation.
 (2), (3) Vedic uses ‘primary’ or ‘secondary’ endings in the subjunctive singular, but ‘secondary’ endings in the 1pl. and 3pl. (cf. 4.47, fn. 170). In Latin, the future continues inherited subjunctive forms (with *-ē-* generalised throughout the paradigm: e.g., 1pl. *-ēmus*). For the development of subj. -ῃς, -ῃ, cf. 1.5 on ind. -εῖς, -ει.
 (4) Vedic ‘primary’ *-ātha* for **-āta* is an Indo-Iranian innovation, also observed in the indicative (2pl. *-atha*); contrast ‘secondary’ ind. *-ata*.
 (5) In Gr. -ωσι, **-ō-* is analogically retained; by Osthoff’s Law, **-ōnti* should have yielded **-onti* > \dagger -ουσι.

The subjunctive is used in a variety of functions. In main clauses it occurs as an adhortative or deliberative subjunctive in the first person (‘let me/us X’, ‘shall I/we X?’) or as a prohibitive subjunctive in the second person (‘do not X!’). In subordinate clauses, final and prospective subjunctives are most common (‘in order that he/she X-es . . .’, ‘if/when he/she X-es . . .’). The common denominator appears to be the speaker’s expectation that an eventuality is or may be coming about (cf. 4.47).

1.8 Optative

For the optative, an ablauting suffix **-ieh_I-*/*-ih_I-* can be reconstructed. The variant **-ih_I-*, added to the thematic vowel **-o-*, yields the thematic optative suffix **-oi(h_I)-* > Gr. -οι- (~ Ved. *-e-*). Unlike **-ē/ō-* in the subjunctive, this -οι- has not been generalised to all athematic stems (but see at least ῥοι ‘might go’, δεικνύοι ‘might show’, etc.). However, its diphthongal nature was perceived as characteristic of the mood and exerted some analogical influence. Thus, following the alphathematisation of the *s*-aorist (8.2), the corresponding optative⁹ acquired the suffix -σσι- (in lieu of

⁹ Contrast the perfect optative, which has -οι- despite its alphathematic remodelling (1.6).