Ablaut and the Latin Verb

Aspects of Morphophonological Change

Inaugural-Dissertation
zur Erlangung
des Doktorgrades der Philosophie an der
Ludwig-Maximilians-Universität München

vorgelegt von

Ville Leppänen

aus Tampere, Finnland

München
2019

Parentibus

Erstgutachter: Prof. Dr. Olav Hackstein (München)
Zweitgutachter: Prof. Dr. Gerhard Meiser (Halle)
Datum der mündlichen Prüfung: 17. Mai 2018

Contents

Acknowledgements

This study is a revised and corrected version of my PhD dissertation. The defence took place on 17 May 2018 at the Ludwig-Maximilians-Universität Munich.

First of all, I would like to thank my supervisor and *Doktorvater* Olav Hackstein for his advice and support in all matters of academic nature during my PhD studies at the department of Indo-European linguistics, LMU Munich. To Gerhard Meiser I owe thanks for acting as the second examiner in my *disputatio* and for providing a useful list of suggestions and corrections, which aided me in further improving my work. I would also like to thank my former teacher, academic advisor and colleague Martti Nyman for introducing me to the world of historical and Indo-European linguistics during my studies at the University of Turku.

Many other people have directly and indirectly supported me in writing this work. Aleksi Mäkilähde and Andreas Opfermann read through the entire final manuscript and presented helpful suggestions and constructive criticism – for this I owe them my deepest gratitude. I am also thankful to Christoph Bross, Romain Garnier, Esa Itkonen, Eduard Meusel and Ondřej Šefčík for reading and commenting on earlier drafts on specific topics. Needless to say, for all remaining errors I alone take full responsibility.

The collegiality of the following fellow academicians was fundamental in shaping the scholarly community of which I had the honour of being part: Tommi Alho, Raimo Anttila, Chiara Bozzone, Catharina Busjan, Sonja Dahlgren, Stefanie Eckmann, Felicitas Erhard, Dieter Gunkel, Sampsa Holopainen, Sami Honkasalo, Emmi Hynönen, Giulio Imberciadori, Petri Kallio, Mikko Kauko, Kari Keinästö, Timo Korkiakangas, Peter-Arnold Mumm, Sergio Neri, Anneli Pajunen, Santeri Palviainen, Tao Pan, Benedikt Peschl, Oliver Plötz, Veli-Matti Rissanen, Theresa Roth, Ryan Sandell, Minna Seppänen, Thomas Steer, Laura Sturm, Jaana Vaahtera, Jyri Vaahtera, Matti Virtanen, Andrew Wigman, Nicholas Zair and Albert Zasada. I present special thanks to the department secretary Elke Bergmeier for her assistance in everyday matters.

This study was funded from 2014 to 2018 by Kone Foundation, to which I present my sincere gratitude: Kone Foundation provided me most generously with a grant for four years of full-time PhD research as well as numerous travel grants for participation in international conferences.

Lastly, I would like to thank my parents for their continuing support. This work is dedicated to them.

Munich-Trudering, 1 May 2019

List of abbreviations and symbols

Linguistic terminology is abbreviated according to the standard conventions of the field (see, e.g., https://www.eva.mpg.de/lingua/resources/glossing-rules.php [08.04.2019]).

Latin authors are quoted according to the conventions of the index volume of *Thesaurus Linguae Latinae* (*ThLL*).

Languages:

Alb.	Albanian	Marr.	Marrucinian
Arm.	Armenian	Mars.	Marsian
Celtib.	Celtiberian	MCymr.	Middle Cymric
CLat.	Classical Latin	MDu.	Middle Dutch
CLuw.	Cuneiform Luwian	ME	Middle English
EModE	Early Modern English	Mess.	Messapian
ENHG	Early New High German	MHG	Middle High German
Fal.	Faliscan	MIr.	Middle Irish
Fin.	Finnish	NHG	New High German
Fr.	French	OAlb.	Old Albanian
Gaul.	Gaulish	OAv.	Old Avestan
Gr.	Ancient Greek	OBret.	Old Breton
Gr.(Aeol.)	Aeolic Greek	OCS	Old Church Slavonic
Gr.(Att.)	Attic Greek	OCymr.	Old Cymric
Gr.(Att.-Ion.)	Attic-Ionian Greek	OE	Old English
Gr.(Cypr.)	Cypriot Greek	OHG	Old High German
Gr.(Dor.)	Doric Greek	OIc.	Old Icelandic
Gr.(East Ion.)	East Ionic Greek	OInd.	Old Indic
Gr.(Hom.)	Homeric Greek	OIr.	Old Irish
Gr.(Hsch.)	Hesychian glosses	OLat.	Old Latin
Gr.(Ion.)	Ionian Greek	OLith.	Old Lithuanian
Go.	Gothic	ON	Old Norse
Hern.	Hernican	OPers.	Old Persian
Hitt.	Hittite	OPr.	Old Prussian
HLuw.	Hieroglyphic Luwian	OS	Old Saxon
IE	Indo-European	Osc.	Oscan
IIr.	Indo-Iranian	Pael.	Paelignian
It.	Italian	Paleo-Umb.	Paleo-Umbrian
Lat.	Latin	PDE	Present-day English
Lat.-Fal.	Latino-Faliscan	PGerm.	Proto-Germanic
Latv.	Latvian	Phryg.	Phrygian
Lith.	Lithuanian	PIE	Proto-Indo-European
LLat.	Late Latin	PIt.	Proto-Italic
Luw.	Luwian	PreS.	Pre-Samnite
Lyd.	Lydian	Sab.	Sabellic

Skt.	Sanskrit	Vest.	Vestinian
Sp.	Spanish	VLat.	Vulgar Latin
SPic.	South Picene	VOLat.	Very Old Latin
Toch.	Tocharian	Vols.	Volscian
Umb.	Umbrian	YAv.	Young Avestan
Ven.	Venetic		

Symbols:

>	develops regularly into
<	develops regularly from
→	is derived/levelled/modified into
←	is derived/levelled/modified from
=	is identical with
≈	is approximately identical with
≠	is not identical with, contrasts with, is distinct from
≡	corresponds to, is a cognate of
*	reconstructed/unattested form
**	conjecture for an earlier reconstruction (e.g. a pre-proto-form)
×	incorrect/imaginary/potential form
°	stem of a compound verb

1. Introduction

This study investigates the development of ablaut alternations in the Latin verb system by tracing the history of the alternations and the associated morphological formations from Proto-Indo-European into Classical Latin. In the synchronic grammar of Latin, reflections of the PIE ablaut, which culminates around the basic scheme of five grades (**e* : **o* : Ø : **ē* : **ō*), are still visible, for example, in such morphophonological alternations as *dīcere* vs. *dictus*, *tegere* vs. *toga* vs. *tēgula*, *dūcere* vs. *dux* vs. *(ē)ducāre*, *fīdere* vs. *fidēs* vs. *foedus*, and so on. However, these alternations are no longer productive and persist in the synchronic grammar of Latin mainly as mere etymological curiosities, although they occasionally serve grammatical functions (such as *facit* vs. *fēcit*).

The PIE ablaut has for a long time remained a somewhat enigmatic phenomenon (for a survey of the relevant literature, see Ch. 1.2. below). By way of comparative reconstruction, it is possible to relate the vocalism of cognate forms in the Indo-European languages with each other and reconstruct the original PIE vocalism. Since some formations exhibit vowel alternations – and some of these alternations seem to be quite systematic and bound to certain morphological categories – the conclusion is that these alternations must have been an essential part of the grammar of the parent language. A careful examination of such alternations allows for the reconstruction of a number of accent/ablaut paradigms by applying internal reconstruction to the results of the comparative method – a standard procedure in historical linguistics (see Fox 1995). However, there is no doubt that the ultimate origin, or cause, of the alternations is so distant that it is no longer reachable by the standard methods of historical linguistics (Fortson 2010: 81).

As a further complication, the Indo-European daughter languages have distorted the original system of alternations in many ways, complicating the reconstruction of the PIE alternations to a significant degree. A morphophonological mechanism of regular grammatical vowel alternations, which is a direct continuation of the PIE alternations, is still very much alive in Old Indic, and some salient traces of it remain in Hittite, Greek and the Germanic languages as well (the Germanic strong verb being a stock example thereof) – elsewhere the alternations have been reduced to the extent that the synchronic grammars of such languages as Latin, Tocharian, Armenian, and Albanian, no longer feature any *phonological system* of regular vowel alternations. But most importantly, almost every language has preserved some *relics* (isolated, unproductive residual forms) of the inherited alternations in the form of morphological anomalies (irregular inflections) and etymological curiosities. Such include the inflection of Greek athematic verbs (e.g. 1sg. τίθη-μι vs. 1pl. τίθε-μεν) and the Latin particle *cedo* vs. *cette* ‘give here!’ (< root aorist 2sg. **k̂e≠deh₃* vs. 2pl. **k̂e≠dh₃-te*; see Ch. 2.3.4.5. for details). Such relics and anomalies are valuable source material for the reconstruction of ablaut in the earlier stages of the Indo-European languages and in PIE. Additionally, some languages have developed other kinds of vowel alternations (for example the Germanic *umlaut*), which are not historically related to PIE ablaut.

Ablaut is rather pervasive in PIE morphology: not only roots but also suffixes – and, to some extent, even inflectional endings – exhibit the alternations regardless of part of speech (cf. Buck 1933: 106–107; Fortson 2010: 80). Consequently, traces of ablaut can be found not

only in Latin verbs but also in nouns, adjectives, pronouns and particles. In fact, almost every Latin word form that has its origin in a PIE root has a reflex of a PIE ablaut grade. But it is not prima facie clear, whether an attested Latin form is a direct continuation of the original PIE ablaut grade: it is possible that some kind of phonological or morphological modification has taken place.

Despite the pervasiveness of ablaut, this study is limited to examining the verb system. Reasons for this are manifold. First, the history of the Latin verb is still in need of further investigation. The general development is deceptively simple: the proliferation of the thematic conjugation and the creation of the fairly regular system of present, perfect and participle stems present the illusion that the morphological history of the Latin verb is generally very straightforward and requires little effort to describe and explain it in an adequate manner. As will be seen in this work, even the development of the regular formations is in many ways problematic. Second, compared to the nominal functions (such as case, number, gender), verbal functions (such as tense, aspect, mood) are fairly complex, and such functions often reach outside the verbal phrase itself, meaning that the verb occupies a central position in the clause – and even in the discourse. Thus, the verb offers unique possibilities for examining morphophonological alternations and their grammatical functions. Third, recent advancements in linguistic typology and Indo-European studies (for example, the coherent and detailed view of the PIE verb presented in *LIV*²) offer a solid foundation for the study of Indo-European verb morphology. And lastly, limiting the examination to a reasonably large but specific domain is useful from the practical perspective, while still providing a good compromise of width and depth.

The structure of the study is as follows: the introductory chapter (Ch. 1) provides an overview of the relevant previous research, definitions of the most important theoretical terms, and a brief look on ablaut (more detailed theoretical discussion follows in Ch. 4). The empirical-historical data of the study is analysed in Chs. 2 and 3, with Ch. 2 focussing on verb systems and individual verb formations, while Ch. 3 provides an overview and assessment of the relevant sound changes. Mechanisms of morphological change are the main topic of Ch. 4. This chapter is relevant for understanding the analysis and interpretation of the results of this study. Ch. 5 summarises the most important findings. Additional material, which is only tangentially related to ablaut and historical verb morphology, is presented in the appendices.

1.1. Scope, aim, theory, data, and method

The scope of this work is limited to the historical examination of verb morphology, i.e. Latin verb forms and paradigms that are ultimately derived from PIE verbal roots. Due to space constraints, an exhaustive analysis, which would cover all ca. 500 PIE roots attested in the Latin verb system and all their derivative forms, is not attempted. The selection includes such formations, which yield relevant information for the development of ablaut. This includes first and foremost those formations that in Latin are of PIE inheritance. The chronological scope extends from PIE into Classical Latin (i.e. until the time of Caesar and Cicero, first century BC). Post-Classical developments and the continuation of Latin in the Romance languages are only occasionally referred to.

The aim of the work is to provide a comprehensive account of the development of ablaut in the language history of the Latin verb, with special emphasis on the Indo-European context on the one hand, and on describing and linguistically explaining the observed developments on the other. This necessitates the use of a well-informed and extensive theoretical framework, which consists of not only Indo-European linguistic but also of general linguistic components. As will be seen, the mechanisms of morphological change, rooted in *analogy*, play a crucial role in this work. The detailed analysis includes 77 Latin verbs that originate from 66 PIE roots, totalling in about 200 individual stem forms. The specific research questions are the following:

- Which Latin verb formations reflect ablaut alternations that originate from PIE?
- Which phonological and morphological factors contribute towards either the preservation or the loss of the inherited alternations?
- Which effect does the loss of vowel alternations have in the historical grammar of Latin? How do the developments affect the functioning of the verb system as a whole?

The framework of this study involves two levels: metatheoretical and theoretical. At the metatheoretical level (which is only discussed briefly), this study is based on the concept of *linguistic normativity*, a central metascientific concept which emphasises the social (or intersubjective) ontology of language. Even though such discussion is only indirectly related to the main topic of this study, the observation of aspects of normativity is in many ways beneficial (see Ch. 5.5. and Appendix III). At the theoretical level, the framework of morphological change of this study consists of a number of individual theories that have been developed within the typological-functional branch of linguistics. Many of these have a long pedigree in historical linguistics, but, in my view, none of them has been superseded or rendered obsolete by more recent alternative approaches. These theories include the following (more accurate descriptions and references follow in Ch. 4.3.):

- **Analogy in language change** constitutes the basic framework of morphological change (e.g. Anttila 1977; Anttila 1989; Anttila 2003; Itkonen 2005).
- **Natural morphology**, which was developed mainly in the 1980s (e.g. Mayerthaler 1981, Wurzel 1984), includes several important insights into morphological change, some of which are useful extensions to the mainstream view of analogical change.
- **Grammaticalisation** is an important framework, which examines a type of reductive change that produces more grammatical entities from less grammatical ones (e.g. Hopper and Traugott 2003; Lehmann 2015).
- **Frequency of use** influences the development of linguistic forms and structures, and is a useful factor that can be easily operationalised (e.g. Bybee 2001, 2007, 2010).

These (and several other components) are, after appropriate reflections, arranged on a *generality continuum*, which reflects the historical reality of language change (Ch. 4.4.).

The primary empirical data of this study, i.e. the Latin verbal forms and paradigms, consist of 1) word forms attested in the literature, preserved by the manuscript tradition and subject to philological analysis, 2) word forms attested in inscriptions and subject to epigraphic analysis, and 3) linguistic reconstructions, i.e. non-attested conjectural forms, which are achieved by the standard methods of historical and comparative linguistics (see below).

The Latin literature is a quite obvious and self-explanatory source. The texts are quoted, when necessary, from the modern standard editions. The most important authors for this study are the most ancient ones, including the following:

– T. Maccius Plautus (ca. 254 – 184 BC).
– P. Terentius Afer (‘Terence’, ca. 195 – ca. 159 BC).
– M. Porcius Cato (‘Cato the Elder’, 234 – 149 BC).
– Livius Andronicus (ca. 284 – ca. 205 BC), fragments preserved only.
– Gnaeus Naevius (ca. 270 – ca. 201 BC), fragments preserved only.
– Quintus Ennius (ca. 239 – ca. 169 BC), fragments preserved only.

Occasionally, the Roman grammarians provide useful evidence either by quoting an older form or by metalinguistic commentary. Such authors include the following:

– M. Terentius Varro (116 – 27 BC).
– M. Tullius Cicero (106 – 43 BC).
– M. Fabius Quintilianus (‘Quintilian’, ca. 35 – 100 AD).
– M. Verrius Flaccus (ca. 55 BC – 20 AD), whose work has been preserved in an epitome by Sex. Pompeius Festus (fl. second century AD), of whose work, in turn, only fragments remain in an epitome by Paul the Deacon (ca. 720 – 799 AD).

According to the clear case principle, I refrain from quoting text passages or citing dictionaries in such cases, where the word form in question is known with certainty and there is no doubt about its authenticity, meaning or form. The Classical Latin words and word forms that necessitate dictionary reference are quoted from *Thesaurus Linguae Latinae* (*ThLL*) or from *Oxford Latin Dictionary* (*OLD*).

The other important source is the epigraphic evidence. Central to this study are not only Latin inscriptions but also those of other Italic languages. Latin inscriptions are quoted from *Corpus Inscriptionum Latinarum* (*CIL*) and *Inscriptiones Latinae Liberae Rei Publicae* (*ILLRP*). Sabellic texts are cited from *Sabellische Texte* (*ST*) and *Imagines Italicae* (*ImIt*). Faliscan texts are cited from the edition of Giacomelli (*GG*), *ILLRP*, and Bakkum (2009). The oldest inscriptions play a crucial role as source material of Latin historical linguistics. Those that contain verb forms or are otherwise relevant for this study include the following (in a roughly chronological order):[1]

Praeneste Fibula (*CIL* I² 3 = *ILLRP* 1; Wachter 1987: 55f; Hartmann 2005: 67f), seventh century BC. This golden brooch appeared probably in 1871 (under somewhat suspicious circumstances) and it originates from Praeneste, modern Palestrina. The text reads (written from right to left): MANIOS : MED : FHE ⋮ FHAKED : NVMASIOI ‘Manius made me for Numerius’. Soon after its publication by the archaeologist Wolfgang Helbig, the authenticity of the brooch and/or of the inscription was questioned, and many scholars have regarded it as a forgery ever since (see Wachter 1987: 55 n. 125, Baldi 2002: 125 n. 2, and Hartmann 2005: 69f for references). However, newest research indicates that neither the brooch nor the inscription on it could have been the work of a 19th century forger (Maras 2012), meaning that the brooch and the text – in all likelihood – are genuine.

Wine container from Gabii (Baldi 2002: 126; Hartmann 2005: 34–35), c. 630 – 620 BC. The text consists of only two words: SALVETOD TITA ‘May Tita be in good health’ (transl. Baldi 2002: 126).[2]

[1] On the problems of dating the oldest Latin inscriptions, see Hartmann (2005: 1–3). Hartmann’s datings (2005: 433) are cited here.

[2] Note that this one and the following *Tita Vendia* inscription are (among others) excluded from the corpus of Latin inscriptions by Hartmann (2005), due to concerns about their linguistic affinity raised by their fragmentary nature.

Tita Vendia Inscription (Silvestri 1993; Rix 1998: 251 n. 220; Hartmann 2005: 29f), c. seventh or sixth century BC, from Rome. The text reads: ECO VRNA TITA VENDIAS MAMAR[COS M]ẸḌ ṾḤẸ[CED] 'I am the urn of Tita Vendia, Mamarcos had me made' (transl. Baldi 2002: 126).

Forum Inscription (or *Forum Romanum cippus*, *CIL* I² 1 = *ILLRP* 3; Wachter 1987: 66f; Vine 1993: 31f; Hartmann 2005: 122f), seventh or sixth century BC. The text has been only partially preserved, but some word forms are rather clearly legible. Two verb forms are worth quoting: ES//ED (lines 2–3), probably the preform of CLat. fut. *erit* or ipf.sbj. *esset*, and KAPIA (line 11), probably the ancestor of CLat. prs.sbj. *capiat*.

Duenos-inscription (*CIL* I² 4 = *ILLRP* 2; Wachter 1987: 70f; Hartmann 2005: 109f), early sixth century BC. This often-debated inscription is notorious in that the first and last lines of the inscription are perfectly legible and well understood, while the middle one poses significant interpretational challenges (see references in Baldi 2002: 197 and Harðarson 2011). The text is as follows (spaces between words added): IOVESAT DEIVOS QVOI MED MITAT NEI TED ENDO COSMIS VIRCO SIED // AS TED NOISI OPET OITESIAI PAḶA RIVOIS // DVẸNOS MED FEḶED EN MANO(M) MEINOM DVẸNOI NE MED MAḶOS TATOD 'The one who gives me swears by the gods – if the girl is not friendly toward you, // and if she does not want to be intimate with you (or enjoy your love), then soothe (her) with the streams (of fragrance)! // Bonus made me as a fine gift for a good man: let an evil person not steal me' (text and translation by Baldi 2002: 197–198; second line by Harðarson 2011).

Lapis Satricanus (*CIL* I² 2832a; Wachter 1987: 75f; Hartmann 2005: 138f), from sixth century to 480 BC. The beginning of the text is broken off, but clearly legible is at least the following (with probable word boundaries added) …IEI STETERAI POPLIOSIO VALESIOSIO SVODALES MAMARTEI 'The companions of Publius Valerius have erected [this] to Mars' (text and translation by Baldi 2002: 205).

Garigliano bowl (Cristofani 1996; Mancini 1997; Vine 1998; Hartmann 2005: 147f), 500 – 480 BC. Following Vine's interpretation of the text, line A reads AHVIDIES 'Audius/Audeius', line B ESOM KOM MEOIS SOKIOIS TRIḂOS AṾDEOM DVO[M] NEI PARI MED 'I am together with my three companions [the bowl/possession] of the two Audii. Do not take possession of me' (translation by Baldi 2002: 201).

Tibur pedestal (*CIL* I² 2658 = *ILLRP* 5; Wachter 1987: 80f; Hartmann 2005: 131), from seventh to fourth century BC. The text reads HOI MED MITAT KAVIOṢ [] ṂONIOS QETIOS D[O]NOM ṖRO FILEOD 'Gavios sends me to him [the god] … as a gift for his son' (translated by V.L. after the German translation of Wachter 1987: 85).

Cista Fococoroni (*CIL* I² 561 = *ILLRP* 1197; Wachter 1987: 123f), Rome 315 BC. The inscription contains two verb forms: FECID and DEDIT.

The *Scipio epitaphs* (*CIL* I² 7, 8, 9; Wachter 1987: 301f) are from the third century BC and include several verb forms such as PROGNATVS, FVIT, CEPIT, SVBIGIT, ABDOVCIT (*CIL* I² 7), CONSENTIONT, FVISE, FVET, CEPIT, DEDET (*CIL* I² 9).

Finally, the *Senatus Consultum de Bacchanalibus* (henceforth *SCdB*; *CIL* I² 581 = *ILLRP* 511) from the year 186 BC contains many OLat. verbs forms written in an archaizing style, e.g. CONSOLVERVNT, ESENT, VELET, DEICERENT, etc.

The third set of data consists of the comparative reconstructions of words, word forms and paradigms. This includes reconstructions of PIE, Proto-Italic and pre-Latin. I use the

following etymological dictionaries as main sources for the reconstructions and for the cognate forms:

- *Lateinisches etymologisches Wörterbuch* by Alois Walde and J. B. Hofmann (*WH*).
- *Indogermanisches etymologisches Wörterbuch* by Julius Pokorny (*IEW*).
- *Dictionnaire étymologique de la langue latine* by Alfred Ernout and Antoine Meillet (*EM*).
- *Wörterbuch des Oskisch-Umbrischen* by Jürgen Untermann (*WOU*).
- *Lexikon der indogermanischen Verben* by Helmut Rix and associates (*LIV²*), with addenda by Martin Kümmel (*LIV²⁺*).
- *Etymological Dictionary of Latin and the Other Italic Languages* by Michiel de Vaan (*EDLIL*).

Etymological dictionaries of other Indo-European languages will also be occasionally cited.

The method of this study consists of three components: 1) the diachronic analysis of the development of the involved words, word forms and paradigms; 2) the structural-functional linguistic analysis of the forms and paradigms; and 3) the comparative and internal reconstruction of pre-Latin and Proto-Italic forms.

The diachronic analysis involves tracing the development of the individual linguistic entities from their oldest reconstructable proto-forms into their Classical Latin forms. Since this area (Indo-European and Latin etymology) is relatively well researched, it is in most cases possible to start from the PIE etyma and work the way chronologically towards the attested forms. For example, since it is generally agreed that the present paradigm of the Latin verb *īre* originates ultimately from the PIE root **h₁ei̯-*, the starting point for the analysis is the corresponding PIE paradigm of the verb (in this case, an athematic root present). By comparative and internal reconstruction, it is possible to reconstruct fragments of its Proto-Italic and pre-Latin conjugation, until the first attested forms appear (in the case of *īre*, not until Old Latin literature). The examination of the PIE paradigms, the various intermediate stages (e.g. Proto-Italic, Old Latin), and the Classical Latin forms reveals which modifications (sound change, morphological changes, changes in the verb system, etc.) the ablauting forms of the verb (e.g. the vocalism of the root and the suffix) have undergone during their existence.

However, the mere discovery and dating of the modifications does not suffice as a linguistic explanation: they must also be properly contextualised in both historical and theoretical terms. To this end, a structural-functional analysis is conducted. The structural component examines the system of forms and categories and the relations of the forms vis-à-vis other forms in the system, while the functional component examines the capability of a form (or a component of a form) to express grammatical and lexical functions within the system. In this study, vowel alternations (or lack thereof) occupy the central role. The changes that concern the systemic and functional aspects can then be explained within a framework of morphological change. For example, the development of the verb system from PIE to Proto-Italic and then from Proto-Italic to Latin is a crucial context for the interpretation of the development of the verb forms themselves, since, within each system, the relationship of a form (even if it is inherited directly from the parent language) to other forms is different; no linguistic change occurs in a vacuum isolated from the workings of the system as a whole.

Reconstruction of forms of earlier language stages is a *sine qua non* in Indo-European studies. As has previously been pointed out, Latin and Indo-European etymology is generally

well researched, and this concerns most of the relevant reconstructions as well. However, the reconstruction of the Proto-Italic verb has thus far remained somewhat fragmentary despite such contributions as Meiser (2003). But since, I argue, the Proto-Italic verb system plays a crucial role in the development of the Latin and Sabellic verb systems, a need to reconstruct a certain verb form or category in Proto-Italic arises occasionally. This will be accomplished by the standard methods of historical linguistics, following the handbooks of Anttila (1989), Fox (1995), and Campbell (2013).

Proto-Italic reconstruction is peculiarly difficult due to the asymmetry of the available data: Latino-Faliscan is dominated by the vast amount of Latin material from basically all periods, while the Sabellic corpus is much smaller and fragmentary. However, there is certainly no doubt that every Latin form that is inherited from PIE must have passed through Proto-Italic as well. This makes "deductive reconstruction" from PIE to Proto-Italic possible (i.e. by conjecturing Proto-Italic forms by deducing their form *lautgesetzlich* from PIE), but the limitations of this method must be observed: it is no real reconstruction, since it is not based on comparative material of at least two daughter languages. In cases where deductive reconstruction and comparative reconstruction contradict, the latter takes preference.

1.2. Previous research

Latin has played an important role in the development of Indo-European studies and historical linguistics, and this position is well reflected in the literature. Despite this, Latin seems to contribute surprisingly little to the reconstruction of the PIE verb system. Ablaut has always been observed in the study of the development of the Latin verb system, but thus far no extensive or systematic accounts of ablaut in this context (or, indeed, in any specifically Latin context) have appeared.

The discussion of ablaut and the development of Indo-European and Latin verb in Bopp (1816), Schleicher (1861/1862), and Osthoff and Brugmann (1878) – among others – is well-known research history of Indo-European studies, and I will not comment on them here. Instead, I begin the literature survey with Lindsay (1894), a monumental exposition of Latin historical linguistics. Lindsay offers a 10-page long (pp. 253–262) exposition of the reflexes of PIE ablaut grades in Latin, with rich comparative material. No particular generalisation follows, other than a short remark that "the Latin tendency to weaken every unaccented vowel has greatly obscured the traces of the I.-Eur. variation of vowels" (Lindsay 1894: 257).[3] A similar exposition is in Stolz (1894–1895: 156–164). According to him, "der ursprüngliche Thatbestand ist infolge der speciell für das Lateinische geltenden Lautgesetze zum nicht geringsten Theile bis zur Unkenntlichkeit entstellt" (Stolz 1894–1895: 157). The summary of ablaut in Sommer (1914: 47–55) does not introduce any relevant new material, but regarding the loss of ablaut, it appears to be, according to Sommer, "eine Folge teils lautgesetzlicher, teils analogischer Umwälzungen". The investigation of PIE ablaut is, as Sommer correctly points out, necessary in order to discover, whether a certain vowel alternation is inherited from the proto-language or whether it is a Latin innovation (Sommer 1914: 48). Of the early historical grammars of Latin, Kieckers (1930) is also worth mentioning, but his presentation of ablaut (pp. 42–47) is similar to the earlier ones and does not include any generalisations regarding the eventual fate

[3] This refers to Latin vowel weakening, see Ch. 3.2.3. and Appendix II in this work.

of the alternations in Latin. The presentation of the Latin verb system in these early handbooks is based on the traditional Latin grammar and the results of the 19th century historical linguistics and Indo-European studies.

Buck (1933) is the first comparative Indo-European grammar of Greek and Latin specifically, and it includes a 12-page chapter on ablaut, titled "Vowel gradation" (pp. 106–117). Rich in comparative Greek and Latin material, Buck's exposition is based on the Neogrammarian-Hirtian conception of ablaut, which at that time was the mainstream view until the widespread adoption of the laryngeal theory (see below). The fate of ablaut in Latin and in related languages is characterised in the following manner:

> Vowel gradation is a conspicuous and vital feature in the interrelations of Greek forms, as it is also in Sanskrit and in the Germanic languages […]. In Latin, on the other hand, vowel gradation has been to a considerable degree eliminated by the generalization of one or the other grade, and while it is still reflected by certain occasional alternations, it has ceased to play any such significant role as in Greek. (Buck 1933: 107).

Leumann (1977), an updated and extended edition of Leumann (1926–1928), provides a summary of PIE ablaut (1977: 29–41) and notes that the alternations are no longer active in Latin and, due to the effect of sound change, they are only preserved under exceptional circumstances (Leumann 1977: 30). Even though laryngeals were already mainstream in most schools of Indo-European studies in the 1970s, Leumann's presentation of ablaut is thoroughly traditional (cf. below) and laryngeal theory and its consequences for the analysis and reconstruction of ablaut are only briefly discussed as an appendix to the main discussion (pp. 39–40). In Leumann's view, laryngeals are *dispensable* ("entbehrlich") in Latin historical grammar and etymology (Leumann 1977: 40). Raimund Pfister's new edition of Sommer's (1914) section on historical phonology (Sommer and Pfister 1977) includes a short remark on Laryngeal theory but the presentation of ablaut is otherwise entirely traditional. According to Risch (1992: 16–17), the loss of ablaut cannot be solely attributed to certain characteristically Latin sound changes; instead, the shift towards exclusively suffixing morphology may have played a more prominent role.

The first large-scale handbook of Latin historical linguistics to systematically include Laryngeal theory is Sihler (1995), which is a complete revision of Buck (1933). The discussion of ablaut is quite extensive (pp. 108–135), modernised (in comparison to Buck and other earlier treatments), and includes plentiful comparative material. On the development of ablaut in Latin, Sihler writes the following:

> In Greek the inherited patterns have been analogically extended, levelled, and otherwise confused; in Latin such disturbances were likewise very extensive, and moreover were coupled with regular sound laws which effaced the original patterns. Thus, for example, the PIE alternation **ew* ~ **ow* ~ **u* is a transparent embodiment of the basic alternating framework (**e* ~ **o* ~ Ø) when followed by **w*. This remains transparent in Greek ευ ~ ου ~ υ and Go. *iu* ~ *au* ~ *u*, but in Latin the pattern was first denatured by an Italic sound law into **ow*, **ow*, **u*, and by a later L(atin) sound law further to *ū*, *ū*, *ŭ*, in which no similarity to the basic pattern *e* ~ *o* ~ Ø can be detected. Amid this ruin, L(atin) established alternations of its own invention. (Sihler 1995: 109).

During the rest of the work, ablaut is brought to discussion where necessary, but there is no attempt to systematically investigate either the development of the PIE ablaut patterns or the alleged innovative vowel alternation patterns of Latin.

The modern view of ablaut and the development of the Latin verb is provided by Meiser (1998), which is an important contribution to Latin historical linguistics and much influenced by the Freiburg school of Helmut Rix and his students and colleagues. Like his predecessors, Meiser presents a concise introduction to PIE and Indo-European ablaut (pp. 30–33) but does not systematically investigate the development of ablaut in Latin. As to the fate of the alternations, Meiser offers the following generalisation:

> Im Lateinischen sind Ablaut sowie die beschriebenen fünf Ablautparadigmen [*scil.* the accent/ablaut patterns, V.L.] durch vielfache Vokalveränderungen (Umfärbung, Kürzung, Dehnung, Verlust, Monophthongierung) und morphologischen Ausgleich weitgehend verdunkelt worden und spielen nur noch eine periphere Rolle. Gleichwohl ist ihre Kenntnis notwendig für die Beurteilung bestimmter Paradigmen und Wortbildungsmuster. (Meiser 1998: 33).

The role of ablaut in PIE phonology and morphology was recognized early on and has been investigated ever since. The culmination of the Neogrammarian conception of ablaut is presented in Karl Brugmann's monumental *Grundriss* (first edition of the first part 1886). The original discussion presents the basic PIE facts, arranged according to the six ablaut series (*Reihen*) with comparative material (Brugmann 1886: 246–261). The second edition (Brugmann 1897: 482–505) features a different presentation: the arrangement based on ablaut series was abandoned and the focus was now on the analysis of individual ablaut contrasts, both quantitative and qualitative. Additionally, other kinds of vowel alternations (e.g. various shortenings and lengthenings), which do not belong to ablaut proper, are discussed within the same section. Brugmann was well aware of the problems associated with the reconstruction of PIE ablaut (see also Buck 1896), and he does not attempt a systematic, exhaustive presentation (as noted in Hirt 1921: 3).

While Brugmann and his fellow Neogrammarians made major strides in the reconstruction of PIE and in the historical phonology and morphology of the Indo-European languages, PIE and Indo-European ablaut was systematically investigated for the first time by Hermann Hirt. His first monograph on the subject (Hirt 1900) concentrates on the influence of accentuation on PIE vocalism and presents a full-fledged conception of ablaut drawn from extensive comparative data. The influence of the Neogrammarians, preceding Hirt by a generation, is quite evident in that Hirt's approach is rather atomistic (focussing on phonology) and he does not take the grammatical or lexical functions of the alternations into account.[4] The second edition (Hirt 1921), published under a different title and as a part of a series of Indo-European grammars, is a considerable improvement in terms of extent and depth of the analysis, and it includes the first ever systematic reconstruction of PIE morphological ablaut types (pp. 201–225).

But the Neogrammarians and Hirt were reluctant to accept the novel ideas of Ferdinand de Saussure's *Mémoire* (1878), which eventually led to the development of laryngeal theory, with concomitant crucial consequences for the reconstruction and interpretation of PIE ablaut.

[4] This is, of course, due to the historical fact that Hirt precedes the birth of structuralist linguistics by at least a decade.

It still took almost a century after the publication of the *Mémoire* that the main tenets of Laryngeal theory became mainstream in Indo-European studies. Since this is well-known research history in IE-studies, I will not expound the birth and development of laryngeal theory here.

After Hirt, the next major study on PIE ablaut was Kuryłowicz (1968a), which is a shortened version of two earlier monographs by the same author (Kuryłowicz 1952, 1956). Kuryłowicz is certainly a master of structural linguistics, internal reconstruction and proportional analogy in particular (Anttila 1970). A central theme in these works is the morphological function of ablaut, even though Kuryłowicz's conception of vowel alternation as a mere supporting feature of the (primary) suffixation is by now somewhat antiquated. The minimal use of laryngeals (in the spirit of Szemerényi) and some Hirtian terminology tends to render Kuryłowicz's contributions partially obsolete. However, the collection of empirical material is extensive and very useful.

The presentation of ablaut in the most recent handbooks of Indo-European studies (e.g. Tichy 2006; Clackson 2007; Fortson 2010; Meier-Brügger 2010; Beekes 2011) is relatively uniform, and includes the following components:

- The framework of PIE phonology follows the established reconstruction of three consonantal laryngeals (*$*h_1$, *$*h_2$, *$*h_3$) and their syllabic counterparts (*$*h_1$, *$*h_2$, *$*h_3$).
- The origin of ablaut is said to be (at least partially) in the changes caused by Pre-PIE accentuation (see Ch. 1.4.).
- The original nature of ablaut was phonological (even though this conjecture can only be vindicated to some degree by applying internal reconstruction and typological generalisations on the comparatively reconstructed material).
- However, the purely phonological ablaut was replaced by its subsequent morphologisation already within PIE.
- Accent/ablaut patterns, as agreed on in the mainstream literature (see Ch. 1.4.), are used as reference points and the primary classification of the various reconstructed alternation patterns.
- The most important ablaut patterns recognised in verb morphology include the athematic ablaut (*$*e$: Ø), Narten ablaut (*$*\bar{e}$: *$*e$), suffixal ablaut (e.g. the athematic optative marker *$*\underset{\frown}{i}eh_1$- : *$*ih_1$-), and perfect ablaut (*$*o$: Ø).

In addition to the standard handbooks, Indo-European ablaut (and topics relating to ablaut) has been investigated in a large number of articles, too numerous to present an exhaustive list here. These contributions discuss individual phonological and morphological problems and are often very limited in scope. Methodological discussion is prevalent in the articles published in Keydana, Widmer, and Oleander (2013).

Four pieces of relatively recent literature on Latin historical linguistics warrant special mention here: Meiser (2003), Bock (2008), Garnier (2010), and Weiss (2011). The origin of Meiser (2003) is his habilitation dissertation, which was completed in 1991. However, this work remains as a central study on the development of the Latin verb system; it is important not only for the development of Latin perfect stems – the main topic of the study – but also for its reconstruction of the Proto-Italic verb. It is mainly based on the framework of *natural morphology*, and its main goal is to investigate and explain the selection and/or creation of the Latin perfect stems, especially in such cases where the perfect stem is inheritance from PIE or

Proto-Italic. Within that framework, Meiser is able to explain which phonological and morphological factors contributed towards the selection and continuation of a certain PIE, Proto-Italic or pre-Latin morphological formation as the Latin perfect stem and why the competing formations were shunned. Ablaut is often a central theme (though not the main topic of the work), but Meiser does not systematically investigate the preservation or loss of certain alternation types. Many aspects of the present study are based on or heavily influenced by Meiser (2003), and my work is, in a sense, a continuation of Meiser's.

Bettina Bock's (2008) monograph is a traditional philological and historical linguistic analysis of the simple thematic verbs of the Latin third conjugation. Bock's study is mostly based on standard handbooks (such as Meiser 1998 and *LIV*²) and on Meiser (2003). While Bock emphasises the continuity of inherited PIE formations in Latin, systematic analysis of ablaut alternations is not attempted. Similar studies that would focus on other verb formations are currently desiderata in Latin historical morphology.

Thematically and material-wise similar to the present study is Romain Garnier's (2010) comprehensive monograph on the root vocalism of the Latin verb. However, the perspective and research questions in these two works are quite different. Most importantly, Garnier focusses on root ablaut from both the synchronic and diachronic perspectives – taking the synchronic alternations as the starting point – while this study is not limited to root ablaut, focusses on the form and function of the morphological categories (with extensive discussion on morphological change), and takes the PIE ablaut as the starting point. One could say that, while Garnier investigates where the vocalism of Latin verbs come from, this study investigates how the PIE vowel alternations developed and ended up being in Latin the way they did. In any case, Garnier's painstakingly detailed study provides insightful ideas and valuable support for any research on Latin historical verb morphology.

Michael Weiss's *Outline* (2011, first printing 2009) is a compact and up-to-date survey of almost all areas of Latin historical linguistics.[5] Like previous handbooks, Weiss provides a short summary of PIE ablaut (pp. 45–47) and comments *passim* on the development of the alternations in certain morphological categories. There is, however, no systematic survey of ablaut (or of any other vowel alternations) in Latin, and the sections on the verb (pp. 377–447) are actually rather short compared with the sections on phonology and nominal morphology and provide only a cursory look at the history of the Latin verb. Nonetheless, Weiss has several brilliant insights which are referred to in the present study, and his collection of vast amounts of scholarship in one book is certainly useful, for example, in the reconstruction of the chronology of Latin sound changes (Ch. 3. in this volume).

In sum, the previous literature on the development of ablaut in Latin provides a broad collection of relevant Latin and comparative Indo-European material in addition to the generalisation that the loss of inherited ablaut alternations appears to have been the composite result of both regular sound change and certain morphological processes (such as analogical levelling); these aspects, however, have thus far been nowhere systematically investigated. This sets the stage for the present study: *the most central themes to be discussed in this study are the evaluation of the effect of sound changes and the associated processes of morphological change on the development of verb paradigms*.

[5] See Hackstein 2012a.

In conclusion to this section, I will demonstrate how the development of ablaut in Latin is typically explained by discussing an example provided by Clackson and Horrocks (2007: 12–14), namely, the development of the PIE primary comparative *-i̯os-*.[6] This suffix had, among others, the following three paradigm forms in PIE, each representing a distinct ablaut grade: 1) nom.sg.m. *-*i̯ōs* in the ō-grade, 2) nom./acc.sg.n. *-*is* in the zero-grade, and 3) acc.sg.m. *-*i̯ŏs-m̥* in the o-grade. First, the o-grade is extended into the nom./acc.sg.n., whence *-*i̯ŏs*, while the more archaic zero-grade suffix is continued in the Latin adverb *magis* 'rather', which was isolated early from the regular paradigm and was thus unaffected by the levelling. Second, the ō-grade of the nom.sg. is extended into other case forms; hence acc.sg.m. *-*i̯ōs-em*. Third, due to rhotacism, the intervocalic *-*s*- in the oblique cases turns regularly into *-*r*-; hence acc.sg.m. -*iōr-em*, while the nom.sg.m. remains as *-*i̯ōs*. Fourth, the non-rhotacised *-*s* of the nom.sg. is levelled into -*r* by paradigmatic analogy, whence Plautine -*iōr.* During the second century BC, regular shortening before all other word-final consonants but -*s* turns the vowel into a short one, yielding the Classical Latin nom.sg. -*iŏr*. Thus, Clackson and Horrocks conclude that "ablaut had ceased to be a productive morphological process before the Early Latin period" (2007: 14).

Concerning the historical details, Clackson and Horrocks's analysis is unobjectionable as such,[7] and we need to keep in mind that the two scholars do not attempt a thorough analysis of ablaut alternations, but rather the presentation of a concise case study for illustrative purposes. Nonetheless, presentations such as this one invite several qualifications. While analogical levelling may in principle take place at any time and into any direction, such explanations are mostly made ad hoc and suffer thus from a lack of theoretical backing. Chronology is often unclear: while the relative chronology is in most cases relatively unproblematic to work out, the exact details of the diachronic dimension are often left without further discussion. In this particular case, it remains somewhat unclear, which of the changes (both analogical and sound changes) that precede rhotacism (which certainly is a specifically Latin sound change) belonged to which chronological stage. The examples and case studies are often presented without any relevant morphological or systemic context; considering the nature of language, observing the structural and functional aspects from a wider perspective would facilitate the achievement of more reliable generalisations and, hence, more plausible explanations.

1.3. Terminology and definitions

Some concepts are so central and so often used in this study that they must be introduced at the outset. More detailed definitions with references to literature follow in Chs. 1.4., 2.1. and 4.

Vowel alternation: the occurrence of two or more vowel phonemes in grammatically (i.e. morphologically or phonologically) conditioned environments within the same formative (i.e. root, stem or affix). Vowel alternations can be classified into three types according to their grammatical relevance: 1) grammatically meaningless alternations, 2) multiple-exponent alternations, and 3) contrastive alternations (see Ch. 4.1.).

[6] Clackson and Horrocks use the traditional Anglo-American convention of writing consonantal glides **i̯* and **u* as **y* and **w*, respectively, and they also use a dot (e.g. **m̥*) as a sign of syllabicity instead of the more common ring (e.g. **m̥*). Since such conventions are inconsequential for the point pursued, I have changed them here to the ones used elsewhere in this work.

[7] The zero-grade suffix of *magis* is, however, etymologically problematic (cf. *EDLIL*, s.v. *magnus*).

Ablaut is to be understood within this study in its Indo-European context, i.e. as the PIE morphophonemic alternation that is based on the basic five-grade scheme (**e* : **o* : Ø : **ē* : **ō*), or as the reflex of this scheme in the daughter languages (e.g. in the Germanic strong verb, e.g. Go. *siggwan* prs. : *saggw* pret.sg. : *suggwun* pret.pl., etc.). Other kinds of vowel alternations, which may serve similar functions like IE ablaut, but which are not etymologically related to it, are not subsumed under this term, even though such uses occasionally occur in the literature.

Grade is the basic unit in the system of ablaut alternations. The PIE grades include the full-grades e-grade and o-grade, the lengthened grades ē-grade and ō-grade, and the zero-grade (abbreviated "Ø").

Ablaut contrast refers to the existence of a distinctive contrast between two word forms containing the same formative in two different ablaut grades, or reflexes thereof. The existence of a minimal pair is a sure indication of an ablaut contrast, but it is not a necessary criterion. For example, the words *tegō* 'I cover' and *toga* 'a covering, men's garment' are reflexes of the PIE root **(s)teg-*. There is an ablaut contrast between the two words (and their proto-forms), since *tegō* reflects the e-grade **(s)teg-e/o-* while *toga* reflects the o-grade **(s)tog-eh₂-*. An ablaut contrast need not be a transparent representation of the PIE basic schema: e.g. there is an ablaut contrast between the Latin words *fānum* 'shrine' and *fēstus* 'festive', since both descend from different ablaut grades of the root PIE **dʰeh₁-* 'put, set, perform', i.e. *fānum* < **fasnom* < **dʰh₁s-no-* (zero-grade), and *fēstus* < **dʰeh₁s-to-* (e-grade), even though the alternation *ā* : *ē* no longer resembles the original **e* : Ø alternation.

Ablaut relation refers to the existence of a paradigm of ablaut contrasts, which have functional relevance. Ablaut relations occur typically in inflectional paradigms. For example, the PIE accent/ablaut paradigms are parade examples of systematic ablaut relations. In Latin, some ablaut relations are known to exist: e.g. the ablaut contrast of the present stem *faci-* (from PIE zero-grade root **dʰh₁(k)-*) and the perfect stem *fēc-* (from PIE e-grade root **dʰeh₁(k)-*) is systematically employed in distinguishing these two stems of this verb; hence, there exists an ablaut relation between the present stem (reflecting the PIE zero-grade) and the perfect stem (reflecting the PIE e-grade). The existence of an ablaut relation presupposes the existence of ablaut contrasts, but not every ablaut contrast involves an ablaut relation.

Neutralisation refers to a loss of an ablaut contrast or an ablaut relation as a result of language change. Neutralisations can be *global* or *local*. **Global** neutralisation refers to the loss of a certain ablaut contrast or relation across the board, i.e. in every word and word form of the language. For example, the Indo-Iranian merger of all non-high vowels into **a* resulted in the (almost) global neutralisation of the ablaut contrast between inherited e- and o-grades and of the associated relations.[8] **Local** neutralisation affects only a particular ablaut contrast or relation in a particular phonological or morphological context. For example, the Latin analogical extension of the e-grade root **h₁eû̯-* into the plural forms (e.g. *īmus* 1pl. < **eû̯-mos* ← **i-mos*) resulted in the local neutralisation of the ablaut relation in the present stem (sg. stem vs. pl. stem) of this verb, while in other contexts the relations and contrasts remained, e.g. e-grade present stem *dīcō* < **deiḱ-e/o-* vs. zero-grade PPP *dictus* < **diḱ-to-*. The opposite of neutralisation is **preservation**.

[8] Some ablaut contrasts, however, remained due to Brugmann's Law, i.e. **ó* > **á́* /_CV.

Submersion refers to the local neutralisation of vowel quality or quantity in such a way that the original quality or quantity is no longer a posteriori recoverable by etymological analysis. For example, the medial *-i-* of the perf. form *meminī* may reflect an e-grade (**memen-aḭ*), o-grade (**memon-aḭ*), zero-grade (**memn̥(n)-aḭ*), or indeed any other non-high vowel (e.g. **meman-aḭ*), since the vowel quality has been submerged due to vowel weakening (see Ch. 3.2.3. and Appendix II). By way of comparative analysis, we can deduce that the most likely candidate for the original vocalism is the zero-grade form **memn̥(n)-aḭ* (see Ch. 2.2.4.2.).

Continuity and **discontinuity** of language change (in morphology, in particular) are central themes in this study. Continuity refers to the undisturbed (≈ phonologically regular) continuation of a form or a category from a previous diachronic stage to the following one, while discontinuity is occasioned by an intervening factor such as morphological modification or functional change. These aspects are crystallized in the *heredity principle* (see Ch. 4.3.1.).

1M1F or ***one meaning – one form*** refers to the principle of *isomorphism*, that is, the tendency of language change to assign exactly one meaning to one form (and vice versa). See Ch. 4.3.3. for details.

In order to properly describe morphological change, discontinuity in the transmission of inherited forms need to be adequately conceptualized. To this end, I use the concepts *innovation* and *renovation*, as defined by Lehmann (2015: 22–24).

Innovation refers to the creation of a new category or a new set of forms that did not previously exist in the language. This can be grammatical innovation as, for example, in the development of Latin demonstrative pronouns (e.g. Lat. *ille*) into definite articles of the Romance languages (e.g. French *il*). The category "definite article" did not exist in Latin; by way of grammaticalisation, a new category was created. Another possibility is formal innovation as, for example, in the development of the Romance *mente*-adverbs (e.g. Italian *chiaramente*) from Latin ablative phrases (e.g. *clārā mente*). Although the category "adverb" did exist in Latin, its forms were built differently (e.g. *clārē*); hence, by way of grammaticalisation a new set of forms for this category is created.

Renovation refers to the replacement of an existing category or a set of forms by a new one. For example, the Latin category "distal demonstrative pronoun" (e.g. *ille*) was renovated by the grammaticalisation of a new set of forms (e.g. French *celui*). Likewise, the replacement of Latin adverbs (e.g. *clārē*) by a new formation (e.g. Italian *chiaramente*) is a case of renovation. Innovation and renovation often overlap: the difference is in the perspective.

The distinction between innovation and renovation is very important in Latin historical verb morphology. Many innovative categories are created (for example, the four present classes), while several inherited categories are often renovated.

1.4. Ablaut

PIE ablaut is connected to the morphological structure of a word form on the one hand and to the accentuation of the paradigm to which the word form belongs on the other. Since ablaut manifests itself as the appearance (or disappearance) of a certain vowel phoneme within a morpheme, it is a case of *vowel alternation*.[9] As indicated by comparative reconstruction, ablaut

[9] For a classification of various vowel alternations, see Ch. 4.1.

was primarily determined by the morphological composition of the word form in which the morpheme carrying the vowel occurred.

A PIE word form (e.g. a noun or a verb form) consisted of a root (R), zero or more suffixes (S), and an ending (E). Every PIE lexical root, several suffixes, and a few endings could appear with one of the five ablaut vowels: **e*, **o*, **ē*, **ō* or *Ø* (no vowel). These ablaut vowels alternate on two axes:

- **Quantitative ablaut**: **e* : **ē* : *Ø*, and **o* : **ō* : *Ø*.
- **Qualitative ablaut**: **e* : **o* (marginally also **ē* : **ō*).[10]

On the quantitative axis, a morpheme carrying a short vowel is said to be in *full grade*, a long vowel in *lengthened grade*, and no vowel in *zero-grade*. On the qualitative axis, a morpheme could be in *e-grade* or *o-grade* (or, *ē-grade* or *ō-grade*, respectively).

There were restrictions concerning the appearance of the morphemes of a word form in certain ablaut grades – this depended also on the accentuation of the word form (see below). For example, the opt.1sg. of the root **bʰer-* 'to carry' is **bʰér-o-ih₁-m*, and it consists of the accented root in e-grade (**bʰér-*), two suffixes (the o-variant of the thematic vowel **-e/o-*, and the optative suffix **-i̯eh₁-* in zero-grade), and the non-ablauting ending **-m*. Since this is a thematic formation, neither the accentuation nor the ablaut vowels change, when the verb is inflected in other persons (e.g. 2sg. **bʰér-o-ih₁-s*, 1pl. **bʰér-o-ih₁-me*, etc.). However, in the athematic conjugation, more variation appears: the opt.1sg form of the root **h₁es-* 'be', which had an athematic root present, is **h₁s-i̯éh₁-m*, while the corresponding 1pl. form was **h₁s-ih₁-mé* (also note the change of accentuation from the root to the suffix). These forms have further ablaut contrasts with the thematic conjugation, when we compare the corresponding indicative forms: 1sg. **bʰér-o-h₂* vs. **h₁és-mi*, 1pl. **bʰér-o-mes* vs. **h₁s-més*.

In order to explain the discrepancies between the reflexes of various PIE ablaut grades in the daughter languages, a system of **accent/ablaut patterns** needs to be reconstructed for PIE. The reconstructions of verb and noun paradigms, namely, indicate that the correlations of accent and ablaut on the one hand, and of the alternations within the paradigms on the other, are not random, but they rather follow a limited number of regular patterns. These patterns are named according to the location of the accent in the word form and the presence or absence of accentual movement between the stem forms of the paradigm:[11]

- Acrostatic I: R(ḗ)-S(Ø)-E(Ø) : R(é)-S(Ø)-E(Ø).
- Acrostatic II: R(ó)-S(Ø)-E(Ø) : R(é)-S(Ø)-E(Ø).
- Proterokinetic: R(é)-S(Ø)-E(Ø) : R(Ø)-S(é)-E(Ø).
- Hysterokinetic: R(Ø)-S(é)-E(Ø) : R(Ø)-S(Ø)-E(é/ó).
- Amphikinetic (or holokinetic): R(é)-S(o)-E(Ø) : R(Ø)-S(Ø)-E(é/ó).
- Root inflection I (e.g. nouns without suffix): R(ó)-E(Ø) : R(é)-E(Ø).
- Root inflection II: R(é)-E(Ø) : R(Ø)-E(é).

These patterns indicate that the accented morpheme correlates with e-grade (in rare cases with o-grade or ē-grade) and the unaccented morphemes with zero-grade (in one case with o-grade).

[10] Furthermore, there is some evidence that a quantitative pattern **a* : **ā* : Ø existed in those roots for which an **a* can be reconstructed as the root vowel (Melchert 2016).

[11] This scheme was developed by Jochem Schindler in the 1970s and is widely accepted today. See Weiss 2011: 257f for a summary and list of references.

Such generalisations, however, do not apply to PIE morphophonemics as a whole, as e.g. accented zero-grades and unaccented e-grades must occasionally be reconstructed.

While the accent/ablaut patterns provide powerful explanations for irregularities observed in the athematic noun and verb paradigms of the IE-languages, they do not cover all possible reconstructable ablaut contrasts and relations. For example, the simple thematic conjugation features acrostatic accentuation, but the ablaut grades of the components (cf. the example above) do not directly correlate with any of these reconstructed patterns.[12]

[12] For ablaut patterns that do occur in the reconstructed verb paradigms, see Ch. 2.1.1. For the evaluation of PIE ablaut in the context of structural and typological analysis of vowel alternation, see Ch. 4.1.2.

2. Verb forms and formations

This chapter consists of the presentation and analysis of the primary empirical data of this study. Section 2.1. introduces the PIE, Proto-Italic and Latin verb systems, their distinctive features, and any systematic ablaut alternations present in these systems. Section 2.2. concerns the development of (originally) thematic formations, while (originally) athematic formations are discussed in section 2.3. Verb formations are arranged according to their CLat. present stem formations; perfect stems and PPPs are discussed under the respective present stems (for example, *vīdī* and *vīsus* are discussed under *vidēre*, Ch. 2.2.5.10.).

2.1. Verb systems overview

This section provides a short overview of three genetically related and chronologically successive verb systems: the PIE verb, the Proto-Italic verb and the Latin verb. The discussion of the development of the individual verbs and word forms is the subject matter of Chs. 2.2. and 2.3. Instead, I concentrate here on the development of verbal categories (such as tense-aspect-mood, voice, person, etc.) and particular formations (e.g. various tense/aspect stem formations). Thus, the focus is on the systemic level. An important aspect, to which due attention will be paid, is also the presence (or absence) of synchronic ablaut alternations in each verb system.

2.1.1. The Proto-Indo-European verb

The traditional (or *Brugmannian*) reconstruction of the PIE verb[13] is mostly based on the evidence of Greek and Old Indic, but since the discovery and identification of the Anatolian languages as a branch of Indo-European, the reconstruction has undergone several notable changes. This is due to the fact that the Hittite (and Anatolian) verb system is radically different from that of other archaic Indo-European languages (it is strikingly simpler), and the derivation of the Hittite verb system directly from the Brugmannian reconstruction is complicated at best, and actually not a plausible option. It follows that the verb system of the *proto*-language (in the strictest sense of the term) must have been, at least in some respects, different than the Brugmannian reconstruction.[14] However, for most Indo-European languages (including Latin), the Brugmannian reconstruction is still a perfectly adequate platform, and there is evidence that a sizeable group of languages once shared this kind of verb system (cf. Polomé 1982: 53). This state of affairs has been attributed to the hypothesis (and *communis opinio*) that the Anatolian languages were the first branch to separate from the PIE community, and that the relatively complex Brugmannian system was developed after the branching-off of Anatolian. The earliest reconstructable PIE + Anatolian verb system has occasionally been termed "Early PIE" and the Brugmannian "Late PIE" (or "Classical PIE"); in the following I refer to the Brugmannian reconstruction (in its modernised form) simply as "PIE".[15]

[13] First edition Brugmann (1892), second edition Brugmann (1906-1916).

[14] Currently, Jasanoff (2003) is the authority on the earliest reconstructable PIE verb system. Willi (2018) introduces several new (and controversial) insights. Shields (1992), Kurzová (1993), and Lehmann (1993) are idiosyncratic and/or by now outdated.

[15] The following presentation is mainly based on the reconstruction of (late-)PIE verb as laid out in *LIV²*, Tichy (2006), and Weiss (2011).

The PIE tense-aspect-mood (TAM) system was based on the opposition of three aspect stems: **present** stem for IMPERFECTIVE aspect, **aorist** stem for PERFECTIVE aspect, and **perfect** stem for RESULTATIVE aspect.[16] There was also a difference between PAST and NON-PAST tense, which was paradigmatic in the IMPERFECTIVE but not in the PERFECTIVE (which was PAST by default) and possibly not in the RESULTATIVE either (which was NON-PAST by default; a PAST RESULTATIVE was probably a later innovation, see below). The resulting set of forms and the conventional names of the categories are shown in Table 1 (from Weiss 2011: 378):

		Aspect		
		IMPERFECTIVE	PERFECTIVE	RESULTATIVE
Tense	NON-PAST	present	–	perfect
	PAST	imperfect	aorist	pluperfect

Table 1: PIE tense and aspect.

There was also a voice distinction between ACTIVE and MIDDLE, of which the former was the unmarked one. The middle had several uses, all characterised by the increased affectedness of the subject (see Weiss 2011: 380f and the references there). Again, this distinction was most prominent in the IMPERFECTIVE aspect, while the others were in this regard neutral (or ACTIVE) by default (but many languages later developed a complete set of aorist and perfect middle/passive forms). Verbs that only occur in the middle despite having ACTIVE function are called *deponents*.

PIE had the following set of moods: the unmarked **indicative** for declarative sentences, **subjunctive** in VOLUNTATIVE and PROSPECTIVE function, **imperative** for commands, and **optative** for wishes and potentiality. There was also the **injunctive**, attested in Homeric Greek and Old Indic, but its position as a mood is somewhat debatable (see below). The moods do not constitute a perfectly symmetrical system with the tenses and aspects, and they are formed differently: the optative is formed with the suffix **-i̯eh₁-/-ih₁-*, the subjunctive with (what appears to be) the thematic vowel **-e-/-o-*, and the imperative with a distinct set of endings. The injunctive, which was basically a tenseless and moodless form, was formally identical with the past tenses (imperfect and aorist) but without the augment **e-* (which is attested only in Greek, Phrygian, Armenian and Indo-Iranian); in fact, the concept of injunctive is only relevant, if the verb system has an *obligatorily* augmented past imperfective. In order not to complicate the presentation, I will not discuss the augment and the injunctive in the remainder of this overview, since they are largely irrelevant for Latin.

PIE had an integrated expression for person and number: FIRST, SECOND and THIRD persons, in SINGULAR, PLURAL and DUAL. There is some transparency in the person/number endings (which I will henceforth refer to as "person endings"), e.g. all first person endings feature a labial, and the 3pl. seems to be an enlarged form of the 3sg, and so on, but the grammaticalisation of the person/number system must have taken place earlier in the prehistory of the proto-language, so that the reconstructable endings have already fused together to the

[16] In the following, I will distinguish verbal *functions* from verbal *categories* by writing the former in SMALL CAPITALS.

extent that the person and number markers are no longer separable (cf. Watkins 1962: 105; Erhart 1970: 56–58).

The PIE tense and aspect stems were formed by affixation (mainly suffixation, marginally infixation), reduplication, vowel alternation (ablaut), or a combination of the three operations. The canonical morphological composition of a PIE word form was **root** (R) – **suffix** (S) – **ending** (E); root could be reduplicated in some formations,[17] suffix was the tense and/or mood marker and was optional (and there could be more than one suffix), and ending expressed the person, number, and voice functions. In those formations that did have intraparadigmatic ablaut alternations, this occurred always as a contrast between strong stem (sg.act.ind. and the whole sbj.) and weak stem (all other formations). There was also a distinction between thematic and athematic formations – the difference is that in the former class the **thematic vowel** **-e-/-o-* is inserted before the ending, while the latter lacks this feature.

We begin the overview of PIE tense-aspect stems by examining the athematic present stem formations. The reconstructed stem types, their morphological composition (including the associated ablaut alternations), and examples from PIE are presented in Table 2 (from *LIV*², *LIV*²⁺, Tichy 2006).

FORMATION	**MORPHOLOGICAL STRUCTURE**	**PIE EXAMPLE**
Root present	R(é)-E(Ø) : R(Ø)-E(é)	**h₁éi̯-ti* : **h₁i̯-énti*
Narten present	R(ḗ)-E(Ø) : R(é)-E(Ø)	**stḗu̯-ti* : **stéu̯-n̥ti*
O-grade root present	R(ó)-E(Ø) : R(é)-E(Ø) or R(Ø)-E(é)	**gʰróbʰ-ti* : **gʰrébʰ-n̥ti*
oi̯-present	R(Ø)-S(ó)-E(Ø) : R(Ø)-S(Ø)-E(é)	**h₁p-ói̯-ti* : **h₁p-i̯-énti*
u-present	R(é)-S-E(Ø) : R(Ø)-S-E(é)	**térh₂-u-ti* : **tr̥h₂-u̯-énti*
Redupl. athem. present	C(C)*i*-R(é)-E(Ø) : C(C)*i*-R(Ø)-E(é)	**sti-stéh₂-ti* : **sti-sth₂-énti*
Nasal present	R(Ø)-S(é)-E(Ø) : R(Ø)-S(Ø)-E(é)	**li-né-kʷ-ti* : **li-n-kʷ-énti*
neu̯-present	R(Ø)-S(é)-E(Ø) : R(Ø)-S(Ø)-E(é)	**h₃r̥-néu̯-ti* : **h₃r̥-nu̯-énti*
neH-present	R(Ø)-S(é)-E(Ø) : R(Ø)-S(Ø)-E(é)	**tk̂i-néH-ti* : **tk̂i-nH-énti*
Desiderative	R(é)-S-E(Ø) : R(Ø)-S-E(é)	**u̯éi̯d-s-ti* : **u̯id-s-énti*
Intensive	C₁*é*C₂-R(o)-E(Ø) : C₁*é*C₂-R(Ø)-E(Ø)	**kʷér-kʷor-ti* : **kʷér-kʷr-énti*
Fientive	R(Ø)-S(é)-E(Ø) : R(Ø)-S(Ø)-E(é)	**mn̥-éh₁-ti* : **mn̥-h₁-énti*

Table 2: PIE athematic present stem formations.

Thematic formations are characterised not only by the presence of the thematic vowel (**-e-* in 2sg., 3sg., 2pl., and **-o-* in 1sg., 1pl., 3pl.) but also by the absence of any intraparadigmatic ablaut alternations, which were present in all athematic formations. The reconstructed thematic present stem formations are presented in Table 3.

[17] Some roots contained (or may have contained) so-called *root extensions*. This issue does not concern this study.

FORMATION	MORPHOLOGICAL STRUCTURE	PIE EXAMPLE
Simple thematic	R(é)-*e/o*-E	**b^{h}ér-e-ti* : **b^{h}ér-o-nti*
Zero-grade thematic	R(Ø)-*é/ó*-E	**sup-é-ti* : **sup-ó-nti*
Redupl. thematic present	C*i*-R(Ø)-*é/ó*-E	**si-sd-é-ti* : **si-sd-ó-nti*
Full-grade *i̯e/o*-present	R(é)-S-*e/o*-E	**spék̂-i̯-e-ti* : **spék̂-i̯-o-nti*
Zero-grade *i̯e/o*-present	R(Ø)-S-*é/ó*-E	**gu̯h$_{1}$-i̯-é-ti* : **gu̯h$_{1}$-i̯-ó-nti*
sk̂e/o-present	R(Ø)-S-*é/ó*-E	**g^{w}u̯-sk̂-é-ti* : **g^{w}u̯-sk̂-ó-nti*
ei̯e/o-present	R(Ø)-S(é)-*e/o*-E	**tu̯p-éi̯-e-ti* : **tu̯p-éi̯-o-nti*
de/o-present	R(é)-S-*e/o*-E	**kléu̯H-d-e-ti* : **kléu̯H-d-o-nti*
d^{h}e/o-present	R(é)-S-*e/o*-E	**pléh$_{1}$-d^{h}-e-ti* : **pléh$_{1}$-d^{h}-o-nti*
te/o-present	R(é)-S-*e/o*-E	**plék̂-t-e-ti* : **plék̂-t-o-nti*
Causative-iterative	R(o)-S(é)-*e/o*-E	**mon-éi̯-e-ti* : **mon-éi̯-o-nti*
Reduplicated desiderative	C*i*-R(Ø)-S-*é/ó*-E	**u̯i-u̯n̥-s-é-ti* : **u̯i-u̯n̥-s-ó-nti*
Essive	R(Ø)-S-*é/ó*-E	**lip-h$_{1}$i̯-é-ti* : **lip-h$_{1}$i̯-ó-nti*

Table 3: PIE thematic present stem formations.

PIE had much fewer distinct aorist formations than present formations, meaning that the tense-aspect system was not symmetrical: a single aorist formation could be used for the expression of the perfective aspect of more than one different present formations. Since aorist forms are past by default, they only take the secondary endings (see below). The reconstructed PIE aorist formations are shown in Table 4.

FORMATION	MORPHOLOGICAL STRUCTURE	PIE EXAMPLE
Root aorist	R(é)-E : R(Ø)-E	**g^{w}ém-t* : **g^{w}m-ént*
O-grade root aorist	R(ó)-E(Ø) : R(Ø)-E(é)	**dórk̂-t* : **dṛk̂-ént*
s-aorist	R(ē)-S-E : R(é)-S-E	**d^{h}ēi̯g^{h}-s-t* : **d^{h}éi̯g^{h}-s-n̥t*
Thematic aorist	R(Ø)-*é/ó*-E	**u̯id-é-t* : **u̯id-ó-nt*
Reduplicated aorist	C*é*-R(Ø)-*e/o*-E	**u̯é-u̯k^{w}-e-t* : **u̯é-u̯k^{w}-o-nt*

Table 4: PIE aorist stem formations.

Finally, PIE had a separate perfect formation as well as two residual stative formations (which were relics of the earlier verb system). These are shown in Table 5.

FORMATION	MORPHOLOGICAL STRUCTURE	PIE EXAMPLE
Reduplicated perfect	C*e*-R(ó)-E : C*e*-R(Ø)-É	**b^{h}e-b^{h}ói̯d^{h}-ei̯* : **b^{h}e-b^{h}id^{h}-ḗri*
Full-grade stative	R(é)-E	**k̂éi̯-ei̯* : **k̂éi̯-ēri*
Zero-grade stative	R(Ø)-É	**tuk-é* : **tuk-ḗri*

Table 5: PIE perfect and stative formations.

The ending contains information about person, number, tense and voice. There are separate sets of endings for present (*primary endings*, active and middle), imperfect and aorist (*secondary endings*, active and middle), and perfect and stative (*perfect endings*, no voice distinction but

primary vs. secondary). The reconstruction of some of the endings is difficult, since most daughter languages have drastically altered the shape of the endings (especially in the less frequently used, more marked categories). In the following, I will not discuss dual endings, since they are not relevant for Latin. The system of PIE person endings is shown in Table 6 (cf. Tichy 2006: 87–90, 93–94; Weiss 2011: 384–397).

	Imperfective and perfective				**Resultative and stative**	
	active		***middle***			
	PRIMARY	SECONDARY	PRIMARY	SECONDARY	PRIMARY	SECONDARY
1sg.	**-mi *-oh₂(e)*	**-m*	**-h₂er*	**-h₂e*	**-h₂ei̯*	**-h₂e*
2sg.	**-si*	**-s*	**-sor*	**-th₂e*	**-th₂ei̯*	**-th₂e*
3sg.	**-ti*	**-t*	**-tor*	**-to*	**-ei̯*	**-e*
1pl.	**-me/os*	**-me*	**-me(s)dʰh₂*	**-medʰh₂*	?	?
2pl.	**-t(h₂)es*	**-te*	**-dʰ(u)u̯e*	**-dʰ(u)u̯e*	?	?
3pl.	**-enti *-n̥ti*	**-ent *-n̥t*	**-ntor*	**-nto*	**-ēri*	**-ēr*

Table 6: PIE person endings.

These endings occur in the indicative: primary endings in non-past categories, secondary in past categories. Other moods took either the primary or secondary endings: the subjunctive could take both (as indicated by Vedic evidence), but the optative took only secondary endings. Additionally, there were separate endings for the imperative: 2sg. **-dʰi* or **-Ø* (athematic), **-Ø* (thematic, i.e. only the thematic vowel), 3sg. **-tu*, 2pl. **-te*, 3pl. **-ntu*. There was also a third person imperative (or "imperative future") ending **-tōd*, possibly originally the abl.sg.n. of the demonstrative pronoun **so-/to-* (Weiss 2011: 422).

Regarding the ablaut relations in the PIE verb system, the following summary can be made:

- The root can occur in four different grades: e-grade, ē-grade, o-grade or zero-grade, depending on the formation. Where a full-grade root occurs, it is usually accentuated, while a zero-grade root is never accentuated. The only intraparadigmatic ablaut alternation in the root exists between the strong and weak stem of some athematic, aorist and perfect formations.
- Not all suffixes have ablaut (especially those consisting of a single consonant, e.g. **-s-*). Those that have, alternate between the strong and the weak stem; and this alternation is always of the type e-grade : zero-grade.
- The only ablauting ending is the 3pl. imperfective ending, which has an unaccentuated zero-grade **-n̥t(i)* and an accentuated e-grade **-ént(i)*. Thematic formations have **-nt(i)*.

Most alternating verb formations follow the known accent/ablaut paradigms. The attested alternations are the following (minor types in *italics*):[18]

[18] Not all types have conventional labels. In naming the types, I have tried to choose names that either represent the major type or that describe the alternation in easily understandable terms. For the mainstream reconstruction of accent/ablaut patterns, see Ch. 1.4.

- **Simple athematic ablaut**: amphikinetic, accentuated e-grade root in the strong stem, unaccentuated zero-grade root and accentuated ending in the weak stem. (Root present, root aorist, *u*-present, desiderative.)
- **Suffix ablaut**: hysterokinetic, accentuated e-grade suffix in the strong stem, unaccentuated zero grade suffix and accentuated ending in the weak stem. (Athematic optative, nasal present, *neu̯*-present, *neH*-present, fientive.)
- **Narten ablaut**: acrostatic (root always accentuated), with ē-grade in the strong stem, e-grade in the weak stem. (Narten present, *s*-aorist.)
- ***O-grade acrostatic ablaut***: acrostatic, with accentuated o-grade in the strong stem, and either accentuated e-grade root with unaccentuated ending or unaccented zero-grade root with accentuated ending. (O-grade root present, o-grade root aorist.)
- **Perfect ablaut**: hysterokinetic, accentuated o-grade root in the strong stem, unaccentuated zero-grade root and accentuated ending in the weak stem. (Perfect.)
- ***Reduplicated present ablaut***: hysterokinetic, accentuated e-grade root in the strong stem, unaccentuated zero-grade root and accentuated ending in the weak stem. (Reduplicated athematic present.)
- ***Intensive ablaut***: acrostatic, reduplicating syllable always accentuated, with o-grade root in the strong stem, and zero-grade root in the weak stem. (Intensive.)
- **Simple thematic ablaut**: acrostatic, accentuated e-grade root throughout (zero-grade suffix, if present). No intraparadigmatic alternation. (Various thematic present formations, athematic subjunctive, full-grade stative.)
- **Zero-grade thematic ablaut**: mesostatic, zero-grade root and accentuated thematic vowel throughout. No intraparadigmatic alternation. (Various thematic present formations, thematic aorist.)
- ***Reduplicated aorist ablaut***: acrostatic, reduplicating syllable always accentuated, with zero-grade root. No intraparadigmatic alternation. (Reduplicated thematic aorist.)
- ***Causative ablaut***: mesostatic, suffix always in e-grade and accentuated, with o-grade root. No intraparadigmatic alternation. (Causative-iterative.)
- ***e̯ie/o-present ablaut***: mesostatic, suffix always in e-grade and accentuated, with zero-grade root. No intraparadigmatic alternation. (*e̯ie/o*-present.)

The PIE verb system was, it seems, rich in different kinds of ablaut alternations. Every root could enter some (but not all) formations in each category (though not necessarily in every category). There was very little uniformity among the ablaut patterns of different verbal roots: e.g. a root that had a reduplicated present and a root aorist featured an entirely different set of ablaut paradigms than a root that had a simple thematic present and an *s*-aorist. The presence of certain ablaut alternations was thus not only morphologically regulated but also lexically specific.

2.1.2. The Proto-Italic verb

As was pointed out in Ch. 1.1, the reconstruction of the Proto-Italic verb is problematic due to the paucity of comparative evidence outside of Latin. Despite this, we still have a somewhat coherent picture about the general outline of the system, even though we lack many important details. Methodologically, the reconstruction can be approached from two perspectives: comparative reconstruction based on the available data from the Italic languages, and deductive

reconstruction from PIE into Proto-Italic according to the known sound changes. The latter method, of course, is no real reconstruction *per se*, but we need to keep in mind that every Latin verb form that demonstrably is of PIE pedigree, must have passed through Proto-Italic as well, i.e. such a form must have had a Proto-Italic representation, even though we cannot reconstruct this representation with 100% accuracy. My interpretation of the Proto-Italic verb is mostly based on Meiser (2003).[19]

In general, Proto-Italic preserved many formations that it inherited from PIE, but the system as a whole was to a large extent renovated: some inherited categories and formations disappeared, and innovative ones were created (Meiser 2003: 37f). The PIE tense-aspect system was developed into a more tense-based direction, with **present** as the unmarked tense (now in exclusively PRESENT function), **future** as an innovative category (see below), and a three-way aspectual differentiation of the PAST function into **imperfect**, **aorist** and **perfect**. The moods were simplified by the functional syncretism of the PIE subjunctive and optative into the Proto-Italic **subjunctive** (most forms of which, however, continue the PIE optative), while the old PIE subjunctive formed the basis of some Italic future formations. Additional modal forms were innovated: more subjunctive formations to match the indicative tenses, as well as a **prospective** and a **preventive**. There was pressure to make the system more regular and uniform, and consequently many combinatory restrictions that had existed in PIE were abandoned (Meiser 2003: 38). An innovative **future perfect** (PERFECTIVE aspect) was developed as a companion to the perfect and (present) future formations. Dual as a number category was dropped.[20] There is no trace of the augment. The morphological composition of the verb was also changed: the root-based inflection (where root, suffix and ending are clearly separable) was changed into a stem-based system.

As for present stem classes, Sabellic shows a similar distribution of present forms into the familiar four conjugations as Latin; it follows that the system of the four present conjugations must have been in place already in Proto-Italic. The origin of each of the four conjugations is as follows:

- **The first conjugation** is based on various sources, including denominal thematic *i̯e/o*-presents from *eh₂*-stem nouns (forming a compound suffix, PIE transponat **-eh₂-i̯e/o-* > **-āi̯e/o-* > PIt. **-ā-*), similarly formed factitives (with the suffix **-h₂-* as in Hitt. *newaḫḫi* 'renew'), verb roots ending in **-(e)h₂-* (Weiss 2011: 401–402), as well as a few composite formations (e.g. frequentatives built to the PPP). However, it is not entirely clear, which of these formations are *einzelsprachlich* Latin innovations and which existed already in Proto-Italic.
- **The second conjugation** likewise has several origins, such as *i̯e/o*-presents of roots ending in **-eh₁-* (hence PIE transponat **-eh₁-i̯e/o-* > PIt. **-ē-*), causative-iterative presents, deverbal statives, and essives (Weiss 2011: 403–404).
- **The third conjugation** is a mixture of present stems of various origins (mostly inherited from PIE with little or no modification). The basis for the inflection of this conjugation is the PIE simple thematic type (e.g. PIE **h₂ég̑-e/o-* > PIt. **age-* > Lat. *agere*, Osc. *acum*),

[19] As of the time of writing of this study, no comprehensive historical and comparative grammar of the Italic languages exists. Such a reference work is indeed a desideratum.

[20] However, the Umbrian imp.2pl. ending (e.g. **etatu**, *etato* from **ei̯tā-i̯e-tā*) probably continues a PIE 2du. secondary ending **-tā* (Meiser 2003: 45), a dialectal variant of **-tom* (Hackstein 1991–1993: 57 n. 27).

but many other types (including original athematics) are drawn to it by *thematisation* (see below).

– **The fourth conjugation** also has a number of inherited present stem formations, but also innovative denominatives of *i*-stem nouns (the suffix was probably PIt. *-*ī*-, from an earlier *-*i-i̯e/o*-) and few other formations.

The innovative formations in the first, second and fourth conjugations can be largely ignored in the following discussion, since they do not provide any evidence for the continuation of PIE ablaut in the verb system.

Overall, the basis of the Proto-Italic verb system is the PIE thematic inflection. This does not mean that the inherited athematic verbs were simply abandoned, but rather many of them were thematised. Thus, the process of **thematisation** plays a central role here. As will be seen in the following discussion, thematisation does not simply involve the replacement of the endings and/or the insertion of the thematic vowel, but, in some cases, it also affects the verb stem and the ablaut grade in it: most importantly, I hypothesize that the most salient effect of thematisation of athematic verbs is the *reduction of inherited ablaut alternations due to the fact that the PIE simple thematic type lacks intraparadigmatic alternations*.

An important feature of the Italic verb is also the harmonisation of the tense stem formations: typically, each root had just one present stem formation (which may not have been the original PIE one) coupled with one aorist and one perfect formation.[21] To this was also added a number of infinite forms, including the infinitive, the gerund, the supine, and the present active and perfect passive participles (there are also traces of a perfect active participle). This evokes a crucial structural aspect, which much henceforth be observed: *the paradigmaticisation of the verb system highlights the analogical organisation of the paradigms and the importance of the intraparadigmatic relations*. I hypothesize that to each Proto-Italic present stem was assigned exactly one aorist stem, one perfect stem and one future-perfect stem. The resulting system is presented in Table 7 (adopted and extended from Meiser 2003: 38).

[21] Sabellic formations, however, do not always match the Latin formations (see Meiser 2003: 67–69). This is most likely due to post-Proto-Italic *einzelsprachlich* restructuring, and does not necessarily indicate the existence of multiple simultaneous aorist and perfect formations in Proto-Italic.

STEM	TENSE	MOOD	MARKER(S)	EXAMPLE (3SG.)	ORIGIN
Present	present	ind.	various (or Ø)	**aget*	PIE present formations and Italic innovations
		sbj.	**-ā-*, **-ī-/*-iē-*	**fakiād*, **siēd*	Italic innovation, PIE optative
		imp.	Ø	**age* (2sg.)	PIE imperative
	imperfect	ind.	**-βā-*	**monēβād*	Italic innovation
	future	ind.	**-s-*, **-e-/-ē-*	**fūsed*, **fakiēd*, **esed*	PIE desiderative, PIE subjunctive
		sbj.	**-sē-*	**fusēd*	Italic innovation
Aorist	aorist	ind.	various (or Ø)	**fēked* (**fakond* 3pl.)	PIE aorist formations
		sbj.	**-ā-*	?	PIE aorist optative
		imp.	Ø	**dō* (2sg.), **date* (2pl.)	PIE aorist imperative
Perfect	perfect	ind.	various	**fefakeį(t)*	PIE perfect
		sbj.	**-ē-*	**fefakēd*	Italic innovation
Future-perfect	future-perfect	ind.	**-s-/-ss-*	**dōnāst*	Italic innovation
		sbj.	**-sī-/-ssī-*	**faksīd*	Italic innovation

Table 7: Proto-Italic verb system.[22]

Notes on the reconstructed examples of Table 7:

- **aget* (< PIE simple thematic **h₂eĝ-e-ti*) > Lat. *agere*, Osc. *acum*.
- **fakiād* (< PIE **dʰh₁(k)-*, zero-grade of **dʰeh₁(k)-*), *ie/o*-present, > Osc. **fakiiad**, Lat. *faciat*; **siēd* (< PIE optative **h₁s-ieh₁-t*, from **h₁es-*) > VOLat. SIED > OLat. *siet* > CLat. *sit*.
- **age* (< PIE imp.2sg. **h₂eg-e*) > Lat. *age*.
- **monēβād* (← PIE causative-iterative **mon-eį-e-ti*, from **men-*) > Lat. *monēbat*. On the origin of the *-bā-* marker and the history of the formation, see Baldi 1976; Meiser 1998: 197–199; Weiss 2011: 414.
- **fūsed* (< PIE **bʰuh₂-*) > Osc. *fust* (fut.); **fakiēd* (with PIE thematic subjunctive marker **-ē-*) > Lat. *faciet*; **esed* (< PIE athematic subjunctive **h₁és-e-t*) > Lat. *erit*.
- **fusēd* (< PIE **bʰuh₂-*) > Lat. *foret* (imf.sbj.), Osc. **fusíd** (imf.sbj.).
- **fēked* (< thematised PIE(?) root aorist **dʰeh₁k-t*) > Lat. *fēcit*; **fakond* (< thematised PIE(?) root aorist **dʰh₁k-ent*).
- **dō* (< PIE root aorist imperative **deh₃*) and **date* (< PIE root aorist imperative **dh̥₃-te*) are preserved in the Latin particles *cedo*, *cette* 'give here' (see Ch. 2.3.4.5.).
- **fefakeį(t)* (< reduplicated perfect PIE transponat **dʰe-dʰeh₁k-eį*) > VOLat. FHE:FHAKED, but the form cannot be *lautgesetzlich* and involves two modifications: 1) the generalisation of the zero-grade variant of the root, and 2) the replacement of the inherited perfect ending with the corresponding aorist ending (cf. VOLat. FECED).

[22] Meiser (2003: 38) also lists a perfect imperative, which is reflected in Lat. imp.2sg./3sg. *mementō* (of *meminisse*). It is not clear, whether pf.imp. was an actual category in Proto-Italic (Meiser 2003: 60).

– **fefakēd* (< PIE reduplicated perfect same as above, characterised by the modal suffix **-ē-* and the secondary endings) > Osc. *fe⟨f⟩acid*.
– **dōnāst* (first conjugation denominative), present stem **dōnā-* with the future *-s-* and 3sg. ending (cf. Meiser 2003: 40).
– **faksīd* (< PIE root **dʰeh₁(k)-*), de-characterised zero-grade present stem with the future *-s-* and the subjunctive *-ī-*, > OLat. *faxit*.

There are two additional formations, which appear partially outside the aforementioned system:

– **Prospective**: according to Meiser (2003: 41), the PIE subjunctive was, in some cases, preserved in Proto-Italic in prospective function. This set of forms is the origin for the Latin third and fourth conjugation futures in *-ē-*. However, it seems to me unclear, how the prospective was functionally separated from the future. Latin lacks any sign of the *-s-* in the future (of the present stem), since it has either the innovative *b*-future or the (originally PIE subjunctive) forms in *-ē-* (with the exception of the 1sg. *-am*, which is contamination from the subjunctive present paradigm).[23] Thus, I find it highly probable that these prospective forms were in fact used in Proto-Italic in the standard future function for at least some verbs (most likely those of the third and fourth conjugations).
– **Preventive**: both Italic sub-branches preserve traces of a formation, which was used in prohibitive function and/or in negated clauses (Meiser 2003: 41–42). This was built to the uncharacterised zero-grade root with the mood marker *-ā-*, e.g. Lat. *tagās* (from *tangere*), Umb. **habas** (cognate of Lat. *habēre*). The formation was probably a negated counterpart to the (affirmative) present and aorist imperatives. Note that this is not the same as aor.sbj., because the preventive is built to the uncharacterised stem (i.e. bare root).

A small group of verbs in the Italic languages have preserved traces of the athematic conjugation. These are high-frequency basic verbs, usually with irregular inflection (e.g. Latin *esse*, *īre*, *velle*, *ēsse* (*edere*), *dare*), and they are reflexes of PIE athematic presents. There is, thus, the possibility that not all inherited athematics were thematised or that the thematisation was only partial. It is also possible that Proto-Italic had a (partially) athematic inflection for these verbs. The issue will be investigated in detail in Chs. 2.2., 2.3.

As for person endings, the original distinction of the primary, secondary and perfect endings is only fragmentarily preserved in the Italic languages. Proto-Italic, however, must have had three distinct sets, which can be reconstructed as shown in Table 8. The middle/passive voice was marked by suffixing *-r* to the inherited thematic middle endings (however, comparative evidence for other than 3sg. and 3pl. is lacking). Perfect did not have a synthetic middle/passive formation – Latin and Sabellic evidence shows clearly that this systemic gap was filled by synthetic (or periphrastic) constructions.

[23] The Plautine attestations of third conjugation 1sg.fut. in *-em* (e.g. *faciem*; see Hodgman 1907: 48) indicate that this ending was probably original, while the adoption of *-am* took place later (but certainly already before Old Latin).

	Present and aorist				**Perfect**
	active		***middle***		
	PRIMARY	SECONDARY	PRIMARY	SECONDARY	
1sg.	**-ō*	**-m*	?	?	**-aį̯*
2sg.	**-s*	**-s*	?	?	**-taį̯* (?)
3sg.	**-t*	**-d*	**-tor / *-ter*	?	**-eį̯(t)*
1pl.	**-mos*	**-mos* (?)	?	?	?
2pl.	**-tes*	**-tes* (?)	?	?	?
3pl.	**-nt*	**-nd*	**-ntor / *-nter*	?	**-ēri*

Table 8: Proto-Italic person endings.

2.1.3. The Latin Verb

The Latin verb system continues the Proto-Italic formations in its outline, but several extensive modifications have been introduced. The most radical changes include the following (also cf. Risch 1992: 20–21):

- The tense stem system was simplified by the marginalisation (and eventual loss) of the Proto-Italic future-perfect forms and, most famously, the merger of the aorist and perfect stems into the Latin neo-perfect.
- The TAM system was also made more symmetrical by pairing each indicative formation (with the exception of the future and neo-future-perfect) with a corresponding subjunctive formation.
- An innovative *v/u*-perfect was grammaticalized; this became the productive perfect stem formation.
- Four new TAM-categories were created: pluperfect indicative, neo-future-perfect (formally not related to the Proto-Italic future-perfect), perfect subjunctive, and pluperfect subjunctive.
- Forms that remained outside this paradigm structure (e.g. the inherited preventive forms) were either abandoned before Classical Latin or were regularised and incorporated into the productive formations.
- Due in part to regular sound change and in part to the aforementioned mergers and systematisations, the difference between primary and secondary endings, and perfect and aorist endings was lost: the only remaining difference between the old primary and secondary endings is that the former has 1sg. in *-ō* (as in prs.ind., fut. of first and second conjugations, and fut.pf.) and the latter *-m* (in all other cases except the pf.ind.). For the indicative (neo-)perfect, the inherited perfect endings were generalised (the 3sg. aorist ending -ED < PIt. **-ed* is attested in some VOLat. inscriptions).
- The voice system was also made symmetrical. However, for passive forms of the perfect stem, innovative periphrases were grammaticalized using *esse* and *īrī* (a rare passive infinitive of *īre*) as auxiliaries.

The VOLat. and OLat. inscriptions and the OLat. literature illustrate the gradual development of the verb system. The system described above was in place at the beginning of the Classical Latin period (early first century BC). The development is characterised by simplification and

regularisation of the inherited formations as well as the innovation of new ones (to fill the gaps left by the regularisation effort, or to renovate some of the inherited formations). The Classical Latin verb system and the origin of the formations are shown in Table 9.

STEM	TENSE	MOOD	MARKER(S)	EXAMPLE (3SG.)	ORIGIN
Present	present	ind.	Ø or conjugation vowel	*facit*	PIt. present formations
		sbj.	*-ē-* (1st conj.), *-ā-* (elsewhere)	*amet*, *faciat*	PIt. subjunctives
		imp.	Ø or conjugation vowel	*amā*, *cane*	PIt. imperative
	imperfect	ind.	*-bā-*	*amābat*	PIt. imperfect
		sbj.	*-rē-*	*faceret*	PIt. future subjunctive
	future	ind.	*-b-* (1st and 2nd conj.), *-ā-* (elsewhere 1sg.), *-ē-* (other persons)	*amābit*, *faciam*, *faciet*	Lat.-Fal. innovation, PIt. prospective
Perfect	perfect	ind.	Ø (only the stem)	*fēcit*	PIt. aorist and perfect
		sbj.	*-erī-*	*fēcerit*	Latin innovation
	pluperfect	ind.	*-erā-*	*fēcerat*	Latin innovation
		sbj.	*-issē-*	*fēcisset*	Latin innovation
	future-perfect	ind.	*-er-*	*fēcerit*	Latin innovation

Table 9: The Latin verb system.

In the first, second and fourth conjugations, the perfect and participle stems can often be directly derived from the present stem. Considering this and the innovative and productive nature of these conjugations, they provide hardly any evidence for the development of ablaut. The most variable of the four conjugations is the third, which (with the fourth) continue most of the Proto-Italic present stem formations, which in turn are of PIE origin. Furthermore, the assigned perfect stems continue either the Proto-Italic perfect **or** aorist stems (and these are, in most cases, also of PIE inheritance). The selection principles between perfect and aorist stems is the topic of Meiser (2003) and will be discussed *passim* below in Chs. 2.2. and 2.3.

This short overview has demonstrated that the history of the Latin verb and the associated ablaut alternations have a strong tendency towards systematisation and uniformisation of the inflection. According to the objectives of this study, the generalisations and hypotheses presented in the preceding sections will be examined and tested on the actual historical and philological data in the following sections.

2.2. Thematic formations

This section presents the historical analysis of such Latin verb formations that originate from PIE thematic verbs. The verbs are ordered and group according to their original present formations; the associated Latin perfect and participle stems are analysed together with their present stems.

2.2.1. Simple thematic presents

Simple thematic presents were in PIE built to the accented e-grade root, suffixed with the thematic vowel *-*e/o*-. The root stays in e-grade in all present forms, while secondary TAM-markers take the invariable zero-grade (e.g. opt. *-*ih₁*-). In the prehistory of Latin, this class became very productive, especially in conjunction with various suffixes, and attracted other formations into it: as we will see, some formations were renovated by a regular simple thematic formation, while others retained their primary markers and were subsequently suffixed with the thematic vowel and the thematic endings. In this section, Latin verbs that originate from inherited simple thematic formations, which do not carry any overt (segmental) present stem marker, are examined.

2.2.1.1. *Agere*

Agere (*ăgō, ēgī, āctus*) 'to drive' originates from one of the best attested and most discussed PIE roots, i.e. **h₂eĝ*- 'to drive (cattle, from behind)' (*LIV*²: 255–256).[24] The root has many nominal derivatives in the IE languages, which go back to certain PIE formations (see *NIL*: 267–277, and Anttila 2000 for an etymological-philological analysis). In the verbal domain, the most important cognates include Ved. *ájati* 'to drive', YAv. *azaiti* 'to drive', Arm. *acem* 'to lead', Gr. ἄγω 'to drive, lead', OCymr. *agit* 'to go', ON *aka* 'to travel', and Toch. B *āśäṃ*, Toch. A *ākeñc*° 'to lead' – all these forms, including Lat. *agere*, reflect a PIE e-grade simple thematic present **h₂éĝ-e/o*-. Possibly of PIE pedigree is the Ved. reduplicated thematic present *íjate* 'to drive' (< PIE **h₂i-h₂ĝ-é/ó*-), but this may also be an IIr. innovation (see *LIV*²: 256 and the references there). This root did not have an aorist or a perfect formation in PIE, meaning that the Greek reduplicated aorist ἤγαγον and the perfects/preterits Gr.(Att.) ἦχα, ON *ók* and possibly Lat. *ēgī* are post-PIE innovations. Related to (or possibly identical with) this root is PIE **h₁eĝ*- or **h₂eĝ*- 'to say' (*LIV*²: 256), which is reflected in Latin as *aiō* 'to speak, say (yes)'.

In Latin, the root and the verb are attested relatively early in a multitude of formations. In addition to the present stem, the most important ones are the long-vocalic perfect stem *ēg*- and the PPP *āctus* – within these three stems the verb is conjugated exactly like a regular third conjugation verb. Apart from those formations that are clearly derived from the present stem (e.g. *abigere* 'to reject' < **ab-agere*) or bear a synchronic relation to the PPP (e.g. *āctus, -ūs* 'driving (of cattle)'), the following groups of derivatives can be identified (cf. *WH*, s.v. *agō*; *EM*, s.v. *agō*; *EDLIL*, s.v. *agō, -ere*):

- *-ĭ̆gāre* compounds: *iūrigare* (later *iūrgāre*) 'to quarrel', *lītigāre* 'to litigate', *nāvigāre* 'to travel by ship', *pūrigāre* 'to purify', *fatīgāre* 'to exhaust', *fastīgāre* 'to taper', and *castīgāre* 'to reprove'.
- The intensive *agitāre* 'to stir, disturb, aspire to' and its derivatives, e.g. *agitātor* 'driver, charioteer', *cōgitāre* 'to think'.

[24] Cf. *IEW* (p. 4f) and Anttila (2000: 1) on the meaning of the root. The actual shape of the root, however, is debated. The standard reconstruction **h₂eĝ*- (*LIV*²: 255–256) is based on the PIE root structure CVC- and on other considerations, as any consonantal reflex of a **h₂*- is not directly attested anywhere. Other possibilities are **h₁aĝ*- (cf. Poetto 1998: 111) and **aĝ*- (Bammesberger 1984b: 66f; Anttila 2000). The long vowel of Latin °*īgāre*-compounds may be evidence for a root-initial laryngeal (Dunkel 2000), but a more detailed analysis of the chronology indicates that they rather originate from a period when consonantal laryngeals were already lost (see Opfermann 2016: 56–57 and the references there).

– Nominal derivatives in *ă(g)-* as the first member: *agmen* ‘train, stream, marching formation’, *exāmen* ‘swarm (of bees), needle of scales’, *ammentum/āmentum* ‘loop attached to a spear’, *agilis* ‘swift, agile’, *agolum* ‘shepherd’s staff’.
– Agent noun compounds in *-ex* and *-ax*: *rēmex* ‘oarsman’, *aureax* ‘charioteer’.
– Nominal compounds with an underlying **-ăg-* (usually *-ig-* due to vowel weakening) as the second member: *exiguus* ‘scanty’, *exīlis* ‘thind’, *prōdigus* ‘wasteful’, *rēmigium* ‘rowing’, *ambiguus* ‘undecided’.[25]
– Nominal compounds with *-āg-* as the second member: *ambāgēs* ‘circumlocution, detour’, *indāgō, -inis* ‘ring of huntsmen’, *coāgulum* ‘rennet’.
– Other nominal derivatives: *aurīga* ‘charioteer’, *vectīgal* ‘toll, revenue’.

Sabellic cognates include Osc. inf. *acum*, 3sg.imp. *actud* ‘to act (legally)’, acc.pl. **aginss** ‘case, action, ritual’, Marr. abl.sg. *agine* ‘case’, Umb. abl.pl. **ahtis**(**per**), acc.sg. **ahtim**(**en**) ‘acts’ (cf. *WOU*, s.v. *acum*).

The present stem is unproblematic: based on solid comparative evidence, there can be little doubt that *ag-* represents a direct continuation of PIE **h₂ég-e/o-*, with the expected full-grade root (Bock 2008: 167).

The perfect stem *ēg-* is more problematic: as noted above, PIE did not have any aorist or perfect formations for this root, meaning that an innovative aorist and perfect were probably created in Proto-Italic to fill the inherited gaps in the paradigm. Unfortunately, however, lack of attestation of the Sabellic neo-perfect makes Proto-Italic reconstruction problematic. There are various proposals for the origin of *ēg-*.

Traditionally, *ēgī* has been explained by analogy from *fēcī, iēcī*, etc., where the *-ē-* is the product of regular sound change. Indeed, these verbs exhibit the same vowel relation: *-a-* of the present stem vs. *-ē-* of the perfect stem. However, these verbs are not simple thematic presents but *i̯e/o-*presents, making the analogical equation less attractive (cf. Meiser 2003: 207).

According to Meiser (1998: 211; 2003: 207), *agō* has adopted the perfect stem of the related verb *aiō*, due to some present stem forms (e.g. 2sg. **ag-es*, 3sg. **ag-et*) having been homophonous at one time. Meiser’s reconstruction is based on the root **h₁eĝ-* for *aiō*, and a reduplicated zero-grade perfect stem would be **h₁e-h₁ĝ-*, which would yield *ēg-* in Latin (this could have been the Proto-Italic perfect stem for this verb). However, it is rather the case that the root of *aiō* is to be reconstructed with **h₂-*, for which there is unambiguous Tocharian evidence (Hackstein 1995: 332–334).

Weiss (1993: 178f; 2011: 412–413) suggests that some Latin long-vocalic neo-perfects (e.g. *ēgī, lēgī, rēgī, ēdī*) originate from imperfects of PIE Narten presents. The idea has recently been elaborated by Jasanoff (2012) and has received some acceptance.[26]

At this point it suffices to say that, although the possibility of analogical extension from *faciō – fēcī* type verbs exists, the ē-grade origin of *ēgī* < **h₂ēg-* is currently the best explanation for the perfect stem of *agere*, despite the difficulty of proving any Narten character for this root (Garnier 2010: 109).

[25] *Prōdigium* ‘unnatural event, omen, portent, prodigy’ is listed in *EDLIL* (s.v. *agō, -ere*), but it is more likely related to *aiō* (Dunkel 2000: 92 n. 23).
[26] I am thankful to Romain Garnier for informing me about this possibility after my presentation at the *22nd International Conference of Historical Linguistics* at Naples, July 2015.

The PPP *āctus* – where the long vowel is due to Lachmann's rule (see Appendix I) – is regular from PIt. **ag-to-*, which could possibly reflect either the expected PIE zero-grade **ḫ₂ĝ-tó-* or an e-grade **h₂eĝ-tó-* (Monteil 1970: 65; Bock 2008: 168). Schrijver (1991: 31) has doubts about the regularity of the sound change PIE **#ḪC-* > PIt. **#aC-*, but in an ablauting context, it is plausible (see Hackstein 2012a: 110–112 for discussion and references). Thus, on morphological grounds, we can presume that *āctus* represents a phonologically regular continuation of the PIE zero-grade *to*-participle.

Agere has in most cases preserved the regular phonological continuation of the original PIE ablaut grades, as per heredity principle. The *a*-vocalism is due to the effect of **h₂*. If *ēg-ī* is indeed a continuation of an old Narten imperfect **h₂ēĝ-/h₂ĕĝ-*, the intraparadigmatic ablaut was at some point (perhaps in Proto-Italic) neutralised, by 1M1F (i.e. the tendency to pair one specific meaning with one specific form; see Ch. 4.3.3.), in favour of the ē-grade strong stem in order to enhance differentiation towards the present stem.

2.2.1.2. *Canere*

Canere (*cănō, cecĭnī, cantus*) 'to sing' is probably of PIE origin, but the exact etymological details are difficult. First of all, potential non-Italic verbal cognates are attested only in Celtic, i.e. OIr. *-cain, -canat* 'to sing' etc. Nominal cognates include Gr.(Hsch.) ἠικανός 'rooster (< dawn-singer)', Go. *hana*, OHG *hana* 'cock', etc. All these point towards a PIE root **kan-*. However, a possible further cognate is Toch. A *kaṃ*, B *kene* 'melody, tune, meter', which reflects an o-grade root, PIE **kon-o-s* (Hackstein 2002a: 188 n. 34; *DTB*, s.v. *kene**). De Vaan (*EDLIL*, s.v. *canō, -ere*) reconstructs a zero-grade thematic present PIE **kh₂n-e/o-*, where the laryngeal surely can only be motivated by the avoidance of reconstructing a PIE **a*. Sabellic cognates include Umb. imp.fut.3sg. **kanetu**, fut.pf.3sg. *procanurent*, and acc.sg. **ařkani** 'ritual song'.

The composition of the Latin paradigm has an archaic feel to it: a perfectly ordinary simple thematic present coupled with a reduplicated perfect and a PPP. Considering the Umbrian cognates, the verb must have existed in Proto-Italic. The following formations can be reconstructed: present stems **kan-e/o-* and **kan-ē-* (due to the Umbrian evidence, **kanetu** < **kan-ē-tōd*), reduplicated perfect **ke-kan-* (the vocalism, however, is submerged due to Latin vowel weakening), and the PPP **kan-to-*. It is possible that these are continuations of respective PIE formations (cf. Bock 2008: 187).

This verb provides very little evidence in terms of PIE ablaut: the *a*-vocalism may be of PIE pedigree, but in that case the paradigms did not exhibit any intraparadigmatic or transparadigmatic alternations. The vocalism of *cecĭnī* is a result of regular sound change. Compounds and derivatives (e.g. *vāti-cinārī* 'to prophesy', *carmen* 'song' < **kan-men*) reflect either the *a*-vocalism of the verb root or the regularly weakened *i*-vocalism in medial syllables.

2.2.1.3. *Colere*

Colere (*colō, coluī, cultus*) 'to cultivate, tend, inhabit' originates from the well-attested PIE root **kʷelh₁-* 'to turn around' (*LIV*²: 386–388). Evidence for a PIE simple thematic present **kʷélh₁-e/o-* is provided by Ved. *cárati* 'to move (oneself), go', OAv. *caraitī* 'to be in motion', Gr.(Hom.) πέλομαι 'to move oneself', and Alb. *sjell* 'to bring, carry, turn'. Gr.(Ion.) τελέθω 'to come into being' may reflect a PIE *dʰe*-present. There is also evidence for a nasal present (e.g.

Gr. τέλλομαι ‘to be born, to become’) and for an o-grade causative-iterative (e.g. Luw. *kuwalīti* ‘turns’, Gr. πολέω ‘to till, move around’). PIE also probably had an athematic root aorist **kʷelh₁-/*kʷl̥h₁-*, but the evidence is indirect: e.g. Arm. *eɫew* ‘became, was’, Gr. ἔπλετο ‘became, took place’, Toch. B *śala*, A *śäl* ‘led, brought’, Alb. *cleh/clè* ‘became’. Ved. (Atharvaveda) *cacā́ra* ‘has gone’ and Toch. B sbj. *kālaṃ* ‘will bring’ may reflect a PIE reduplicated perfect **kʷe-kʷólh₁-/kʷe-kʷl̥h₁-*. Sabellic evidence includes only one potential cognate, Umb. fut.imp.3sg. **ařpeltu** (≡ Lat. *adcolitō*?) (*WOU*, s.v. *ařpeltu*; *EDLIL*, s.v. *colō, -ere*).

The Latin present stem *col-* is a direct continuation of the PIE simple thematic present (Bock 2008: 211–212). The vocalism **-e-* > *-o-* (fifth century BC, Meiser 1998: 82) and the consonant change **kʷ-* > *c-* (second century BC, Meiser 1998: 99) are results of regular sound changes. As Meiser (1998: 82) has noted, the present paradigm has been levelled according to the root vocalism that occurred before the thematic vowel **-o-*; otherwise the result would have been, e.g., 2sg. **kʷél-e-si* > *ˣquelis*. This is in line with the 1M1F principle (see Ch. 4.3.3.). The Proto-Italic present stem must have been **kʷel-e/o-*, of which both the Latin verb and the Umbrian cognate (**kʷ-* > *p-* is regular in Umbrian, Meiser 1986: 79) are phonologically regular continuations.

The evidence is rather scarce to securely reconstruct Proto-Italic aorist and perfect formations. Meiser (2003: 96) presumes a Proto-Italic root aorist, based on the reconstruction of this category for PIE (even though the evidence is not entirely unproblematic, see above). Due to Proto-Italic vocalisation of PIE syllabic liquids (see Ch. 3.1.3.), the inherited ablaut alternation **kʷelh₁-/kʷl̥h₁-* would have been continued as PIt. **kʷel(a)-/kʷol-*, and finally neutralised in Latin into *col-/col-*, all by regular sound change. Because the comparative evidence is lacking, it is not possible to say if the Proto-Italic aorist still had the inherited ablaut relation or when it was thematised. It would be tempting to reconstruct an “alpha-thematic” or *a*-stem aorist, considering the regular development of PIE **-h₁-* into PIt. *-a-* (e.g. 3sg. **kʷélh₁-t* > **kʷela-d*), but there is no comparative Italic evidence for this. In any case, in Latin an innovative *u*-perfect *colu-ī* was created as the neo-perfect stem. According to Meiser (2003: 169), this was due to the preference for overtly marked neo-perfect formations instead of markerless ones – and the Proto-Italic root aorist (discarding the idea of an *a*-stem inflection) would have been exactly identical with the simple thematic present stem.

The PPP *cultus* cannot be a regular continuation of a PIE *to*-participle **kʷl̥h₁-tó-*, for regular sound change would have produced PIt. ˣ*kʷlā-to- > Lat. ˣ*clātus*. Instead, the original zero-grade root must have been renovated very early into an e-grade or o-grade-looking form (the former is very likely, being the ablaut variant of the present stem). Thus, pre-PIt. **kʷlā-to-* → PIt. **kʷel-to-* > Lat. *cultus*, where **o* > *u* is a regular change in this phonological environment (Meiser 1998: 84).[27] This development is paralleled by the renovation of PIE **ugʰ-tó-* into Lat. *vectus* (see Ch. 2.2.1.18.).

2.2.1.4. *Dīcere*

Dīcere (*dīcō*, *dīxī*, *dictus*) ‘to say’ is another verb that originates from a widely-attested PIE root: **deiḱ-* ‘to show, point out’ (*LIV*²: 108–109). It is cognate of Ved. aor. *ádiṣṭa* ‘has shown’,

[27] According to Bock (2008: 213), *cultus* may also be a syncopated continuation of **colitus*, which in turn is comparable with such PPPs as *vomitus* (of *vomere*) and *molitus* (of *molere*).

imp.3sg. *dídeṣṭu* ‘should allocate’, Gr. prs. δείκνῡμι (a secondary νῡ-present, see Rix 1992: 210), OAv. intens.inj.3sg. *daēdōišt* ‘shows’. The simple thematic present formation PIE **déi̯k̂-e/o-* is attested also in Germanic as Go. *ga-teihan* ‘to indicate’, OHG *zīhan* ‘to accuse’ (> NHG *zeihen*), and in Sabellic as Osc. inf. **deíkum** ‘to say’, Umb. fut.imp.3sg. **teitu**, *deitu* ‘should say’.[28]

The Latin present stem *dīc-* is a regular phonological continuation of the PIE simple thematic present. The monophthongisation of **-ei̯-* into *-ē̆-* occurred in the third century BC, yielding the Old Latin present stem DEIC- /dē̆k-/ (e.g. DEICERENT, *SCdB*), until *-ē̆-* rose into *-ī-* during the first half of the second century BC, producing the CLat. *dīc-*.

The perfect stem *dīx-* continues an earlier *s*-aorist, probably of at least Proto-Italic age, possibly even more ancient (Meiser 2003: 111). The *s*-aorist is in *LIV*² (p. 108) classified as an innovative form; however, considering that the *s*-aorist is attested in Latin, Greek and Avestan (cf. Bock 2008: 222), and that simple thematics were usually paired with *s*-aorists in PIE (Tichy 2006: 111), the formation most likely is inheritance from PIE (so *LIV*²⁺). The quantiatative ablaut PIE **dēi̯k̂-s-/dĕi̯k̂-s-* was neutralised early by Osthoff’s Law (Ch. 3.1.5.); hence PIt. **dĕi̯k-s-*. In Latin, the identical vocalism in the inherited present and aorist stems did not prevent the continuation of the *s*-aorist as the Latin neo-perfect, as the perfect stem exhibited an overt marker, and sufficient contrasts were thus maintained. However, in Sabellic PIt. *s*-aorists were generally eschewed (e.g. Meiser 2003: 107), and the inherited reduplicated perfect was continued there.

The PPP *dĭctus* is a regular phonological continuation of the PIE *to*-participle **dik̂-tó-*. *Dīcere* continues all its paradigm forms (including the involved ablaut contrasts) in a regular fashion. The neutralisation of the strong vs. weak stem alternation in the *s*-aorist is also due to regular sound change, which took place before Proto-Italic.

2.2.1.5. *Dūcere*

Dūcere (*dūcō*, *dūxī*, *dŭctus*) ‘to lead’ is synchronically conjugated exactly like *dīcere*, the two verbs differing only in vocalism,[29] but the prehistory of these two verbs is not exactly identical. *Dūcere* is from the PIE root **deu̯k-* ‘to pull’ (*LIV*²: 124), cognate of Gr. (δα-)δύσσομαι ‘to be torn’, OCymr. sbj. *-duch*, MCymr. *duwch* ‘would bring’, Toch. B *tsauksā°* ‘pulled, drank’, ON *teygja* ‘to entice’. Reflexes of the simple thematic present PIE **déu̯k-e/o-* include Waxi *δic-* ‘to milk’ (*LIV*²⁺), MCymr. *dwc* ‘brings’, Go. *tiuhan* ‘to pull’, Alb. *n-duk* ‘pulls out’, and possibly Toch. A pret. *śuk* ‘drank’, *tskāt* ‘pulled out’ – however, these formations are in *LIV*² classified as secondary IE renovations: the original present formation was an athematic root present **déu̯k-/duk-*, which was thematised in the IE languages (cf. Bock 2008: 225). There are no Sabellic cognates.

The Latin present stem *dūc-* is a thematised continuation of the original PIE simple athematic present. Although the vocalism is partially submerged due to Proto-Italic change **-eu̯-* > **-ou̯-*, there is little doubt that the root was originally the e-grade strong stem variant of PIE **déu̯k-/duk-*. As a side effect of thematisation – which most likely took place very early – the original athematic ablaut relation was neutralised. The PIt. form **deu̯k-e/o-* remained in

[28] For a more complete list of Sabellic attestations, see *WH*, s.v. *dīcō*; *WOU*, s.v. *deíkum*; *EDLIL*, s.v. *dīcō, -ere*. Umb. *-ei-* /ē/ is regular from **-ei̯k*C- (Meiser 1986: 124).
[29] Since Italic is a *centum*-branch, the difference of the palatal **-k̂-* and non-palatal **-k-* was neutralised early.

Latin until the third century BC monophthongisation into *dōc-* (cf. ABDOVCIT, *SCdB*), and was finally raised into *dūc-* in the second century BC. These relatively late sound changes did not result in any neutralisations.

Like *dīx-*, the *s*-perfect *dūx-* most likely represents an inherited PIE *s*-aorist **dĕ̯u̯k-s-*, which is also reflected in Cymric and Tocharian. The inherited strong stem vs. weak stem ablaut relation was neutralised early by Osthoff's Law, and the resulting **-ĕu̯-* underwent the same changes as the original **-ĕu̯-* of the present stem.

The PPP *dŭctus* is a regular phonological continuation of the PIE **to*-participle **duk-tó-* > *ductus*.

Dūcere continues in most cases the inherited PIE ablaut alternations. The original athematic ablaut of the present stem was neutralised by thematisation. The neutralisation of the strong vs. weak stem alternation of the *s*-aorist/perfect was due to regular sound change. Other, relatively late sound changes did not result in any further neutralisations.

2.2.1.6. *Emere*

Emere (*ĕmō, ēmī, emptum*) 'to buy' originates from the PIE root **h₁em-* 'to take' (*LIV*²: 236–237). This root had a simple thematic present **h₁ém-e/o-*, reflected in OIr. *-eim, -emat* 'to take', Lith. (dialectal) *emù* 'to take', and Latv. *jęmu* 'to take', and an athematic root aorist **h₁ém-/h₁m-*, reflected in OCS *jętъ* 'took', indirectly in OIr. *-ét* 'took', and possibly in Hitt. *w-emiyezzi* 'finds' and Lith. *ẽmė* 'took' (on Lat. interj. *em*, see below). The Latin perfect stem is the only evidence for a PIE reduplicated perfect **h₁e-h₁óm/h₁e-h₁m-*. Sabellic cognates include Umb. sbj.prs.3pl.pass. **emantur**, **emantu** 'should be taken', pf.3sg.pass. *emps est* 'has been taken', Osc. pf.3pl. **emmens** 'have taken', fut.pf.3sg. *peremust* 'has received', inf. *pertumum*, fut.3sg. *pertemest*, fut.pf.3sg. *pertemust* 'to prevent', and Umb. **sumtu** fut.imp.3sg. (≡ Lat. *sūmitō*).

The Latin present stem *em-* is a direct continuation of the PIE simple thematic present (Bock 2008: 229). The particle/interjection *em* 'take!, there!' may be derived from an old root aorist imperative **(h₁)em* (so *LIV*²: 236; Bock 2008: 229) or it may be an apocopated variant of the regular thematic present imperative *eme* (so *EDLIL*, s.v. *emō, -ere*), cf. e.g. *fac* < *face*.

The perfect stem *ēm-* probably originates from the PIE reduplicated present weak stem, whence regularly **h₁e-h₁m-h₂e(i̯)* > PIt. **ēm-ai̯* > Lat. *ēmī* (cf. Meiser 2003: 199); but this formation is the only evidence for its existence in PIE. Another alternative, tracing *ēmī* to an imperfect of a Narten present **h₁ēm-* (à la Weiss & Jasanoff), seems unlikely in the face of the fact that there is absolutely no evidence for Narten ablaut for this root (cf. Garnier 2010: 77). Proto-Italic also had a root aorist, which is continued as the Sabellic neo-perfect stem *em-*, e.g. Osc. *pert-em-ust* (and possibly as the Lat. interjection *em*, see previous paragraph). The continuation of the Proto-Italic perfect instead of the aorist as the Latin neo-perfect can be explained by the fact that the perfect formation was more distinctively differentiated against the present stem (**ēm-* vs. **ĕm-*) (Meiser 2003: 199).

There is also a complementary perfect stem *°(e)mps-ī*, which occurs in preverb compounds, e.g. ** dē-emō* > *dēmō* → *dēmpsī*, **subs-(e)mō* > *sūmō* → *sūmpsī*. This is an innovative formation, created in order to enhance the iconic differentiation of the present and perfect stems, since a regular continuation of the Proto-Italic longvocalic perfect would have resulted in a lack of distinction (i.e. pf. *ˣdēmī*, *ˣsūmī*) (Meiser 1998: 208; 2003: 250).

The PPP may reflect either the expected zero-grade PIE **h₁m-tó-* > PIt. **em-tó-* (for the sound change, see Ch. 3.1.3.) > *emptus* (Bock 2008: 229), or a remodelled e-grade PIE **h₁em-tó-* (with identical results). An epigraphically attested ÉMPTVS is problematic, and may not count as genuine evidence for a long vowel (see Leumann 1977: 113).

Emere shows phonologically regular continuation of almost all inherited ablaut relations. The neo-perfect *ēmī*, however, is based exclusively on the zero-grade weak stem, meaning that paradigmatic levelling (towards 1M1F) has taken place.

2.2.1.7. *Ferre*

Ferre (*fĕrō*, *(te)tŭlī*, *lātus*) 'to bear, carry' is partly irregular in that some present stem forms are syncopated and that the perfect and participle stems are suppletive. It originates from the PIE root **bʰer-* 'to carry', widely attested in the IE languages (*LIV*²: 76–77). Attested Italic cognate verb forms include Vols. inf. *ferom*, Marr. prs.3sg.act. *feret*, prs.3sg.pass. *ferenter*, Umb. sbj.prs.3sg. *f⟨e⟩rar* imp.3sg. **fertu**, *fertu*, **fertuta**, fut.3sg. **ferest**, inf. **aferum**, *afero*, Osc. prs.3sg. **amfret**, sbj.ipv.3pl. **f]erríns**.

The Latin present stem *fer-* is a continuation of the PIE simple thematic present **bʰér-e/o-*, also reflected in (all meaning 'to bear, carry' unless otherwise indicated) Ved. *bhárati*, OAv. *baraitī*, Arm. *berem*, Phryg. 3sg. αβ-βερετ, Gr. φέρω, OIr. *-beir*, Go. *bairan* 'to bear, give birth', OCS *berǫ* 'to take, collect', Toch. B *paräm*, Toch A 3sg.mid *pärtär* 'to carry, bring, take', Alb. *bie* 'to carry, bring', Mess. opt. *berain* (*LIV*²⁺). The only Latin present stem forms that are not regular third conjugation forms are prs.2sg. *fers*, 3sg. *fert*, 2pl. *fertis*, sbj.ipv. *ferrem* etc., inf. *ferre*. The most plausible explanation for these forms is that the thematic vowel was simply lost by syncope, this being a very likely development in an allegro-context (Sommer 1914: 542; Szemerényi 1964: 198f; Leumann 1977: 530; Meiser 1998: 224; *LIV*²: 77; Bock 2008: 236). Lack of comparable cases is best explained by the fact that *fer-* is the only Latin present stem that ends in *r*. Some scholars (e.g. *EM*, s.v. *ferō*; Garnier 2010: 298) consider the syncopated forms to be evidence for the continuation of a PIE reduplicated present: according to this view, *ferō* would be a cognate of Ved. *bíbharti* < PIE **bʰi-bʰer-ti* (the only attested reduplicated present for this root). I find this less likely,[30] considering that there is enough solid evidence for the existence of a PIE simple thematic present and that sporadic syncope and the subsequent assimilations are possible (and even highly probable) in a phonological environment involving liquids.

The perfect stem *(te)tul-ī* and the PPP *lātus* are etymologically related to the present stem *toll-* 'to lift' and will be discussed in connection with that verb (see *tollere*, Ch. 2.3.2.9. below).

2.2.1.8. *Fīdere*

Fīdere (*fīdō*, no perfect,[31] *fīsus*) 'to trust' originates from the PIE root **bʰe̯id̯ʰ-* 'to confide' (*LIV*²: 71–72). This root originally had a nasal present **bʰi-né-dʰ-/bʰi-n-dʰ-* (residually reflected in Alb. *bind* 'to convince', Demiraj 1997: 101) and a root aorist **bʰéi̯dʰ-/bʰidʰ-* (reflected in thematised form in Gr. mid. ἐπιθόμην 'obeyed'). Probably already in late-PIE or in the immediate post-PIE period, a simple thematic present was introduced. This is reflected in Gr. πείθομαι 'to obey' and Go. *beidan* 'to wait'. Italic verbal cognates include Umb. imp.3sg.

[30] Regular sound change would have produced Lat. 3sg. **fibert*.
[31] OLat. *fīsī*, a hapax legomenon, is attested in Priscianus (*GL* 2, 420, 11).

kumpifiatu ‘shall announce’ etc., but these are all denominatives based on a noun **kombifiom* < **kom-bʰeu̯dʰ-i̯o-* (*OUW*, s.v. *combifiatu*; *EDLIL*, s.v. *fīdō, -ere*).
The present stem *fīd-* is a direct continuation of the late-/post-PIE simple thematic present (Bock 2008: 237), i.e. **bʰéu̯dʰ-e/o-* > PIt. **feu̯δ-e/o-* > [monophthongization, third century BC, see Ch. 3.2.4.] OLat. *fēd-ō* (cf. prs.ptc. DIFEIDENS, *CIL* I² 1531) > [long vowel tensening, early second century BC, see Ch. 3.2.6.] CLat. *fīdō*.

The PPP *fīsus* can hardly be a regular phonological continuation of an original zero-grade PIE *to*-participle **bʰidʰs-tó-* as this would eventually have produced CLat. **fissus*. The long vowel cannot be explained by Lachmann’s rule. We must therefore take a generalised e-grade form as the starting point; thus, **bʰeu̯dʰs-tó-* > PIt. **feu̯δˢ-to-* > OLat. **fēssus* > **fīssus* > CLat. *fīsus*.

There are also two nominal forms of interest (for more derivatives, see *WH*, s.v. *fīdō*; *EM*, s.v. *fīdes*): *fīdēs* ‘faith’ continues the zero-grade root **bʰidʰ-*, and *foedus, -eris* (with archaic *-oe-* instead of regular *-ī-*) continues the o-grade root **bʰou̯dʰ-*.

Apart from the PPP, this verb and its nominal congates have preserved the inherited ablaut alternations intact (as per heredity principle), only to be modified at the surface level by such relatively late sound changes as monophthongisation and long vowel tensening.

2.2.1.9. *Legere*

Legere (*lĕgō, lēgī, lēctus*) ‘to gather, collect, read’ originates from the PIE root **leg-* ‘to gather’ (*LIV*²: 397). Present stem cognates, which are evidence for a PIE simple thematic present **lég-e/o-*, include Gr. λέγω ‘to gather, read, count, say’ and Alb. *mb-ledh* ‘to gather, harvest’ (< **en-leg-e-*, Demiraj 1997: 261). The only evidence for a PIE *s*-aorist is the Gr. ἔλεξα ‘collected, read, counted, said’. Italic cognates consist of but two verb forms: Pael. *lexe*, Marr. *leexe, pelegie*, but these are problematic both formally and semantically (*WOU*, s.v. *lexe*; *EDLIL*, s.v. *legō, -ere*). Verb forms are not attested in other Sabellic languages, but a possible nominal cognate is Osc. **leginum** (*WOU*, s.v. *leginum*).

The present stem *leg-* is a regular phonological continuation of the PIE simple thematic present and requires no further comment (Bock 2008: 282). The preverb compounds *neglegere* ‘to disregard’, *dīligere* ‘to love’ and *intellegere* ‘to perceive, understand’ have been analysed (*LIV*²: 276–277; Bock 2008: 281f; Garnier 2010: 65) as cognates of Gr. ἀλέγω ‘to mind, heed’, from a different PIE root, i.e. **h₂leg-* ‘to care for’. This view, however, must be approached with caution (e.g. *EDLIL*, s.v. *legō, -ere*), as the lack of vowel weakening in *neglegere* and *intellegere* suggests a relatively late date of composition, and the semantics are not that difficult to connect with the simplex *legere*.[32]

[32] The compounds *neg-*, *dī-* and *intellegere* also feature a different perfect formation: °*lēxī*. For this reason, the compounds have been assigned to a different root (so *LIV*²: 276–277). However, in my opinion the *s*-aorist-looking °*lēxī* may well be a secondary innovation (cf. above simplex *ēmī* vs. compound °*mpsī*) and it thus need not indicate that there are two PIE roots involved.

The original meaning of **leg-* was probably connected with harvesting, i.e. proceeding in straight lines, gathering pieces of food from the field. The notion of “reading” is a metaphorical extension of this, i.e. following the text in straight lines and picking up the letters (repeated action is also involved, cf. Garnier 2010: 65). *Neglegere* can be understood as a semantic extension of the notion of proceeding in a straight line and not gathering some items that could have been gathered; hence the notion of “ignoring”. *Dīligere* originally meant ‘to single out, separate’, again tightly connected with the basic meaning, modified by the preverb *dis-* ‘apart’. *Intellegere* can be

The perfect stem *lēg-* is problematic in that it does not seem to be a phonologically regular continuation of any PIE aorist or perfect formation. The long vowel, in particular, is difficult to explain (is it a reflection of PIE lengthened grade?). Three plausible solutions are available:

1) Analogical lengthening of the vowel on the model of other verbs, which exhibit such a paradigmatic vowel alternation (of whatever origin), e.g. *ĕdō* : *ēdī*, *ĕmō* : *ēmī*, *scăbō* : *scābī*, *fŏdiō* : *fōdī* (cf. Meiser 2003: 207).
2) Replacement of the inherited reduplicated perfect weak stem zero-grade root **le-lg-* with a longvocalic non-reduplicated root, i.e. **lēg-* (Meiser 2003: 208). Alb. *mb-lodha* 'gathered' (< **en-lēg-*) is a cognate, meaning that this renovation may be of (late-)PIE date. If this is so, **lēg-* was probably used as a perfect stem for this verb in Proto-Italic, and thus continued as the Latin neo-perfect.
3) Narten imperfect theory (see Jasanoff 1998: 306–307): the strong stem of the imperfect/injunctive of a PIE Narten present was – after the loss of this formation in the Italic branch – reanalysed as a PIt. aorist stem **lēg-*. This was subsequently continued as the Latin neo-perfect. A similar explanation holds for Alb. *mblodha* as well.

Analogical extension is in principle always possible, but considering that *legere* is a relatively frequent (although not a high-frequent) basic verb, a continuation of an inherited formation (as per heredity principle), perhaps with straightforward analogical levelling (as per 1M1F), is more likely. The Narten imperfect theory suffers from the lack of evidence of Narten character for this root (Garnier 2010: 66). In light of comparative evidence (see Meiser 2003: 153 for references), the second option seems the most plausible.

The PPP *lēctus* does not originate directly from a PIE *to*-participle **l̥g-tó-*, but the root clearly reflects an e-grade (a substitution probably going as far back as PIE itself);[33] hence **leg-tó-* > PIt. **leg-to-* > [Lachmann's rule] Lat. *lēctus*.

Legere continues some of the inherited PIE ablaut contrasts but in a modified form. The original zero-grade of the reduplicated perfect weak stem was replaced by a nonreduplicated lengthened grade-looking form, which was then extended into the strong stem (as per 1M1F). The PPP was renovated by an e-grade-looking form in order to enhance paradigmatic uniformity.

2.2.1.10. *Regere*

Regere (*rĕgō*, *rēxī*, *rēctus*) 'to guide, direct, rule' originates from the PIE root **h₃reg-* 'to set straight, stretch' (*LIV*²: 304–305). There is comparative evidence for a PIE nasal present, a Narten present and a simple thematic present, paired with an *s*-aorist. The nasal present **h₃r̥-né-g-/h₃r̥-n-g-* is reflected in Ved. 3pl. *ṛñjate* 'they move forwards quickly in a straight line', and indirectly in Gr.(Hom.) (χεῖρας) ὀρεγνῡ́ς 'stretching out (arms)' and Lith. *rężiu* 'to strain, tighten'. The reconstruction of a Narten present **h₃ré̯g-/h₃ré̯g-* is based on indirect evidence: with the exception of Ved. hapax *rā́ṣṭi* 'rules' (which itself is problematic; see *LIV*²: 305 for references), all IE formations are thematic, i.e. Ved. *rā́jati* 'to rule, shine', YAv. *vi-rāzaiti* 'to rule', Gr. ὀρέγω 'to reach, stretch (out)', OIr. *a-t·raig* 'to rise', Go. *rikan* 'to heap up', and Toch. B sbj. *rāśäṃ* 'should reach out'; the long vowel in the Indo-Iranian branch indicates that PIE

compared with the saying "reading between the lines"; hence the notion of "perceiving, understanding". Or, it may be connected with the notion of "choosing (spiritually)" (*EM*, s.v. *legō*).

[33] According to Garnier (2010: 68), this was a hypercorrect pronunciation.

originally had a Narten present, as otherwise the reflection of a PIE ē-grade would be inexplicable (cf. Bock 2008: 351). However, the comparative evidence points out quite clearly that the thematisation of the Narten present must have occurred very early after the dissolution of (late-)PIE. As for the *s*-aorist, *einzelsprachlich* evidence includes Gr. ὤρεξα ‘stretched’, OIr. *a-t·racht* ‘rose’, and Toch. B *reksa*, A *raksāṃ* ‘spread out’. The pairing of a simple thematic present with a *s*-aorist is a typical combination, but it alone does not count as counter-evidence against the existence of the Narten present. There are no Sabellic verbal cognates.[34]

The Latin present stem *reg-* is a continuation of the post-PIE simple thematic present, which is based on the earlier Narten present (but probably not a continuation of the prs.sbj. of the Narten formation, *pace* Garnier 2010: 70). As was the case with the thematisation of 1sg. *ĕdō* ‘I eat’ (← **h₁éd-mi*; see Ch. 2.3.4.4.) and *vŏlō* ‘I want’ (← **u̯él(h₁)-mi*; see Ch. 2.3.4.3.), the e-grade was continued in the present stem, as expected for a regular simple thematic present.

The perfect stem *rēx-* is a straightforward and regular continuation of the PIE *s*-aorist strong stem **h₃rḗg-s-* (Bock 2008: 351). Here, regular sound change cannot have neutralised the **ē* : **ĕ* alternation (as was the case with *dīxī* and *dūxī*). The neutralisation took place by paradigmatic levelling, as per 1M1F. As to why the more marked ē-grade form was continued despite the formation already having an overt tense-stem marker (i.e. **-s-*), the motivation is threefold: first, ē-grade formed a contrast with the e-grade of the present stem, enhancing the encoding of the present and aorist stems (and, effectively, resulting in multiple exponence); second, the aorist stem is more marked in relation to the less-marked present stem, for which reason the continuation of the more marked ablaut grade resulted in a more natural total formation; and third, many Latin (and Proto-Italic) *s*-perfects/aorists have long vowels, and this fact may have exerted paradigmatic pressure towards preference for the longvocalic stem variant.

The PPP *rēctus* cannot be a regular phonological continuation of the PIE *to*-participle **h₃rḝ̥ĝ-tó-*, as this would have produced Lat. **orctus* by regular sound change (on the vocalisation of **#HRC-*, see Ch. 3.1.3.). Instead, the renovation of the form by the e-grade must have taken place relatively early, as the form has undergone Lachmann’s rule, i.e. PIE transponat **h₃reĝ-tó-* > PIt. **reg-to-* > Lat. *rēctus* (cf. Bock 2008: 351; Garnier 2010: 70–71).

2.2.1.11. *Scabere*

Scabere (*scăbō*, *scābī*, no PPP) ‘to scratch’ is an etymologically problematic verb. The most likely origin is the PIE root **skabʰ-* (or **skh₂ebʰ-*) ‘to scratch’ (*LIV*²: 549). The PIE simple thematic present **skábʰ-e/o-* is reflected in Go. *skaban* ‘to shear’ and possibly in Lith. *skabù* ‘to pick off’ – Gr. σκάπτω ‘to dig up’ and Lith. *skabiù* ‘to scrape’ are regarded as secondary formations (so *LIV*²: 549), not inherited *i̯e/o*-presents. Gr. ἔσκαψα may reflect a PIE *s*-aorist. There are no Italic cognates.

The present stem *scab-* is most likely a regular continuation of the PIE simple thematic present (Bock 2008: 362). If one wishes to adopt Schrijver’s (1991: 431) interpretation that PIE **e* > Lat. *a* after a pure velar, then the root could be reconstructed as **skebʰ-* on the basis of Latin evidence, but that would leave the Germanic and Lithuanian vocalism inexplicable.

[34] Of the same root, cf. Marr. dat.sg. *regen[ai]* ‘queen’ (≡ Lat. *rēgīnae*), Umb. adv. **rehte** ‘rightly’ (≡ Lat. *rēctē*), Osc. ρεγο ‘king?’.

Adding an extra laryngeal (**skh₂eb^{h}-*) is not attractive, either. According to Kortland (1989: 104), *scabere* is derived from the PIE adjective **skbro-* 'rough' with a secondary *-a-* inserted between the consonant clusters. However, Latin denominatives usually contain a special morphological marker (e.g. **-eh₂i̯e/o-* > Lat. *-ā-*), for which reason they never end up as simple-thematic third conjugation verbs.

The perfect stem *scāb-* is secondary, based on other longvocalic perfects (e.g. *ĕdō* : *ēdī*). It may be a renovation of an earlier **skēb-*, which in turn is a replacement for a reduplicated perfect weak stem ***ske-sk(a)b^{h}-* (Meiser 1998: 212; 2003: 156). The motivation for this change was probably the maintenance of paradigmatic uniformity (but cf. *agō* : *ēgī*).

2.2.1.12. *Sequī*

Sequī (*sĕquor, sĕcūtus*) 'to follow' originates from the PIE root **sek^{w}-* 'to scent, have in sight, accompany'.[35] This old deponent has a number of good cognates (all meaning roughly 'to follow, accompany'), all reflecting a PIE simple thematic present **sek^{w}-e/o-* (medium tantum), namely Ved. *sácate*, OAv. *hacaitē*, Gr. ἕπομαι, and OIr. *sechithir*. There are no Italic cognates, however.

The present stem *sequ-* is a phonologically regular continuation of the PIE simple thematic present (Bock 2008: 367). It has even preserved its deponent character.

The original PPP **sek-to-* is indirectly reflected in the frequentative *sectārī* 'to pursue'. This is probably an e-grade renovation of an original PIE zero-grade *to*-participle **sk^{w}-tó-*; the root did have regular vowelless zero-grade forms, which are reflected in such Greek forms as aor. ἐσπόμην (< **e-sk^{w}-e/o-*, with secondary *spiritus asper*), aor.inf. σπέσθαι (< **sk^{w}-e-*). The paradigmatic PPP *sĕcūtus* is a later renovation based on the present stem. De Vaan (*EDLIL*, s.v. *sequor, sequī*) suggests that the model came from third conjugation *-uō* verbs (e.g. *minuere*, PPP *minūtus*), but it is in my opinion unclear, why such verbs would have been used as a model. The motivation for the renovation was probably the avoidance of homophony with *sectus* 'cut', PPP of *secāre* 'to cut'.

2.2.1.13. *Tegere*

Tegere (*tĕgō, tēxī, tēctus*) 'to cover' originates from the PIE root **(s)teg-* 'to cover' (*LIV*²: 589). For PIE, a typical paradigmatic constellation consisting of a simple thematic present **(s)tég-e/o-* (> Gr. στέγω 'to cover, protect') and an *s*-aorist **(s)tḗg-s-/(s)tég-s-* (> Gr. ἔστεξα 'covered, protected') can be reconstructed. Other cognates, which reflect a PIE causative-iterative **(s)tog-éi̯-e/o-*, include OIr. *-tuigethar* 'to cover' and ON *þekja* 'to cover'. There are no non-Latin Italic verbal congates attested.[36]

The present stem *teg-* is a straightforward continuation of the PIE simple thematic present, i.e. **(s)tég-e/o-* > PIt. **teg-e/o-* > Lat. *teg-* (Bock 2008: 390).

The perfect stem *tēx-* is a continuation of the PIE *s*-aorist (Meiser 2003: 110). Due to being in a *positione* heavy syllable, the quantity of the vowel is actually submerged, but almost all pieces of secondary literature presume a long vowel (due to the epigraphical attestation of

[35] *IEW*, *LIV*² and *EDPG* reconstruct a total of three homophonous verb roots to account for the semantic difficulties associated with the quite different meanings that the potential reflexes of this verb have in the IE languages.
[36] The three possible nominal cognates (SPic. acc.sg. **tokam** 'grave stone, figure', Umb. *tettome* '?' and **tehteřim** '?') are difficult. See *WOU*, s.v.; *EDLIL*, s.v. *tegō, -ere*.

TÉXI; Leumann 1977: 593). Both vowel lengths are possible: there exists no rule according to which a PIE **ē* would have been shortened or a PIE **ĕ* would have been lengthened in this environment. As with *rēxī*, the most likely scenario ist that the ē-grade variant of the singular stem was extended into the plural (towards 1M1F).

The PPP *tēctus* cannot continue a PIE *to*-participle with a zero-grade root; instead, an e-grade root must be the starting point, owing to the fact that a vowelless zero-grade **(s)tg-* would be unpronounceable by most standards; thus PIE **(s)teg-tó-* > PIt. **teg-to-* > [Lachmann's rule] Lat. *tēctus*.

Tegere has a number of nominal derivatives and cognates, most of which reflect the e-grade root **(s)teg-*, e.g. *teg(i)men, -inis* 'a covering', *teges, -itis* 'mat, bedrug' (see *WH*, s.v. *tegō*; *EM*, s.v. *tegō*). But two nouns are of interest due the continuation of earlier ablaut alternations: *toga* 'garment', continuing an old o-grade, PIE **(s)tog-eh₂-*, and *tēgula* 'roof tile', which has an ē-grade-looking root (most likely of secondary origin, perhaps analogical to *rēgula* 'stick, rule(r)' from *regere*).

Most forms of *tegere* are regular phonological continuations of transparadigmatic PIE ablaut alternations, in line with the heredity principle. The *s*-aorist/perfect *tēxī* underwent loss of intraparadigmatic ablaut by 1M1F. For phonotactic reasons, this root may not have had a vowelless zero-grade; an e-grade-looking form was substituted.

2.2.1.14. *Trahere*

Trahere (*trăhō, trāxī, tractus*) 'to draw, pull' is an etymologically problematic verb. It is inflected like a regular third conjugation verb, and its phonological and morphological structure is parallel to that of *vehere* (Ch. 2.2.1.18.). Nonetheless, its etymology is difficult (see Bock 2008: 400f for discussion). According to *LIV²* (p. 154), *trahere* originates from the PIE root **d^hreg^h-* (or **d^hreg^h-*), which is possibly attested only in Latin, Greek (τρέχω 'to run') and Germanic (e.g. Go. *dragan* 'to draw') (cf. *EDPG*, s.v. *dragan*). The continuation of this root in Latin with *a*-vocalism is, however, problematic, as no known regular sound change produces Lat. *trah-* or *trăc-* out of PIE **d^hreg^h-*, **d^hrog^h-* or **$d^hr̥g^h$-*. There is no Sabellic evidence. Nearest potential cognates are a handful of Celtic forms, e.g. OIr. pret. *tethraig** 'ran away, receded', *tráig* 'ebb, beach', MCymr. *treul* 'trouble, weakness' (*EDLIL*, s.v. *trahō, -ere*). It is speculated that the verb could be a loanword from Germanic into Italo-Celtic, or that the Italo-Celtic and Germanic verbs are borrowed from a third source (*EDLIL*, s.v. *trahō, -ere*); but these speculations are difficult to verify.

According to Bock (2008: 401), the present stem *trah-* originates from a thematised athematic root present weak stem, with "reduced grade" **$d^hr_ag^h$-* instead of a regular zero-grade **$d^hr̥g^h$-*. However, it is unclear, why the reduced grade in this case takes the form of **$_a$*, and not **$_e$* like in many other cases (see discussion in Ch. 2.4.). Garnier (2010: 425–426) reconstructs a PIt. PPP **drāχ-to-* (from PIE **$dr̥Hg^h$-tó-*), with "un assourdissement secondaire" into **trāχ-to-*, on which the present stem **traχ-e/o-* is based, forming an analogical pair *vectus* : *vehere* :: *tractus* : X, where X = *trahere*.

Since there is no absolute certainty that the verb is of direct PIE inheritance, there is no point in speculating further about the continuation of PIE ablaut alternations in this verb. We may, however, note the synchronic Latin vowel alternations between the stems. A handful of Latin third conjugation verbs have *-a-* in the present stem (e.g. *agere, facere, scabere*), and Lat.

-a- may reflect a PIE sequence *-*h₂e-*, meaning that Lat. *-a-* as a reflex of a PIE e-grade (which is expected in a simple thematic present) is etymologically unremarkable and morphologically natural.[37] The long vowel of the perfect stem *trāx-* (TRÁXI, Leumann 1977: 593) is also unremarkable in that most Latin *s*-perfects feature a long vowel (which may be of same or different quality than the vowel of the present and participle stems). In fact, quantitatively *trăh-ō* : *trāx-ī* is exactly parallel with *vĕh-ō* : *vēx-ī*. This may be an indication for a tendency to lengthen the vowel of the *s*-perfect regardless of the origin of the verb. This is also a piece of evidence for the empirical fact that not all vowel alternations in the Latin verb system can be traced to PIE ablaut and regular sound change.

2.2.1.15. *Tremere*

Tremere (*trĕmō, trĕmuī*, no PPP) 'to shake, quiver' originates from the PIE root **trem-* 'to tremble (at fear)' (*LIV*²: 648–649). Toch. A 3sg. *träm-äṣ* : 3pl. *tärm-iñc* 'quiver(s)' reflects a PIE athematic root present with e-grade **trém-* in the singular, zero-grade **tr̥m-* in the plural. In other IE languages, the present formation has been thematised with an invariable e-grade root: Gr. τρέμω 'to shake', Lat. *tremō* (Bock 2008: 402). There is evidence in Greek (τρομέω 'to quiver') and Umbrian (imp.fut.3sg. *tremitu* 'should make to quiver', with a secondary e-grade, analogical from the thematic present) for a PIE causative-iterative **trom-éi̯e/o-*, and in Oscan (sbj.3sg. *turumiiad* 'should quiver') for an essive **tr̥m-(e)hₓi̯é/ó-* or a zero-grade causative **tr̥m-éi̯e/o-*.

In light of the Tocharian evidence, the athematic root present was probably the original formation in PIE, which was later replaced by a thematic formation. The Latin present stem is thus of late-PIE or post-PIE origin (the Greek thematic present may be a separate innovation); we may presume that the simple thematic existed in Proto-Italic as **trem-e/o-*. However, the Oscan and Umbrian formations indicate that Proto-Italic also had a second conjugation present stem **trom-ē-* (this would have been continued in Latin as ˣ*tromēre*). If Osc. *turumiiad* reflects the zero-grade root, its phonologically regular Proto-Italic preform must have been **torm-ē-*.

As this root lacked both an aorist and a perfect in PIE, it is no surprise that Latin has produced an innovative *u*-perfect *trĕmu-ī* for this verb. This, however, may be a replacement for an earlier (but likewise innovative) *s*-aorist **trĕm-s-* > ˣ*trĕm(p)sī* due to the tendency to avoid such formations for roots ending in **m* (Meiser 2003: 124–125). In both formations the vocalism was probably just copied from the present stem, and thus it does not represent a continuation of any PIE ablaut alternation.

2.2.1.16. °*uere*

The verb °*uere* (°*uō*, °*uī*, °*ūtus*) occurs only in compounds, most notably as *induere* 'to put on (clothing)' and *exuere* 'to put off (clothing)'. The original PIE root was something like **hₓeu̯(H)-* (*LIV*²: 275) or **h₃eu̯-* (*EDLIL*, s.v. *-uō, -ere*) – the final laryngeal is not necessary, as IE reflexes with *-ū-* can also be explained by laryngeal metathesis in the zero-grade root (see Ch. 3.1.2.). If Arm. *(h)aganim* 'to put on' reflects earlier **(hₓ)au̯-nH-* (Klingenschmitt 1982: 176–177, contra *EDHIL*, s.v. *unu-*^{zi}), a modification of a PIE nasal present **h₂u-né-(H-)/*h₂u-n-(H-)*, then the reconstruction of **h₂* is correct. If, however, Hitt. *unu-*^{zi} 'to adorn, decorate' is

[37] I am not suggesting that the vocalism of *trahō* necessarily originates from the PIE sequence **-h₂e-*. I am merely pointing out the fact that a PIE e-grade verb root can, by regular sound change, result in Lat. *-a-*.

related, **h₃* must be reconstructed (*EDHIL*, s.v. *unu-*[zi]); thus, the reconstruction PIE **h₃eu̯-* should be preferred (*pace* Bock 2008: 411–412; Garnier 2010: 382), even though for the reflected Italic vocalism the quality of the laryngeal is not relevant. There is also a Sabellic cognate, Umb. fut.imp.3sg.pass. *anouihimu* 'should be put on'.

The Latin formation is the only evidence for a (possible) PIE simple thematic present **h₃éu̯-e/o-*, which would yield PIt. **ou̯-e/o-*. In Latin, the regular phonological development in compounds produces 3sg. **(endo-)ou̯-et > *(endo-)ǝu̯-et > *(ind'-)uu̯-it > induit*. Umb. *anouihimu*, however, seems to reflect a Proto-Italic second conjugation form (originally a causative?), i.e. **an-ou̯-ē-* (cf. *EDLIL*, s.v. *-uō, -ere*), but it may also be a denominative of a verbal noun corresponding to Lat. *induviae* 'clothing' and *exuviae* 'clothing' (*WOU*, s.v. *anouihimu*), or a fourth conjugation present, PIt. **an-ou̯-ī-* (Meiser 2003: 69).

The perfect stem °*u-* is best characterised as a *v*-perfect built to a present stem ending in *u*, for which reason the perfect stem ended up being homophonous with the present stem (Meiser 2003: 233–235). Proto-Italic may still have continued a PIE root aorist, which is reflected in Arm. *agaw* (Klingenschmitt 1982: 176, 274; *LIV*²: 275).

2.2.1.17. *Unguere*

Unguere (*unguō, ūnxī, unctus*) 'to smear' is certainly of PIE inheritance, but the reconstruction of the PIE root is debated. Cognates in other Indo-European languages include Ved. *anákti* 'to anoint' (a nasal present), and possibly Arm. aor. *awc* 'anointed', prs. *awcanem* 'I anoint'. The Italic forms point either towards **h₃eng^w-* (so *EDLIL*, s.v. *unguō, -ere*) or **h₂eng^w-* (so *LIV*²: 267); the only evidence for **h₂* comes from a Greek cognate (see Klingenschmitt 1982: 272; Janda 2000: 282–287). The only Sabellic cognate verb is Umb. fut.imp.3sg. **umtu** (< **ombetōd* ≡ Lat. *unguitō*; *WOU*, s.v. *umtu*); a cognate of the Latin noun *unguen* 'ointment' is Umb. **umen** (< **omben* < **ong^wen*; *WOU*, s.v. *umen*).

As for the Latin present stem, three diachronic scenarios are available (cf. Bock 2008: 410–411):

1) PIE thematic present **h₃éng^w-e/o-* > PIt. **ong^w-e/o-* > Pre-Lat. **onguere* > Lat. *unguere*, all by regular sound change (*o > u / _ŋ* in the third century BC, Meiser 1998: 83).
2) PIE nasal present (cf. the Vedic cognate) weak stem **h₃n̥-(n-)g^w-* > **on(n)g^we-* > **onguere* > *unguere* (*LIV*²: 267; *EDLIL*, s.v. *unguō, -ere*).[38]
3) PIE **h₂eng^w-* > **ang^w-* modified into **ong^w-* due to the associated noun **h₂óng^w-n̥* > **ong^w-en* > Lat. *unguen* (preferred by *LIV*²: 267).

Because Latin and Umbrian show the same vocalism, the presumed modification **ang^w-* → **ong^w-* must have been Proto-Italic, or taken place independently in the languages. I consider this alternative the least likely: whether Gr. -αμβος truly is associated with Lat. *unguere* and cognates, is a matter of debate (see Bock 2008: 410 n. 957), and, in the face of the available evidence, I prefer the reconstruction PIE **h₃eng^w-* (so also Meiser 2003: 119). Due to the root already containing a nasal, it is impossible to decide, whether the Latin present stem continues an actual PIE simple thematic present (as presumed by Meiser 2003: 64), or whether it is a thematised PIE nasal present. However, in both cases the original ablaut grade (e-grade for the

[38] Due to PIE **#h₂*RC- > PIt. **#a*RC-, the nasal present hypothesis is only possible if the PIE root was **h₃eng^w-* (i.e. PIE **#h₃*RC- > PIt. **#o*RC-).

thematic present, zero-grade for the nasal present) would have been maintained by regular sound change.

The perfect stem *ūnx-* cannot be directly traced to any PIE formation (no *s*-aorist can be comparatively reconstructed). It probably replaced the inherited root aorist at some period, but the chronology is unclear. Assuming a regular development from Proto-Italic, i.e. **ong^{w}-s-a̯i̯* > **onχ-s-a̯i̯* > ˣ*ōnxī* does not produce the correct result (recall that *o* > *u* /_*ŋ* occurred not until the third century BC). Assuming a more recent formation, however, does not explain the long vowel (the NS-lengthening before **χ* is only possible in Proto-Italic). Perhaps, then, **ōnxī* was qualitatively renovated into *ūnxī* due to the vocalism of the present and participle stems. It is also possible that the long vowel is analogical due to many other Latin *s*-perfects having a long vowel. Maintaining the naturalness of the inflectional paradigm surely plays a part here.

The PPP *unctus* originates regularly from PIE **h$_3$n̥g^{w}-tó-* via PIt. **onk-to-* (Bock 2008: 411). If, however, the PIE root was **h$_2$eng^{w}-*, a remodelling of the phonologically regular outcome PIt. ˣ**ang^{w}-to-* into **ong^{w}-to-* needs to be assumed, adding a further complication.

2.2.1.18. *Vehere*

Vehere (*vehō, vēxī, vectus*) 'to transport' originates from a widely-attested PIE root **u̯eg^{h}-* 'to float, travel' (*LIV*²: 661–662). The PIE simple thematic present (**u̯ég^{h}-e/o-*) is reflected in Ved. *váhati* 'to stream, flow, travel', YAv. *vazaiti* 'to travel, flow, drive', ON *vega* 'to move, weigh', Lith. *vežù* 'to travel', OCS *vezǫ* 'to travel', Alb. *vjedh* 'steals'.[39] The evidence for other PIE present formations is less secure: a simple athematic present Ved. opt.3sg.mid. *uhīta* 'would bring' (< **ug^{h}-*), a thematic reduplicated present Ved. *ū́hati* 'pushes' (< **u̯i-u̯g^{h}-é-*), a *sk̂e/o-* present Toch. A *wāsk-* 'to stir, quiver'. Securely reconstructable PIE formations include an *s*-aorist (**u̯ég^{h}-s-/u̯ég^{h}-s-*), reflected as Ved. *ávāṭ* 'has travelled', YAv. sbj. *uz-uuažaṯ* 'will fetch', Gr.(Cypr.) ἔϝεξε 'brought', OCS *otъ-vĕsta* 'departed'. There is also evidence for an o-grade root PIE causative-iterative (**u̯og^{h}-éi̯e/o-*), reflected as Gr. ὀχέομαι 'to travel, Go. °*wagjan* 'to shake, move', OCS *vožǫ* 'to travel', and possibly Ved. *vāhayati* 'to cause to travel' (although this may be an innovative form). Sabellic cognates are limited to a set of Umbrian imp.fut.3sg. forms, all preverb compounds: **ařveitu**, **arveitu**, **aveitu**, *arsueitu*, *arueitu* 'should add', **kuveitu** 'should put together' (*EM*, s.v. *vehō*; *EDLIL*, s.v. *vehō, -ere*).

There is hardly any doubt that the Latin present stem *veh-* and the perfect stem *vēx-* are direct, phonologically regular continuations of the inherited PIE simple thematic present and the *s*-aorist, respectively (Bock 2008: 419–420).

Unlike in the formally similar *s*-aorists *dīxī* and *dūxī*, the original Narten ablaut in *vēxī* was not levelled by Osthoff's, as the root did not contain an *-e*R- sequence: there is no phonological reason to expect that the contrast between the lengthened grade and the full-grade root would have been neutralised (direct continuation would have resulted in CLat. 3sg. *vēxit* : 3pl. ˣ*vĕxērunt*). Instead, the vocalism of the plural forms has been levelled according to the model of the singular forms – a completely rational and predictable renovation towards 1M1F.

[39] According to Weiss (1993: 178), this root had originally a Narten present. While this presumption may explain a number of etymological anomalies, the widely-attested simple thematic present must be of (late-)PIE date. Weiss also proposes that the imperfects of such Narten presents were "shunted off" into the aorist system. This may explain the long vowel of some Latin longvocalic neo-perfects, but the issue does not directly concern *vehere*. I am thus unwilling to speculate, whether the root **u̯eg^{h}-* originally had Narten ablaut, as the reconstructed evidence clearly point towards a "normal" root with a simple thematic present and an *s*-aorist.

When this levelling took place is debatable, due to three reasons: first, lack of early attestations, second, lack of Sabellic neo-perfect cognates, and third, the prosodic submersion of the vowel quantity (metrical evidence is useless in a closed, heavy syllable). School grammars and conventional wisdom presuppose a long vowel, but long vowels in such "superheavy" syllables may have been shortened relatively early. In any case, there is no indication whatsoever that the Latin pf.sg. and pf.pl. forms would have been distinguished by a quantitative difference. The evidence for Proto-Italic intraparadigmatic ablaut in the *s*-aorist is inconclusive and any ablaut relation in the aorist stem seems to be limited to rare cases (such as **fēk-ed* : **fak-ond*, discussed in Ch. 2.2.7.3.); therefore, I presume that Proto-Italic only had an invariable aorist stem **u̯ēχ-s-*.

The PPP *vectus* cannot be directly inherited from a PIE zero-grade *to*-participle **ug^{h}-tó-*. The corresponding Vedic cognate *ūḍha-*, however, is the result of regular phonological development; the expected Latin form would be ˣ*uctus*. Considering that Latin tolerates stem allomorphy much less than Vedic, it is no surprise that the inherited form was at some point renovated by e-grade-looking vocalism in order to enhance paradigmatic uniformity. The differing consonantism between the present stem *veh-*, the perfect stem *vēx-* /u̯ēks-/ and the PPP *vect-us* originates from the Proto-Italic and Latin reflexes of PIE **-g^{h}-* (see Meiser 1998: 104). It is therefore very likely that the renovation of the PPP took place already before Proto-Italic.

While the present stem of *vehere* is a phonologically regular continuation of the PIE non-alternating e-grade, other ablaut relations within the paradigm were neutralised by analogical levelling (towards 1M1F).

2.2.1.19. *Vertere*

Vertere (*vertō*, *vertī*, *versus*) 'to turn' originates from the widely-attested PIE root **u̯ert-* 'to turn (around)' (*LIV*²: 691–692). For PIE, a simple thematic present **u̯ért-e/o-* (medium tantum) can be reconstructed; this is reflected as Ved. *vártate* 'to turn around, roll', YAv. imp.2pl. *varətata* 'turn!', and Go. *wairþan* 'to become' (and other Germanic cognates). Considering the comparative evidence, it is possible that the Latin verb was originally deponent (*vertī*), to which a corresponding active formation was created (*vertere*, with active, transitive function) (*LIV*²: 692); the semi-deponent *revertor*, *revertī* 'to return' is a trace thereof (Meiser 2003: 216). PIE also had a causative-iterative **u̯ort-éi̯e/o-*, reflected as Ved. *vartáyati* 'to turn', OIr. *di-forti-* 'to pour out', Go. *fra-wardjan* 'to spoil', and OCS *vrašťǫ* 'to turn'. Vedic also has reflexes of an athematic root aorist (*avart* 'has turned' < PIE **u̯ért-*) and of a reduplicated perfect (*vāvárta* 'has turned around' < PIE **u̯e-u̯órt-*) – Go. pret. *warþ* and OCS *vrъštǫ* may also be related (see *LIV*²: 691). Sabellic cognates include Umb. imp.3sg. **kuvertu**, *couertu* (≡ Lat. *convertitō*), fut.pf.3sg. **kuvurtus**, *couortus*, *courtust*, adv. *trahuorfi* 'placed across' (< **trans-u̯orssēd*), Osc. ϝερσορει dat.sg. 'epithet of Jupiter' (≡ Lat. *Versōrī*) (*EDLIL*, s.v. *ve/ortō, -ere*). In Old Latin (and occasionally later), there is variation between initial *vo-* and *ve-*, as a result of regular sound change (see Meiser 1998: 84).

As already noted, the Latin present stem *vert-* originates from the PIE simple thematic present, where e-grade root is original; hence, the occasional Latin present stem variant with

vo- (e.g. *vortitur*, Plaut. *Merc.* 122) must be explained as contamination from other forms of the paradigm, which reflect the original o-grade root (cf. Bock 2008: 426).[40]

The perfect stem OLat. *vort-* > CLat. *vert-* probably reflects the o-grade strong stem of the PIE reduplicated perfect, with dereduplication having taken place; hence PIE **u̯e-u̯ort-h₂e(i̯)* > PIt. **(u̯e-)u̯ort-ai̯* > OLat. *vortī* (*LIV*²: 691–692); the Umbrian fut.pf. forms seem also to reflect o-grade vocalism. However, due to the Proto-Italic change **r̥* > **or*, the underlying form may also have been a zero-grade root, i.e. PIE **u̯e-u̯r̥t-*. Considering that Proto-Italic and Latin reduplicated perfects generally continue an earlier zero-grade, this is probably the case here. Even if the protoparadigm did preserve the inherited strong vs. weak stem relation, it was neutralised by Proto-Italic, at the latest, by the regular sound change. According to Meiser (2003: 216), the dereduplication may have taken place already in Proto-Italic. In this case, the eventual merger of the present stem (e-grade) and perfect stem (o-grade) vocalism was the result of regular sound change. But recall that this change occurred only in the second century BC, and is thus a relatively late change with a purely local effect.

The PPP was originally *vorsus* (later, regularly *versus*), which originates regularly from the PIE *to*-participle with zero-grade root; thus, PIE **u̯r̥ˢ-tó-* > PIt. **u̯ortˢ-to-* > OLat. *vorsus* > CLat. *versus*. Here, too, the vowel contrasts between the present and perfect stems were neutralised as a result of regular, but relatively late, sound change.

Vertere has also a large number verbal and nominal derivatives (see *WH*, s.v. *vertō*; *EM*, s.v. *vertō*; *EDLIL*, s.v. *ve/ortō, -ere*). These are based on the root shapes that have been discussed already and do not provide any relevant evidence for the continuation of PIE ablaut alternations.

2.2.2. *i̯e/o*-presents

i̯e/o-presents were in PIE built to the zero-grade root, suffixed with the marker **-i̯-* and the accented thematic vowel **-é/ó-*. The root stays in zero-grade in all present forms, while secondary TAM-markers likewise take the invariable zero-grade (e.g. opt. **-ih₁-*). In the prehistory of Latin, this class became somewhat productive. Some inherited (and innovated) *i̯e/o*-presents ended up as third conjugation *-iō* verbs, while some were assigned to the fourth conjugation (and °*plēre* to the second) due to phonological factors.

A specific problem for the reconstruction of the prehistory of this class is whether Proto-Italic had a fully thematic inflection or only a "half-thematic" one, i.e. whether certain endings were attached directly to the stem without the intervening thematic vowel (cf. Meiser 1998: 195). This is most salient in 2sg. and 3sg.: do, for example, the Latin forms *capis, -it* reflect Proto-Italic **kapi̯-es, -et* or rather **kapi-s, -t*? It is possible (but very unlikely) that *capis, -it* etc. are later analogical modifications based on simple thematic presents (e.g. *dīcis, -it* < **dei̯k-es, -et*). However, I prefer a phonological explanation, which ultimately explains the distribution of stems containing the sequence **-Vi̯e/o-* into the Latin second, third (*-iō*) and fourth conjugations:

– Stems with PIt. **-ē-* end up as second conjugation verbs, e.g. 2sg. **-ĕ̄(i̯)es* > *-ēs*.

[40] After the sound change *vo-* > *ve-* had taken place, the forms with *vo-* probably acquired a certain stylistic value, promoting their continued use in the literature and causing an occasional hypercorrection. The unetymological *vo-* in Latin literature has thus a rational explanation.

– Stems with PIt. *-*i(i̯)e/o*- (a Sievers/Lindeman variant of *-*i̯e/o*-; Meiser 1998: 89) end up as fourth conjugation verbs, e.g. 2sg. *-*i̯ies* > -*īs*.
– Stems with PIt. *-(C)*i̯e/o*- end up as third conjugation -*iō* verbs, i.e. the development **kapi̯-es* > **kapi̯-is* > *capis* is phonologically regular.

There is, thus, no need to assume a Proto-Italic "half-thematic" inflection for those verbs that are in Latin continued as third conjugation -*iō* verbs.

The *i̯e/o*-present *facere*, *faciō* belonging to the PIE root **dʰeh₁(k)*- will be discussed separately below (Ch. 2.2.7.).

2.2.2.1. *Capere*

Capere (*căpiō*, *cēpī*, *căptus*) 'to take' originates from the PIE root **keh₂p*- 'to grab, snatch' (*LIV*²: 344–345). There is evidence for a PIE *i̯e/o*-present **kh₂p-i̯é/ó*- in Gr. κάπτω 'to gulp down' (on meaning, cf. *EDG*, s.v. κάπτω), Go. *hafjan* 'to lift' and possibly in Latv. *kàmpju* 'to grab'. There are no attested Sabellic cognates.

The Latin present stem *capi*- is a direct, phonologically regular continuation of the PIE *i̯e/o*-present (cf. Garnier 2010: 82–83), e.g. 3sg. **kh₂p-i̯-é-s* > PIt. **kapi̯-es* > Lat. *capis*.

The perfect stem *cēp*- cannot reflect any PIE formation directly. There is only one indirect piece of evidence for a PIE athematic root aorist: ON *hǫfundr* 'judge' < ptc. **habund* < **kh₂p-n̥t*- (Meiser 2003: 198). But PIE **keh₂p*- would result in Lat. ˣ*cāp*-. A Narten imperfect origin (PIE **kēh₂p*-) would be phonologically possible and may have morphological parallels in Latin, but this root has no traces of Narten ablaut whatsoever. The most commonly accepted explanation is that *cēp-ī* is analogically (re)modelled after such verbs as *faciō* : *fēcī* and *apiō* : *ēpī*, where the vowel alternation *a* : *ē* originates regularly from a PIE ablaut relation. According to Meiser (2003: 199), **kēp*- was created in Proto-Italic to serve as a perfect formation; if a Proto-Italic root aorist (e.g. 3sg. **kāp-ed*?) ever existed, it fell out of use (cf. Meiser 2003: 198).

The PPP *captus* is a phonologically regular continuation of a PIE *to*-participle with zero-grade root, i.e. **kh₂p-tó*- > PIt. **kap-to*- > Lat. *captus*.

2.2.2.2. *Cupere*

Cupere (*cŭpiō*, *cŭpiī/cŭpīvī*, *cŭpītus*) 'to desire, wish' originates from the PIE root **keu̯p*- 'to tremble (internally)' (*LIV*²: 359), which is attested in Indo-Iranian (Indic), Italic, Celtic, Balto-Slavic, and Germanic. The reconstructable PIE formations are not many: there is evidence for a *i̯e/o*-present **kup-i̯é/ó*- (Skt. *kupyati* 'to be angry, tremble'), a causative-iterative **kou̯p-éi̯e/o*- (Ved. *kopáyati* 'to shake, shatter'), and possibly for a simple thematic present **kéu̯p-e/o*- (ON *hjúfa* 'to lament'). Other cognates include OIr. *ad·cobra* 'wants' (a denominative?), Lith. *kūpė́ti*, OCS *kypěti* 'to simmer, boil'. There are no Sabellic cognate verbs attested, but possibly a handful of nouns derived from the verb or the root (see *WOU*, s.v. *cubrar*; *EDLIL*, s.v. *cupiō, -ere*).

The Latin present stem *cupi*- is clearly a direct continuation of the PIE *i̯e/o*-present.

The perfect stems *cupi*- and *cupīv*- are historically more problematic. No PIE aorist formation can be reconstructed; this does not automatically mean that the Latin perfect stems are innovations, but considering that *cupīvī* clearly is a productive *v*-perfect, this is very likely. Schrijver (2003) and de Vaan (*EDLIL*, s.v. *cupiō, -ere*) reconstruct a Proto-Italic "*ē*-aorist", whose existence may be implied by the typical (?) pairing with *i̯e/o*-presents. I see no concrete

evidence for this. Meiser (2003: 244) suggests that fourth-conjugation-looking forms with *-ī-* are extracted from preverb compounds (such as **kon-kup(i)i̯-*) and then extended into the simplex verb. It is possible that the productive *v*-perfect replaced an earlier reduplicated perfect **ku-kup-* and/or an *s*-aorist **kup-s-* (Meiser 2003: 244). In any case, there is very little in the attested Latin perfect stems that reflects a PIE formation or its ablaut alternations.

The PPP *cupītus* is also formed according to a productive pattern (cf. *audītus*). A direct inheritance of a PIE *to*-participle **kup-tó-* would have produced Lat. ˣ*cuptus*.

2.2.2.3. *Fierī*

Fierī (*fīō, factus sum*) 'to be made, happen, become' is synchronically and functionally the passive counterpart to the active *facere* (see Garnier 2010: 227–228 on this suppletive relation). Formally, it only has present stem forms, which occur exclusively in the active voice despite the passive function. The origin of this verb is the PIE root **bʰuh₂-* (*LIV*²: 98–101; see also, in this work, Ch. 3.2.1.2.). Its Sabellic cognates include Osc. prs.3sg. **fiíet**, **fiiet** (≡ Lat. *fit*), Umb. sbj.3sg. **fuia**, fut.3sg. **fuiest**.

The Latin forms most likely originate from a *i̯e/o*-present, which may be of PIE inheritance, but may also be a younger innovation. The only secure non-Italic comparative evidence comes from the Celtic branch (see *LIV*²: 98; *EDLIL*, s.v. *fīō, fierī*); Gr.(Hom.) φῠ́ομαι may be based on a root aorist (*EDG*, s.v. φύομαι), and the Old English and Albanian forms cited in *LIV*² (p. 98) are also problematic. Whatever the pedigree is, Proto-Italic certainly had a regularly inflected *i̯e/o*-present with zero-grade root, i.e. PIE (transponat?) **bʰuh₂-i̯é/ó-* > **fū-i̯e/o-* > [by Pius rule, see Ch. 3.1.4.] PIt. **fīi̯e/o-* (cf. Garnier 2010: 223). Judging from the fact that most forms are not affected by Hiatus shortening (see Ch. 3.2.5.), e.g. *fīō, fīunt, fīam*, etc., the glide was probably preserved in this verb much longer than would be regularly expected (cf. Ch. 3.1.5.). Otherwise the forms are phonologically regular. Innovative formations such as prs.sbj. *fī-am* etc. and ipf.ind. *fiē-ba-m* are regular third/fourth conjugation forms.

2.2.2.4. *Fugere*

Fugere (*fŭgiō, fūgī, fŭgĭtus*) 'to flee' originates from the PIE root **bʰeu̯g-* 'to get away' (*LIV*²: 84). There is evidence for a root aorist **bʰéu̯g-/bʰug-* (Gr. ἔφυγον 'escaped', possibly YAv. *būjat* 'freed'), a nasal present **bʰu-né-g-/bʰu-n-g-* (YAv. *buṇjaiṇti* 'they release, rescue', Pāli *pari-bhuñjati* 'cleanses'), an *e i̯e/o*-present **bʰug-éi̯e/o-* (YAv. *būjaiiamna-* 'freeing from sth.'), a reduplicated perfect **bʰe-bʰóu̯g-/bʰe-bʰug-* (Gr. πέφευγα 'has escaped', with secondary e-grade root), a desiderative **bʰéu̯g-s-/bʰug-s-* (Gr. fut. φεύξομαι 'will flee'), and possibly a causative-iterative **bʰou̯g-éi̯e/o-* (MPers. *bwz-*, Parth. *bwj-* 'to release', Go. *us-baugjan* 'to sweep'). Gr. φεύγω 'to flee' must be a secondary simple thematic present. Gr. aor. ἔφυγον may also reflect a PIE thematic aorist (not reconstructed by *LIV*²). There are no attested Sabellic cognates.

The Latin present stem reflects a PIE *i̯e/o*-present **bʰug-i̯é/ó-* (so *LIV*²: 84; *EDLIL*, s.v. *fugiō, -ere*), built expectedly to the zero-grade root. However, this is the only evidence we have for a PIE *i̯e/o*-present (cf. above), and, considering the fact that innovative *i̯e/o*-presents were created in Proto-Italic and patterned after the (root) aorist weak stem, it is possible that *fugiō* (like *faciō* and *iaciō*) is also a post-PIE innovation.

The Latin perfect stem *fūg-* continues the PIE root aorist e-grade strong stem: by regular sound change PIE **bʰeu̯g-* > PIt. **fou̯g-* > Lat. *fūg-* (Garnier 2010: 139). It was probably thematised back in Proto-Italic, like similar old root aorists. If *fūgī* was conjugated in Proto-Italic according to the same pattern as *fēcī*, we would still expect the inherited ablaut relation to have survived, i.e. PIt. 3sg. **fou̯g-ed* : 3pl. **fug-ond*, but the absence of Sabellic evidence (and any other piece of evidence) that could verify the continuation of the PIt. zero-grade aorist stem means that the reconstruction of the alternation cannot be verified empirically. The neutralisation of the alternation was in any case motivated by the restoration of paradigmatic uniformity (as per 1M1F). Proto-Italic probably also had a reduplicated perfect (**fu-fŭg-*); but the root aorist was continued as the Latin neo-perfect (Meiser 2003: 201).

The PPP *fugitus* cannot be a regular phonological continuation of a PIE *to*-participle **bʰug-tó-* (> ˣ*fūctus*?), but is rather modelled (or renovated) after the present stem *fugi-ō*.

2.2.2.5. *Iacere*

Iacere (*iăciō, iēcī, iăctus*) 'to throw' originates from the PIE root **H₁ieh₁-* 'to throw' (*LIV*²: 225), which is attested in Anatolian, Greek and Latin (there are no Sabellic cognates). The Hitt. verb *peie-*^{zi} (*EDHIL*, s.v.) is evidence for a PIE root formation **H₁éh₁-/Hih₁-* (an aorist, according to *LIV*²: 225). Gr.(Hom.) ἔηκα (< **e-(H)i̯eh₁-k-*) is also a reflection of a PIE root aorist (Rix 1992: 215), with the *k*-extension that is also part of the Latin formations. Gr. ῑημι (< **Hi-H₁ieh₁-mi*) goes back to the original PIE reduplicated present **Hi-H₁ieh₁-/Hi-Hih₁-*. The *k*-extension in Greek and Latin probably has a similar history than in the root **dʰeh₁(k)-* (see Ch. 2.2.7.).

The prehistory of Lat. *iacere* is probably mostly parallel with that of *facere* (see Ch. 2.2.7.). The starting point is the PIE root aorist, whose singular stem originally featured the *k*-extension; this was later extended into the plural and thematised, yielding Proto-Italic 3sg. **i̯ēk-ed* : 3pl. **i̯ăk-ond* (just like **fēk-ed* : **făk-ond*) – but the ablaut alternation is not comparatively reconstructable for this verb due to lack of Sabellic comparanda. A *i̯e/o*-present was then built to the aorist weak stem, i.e. PIt. **i̯aki̯-e/o-*. But note that unlike **fak-* from **dʰh₁k-*, **i̯ak-* is not a regular continuation of PIE zero-grade **Hih₁k-* (this would have produced Lat. ˣ*īc-*; cf. *LIV*²: 225). The only viable explanation is that the root was renovated in order to preserve the canonical root structure CVC-, to enhance the paradigmatic uniformity, and to conform to the model of other similarly inflected verbs such as *facere* (cf. *EDLIL*, s.v. *iaciō, -ere*).

The same issue about the continuation of the zero-grade root concerns also the PPP *iăctus*, which is a renovated continuation of PIE **Hih₁-tó-*.

2.2.2.6. *Parere*, °*perīre*

Parere (*păriō, pepĕrī, păr(i)tus*) 'to bring forth' and its compounds (here represented by *reperīre, repĕriō, reppĕrī, repĕrtus* 'to find out') originate from the PIE root **perh₃-* 'to procure' (*LIV*²: 474–475). The Latin forms are the only evidence for a PIE *i̯e/o*-present **pr̥h₃-i̯é/ó-*. Other evidence includes a nasal present (Ved. *pr̥ṇáti* 'to give'), a root aorist (Ved. imp.2sg. *pūrdhí* 'give!', Gr. ἔπορον 'procured, gave', Lat. *parēns* 'parent'), and possibly a reduplicated perfect (Gr. πέπρωται 'it is destined', OIr. *ro-ír* 'imparted', and the Latino-Faliscan perfect stem, see below). Italic cognates include Fal. pf.1sg. **pe:para**[**i**], Umb. fut.imp.3sg.act. **amparitu**, fut.imp.3sg.pass. **amparihmu** 'shall (be) erect(ed)'.

The present stem is problematic insofar as the expected zero-grade PIE **pr̥h₃-i̯é/ó-* would regularly result in ˣ**prā-i̯e/o-* > Lat. ˣ*prāre*. A partial solution would be to presume that the root was *accented*, for PIE **pŕ̥h₃-i̯e/o-* would produce the expected **para-i̯e/o-* by the so-called Palma rule (see Peters 1980: 21; Höfler 2017), but the presumption is problematic, as *i̯e/o-*presents are otherwise built to the *unaccented* root. Moreover, **para-i̯e/o-* cannot be the immediate preform of *parere/-perīre*, but rather of *parāre* 'to prepare', a different but etymologically related verb. Another solution is to presume that **pr̥h₃-i-* yields **par-i-* directly (Schrijver 1991: 293), but this is a problematic sound change (the **-i̯-* of the present marker was probably consonantal, not vocalic, as assumed by Schrijver). The most plausible suggestion made thus far takes the PIE root aorist **pérh₃-/pr̥h₃-* as the starting point (Meiser 2003: 185), which in a thematised guise yields PIt. sg. **per-e/o-* : pl. **par-e/o-*. The plural stem could then be used as a basis for an innovative *i̯e/o*-present **par-i̯e/o-* (cf. *faciō* and *iaciō* above, which are also *i̯e/o*-presents based on zero-grade aorist stems). The rest is regular: the simplex **par-i̯e/o-* ends up as third conjugation *-iō* verb *parere*, while preverb compounds such as **re-par-(i)i̯e/o-* end up in the fourth conjugation (cf. Meiser 2003: 72), having undergone phonologically regular vowel weakening; hence, *reperīre*.

It is unclear whether the reduplicated perfect *peper-/(re)pper-* originates from a PIE reduplicated perfect or from a similarly built Proto-Italic innovation (cf. Meiser 2003: 185); in any case, for Proto-Italic, a reduplicated perfect based on the zero-grade aorist stem can be reconstructed, i.e. **pe-păr-* (cf. VOLat. fhe꞉fhaked, from PIt. aor.pl. **fak-*). This produces the Latin simplex perfect forms by regular vowel weakening, i.e. *peperī*, and the preverb compound perfect stems via the additional (but phonologically expected) syncope, i.e. **re≠pə-pər-a̯i̯ > *re≠ppər-a̯i̯ > repperī*.

The PPP *partus* is not a direct continuation of a PIE zero-grade *to*-participle **pr̥h₃-tó-*, as this would have resulted in Lat. ˣ*prātus*. Instead, the PPP was renovated by extracting the stem *par-* from the present and aorist stems (or from the perfect stem, Meiser 2003: 228), possibly already in Proto-Italic. The variant *parĭtus* includes an etymologically secondary *-i-*, probably on the analogy of other PPPs, e.g. *hab-i-tus*, *fug-i-tus*. The preverb compound variant *repertus* is the product of regular vowel weakening (< **re≠pər-to-s*), or syncope (< **re≠pər-i-to-s*).

2.2.2.7. °*plēre*

The verbal element °*plēre*, with basic meaning 'to fill', occurs only in compounds (here represented by *complēre*, *compleō*, *complēvī*, *complētus* 'to fill (up)').[41] It originates from the PIE root **pleh₁-* 'to become full' (*LIV*²: 482–483), which is fairly well attested in the IE languages. The original paradigm constellation of this verb probably included a nasal present **pl̥-né-h₁-/pl̥-n-h₁-*, reflected in Ved. *pr̥ṇā́ti* 'to fill', OAv. imp.2sg. *pərənā* 'fill!', and indirectly in Arm. *lnowm* 'to fill', Alb. *m-blon* 'to fill'. There is also evidence for a reduplicated present **pi-pléh₁-/pi-pl̥h₁-* in Ved. ipf. *ápiprata* 'filled (his stomach)', Gr. πίμπλημι 'to fill' (the nasal element is secondary), and for a *dʰe/o*-present **pléh₁-dʰe/o-* in OAv. *frādaŧ* 'encourages', Gr. πλήθω 'to become full' (but the Greek form may be secondary; *EDG*, s.v. πίμπλημι). The present formations were in PIE paired with a root aorist **pléh₁-/pl̥h₁-*, reflected in Gr. πλῆτο

[41] *Plentur antiqui etiam sine praepositionibus dicebant* "the ancients said *plentur* also without prepositions [*rectius* preverbs]" (Paul. Fest. 230). But the simplex is attested nowhere else in Latin literature.

‘became full’ (for the Latin neo-perfect stem, see below), while the *s*-aorists in Vedic (*aprās* ‘has filled’) and Greek (ἔπλησα ‘filled’) are secondary (according to *LIV*²: 482). There are no Sabellic verb cognates.

The Latin present stem *complē-* is conjugated like a regular second conjugation verb, hinting at an origin as an essive or some other formation with underlying **-ē-*. Despite this superficiality, *complē-* actually originates from a *i̯e/o*-present (but not of PIE date). The PIE root aorist was probably continued in Proto-Italic (see above and below), and the present stem is very likely based on the aorist stem; hence PIE transponat **pleh₁-i̯e/o-* > PIt. **plē-i̯e/o-* > Lat. *°plē-*. The reason why *complēre* ended up as a second conjugation verb is due to the phonological structure of the root (CRV*h₁*-).

The Latin perfect stem *complēv-* is an innovative *v*-perfect. This was most likely created as a replacement for the Proto-Italic root aorist, a formation of PIE inheritance (e.g. 3sg. PIE **pleh₁-t* > PIt. **plē-d*). However, unlike other *i̯e/o*-presents based on root aorists, the strong stem (reflecting a PIE full-grade root) was taken as the starting point. Direct continuation of the PIE aorist formation would have resulted in the following PIt. plural forms: 1pl. **plā-me,* 2pl. **plā-te,* 3pl. **păl-end*. A *i̯e/o*-present based on these forms would probably have been *×*plā-i̯e/o-* or *×*păl-i̯e/o-* (> Lat. *×plāre/plō*, *×palere/paliō*?). As such forms cannot be reconstructed according to the available comparative and historical evidence, the conclusion is that the Proto-Italic aorist did not have intraparadigmatic ablaut alternation between the singular and plural forms. The neutralisation of this alternation can only have occurred by way of analogical levelling (according to the 1M1F principle).

The PPP *complētus* is not a phonologically regular continuation of the PIE *to*-participle **°pl̥h₁-tó-*, as this would have produced PIt. **plā-to-* > Lat. *×*(*com*)*plātus*. The actual PPP is either directly based on the present stem, or its vocalism has been renovated according to the ubiquitous *-ē-* in all other formations, motivated by paradigmatic uniformity.

2.2.2.8. *Sentīre*

Sentīre (*sĕntiō*, *sēnsī*, *sēnsus*) ‘to perceive, feel’ originates from the PIE root **sent-* ‘to go; to perceive’ (*LIV*²: 533). The root is only sporadically attested in Latin (there are no Sabellic cognates), Celtic, Germanic and Balto-Slavic. Of the attested verbal formations, Lith. *sintéti* ‘to ponder’ is most likely an innovative essive (so *LIV*²: 533), while the Germanic ‘send’-verbs (e.g. Go. *sandjan*) originate from a PIE causative-iterative **sont-éi̯e/o-* (*EDPG*, s.v. **sandjan*).[42] All other evidence for PIE verb formations comes from Latin.

The Latin present stem originates from the PIE *i̯e/o*-present **sn̥t-i̯é/ó-*, with the expected zero-grade root. The development is phonologically regular: e.g. 3sg. PIE **sn̥t-i̯-é-ti* > PIt. **sn̥t-i̯-et* > **sent-i̯i̯-et* > OLat. *sentīt* > CLat. *sentit*. Note that the neutralisation of the e-grade and zero-grade did not take place until Latino-Faliscan (see Ch. 3.2.2.); the e-grade looking vocalism of the Latin verb is thus a consequence of regular sound change.

The perfect stem *sēns-* has a submerged vowel quantity due to the *ns*-cluster (see Ch. 3.1.4.). According to *LIV*² (p. 533), this formation originates from a PIE *s*-aorist **sēnt-s-*/**sĕnt-s-*, but the exact prehistory is unknown (Meiser 2003: 121), and it may also be a later innovation.

[42] Another related set of Germanic verbs, e.g. MDu. *sinnen*, OHG *sinnan* ‘to contemplate’, etc., is based on a nasal extension of the root, i.e. **sent-ne-* (*EDPG*, s.v. **sinnan*).

It is thus difficult to determine when and how the inherited ablaut alternations (if present at all) were neutralised.

The PPP *sēnsus* is a regular continuation of a PIE *to*-participle, i.e. **sn̥tˢ-tó-* > PIt. **sn̥tˢ-to-* > **sentˢ-to-* > **sens(s)o-* > *sēnsus* (cf. Garnier 2010: 151).

2.2.2.9. *Specere*

Specere (*spĕciō*, *spexī*, *spectus*; but present stem especially in compounds °*spĭciō* due to vowel weakening) 'to look (at)' originates from the PIE root **spek̂-* 'to look, pry' (*LIV*²: 575–576). This root features a familiar constellation of a thematic present (a *i̯e/o*-present) and an *s*-aorist, both of which are attested in three different branches: Indo-Iranian, Greek, and Italic (but mostly just in Latin). The only Sabellic cognate is the Umb. noun **speture** dat.sg. (≡ Lat. *spectōrī*?) (see *WOU*, s.v. *speture*).

For a PIE *i̯e/o*-present, an unaccented zero-grade root is usually reconstructed (PIE **spk̂-i̯é/ó-*), but all IE reflexes point towards an e-grade root: Ved. *páśyati* 'to see, look, observe' (note the accent!), OAv. *spasiiā* 'to observe, pry', Gr. σκέπτομαι 'to look about, pry', and Lat. *speciō*. This may indicate that a zero-grade variant **spk̂-* of this root did not exist, perhaps due to the fact that such a cluster of plosives is phonotactically disallowed.[43] At least the Latin verb implies neither a (post-)PIE "schwa primum" nor a "schwa secundum", since these would have resulted in ˣ*spaciō* (see the discussion in Ch. 2.4.); the Latin present stem can only continue a preform with an original **e* in the root. In light of the evidence, this e-grade looking "zero-grade" root may be as old as PIE, and most likely does not involve a modification of the ablaut grade within the *einzelsprachlich* history of Latin. Apparently, there was never motivation to renovate the root into a more "zero-grade-looking" form (such as ˣ*spaciō* on the model of *faciō*, *capiō*, *iaciō*), providing further support for the presumption that the *e*-vocalism is original. This being the case, *speciō* is simply a regular continuation of the corresponding PIE form (cf. Garnier 2010: 150).

The perfect stem *spex-* is a continuation of the PIE *s*-aorist, also attested in Vedic (*áspaṣṭa* 'looked') and Greek (σκέψατο 'looked about, pried'), confirming the antiquity of the formation. PIE *s*-aorist had Narten ablaut, i.e. ē-grade in the strong stem (**spēk̂-s-*), e-grade in the weak stem (**spĕk̂-s-*). Both Greek and Vedic cognates are medial, reflecting the weak stem, and do not provide any evidence for the existence of the lengthened grade. *Spexī* is also ambiguous in this regard, since the vowel quality is submerged due to the heavy syllable coda. Typically, however, Latin *s*-perfects have long vowels, but for this verb it is not clear, whether the strong stem ē-grade or the weak stem e-grade is directly continued and when the ablaut relation between the two stems was neutralised. Such neutralisation, however, cannot have taken place by regular sound change; analogical levelling must have been involved.

For the PPP *spectus*, a continuation of the PIE zero-grade would be expected; instead, we find an e-grade looking root. As pointed out above, this verb was probably lacking a vowelless zero-grade, for which reason a full vowel appears even in such morphological contexts that typically have the zero-grade.

[43] Another possibility is to reconstruct an e-grade *i̯e/o*-present formation, as in *LIV*² (p. 19). Evidence for such a formation is, however, much scantier than for the corresponding zero-grade formation.

2.2.3. *sḱe/o*-presents

PIE had a class of thematic present formations, which were built to the zero-grade root and suffixed with the marker **-sḱ-* and the accented thematic vowel.[44] There was no intraparadigmatic ablaut. The formation had originally an iterative function, but this was bleached in Latin. Instead, productive deverbal (and also denominative) *sḱe/o*-presents with INCHOATIVE function were built to verbal and nominal bases of the first, second and fourth conjugations (e.g. *albēre* 'to be white' → *albēscere* 'to become white'); these productive formations are not analysed here.

We should note that, regardless of the exact origin of the respective formation (be it inherited or productive), the **-sḱ-* (> Lat. *-sc-*) suffix occurs almost exclusively in present stem forms (and verbal nouns derived thereof). The only exceptions are the perfect stems *poposc-* (see Ch. 2.2.3.3. below) and *miscu-* (of *miscēre* 'to mix', not discussed in this work).

2.2.3.1. *Discere*

Discere (*discō, dĭdĭcī*, no PPP) 'to learn' originates from the PIE root **dek-* 'to notice, observe' (*LIV*²: 109–112), same as the verbs *docēre* (Ch. 2.2.4.1.) and *decet* (Ch. 2.2.5.2.). There are no IE cognate *sḱe/o*-presents built to this root.

The Latin present stem *disc-* seems to originate from a reduplicated *sḱe/o*-present, i.e. **di-dḱ-sḱ-e/o-*, which would be a difficult formation to explain (and PIE did not have an *i*-reduplicated present for this root to start with). It may also be explained as a continuation of a reduplicated thematic desiderative PIE **di-dḱ-s-é/ó-* (Leumann 1977: 586), and it would thus be a cognate with Ved. *dīkṣate* 'to dedicate oneself'. This would mean that the resemblance with an actual *sḱe/o*-present is merely a coincidence. Due to semantics (the verb does not mean 'to wish to observe' but rather 'to observe repeatedly → to learn'), de Vaan (*EDLIL*, s.v. *discō, -ere*) analyses the verb as a genuine iterative *sḱe/o*-present with reduplication (but he offers no explanation for the reduplication). In the end, it is possible to analyse the verb as an original desiderative secondarily rebuilt into a *sḱe/o*-present with iterative function. In any case, the Latin present stem requires a genuine (i.e. not restored or modified) zero-grade root **dḱ-* and an *i*-reduplication (which is characteristic of most reduplicated present constructions), and the eventual simplification of the consonant cluster resulted in a *sḱe/o*-present-looking form. This may be an indication that the desiderative was early reanalysed as an opaque present stem, to which a *sḱe/o*-present could be built. Hence, PIE des. **di-dḱ-s-é/ó-* → iter. **did(ḱ)-sḱ-é/ó-* > PIt. **di(d)sk-e/o-* > Lat. *disc-*.

The perfect stem *didic-* probably originates from the PIE reduplicated perfect **de-doḱ-/de-dḱ-*, reflected in Ved. *dadáśa* 'has payed homage' and Gr.(Hom.) imp.2sg. δέδεξο 'take!' (also ptc. δεδεγμένος). This formation may have been used as a common perfect stem for all verbs derived from this root, but it eventually ended up as the neo-perfect stem for *discere* alone. But the formal details warrant discussion. First, the reduplication syllable shows *i* instead of *e*, which would be more typical for a perfect formation. This has been explained as analogical levelling of the present stem vocalism (Leumann 1977: 586). Second, the original vocalism of the root is unclear, due to the vowel quality having been submerged as a result of vowel weakening. The starting point is usually the o-grade strong stem, i.e. **de-dóḱ-* → **didok-* >

[44] For a more elaborate discussion on the development of this class of verbs in Latin, see Garnier 2010: 159f.

didək-* > *didic-*; the weak stem was probably phonotactically dispreferred (de-dk̂-*). But considering that the Greek forms show an e-grade-looking form in the inherited weak stem forms, the phonologically difficult zero-grade may have already in PIE been substituted by a secondary e-grade; this may also underlie the Latin perfect stem root. A further possibility is that the root vocalism was modified on the model of the present stem (similar development has occurred in the Latin neo-perfect stems, e.g. *scābī*, Ch. 2.2.1.11., and *poposcī*, Ch. 2.2.3.3.). If this is so, then the *-i-* of the reduplication syllable can be explained by the vowel-harmonic effect typically seen in Latin reduplicated perfects; hence **de-d*V*k-* → **de-dik-* > *didic-*. In any case, the perfect stem *didic-* does not provide any relevant evidence for the continuation of PIE ablaut in Latin.

2.2.3.2. *Nōscere*

Nōscere (OLat. *gnōscō, gnōvī, gnōtus*; CLat. *nōscō, nōvī, nōtus*) 'to come to know' originates from the well-attested PIE root **gneh₃-* 'to perceive' (*LIV*²: 168–170). Other IE *sk̂e/o*-present cognates include OPers. sbj. *xšnāsātiy* 'should perceive', Arm. *čanač'em* 'I perceive', Alb. *njoh* 'I know' and Gr.(Att.) γιγνώσκω 'to perceive' (with secondary reduplication). There are no Italic cognates.

The present stem *(g)nōsc-* surely continues the PIE *sk̂e/o*-present, but the vocalism reflects an e-grade root rather than the expected zero-grade root (regular continuation of the zero-grade PIE **gn̥h₃-sk̂-é/ó-* would have resulted in Lat. ×*(g)nāsc-ō*). It is possible that the phonologically regular form was transmitted, but its vocalism was renovated by paradigmatic levelling (possibly from the perfect stem; cf. Garnier 2010: 184) at a later date. However, most cognates also reflect an e-grade root (Gr. γιγνώσκω is in this regard ambiguous, as it can reflect both the expected zero-grade and an e-grade form by regular sound change), meaning that the renovation is datable to the late-PIE or the immediate post-PIE period.

The perfet stem *(g)nōv-* is an innovative Latin *v*-perfect, which was created as a replacement for the Proto-Italic root aorist – an inheritance from PIE; cf. Ved. aor.opt.2sg. *jñeyā́s* 'wouldst thou learn to know', Gr. ἔγνων 'recognised' (Meiser 2003: 226). The vocalism is taken from the root aorist strong stem **ĝneh₃-*, with e-grade root. Garnier (2010: 180) reconstructs a Proto-Italic athematic root aorist, e.g. 3sg. **gnō-d*. It is not known, whether the original athematic ablaut alternation was preserved (e.g. 1pl. **gnā-mos*), levelled according to the singular forms (e.g. 1pl. **gnō-mos*), or otherwise modified (perhaps into **gnŏ-mos*).

The PPP *(g)nōtus*, like the present stem, reflects a PIE e-grade rather than the expected zero-grade (i.e. not Lat. ×*(g)nātus*). This renovation is most likely based on other tense stems, where the *ō*-vocalism was the result of regular phonological development.[45]

2.2.3.3. *Poscere*

Poscere (*poscō, poposcī*,[46] no PPP) 'to demand' originates from the PIE root **prek̂-* 'to ask' (*LIV*²: 490–491). A PIE *sk̂e/o*-present is for this root securely reconstructable: it is reflected in Ved. *pr̥cchá́ti* 'to ask', OAv. *pərəsā* 'I ask', Arm. aor. *eharc'* 'asked', and OIr. *-airc* 'to ask'. PIE also had an *s*-aorist, reflected in Ved. *áprāṭ* 'has asked', OAv. inj.1sg.mid. *frašī* 'I deliberate', and Toch. B *preksa*, A *prakäs* 'asked'. Originally, the root may have had a root

[45] For other proposals, which do not take a regular PIE *to*-participle as the origin, see Schrijver 1991: 199f.
[46] An OLat. perfect *peposcī* was used by Valerius Antias, according to Gellius (6, 9, 9).

aorist (possibly indirectly reflected in YAv. sbj.1sg. *ā-frasāne* ‘I will deliberate’), and the *s*-aorist was later created as a counterpart to the *sḱe/o*-present (Klingenschmitt 1982: 62–63). There is a number of Sabellic cognates, most of which are nouns derived from the same root, or denominative verbs. Non-denominative verbal cognates include Umb. fut.pf.3pl. **pepurkurent**, Osc. fut.pf.3sg.pass. *comparascuster* (cf. *WOU*, s.v. *pepurkurent*).

The Latin present stem *posc*- is a direct continuation of the PIE *sḱe/o*-present. It is possible that the consonant cluster **-r̥ksḱ-* was already in PIE simplified into **-r̥sḱ-* (*LIV*²: 491). Taking this as the starting point, the development is phonologically regular, i.e. PIE **pr̥(k)-sḱ-é/ó-* > [vocalisation of syllabic liquids, see Ch. 3.1.3.] PIt. **porsk-e/o-*[47] > Lat. *posc-ō*. The quantity of the root vowel is not entirely clear, as it stands in a *positione* heavy syllable and is thus submerged.

The perfect stem *peposc-/poposc*- is clearly a reduplicated formation of some antiquity, but it does not continue any PIE formation (this root only had a *s*-aorist and possibly a root aorist). The reduplicated perfect is most likely a Proto-Italic innovation (Meiser 2003: 188), based on the present stem. Curiously, this is the only case in the third conjugation that the *-sc-* marker of the present stem is part of another tense stem (cf. *miscuī* of *miscēre* ‘to mix’); it is very likely that the marker was early reanalysed as part of the verb root, and was no longer synchronically felt as a suffix. Garnier (2010: 186) presents a slightly different scenario: a regular Proto-Italic reduplicated perfect with o-grade root was created, but the consonantism was levelled on the basis of the present stem; thus, **pe-prok-* → **pe-po(r)sk-* > *peposc-* > *poposc-*.

2.2.4. Causative-iteratives

PIE causative-iteratives were thematic formations built to the o-grade root, suffixed with the accented e-grade marker **-éi̯-* and the thematic vowel. This is the normal type: *LIV*² (p. 22–23, 721–723) lists 440 roots that form causative-iteratives in this way. Another type, otherwise the same but built to the accented ō-grade root, can only be reconstructed for 24 roots (*LIV*²: 23, 723). The most famous Latin representative of the ō-grade formation (*sōpīre* ‘to become senseless, put to sleep’) is now regarded as a denominative rather than a continuation of a PIE formation (Weiss 2016).

Being a thematic formation, no intraparadigmatic ablaut is expected in this verb class. Due to regular sound change, the causative marker **-éi̯-e/o-* contracts regularly to Latin *-ē-*, meaning that these verbs are without exception inflected as regular second conjugation verbs. In few cases, the o-grade root of the causative-iterative contrasts with a root in another grade of another formation: the preservation and/or loss of such ablaut contrasts needs to be investigated.

2.2.4.1. *Docēre*

Docēre (*dŏceō, dŏcuī, dŏctus*) ‘to teach, inform’ originates from the PIE root **dek̂-* ‘to notice, observe’ (*LIV*²: 109–112), and is thus a cognate of *decet* (see Ch. 2.2.5.2.) and *discere* (see Ch. 2.2.3.1.). The original PIE causative-iterative of this root is reflected in Gr. δοκεῖ ‘seems’ and Hitt. *dākki, takkanzi* ‘to resemble’. There are no Italic cognates for the causative-iterative.

[47] Umb. **pepurkurent** is evidence for the preservation of **-rsk-* until Proto-Italic (Meiser 2003: 188 n. 23).

The Latin present stem *docē-* continues the PIE causative-iterative by regular phonological development, i.e. **dok̂-éi̯-e/o-* > PIt. **dok-ē-* > Lat. *docē-*.

The rest of the paradigm is built out of regular and productive elements, which do not convey any evidence for PIE ablaut. The perfect stem *docu-* is an innovative Latin *u*-perfect built to the decharacterised present stem, as usual in the second conjugation (cf. Meiser 1998: 205–206). The PPP *doctus* is also directly built to the decharacterised present stem without an intervening vowel (not, e.g., ˣ*docitus* or ˣ*docētus*).

2.2.4.2. *Monēre*, *meminisse*

Monēre (*mŏneō, mŏnuī, mŏnĭtus*) 'to remind, warn' originates from the PIE root **men-* 'to think' (*LIV*²: 435–436). The PIE o-grade causative-iterative of this widely-attested root is reflected in Ved.(Atharvaveda) *mānáyati* 'to respect, appreciate', OAv. *mānaiieiti* 'to commemorate', YAv. ptc. *mānaiiən* 'causing to think', and possibly in OBret. *guo-monim* 'to agree'. The only Italic cognate may be the SPic. noun **múfqlúm** 'monument (?)' (see *WOU*, s.v. *múfqlúm* for references).

The present stem *monē-* is a direct continuation of the PIE formation, i.e. **mon-éi̯-e/o-* > PIt. **mon-ē-* > Lat. *monē-*. However, if Schrijver's (1991: 454–474) sound change **mo-* > *ma-* /_CV is accepted as a regular phonological development, then the expected outcome of PIE **mon-éi̯-e/o-* would be ˣ*manē-*, in which case the o-vocalism must be explained as an analogical modification based on other o-grade causatives (Schrijver 1991: 472; also cf. Meiser 1998: 84–85). This is indeed a possibility; however, as pointed out by Schrijver (1991: 473), the preservation of PIE **o* in words such as *mola* 'millstone' (< **molh₁-eh₂-*), *mora* 'delay' (< **morH-eh₂-*) and *sonus* 'sound' (< **sṷonh₂o-*) indicate that the change **mo-* > *ma-* must have occurred before the loss of consonantal laryngeals, i.e. very early in the prehistory of Latin. If **mon-ei̯-e/o-* was regularly changed into **man-ei̯-e/o-* and then back again based on other causatives with o-vocalism, the reversion must also have occurred very early, perhaps at a time when the causative formation was still a productive class. This means that the Proto-Italic reconstruction (in light of SPic. **múfqlúm**) must have o-vocalism.

The perfect stem *monu-* and the PPP *monitus* are regular innovative formations which do not continue any PIE categories directly. Another form of the PPP is preserved as *Monēta* 'The Warner, epithet of Juno', containing the *-ē-* of the present stem (also cf. *monētrīx* 'adviser' Plaut. *Truc*. 501, vs. *monitor* 'adviser' Ter. *Haut*. 875).

Related to *monēre* is the verb *meminisse* 'to remember', which is synchronically a *perfectum tantum* in form, but with an *infectum* meaning (and is thus comparable with the preterit-presents of the Germanic languages; cf. Meiser 2003: 81). It is a continuation of the PIE reduplicated perfect **me-mon-/me-mn-*, reflected also in Gr. μέμονα 'to wish eagerly', YAv. 3sg.mid. *mamne* 'has thought' and Go. *man* 'I mean', *ga-man* 'I remember' (possible Anatolian and Vedic cognates are more problematic, see *LIV*²: 435–436 and Meiser 2003: 194 for references). The *communis opinio* is that the perfect stem reflects the PIE o-grade of the strong stem **me-mon-* (Meiser 2003: 194) while the imperative *mementō* is a reflection of the expected zero-grade weak stem **me-mn̥-(tōd)* (*EDLIL*, s.v. *meminī*). From the Latin perspective, however, the vocalism is partially submerged due to regular vowel weakening (see Ch. 3.2.3. and Appendix II): *memi̯nī* may reflect earlier **-men-*, **-mon-* or **-mn̥(n)-*, while

mem̲entō must decend either from *-*men*- or *-*mn̥*- (o-grade *-*mon*- is not a possibility, as this would have produced Lat. ˣ*memuntō*).

2.2.4.3. *Spondēre*

Spondēre (*spondeō, spopondī, spōnsus*) 'to promise sacredly' originates from the PIE root **spend*- 'to libate' (*LIV*²: 577–578). The Latin verb is the only attested evidence for a PIE causative-iterative. Other cognates include Hitt. *išpānt-*^{i} 'to libate, sacrifice', Gr. σπένδω 'to libate, pour' and Toch. B *späntetär* 'to trust'. Sabellic evidence consists of but two items: Osc. imp.3sg. *spentud* and Umb. PPP acc./abl.sg.f. *spefa* 'offered'.

The present stem *spondē*- is a straightforward continuation of the PIE causative-iterative, i.e. **spond-éi̯-e/o*- > PIt. **spond-ē*- > Lat. *spondē*-. The Oscan verb probably continues an earlier simple thematic present **spénd-e/o*- (cf. above; *EDLIL*, s.v. *spondeō*), which was lost in Latin.

The perfect stem *spopond*- was already examined in connection with *tondēre/totondī* (see previous section).

The PPP *spōnsus* cannot be a regular phonological continuation of the PIE *to*-participle **spn̥d*^{s}*-tó*-, as this would have resulted in Lat. ˣ*spēnsus*; either the PPP is based directly on the present stem or the phonologically regular continuation was renovated by the *o*-vocalism imported from other tense stems.

2.2.4.4. *Terrēre*

Terrēre (*terreō, terruī, terrĭtus*) 'to frighten' originates from the PIE root **tres*- 'to tremble (in fear)' (*LIV*²: 650–651). The PIE causative-iterative **tros-éi̯-e/o*- is also reflected in Ved.(Atharvaveda) imp.2sg. *trāsaya* 'make to tremble!', and YAv. *θrå̊ŋhaiiete* 'to move in terror'. Other important cognates include the simple thematic presents Ved. *trásati* 'to tremble, be afraid', and Gr. τρέω 'to be afraid, flee in terror', and the *s*-aorist Gr. ἔτρεσεν 'trembled, was afraid'. Sabellic cognates include Umb. imp.3sg. **tuse⟨t⟩u**, *tursitu*, **tusetutu**, *tursituto*, sbj.prs.3sg.pass. *tursiandu* 'to scare', and dat.sg. **turse**, **tuse**, *turse*, gen.sg. *tursar*, voc.sg. *tursa* 'name of a goddess invoked in the curse of foes' (< **torsā*- 'fright') (cf. *EDLIL*, s.v. *terreō*).

Despite their appearances, the Latin present stem *terrē*- and the Umbrian cognate are most likely regular phonological continuations of the PIE causative-iterative. The comparative evidence shows clearly that the PIE full-grade must be reconstructed as **tres-/tros*- (not ˣ**ters-/tors*-), so that is the starting point. This results regularly in PIt. **tros-ē*-, which then syncopates into **tr̥₂s-ē*- (like **tritiu̯o*- 'third' > **tr̥₂tiu̯o*-);[48] the secondary syllabic liquid then develops into Lat. *-er-*, Umb. *-or-*, hence **ters-ē*- > Lat. *terrē*- (like **tr̥₂tiu̯o*- > **tertiu̯o*- > Lat. *tertius*), **tors-ē*- > Umb. *torsē*- (*LIV*²: 651).

The perfect stem *terru*- is clearly an innovation, i.e. a regular second-conjugation *u*-perfect. It may be a replacement for the PIt. *s*-aorist **tres-s-e/o*- (cf. Meiser 2003: 224–225), itself a continuation of the PIE *s*-aorist.

The PPP *territus* is also an innovative form based on the present stem. Again, it may be a replacement for an inherited PIE *to*-participle **tr̥s-tó*- > PIt. **tors-to*-.

[48] Such initial-syllable syncope is possible before the onset of the (late-)Proto-Italic initial syllable stress (cf. Ch. 3.1.5.).

2.2.4.5. *Tondēre*

Tondēre (*tondeō*, *totondī*, *tōnsus*) ‘to shear, clip’ originates from the PIE root **tend-* ‘to cut, split’ (*LIV*²: 628), which is possibly related to the root **temh₁-* ‘to cut’ (*LIV*²: 625). The Latin present stem is the only evidence for a PIE causative-iterative. Cognates of other verb formations include Gr. τένδω ‘to gnaw at’ (simple thematic present) and OIr. *teinnid** ‘to break, cut’ (simple thematic present or thematised nasal present). There are no cognates in other Italic languages than Latin.

The present stem is a straightforward continuation of the PIE causative-iterative (though semantically rather an intensive), i.e. **tond-éi̯-e/o-* > PIt. *tond-ē-* > Lat. *tondē-*.

The perfect stem *totond-* is clearly a reduplicated perfect, which may originate from a corresponding PIE formation (**te-tónd-/te-tn̥d-*),[49] but it may also be significantly younger (*EDLIL*, s.v. *tondeō*). *Totondī* is one of the three reduplicated perfects associated with second-conjugation causative-iteratives with intensive semantics, the other two being *momordī* (of *mordēre* ‘to bite’) and *spopondī* (of *spondēre* ‘to promise sacredly’, see next section). Meiser (2003: 150), following Leumann (1977: 588), suggests that the three present formations were built to corresponding (but subsequently lost and hence unattested) basic verbs **tendĕre* (recall Gr. τένδω!), **merdĕre*, **spendĕre*, which had both *s*-aorists (perhaps **tēnsī*, **mersī*, **spēnsī*) and reduplicated perfects reflecting the o-grade strong stem variant (i.e. **tetondī*, **memordī*, OLat. *spepondī*); the intensives shared the same perfect and aorist forms. Typically, the concurrence of a PIt. *s*-aorist and a reduplicated perfect is in Latin resolved in favour of the continuation of the *s*-aorist as the neo-perfect stem, presenting a problem for the theory of the development of Latin neo-perfects. However, Meiser (*loc. cit.*) points out that the uniformity of the vocalism of the intensive and the perfect stem resulted in enhanced paradigmatic iconicity, leading thus to the continuation of the reduplicated formation.

The PPP *tōnsus* cannot be a regular continuation of a PIE *to*-participle **tn̥d^{s}-tó-* with zero-grade root (this would have produced Lat. ˣ*tēnsus*). The vocalism is either based on that of the present stem, or it is a later renovation of the phonologically regular form.

2.2.5. Essives

Under the term *essives* I understand in the present context all such second conjugation (and one first conjugation) verbs that are of PIE inheritance (i.e. are not specifically Latin innovations) and are neither causative-iteratives (see Ch. 2.2.4.) nor denominatives (such as *senēre* ‘to be old’ and *albēre* ‘to be white’; cf. Harðarson 1998: 337). The basis of this class of verbs is the PIE essive, a thematic formation characterised by the zero-grade root and the suffix **-h₁i̯-é/ó-*, with an accented thematic vowel. According to Harðarson (1998), PIE essives developed out of athematic aorists characterised by hysterokinetic accent/ablaut and the suffix **-éh₁-/-h₁-* (classified as fientive-presents in *LIV*²); the essive-presents were built to the weak stem of the *eh₁*-aorist, suffixed by **-i̯é/ó-* (p. 328). Functionally, these *eh₁*-aorists were fientives (of intransitive roots) or patientives (of transitive roots) (p. 327), i.e. they expressed the acquiring of a state, while the essive-presents were (literally) essives, i.e. expressing the staying in a state (p. 334).

[49] The origin as a reduplicated aorist, reflecting PIE **té-tn̥d-e/o-*, can be excluded on phonological grounds: the stem would have evolved into Lat. ˣ*tetend-* by regular sound change.

Inherited essives developed into Proto-Italic second conjugations verbs, in which class they eventually became, apart from the inherited ablaut grade of the root, formally indistinguishable from other second conjugation verbs (e.g. the causative-iteratives). However, the required *-*ē*- of the present stem does not result from regular phonological development from *-*h₁i̯e/o*-. According to Harðarson (1998: 334), the *-*ē* of the inherited *eh₁*-aorist strong stem (from PIE *-*eh₁*-) was imported to the essive-present stem, possibly also influenced by second-conjugation denominative-essives, which had an inherited *-*e*-*h₁i̯e/o*-, the first *-*e*- being the thematic vowel of the noun. Since this modification (which can be dated to the Proto-Italic period) concerns the whole conjugation class and not just specific individual cases, it falls within the heredity principle and can be considered regular development in this class.

In this section, I will concentrate on the analysis of the Latin present stem and the continuation of the expected zero-grade root. Most Latin essives have an innovative, secondary *u*-perfect; this will not be discussed. The PPP is only discussed, if it provides relevant evidence for the continuation of PIE ablaut.

2.2.5.1. *Carēre*

Carēre (*căreō*, *căruī*, *căritūrus*) ‘to lack’ is an etymologically problematic verb. The adjective *castus* ‘pure, unpolluted, virtuous’, probably the original PPP of *carēre*, and the Oscan cognate prs.3sg. **kasit** ‘it is necessary’ (≡ Lat. *caret*) indicate that the original stem was **kas*-*ē*- (the Fal. cognate fut.1sg. **carefo** ‘I will lack’ also shows the rhotacised stem). Possible origins include the PIE roots **ḱes*- ‘to cut’ (*LIV*²: 329), **keHs*- ‘?’ (Schrijver 1991: 101), and **ḱeHs*- ‘to instruct’ (*LIV*²: 318). All are problematic: **ḱes*- leaves the Lat. -*a*- unexplained and is semantically difficult (essive ‘to be cutting’ → ‘to lack’?), **keHs*- lacks cognates, and **ḱeHs*- is semantically not plausible (‘to instruct’ → ‘to lack’? cf. *EDLIL*, s.v. *careō*).

Notwithstanding the etymological problems, some observations can be made considering the ablaut of *carēre*. The present stem cannot reflect an e-grade root or an e-grade-looking root (unless the etymon contained the sequence *-*h₂e*-, but this has thus far not been suggested), the latter of which is sometimes reflected instead of the morphologically expected vowelless zero-grade. Provided that the root continues an earlier zero-grade – the expected form – the issue is trivial only if the root contained a laryngeal (*-*H*- being the source of Lat. -*a*-). If it can be demonstrated that the *a*-vocalism is not due to a laryngeal, the options are limited: the replacement of a phonotactically disallowed zero-grade (here e.g. **ḱs*-) typically results in an e-grade-looking form (cf. *sedēre*, Ch. 2.2.5.5.). A denominal origin is also possible, but this would push the ultimate explanation for the Lat. -*a*- only further (and is not discussed here).

The adj. *castus* is probably the original PPP of *carēre*, and was later lexicalised as an adjective and the paradigmatic connection with the verb was lost (and there was no replacement). It may continue an earlier *to*-participle, having the same zero-grade root as the present stem. The fut.ptc. *caritūrus* is a regular formation, created analogically on the model of such cases as *habēre* : *habitūrus* :: *carēre* : X, where X = *caritūrus*.

2.2.5.2. *Decet*

Decet (*dĕcet*, *dĕcuit*, only in third person) ‘it is fitting, suitable, proper’ originates from the PIE root **dek̂*- ‘to notice, observe’ (*LIV*²: 109–112), and is thus a close cognate of the verbs *docēre* (see Ch. 2.2.4.1.) and *discere* (see Ch. 2.2.3.1.). There are no IE congates of the PIE essive

attested outside of the Italic branch. Sabellic cognates include Umb. prs.3sg. **tiçit** ‘ought to’ (≡ Lat. *decet*), and the noun Umb. nom.pl. *dersecor* ‘required(?)’.

The present stem *dece-* most likely continues an earlier essive formation. Judging from the IE cognates, this verb root did not have a vowelless zero-grade alternant: e-grade is used instead. *LIV*² (p. 110) uses a subscript *e* to indicate a kind of prop vowel (i.e. **$d_e\hat{k}$-*). However, this prop vowel cannot be the same one that results in Lat. *-a-* (see, e.g., *pandere* Ch. 2.3.2.6.) and Gr. -ι- (cf. Gr.(Hom.) pf.imp.2sg. δέδε̲ξο ‘take!’) in other roots. The most elegant explanation is to take an e-grade-looking root as the starting point, i.e. PIE **dek̂-(e)h_1i̯-é/ó-* > PIt. **dek-ē-* > Lat. *dece-*, by regular phonological development.

It has also been suggested (see references in *LIV*²: 111) that the verb is actually a denominative of the noun **dek̂-os* (n.) ‘that which is observed’ (which evolved into Lat. *decus, -oris* ‘grace, honour’), i.e. **dek̂-es-i̯e/o-*, and thus a cognate of Ved. *daśasyati* ‘to honour’. As correctly pointed out in *LIV*² (p. 111), this suggestion is phonologically problematic: **-esi̯e-* would yield Lat. ˣ*-eii̯e-* (ˣ*deceiere* ?), not *-ē-*.

The perfect stem *decu-* is a regular Latin *u*-perfect.

2.2.5.3. *Habēre*

Habēre (*hăbeō, hăbuī, habitus*) ‘to have’ possibly originates from the PIE root **g^heHb-* ‘to grasp, take’ (*LIV*²: 195), which is only attested in Italic and Celtic, but it may also belong together with PIE **g^heb^h-* ‘to grab, take, give’ (*LIV*²: 193), which has Germanic (e.g. Go. *giban* ‘to give’) and Baltic (e.g. Lith. *gebù* ‘to be able’) cognates. Essive-presents are not attested outside Italic, however. Italic cognates include Umb. ind.prs.3sg. **habe**, *habe* (≡ Lat. *habet*), sbj.prs.3sg. **habia** (≡ Lat. *habeat*), imp.3sg. **habetu**, *habitu* (≡ Lat. *habētō*), imp.3pl. **habetutu**, *habituto*, fut.2sg. *habiest*, fut.pf.3sg. *habus*, fut.pf.3pl. *haburent*, Osc. fut.3sg. *hafie⟨i⟩st*.

Since the exact origin is unclear, the continuation of PIE ablaut is equally unclear. If the present stem does continue a PIE essive of the root **g^heHb-*, the development is entirely regular, i.e. **g^hHb-i̯é/ó-* > PIt. **χaβ-ē-* > Lat. *habeō*. If the origin is the root **g^heb^h-*, then PIt. **χaβ-* must be explained as a secondary zero-grade (possibly via **$g^həb^h$-* ← ***g^hb^h-*); but if the secondary zero-grade would have been more ancient, we would have expected an e-grade looking form, i.e. PIE ˣ**g^heb^h-* > PIt. ˣ**χeβ-* > Lat. ˣ*heb-* (cf. e.g. *decet* < **dek̂-*, not ˣ**dk̂-*, Ch. 2.2.5.2.).

The perfect stem *habu-ī* and the PPP *habitus* are regular and require no further comment.

2.2.5.4. *Manēre*

Manēre (*măneō, mānsī, mānsus*) ‘to stay, remain’ originates from the PIE root **men-* ‘to stay, wait’ (*LIV*²: 437). The only essive cognate listed in *LIV*² is Arm. *mnam* ‘to stay’ (but this may also be a denominative, see Klingenschmitt 1982: 91–92). There are no Italic congates attested.

According to *LIV*² (p. 437), the Latin present stem *manē-* originates from a PIE fientive **m_en-eh_1-*, but if these fientives are better classified as aorists (Harðarson 1998), then an essive origin is more likely for a present stem: the PIE reconstruction would be **mn-(e)h_1i̯é/ó-*, but this does not imply that the formation is necessarily of PIE date. The stem vocalism is, namely, problematic: the regular continuation of a PIE zero-grade would have resulted in Lat. ˣ*menē-* or ˣ*monē-*. Various solutions have been proposed:

– Schrijver (1991: 457, 472) suggests that the underlying form is an o-grade of an assumed PIE perfect **me-mon-*, which was then unrounded in an open syllable after *m*. This is a complicated and problematic suggestion.[50]
– Sihler (1995: 98) suggests that the stem vowel of an earlier **menē-* was contaminated by other second conjugation verbs (such as *habēre*, *iacēre*, *placēre*), but this is unlikely, considering that there are many second conjugation verbs with *e*-vocalism as well (e.g. *tenēre*, *merēre*, *sedēre*; cf. *EDLIL*, s.v. *maneō*).
– *LIV*² (p. 437) reconstructs a kind of prop vowel (**mₑn-*) to explain the non-regular reflex. However, it remains entirely unclear, when such a prop vowel results in Latin *-a-* and when in *-e-* (see discussion in Ch. 2.4.).
– De Vaan (*EDLIL*, s.v. *maneō*) argues for Schrijver's unrounding rule, but assumes that the PIt. **mn̥(n)-* was regularly vocalised into **mon-* before unrounding into *man-* in an open syllable. This is a difficult assumption and must be rejected (Vine 2011: 271).
– Finally, Vine (2011: 270f), following Nussbaum's (2004) suggestions in another context, argues for the regularity of initial **mo-* > Lat. *ma-*, but in another phonological context than the earlier attempts, namely in closed syllables. However, Vine's argument depends on his interpretation of **m̥(m)-* > **om-* /_V, instead of > **em-* (cf. Ch. 3.1.3.).

I think that the current scholarship is not conclusive enough to show which ablaut grade Lat. *manē-* actually continues, and which changes it has undergone.

The perfect stem *māns-* continues an earlier *s*-aorist, possibly of PIE date (**mēn-s-/měn-s-*) in light of the Greek cognate ἔμεινα 'stayed' (< **e-men-s-a*). The vocalism is based on (or renovated on the model of) the present stem, and the long vowel is due to NS-lengthening (see Ch. 3.1.4.).

The original PPP must have been **mantos*; this is reflected in the derivative *mantāre* 'to remain' (*EDLIL*, s.v. *maneō*). This was later replaced by *mānsus*, a renovation influenced by the *s*-perfect (Meiser 2003: 139).

2.2.5.5. *Sedēre*

Sedēre (*sĕdeō*, *sēdī*, *sessus*) 'to sit' originates from the widely-attested PIE root **sed-* 'to sit down' (*LIV*²: 513–515), and is thus a cognate of *sīdere* (see Ch. 2.2.6.3.), with which it shares the perfect stem and PPP. The cognate Slavic essives Lith. *sė́džiu* 'to sit' and OCS *sěždǫ* 'to sit' are classified as *einzelsprachlich* innovations in *LIV*². Italic cognates include Umb. imp.3sg. *sersitu* (≡ Lat. *sedētō*), prs.ptc.nom.sg.m. **zeřef**, *serse*, and the noun loc./abl.sg. *sersi* 'seat'.

The present stem *sedē-* is also analysed as a secondary creation: it replaces a present formation of the suppletive root **h₁éh₁s-* (*LIV*²: 232) in the stative/resultative/essive function 'to remain seated' (as opposed to 'to sit down, take a seat', which is the basic meaning of the root **sed-*). Instead of the expected zero-grade **sd-*, the form clearly has an e-grade-looking root. Either the e-grade was analogically restored (extended from a full-grade form elsewhere in the paradigmatic constellation),[51] or the e-grade is a phonological replacement for a

[50] As correctly pointed out by Schrijver (1991: 472; contra *LIV*²: 437), the fact that *monēre* 'to remind, warn' (Ch. 2.2.4.2.) was not unrounded into **manēre* can be explained by the restoration of the morphologically regular o-grade vocalism of the causative.
[51] Garnier (2010: 42) reconstructs a lost simple thematic **sed-e/o-* in order to account for the e-grade-looking **sed-ē-*.

vowelless zero-grade in order to avoid a phonotactically disallowed shape. Note that the genuine zero-grade is attested in the reduplicated present (*si-sd-) underlying Lat. *sīdere*.

For the perfect stem *sēd-* and the PPP *sessus,* see Ch. 2.2.6.3.

2.2.5.6. *Stāre*

Stāre (*stō, stetī, stătus*) 'to stand' originates from the widely-attested PIE root **steh₂-* 'to step' (*LIV*²: 590–592), and is thus a close cognate of *sistere* (see Ch. 2.2.6.4.), with which it shares the perfect stem and PPP. IE essive cognates include OHG *stēn/stān* 'to stand', OCS *stojǫ* 'to stand', and OIr. *táu* 'I am, exist' – in *LIV*², these and the Latin present stem are all classified as *einzelsprachlich* innovations, which replaced the inherited PIE perfect (in stative function) in these branches. Italic verbal cognates include Fal. prs.3sg. **sta**, Umb. prs.1sg. *stahu*, imp.3sg. *stahitu*, 3pl. *stahituto*, fut.3pl. **staheren**, Osc. prs.3sg. **staít**, 3pl. **stahínt**, **stahint**, **staíet**, pf.3sg. **staieffud**, pf.3pl. **eestínt**, SPic. prs.3sg. **praistaít**, 1pl. **adstaeoms**, 3pl. **praistaínt**, pf.3pl. **astaíúh**, **pra**]**istaiúh**.

The Latin present stem is conjugated exactly like a regular first conjugation verb. As to why *stāre* ended up in the first conjugation (instead of the second like all other essives) is due to phonological factors. Morphologically, the starting point is an essive-present **sth₂-h₁i̯é/ó-* with zero-grade root. One of the adjacent laryngeals was lost and the other one vocalised into **-a-*; the resulting formation **stă-i̯e/o-* was then regularly continued as a Latin first-conjugation verb after the loss of intervocalic **-i̯-* and the contraction of the root vowel **-a-* with the thematic vowel into *-ā-*. The vocalism is, thus, ultimately a regular phonological reflex of the PIE zero-grade root. In the Sabellic languages, the formation was reinforced into (or re-characterised as) a "proper" second conjugation essive; hence Proto-Sabellic **stă-ē-* (cf. Meiser 2003: 190).

The perfect stem *stet-* continues the PIE reduplicated perfect **ste-stóh₂-/ste-sth₂-*, which is also reflected in Ved. *tastháu* 'to stand, to have placed oneself', YAv. *vi-šastarə* 'they stretch (intr.)', Gr. ἔσταμεν 'we stand' and OIr. *-sestar* 'remained standing'. This formation was originally the perfect for *sistere* 'to cause to stand, place', with stative function 'to stand'. Following the creation of the novel essive-present for this function, the perfect evolved into a resultative perfect (*LIV*²: 591), possibly in Proto-Italic, and was thereafter used as the perfect stem for both *sistere* and *stāre*. It is very likely that Proto-Italic also continued the PIE root aorist **stéh₂-/sth₂-* (cf. Ved. *ásthāt* 'has stepped', Arm. *er-t'a-* 'to go', Gr. ἔστην 'stepped', Toch. A sbj.1pl. *tāmäs* 'we will be') as PIt. **stā-/stă-*, but this was lost in Latin and the reduplicated perfect was continued as the neo-perfect (Meiser 2003: 190).

The PPP *status* is a phonologically regular continuation of the PIE *to*-participle with zero-grade root, i.e. **sth₂-tó-* > PIt. **stă-to-* > Lat. *stătus*.

2.2.5.7. *Tacēre*

Tacēre (*tăceō, tăcuī, tăcitus*) 'to be silent' originates from the PIE root **teh₂k-* 'to cower, crouch' (*LIV*²: 495; *LIV*²⁺). The most reliable verbal cognates are the Germanic verbs for 'to be silent', e.g. Go. *þahan*, OHG *dagēn*. Gr. πτήσσω, πτώσσω 'to duck (for fright)' (see Hackstein 1992) and Arm. *t'ak'eaw* 'hid himself' are semantically problematic, and probably unrelated (*EDLIL,* s.v. *taceō*; *LIV*²⁺). If this is so, the root may also be reconstructed as **teHk-* or **tak-*,

meaning ‘to be silent’. Italic cognates include Umb. PPP nom.sg.m. **taçez**, *tases*, *tasis* (≡ Lat. *tacitus*), nom.pl.m. *tasetur*.

Taking the reconstruction of *LIV*² as the starting point, the Latin present stem *tacē-* is a regular continuation of the PIE essive with zero-grade root, i.e. **th₂k-(e)h₁-i̯é/ó-* > PIt. **tak-ē-* > Lat. *taceō*.

The perfect stem *tăcu-ī* is an innovative *u*-perfect. The PPP *tăcitus* is also regular, probably from PIt. **tak-ĕ-to-* in light of the Umbrian cognates.

2.2.5.8. *Tenēre*

Tenēre (*tĕneō*, *tĕnui/tetĭnī*, *tentus*) ‘to hold, keep’ originates from the PIE root **ten-* ‘to tighten, expand (intr.)’ (*LIV*²: 626–627), and is thus a cognate of *tendere* ‘to stretch’ (see Meiser 2003: 191 on the relationship of these two verbs). Reflexes of the PIE essive **tn̥-h₁i̯é/ó-* include OHG *donēn* ‘to be stretched’ and possibly Ved. 3sg.pass. *tāyáte* ‘is expanded’. The only Italic cognate is Umb. imp.3sg. *tenitu* (≡ Lat. *tenētō*).

The present stem *tenē-* can be derived from both the expected PIE zero-grade root and from a full-grade root, but the Umbrian cognate can only reflect a full-grade form (otherwise we would have Umb. ˣ*tanitu*; cf. Meiser 1986: 69). It is possible that Proto-Italic still had a zero-grade root, while the Umb. e-grade was analogically introduced from other forms derived of the same root. Taking the PIE essive with zero-grade root as the starting point, the development is otherwise regular, i.e. **tn̥-(e)h₁i̯é/ó-* > PIt. **tn̥(n)-ē-* > Lat. *tenē-* (cf. 3.2.2.). However, the regularity of this development has been contested, for which reason Vine (2011: 273) prefers to derive *tenē-* from a full grade etymon (see above on *manēre*, Ch. 2.2.5.4.).

The regular Classical Latin perfect stem is *tenu-ī*, an innovative Latin *u*-perfect. The reduplicated perfect stem *tetin-ī* is only attested four times: *tetinerit* (Acc. *Trag.* 39), *tetinerim* (Pacuv. *Trag.* 172), *tetinisse* (Pacuv. *Trag.* 226) and *tetinero* (Fest. 253, 59), and it is the older of the two stems. It continues a Proto-Italic reduplicated perfect **te-ton-* (or **te-tn̥(n)-*), originally a perfect of *tendere* as well (before the introduction of the *-d-* from the present stem; hence, CLat. *tetendī*), which was subsequently replaced by the Latin *u*-perfect (Meiser 2003: 192).

The PPP *tentus* (also shared with *tendere*) is a regular continuation of a PIE *to*-participle with zero-grade root, i.e. **tn̥-tó-* > PIt. **tn̥-to-* > Lat. *tentus*.

2.2.5.9. *Tepēre*

Tepēre (*tĕpeō*, no other stem forms) ‘to be moderately warm’ originates from the PIE root **tep-* ‘to be warm’ (*LIV*²: 629–630). There are no other essive cognates attested. In PIE, this root had a simple thematic present **tép-e/o-*, reflected in Ved. *tápati* ‘to burn (intr.), be hot’. There are no reflexes of this root in the Italic languages other than Latin.

According to *LIV*² (p. 630), the Latin present stem *tepē-* is a continuation of a PIE essive **tₑp-h₁i̯é/ó-*, with the additional remark that the root has e-grade due to phonotactic reasons. Considering that a zero-grade is the morphologically expected form, an e-grade-looking root would be a more accurate characterisation. Otherwise the development is phonologically regular: **tep-(e)h₁i̯é/ó-* > PIt. **tep-ē-* > Lat. *tepē-*.

2.2.5.10. *Vidēre*

Vidēre (*vĭdeō, vīdī, vīsus*) originates from the widely-attested PIE root ***u̯eid-*** ‘to see, have a look’ (*LIV*²: 665–667). The essive formations, as attested in Go. *witan* ‘to watch, mind’ and Lith. *pa-vydžiù* ‘to envy’ are in *LIV*² classified as *einzelsprachlich* innovations. Italic cognates include SPic. prs.2pl. **videtas** (≡ Lat. *vidētis*), Umb. PPP nom.sg. *uirseto* (Umb. imp.3sg. **revestu** < ***re-u̯eid-s-etōd*** belongs together with Lat. *vīsere*, see Ch. 2.3.3.2.).

The present stem *vidē-* may be a post-PIE innovation, if the comparative evidence is not considered sufficient to reconstruct a PIE essive ***u̯id-h₁éi̯/ó-*** (but hardly an instrumental denominative, *pace* Garnier 2010: 150). In any case, the formation must be of significant antiquity, as it reflects the expected PIE zero-grade root. The Umbrian and South Picene cognates testify for a Proto-Italic second conjugation verb ***u̯id-ē-***, which is the ancestor of all these Italic formations.

The history of the perfect stem *vīd-* is more complicated than it seems at first sight. To start with, a paradigmatically isolated essive would normally have a *u*-perfect in Latin (×*viduī*): the occurrence of other perfect types is usually connected with the parallel existence of another related present stem, from which the perfect formation originates and with which it is synchronically shared (Meiser 2003: 205–206); but no such parallel present is attested for *vidēre*. This fact leads Meiser (*loc. cit.*) to reconstruct a lost nasal present (***u̯ind-*** > Lat. ×*vindere*, cf. Ved. *vindáti*; cf. Garnier 2010: 150), to which the ancestor of *vīdī* originally belonged. A possible origin is the PIE athematic root aorist ***u̯éi̯d-/u̯id-*** strong stem, which was continued in Proto-Italic and eventually as the Latin neo-perfect (the development is phonologically regular) (*LIV*²: 665; Meiser 2003: 206). However, the reflexes of a PIE aorist Ved. *ávidat* ‘has found’, OAv. *vīdat* ‘finds’, Gr. εἶδον < ***e-u̯id-o-m*** (Arm. *egit* ‘found ‘is ambiguous as to whether it continues a thematic or an athematic formation, Meiser 2003: 206 n. 38) are all thematic, and a thematic aorist with an invariable zero-grade root ***u̯id-é/ó-*** can be reconstructed for PIE as well. This would leave the Lat. *-ī-* unexplained. The original PIE perfect ***u̯ói̯d-/u̯id-*** was exceptional in that it lacked reduplication and was in most daughter languages lexicalised as a verb meaning ‘to see’ (so e.g. Ved. *véda*, Gr. οἶδα), and is most likely not connected with *vīdī*. However, J. Jasanoff (*apud* Meiser 2003: 206 n. 39) suggests that Proto-Italic may have created an innovative reduplicated perfect ***u̯i-u̯id-*** (> *vīd-*) in order to complement the paradigm. Meiser (*loc. cit.*) is rightly sceptical about Proto-Italic having a reduplicated perfect from a root beginning with ***u̯-***; but *vīd-* may also be considered a longvocalic replacement for the original reduplicated form with zero-grade root, in the same way that *lēg-* replaced **le-lg-* (Ch. 2.2.1.9.), and so on.

The PPP *vīsus* is a phonologically regular continuation of a PIE *to*-participle ***u̯id^{s}-tó-*** > PIt. ***u̯id^{s}-to-*** > [Lachmann’s rule] ***vīssus*** > ***vīsus***. Umb. *uirseto* has been renovated by adding an *-e-* from the present stem (Meiser 2003: 206).

2.2.6. Reduplicated presents

PIE had two types of reduplicated presents:

1) An athematic reduplicated present built to the *i*-reduplicated root, which alternated according to the hysterokinetic pattern, i.e. accented e-grade root in the strong stem, unaccented zero-grade root with accented endings in the weak stem. Ablauting secondary

TAM-markers, when present, alternate instead of the root, which then defaults to zero-grade. In Latin (and very likely already in Proto-Italic), the formation was entirely thematised, and the reduplication was lexicalised as a part of the root, losing its status (and in most cases also some phonological substance) as a functionally and segmentally separate quasi-morpheme.

2) A thematic reduplicated present built to the *i*-reduplicated root with an invariable zero-grade, suffixed by the accented thematic vowel. This formation was directly continued in Latin, as it was, apart from the reduplication, identical in inflection with the simple thematic presents.

Regarding ablaut, a central topic in this section is to investigate which of the PIE root variants is continued in Latin, when the selection occurred and how it was motivated.

2.2.6.1. *Bibere*

Bibere (*bĭbō, bĭbī, bĭbĭtus*) 'to drink' originates from the PIE root **peh₃(i)-* 'to drink' (*LIV*²: 462–463). PIE had a thematic reduplicated present, a root aorist, and a reduplicated perfect for this root. The reduplicated present **pi-ph₃-é/ó-* is reflected in (all meaning 'to drink') Ved. *píbati*, Arm. *əmpem*, Gaul. imp.2pl. *ibeti-s*, OIr. *-ib*, *ebait*, and OAlb. *pii* (see Demiraj 1997: 318–319). The root aorist **péh₃-/pih₃-* is reflected in Ved. *ápāt* 'had drunk', Gr.(Att.) imp.2sg. πῖθι, and OCS *pitъ* 'drank'. The reduplicated perfect **pe-póh₃-/pe-ph₃-* is reflected in Ved. *papaú* 'has drunk' and Gr.(Hom.) ἐκ-πέποται (*Od*. 22, 56) 'has been drunk up'. The only certain Italic cognate is Fal. fut.1sg. **pafo**, **pipafo** 'I will drink'; note also Sicel imp.2sg. πιβε 'drink!' (*EDLIL*, s.v. *bibō, -ere*).

The present stem *bib-* is a continuation of the PIE reduplicated present. The change **-ph₃- > *-b(h₃)-* is also reflected in the IE comparanda (also see Ch. 3.1.2.). The Lat. initial *b-* is usually explained as an assimilation of the original **p-* to the medial *-b-*.

It is best to interpret the perfect stem *bib-* as a reflection of the PIE reduplicated perfect (Meiser 2003: 210), but the development is phonologically not entirely regular. As pointed out by Meiser (*loc. cit.*), regular phonological change would have produced PIt. **pepō-/pepa-/peb-*; this unnecessary formal variety was then levelled by modelling the consonantism according to the present stem (i.e. **p…b-*), assimilating the initial **p-* (> **b…b-*), and finally by levelling the vocalism of the reduplication syllable with that of the present stem (i.e. **beb- → bib-*). The chronology is unclear: it is possible that **beb-* or **bib-* was the invariant perfect stem already in Proto-Italic (Sicel πιβε, however, speaks for a PIt. **pib-*).

The PIE root aorist was probably continued in Proto-Italic. This is indirectly reflected in the Lat. verb *pōtāre* 'to drink' and its PPP *pōtus* 'drunk(en)', where *pō-* < PIE **peh₃-* (Meiser 2003: 210).

The PPP *bibitus* cannot be derived from a PIE *to*-participle **ph₃(i)-tó-*, which would have produced Lat. ˣ*patus* or ˣ*pītus*. A full grade root **peh₃-tó-* produced *pōtus*, synchronically the PPP of *pōtāre*. *Bibitus* is a secondary innovation (a replacement of *pōtus*?) built to the present stem *bib-*.

2.2.6.2. *Gignere*

Gignere (*gĭgnō, gĕnuī, gĕnĭtus*) 'to produce, give birth to' originates from the well-attested PIE root **genh₁-* 'to create' (*LIV*²: 163–165). At least three different PIE present formations can be

reconstructed (a nasal present, a simple thematic present, and a *i̯e/o*-present), of which the reduplicated present is relevant for our discussion. It is reflected in Ved. aor. *ájījanat* 'has produced, achieved', YAv. *zīzanəṇti* 'they produce' and Gr. γίγνομαι 'to become'. *LIV*² (p. 163) reconstructs an athematic formation, despite the fact that all attested formations are thematic. There are no attested Italic verbal formations of this root outside Latin.

The Latin present stem originates from the PIE reduplicated present, with zero-grade root, i.e. **gi-gn̥h₁-é/ó-* > PIt. **gi-gn-e/o-* > Lat. *gign-ō*.[52]

The perfect stem *genu-* is a Latin replacement for the Proto-Italic root aorist **gen-e/o-* (Meiser 2003: 228), for which there is comparative evidence (e.g. Ved. *ájani* 'I am born', Gr. ἔγενετο 'was born, became') going back to a PIE athematic root aorist **genh₁-/gn̥h₁-*. Proto-Italic most likely also had a reduplicated perfect **ge-gon-/ge-gnā-* (backed by comparative evidence such as Ved. *jajā́na* 'has produced, gave birth', Gr. γέγονα 'I am born, have become' < PIE **ge-gónh₁-/ge-gn̥h₁-*). This would have produced Lat. ˣ*geginī* or ˣ*gignī*. In any case, the Proto-Italic aorist was modified into a Lat. *u*-perfect and continued as the neo-perfect stem.

The PPP *genitus* does not originate from a PIE *to*-participle **gn̥h₁-tó-*, but is rather a later innovative replacement for the inherited (and phonologically regular) *(g)nātus*, which is continued as a lexicalised noun ('son') and as a PPP for *nascī* 'to be born', a deponent *sk̂e/o-*present built to the same root.

2.2.6.3. *Sīdere*

Sīdere (*sīdō*, *sēdī*, *sessus*) 'to sit down' originates from the extremely well-attested PIE root **sed-* 'to sit down' (*LIV*²: 513–515). The perfect stem and PPP are shared by *sedēre* 'to sit', also of the same root (see Ch. 2.2.5.5.). Sabellic cognates include Umb. imp.3sg. **sistu** (≡ Lat. *sīditō*), fut.pfs. *sesust*.

The Latin present stem *sīd-* originates from the PIE reduplicated thematic present **si-sd-é/ó-* (cf. Garnier 2010: 42), with *i*-reduplication and invariable zero-grade root. Comparative evidence includes (all meaning 'to sit down') Ved. *sī́dati*, YAv. *-šhiδaiti*, Arm. *n-stim*, and Gr. ἵζω. The Umbrian comparanda indicate that the change **sisd-* (or **sizd-*) > *sīd-* occurred not until *einzelsprachlich* Latin, i.e. the Proto-Italic reconstruction must be **sisd-e/o-*. It is probable that the reduplication syllable was early lexicalized as a part of the root, for which reason Pre-Lat. **sizd-* was allowed to undergo regular sound change without any need for renovation or modification (the semantic connection with *sedēre* was nonetheless obvious).

The perfect stem *sēd-* originates most likely from a late-PIE (or post-PIE) reduplicated perfect **se-sód-/se-sd-* (Meiser 2003: 203–204). PIE proper did not have a perfect formation for this verb, as the meaning 'to be in a state of having sat down → to sit' was expressed by the root **h₁eh₁s-* (< Gr. ἧμαι) (*LIV*²: 232; cf. Meiser 2003: 204). In any case, *sēd-ī* can be derived from a reduplicated perfect weak stem **se-sd-* by regular sound change: PIt. **sezd-* > Lat. *sēd-*. Another possibility is to derive it from an imperfect of a Narten present strong stem; thus PIE(?) **sḗd-* > PIt. (aorist?) **sēd-(e/o-)* > Lat. *sēd-*. But I consider this option less likely, as there is only scanty evidence for the existence of Narten formations for this root (*LIV*²: 513–514).

[52] Continuation of a PIE athematic formation would be less likely due to phonological factors: 3sg. PIE **gi-génh₁-ti* > PIt. **gi-gena-t*, 1pl. PIE **gi-gn̥h₁-mé* > PIt. **gi-gnā-me*, 3pl. PIE **gi-gn̥h₁-énti* > PIt. **gi-găn-ent*. Explaining the levelling of such a paradigm into Lat. *gign-* would require much more complicated analogical modifications than the straightforward phonological development from a PIE thematic formation.

The PPP *sĕssus* requires an e-grade root as its preform; otherwise it is a phonologically regular continuation of a PIE *to*-participle, i.e. **sĕdˢ-tó-* > PIt. **sĕdˢ-to-* > Lat. *sĕssus*.[53]

2.2.6.4. *Sistere*

Sistere (*sistō, stitī, stătus*) 'to cause to stand, place' originates from a well-attested PIE root **steh₂-* 'to step (in)' (*LIV*²: 590–592). As this root is very well attested also in Latin, I will limit myself to discussing the history of this particular present stem formation only.

The starting point is the PIE athematic reduplicated present **sti-stéh₂-/sti-sth₂-*, which is reflected directly as Gr.(Att.-Ion.) ἵστημι, Gr.(Dor.) ἵστᾱμι 'to place' and Celtib. *sistat* 'has put up'. All other cognate formations are thematic (or continue a thematic preform): Ved. *tíṣṭhati* 'to step, stand', YAv. *hištəṇti* 'they place themselves, stand', Arm. *er-tʿam* 'I go', OIr. *air-sissedar* 'remains standing', as well as Lat. *sistere* and its Sabellic cognates (only present stem forms listed) Umb. prs.1sg. **sestu** (≡ Lat. *sistō*), fut.imp.3sg. **sestu** (≡ Lat. *sistitō*), prs.2sg./3sg.act. or prs.3sg.pass. **seste** (≡ Lat. *sistis, sistit, sistitur*), and fut.imp.3sg. **restate** (≡ Lat. *restitō*). Despite the obviously archaic present reduplication, the evidence shows that the formation was thematised early, most likely within PIE (*LIV*²: 591). I find it almost certain that the Italic thematised forms originate from a Proto-Italic thematised formation **s(t)i-st-e/o-* (despite doubts presented in Schrijver 1991: 412 and *EDLIL*, s.v. *sistō, -ere*). I have not found any compelling evidence to support a (partially) "*a*-thematic" inflection in Proto-Italic (cf. Meiser 1998: 185), even though PIE **h₂* would have coloured the following thematic vowel **e* into **a* by regular sound change (see Ch. 3.1.2.) – all Italic evidence points towards a fully thematised Proto-Italic present inflection.

On the perfect stem and PPP, see Ch. 2.2.5.6.

2.2.7. Special case: *facere*

The verb *facere* (*faciō, fēcī, factus*) 'to make' originates from an ancestor form **dʰeh₁k-* (*LIV*²: 139–140), which most likely is the widely-attested PIE root **dʰeh₁-* (*LIV*²: 136–138) with a "*k*-extension" of problematic origin. Synchronically, *facere* is almost perfectly regular: its passive infectum forms are supplied by *fierī* – otherwise it is a regular third conjugation *-iō* verb. Historically, however, the verb is problematic, not only because of the *k*-extension but because its development is in several ways exceptional.

2.2.7.1. The root **dʰeh₁-* and the "*k*-extension"

The root **dʰeh₁-* had in PIE a quite standard array of verb formations: a reduplicated present **dʰi-dʰéh₁-/*dʰi-dʰh₁-* (Ved. *dádhāti*, OAv. *dadāiti*, Gr. τίθημι : τίθεμεν, etc.), a *sk̂e/o*-present **dʰeh₁-sk̂é/ó-* (Heth. *zikkizzi*, Toch. A ptc.mid. *tāskmāṃ*),[54] a root aorist **(e-)dʰéh₁-/*(e-)dʰh₁-* (Hitt. *tēzzi*, Lyc. *tadi* : *tāti*, Ved. *ádhāt*, Gr. ἔθηκα : ἔθεμεν, etc.),[55] and a desiderative **dʰéh₁-s-/dʰh₁-s-* (Ved. 2du. *dhāsatha(s)*, Gr. fut. θήσω, etc.). Innovative formations are created in several

[53] Note the absence of Lachmann's rule or similar sound change with lengthening of the vowel (**sēssus* would have produced CLat. **sēsus*). This means that 2sg. *ēs* and 3sg. *ēst* (from *ēsse* 'to eat') cannot be explained by regular sound change from **h₁ĕd-si* and **h₁ĕd-ti*, respectively, necessitating a reconstruction of a PIE Narten present for the root **h₁ed-* (see Ch. 2.3.4.4.).

[54] See Hackstein 1995: 198.

[55] On the Greek κ-aorist forms, see Kimball 1991; Rix 1992: 215; Harðarson 1993: 148–150.

IE-languages, e.g. an *s*-aorist (Ved. *dhāsur*, Toch. A *casäs*) and a reduplicated perfect (Gr. τέθηκα, YAv. *dadā*, *daδa*, Gall. *δεδε*; for Italic forms see below).

While the plain root **$d^{h}eh_{1}$-* is widely-attested, the extended root **$d^{h}eh_{1}k$-* is much more limited in its attestation.[56] Evidence is available from the following branches/languages:

- **Italic/Venetic**: in both Italic subgroups, i.e. Latino-Faliscan and Sabellic, as well as in Venetic (for forms, see below).
- **Hellenic/Greek**: it is, however, limited to aor.sg.act. (i.e. the strong stem). The κ-aorist appears but for three athematic verbs: ἔθηκα (for τίθημι), ἧκα (for ἵημι), and ἔδωκα (for δίδωμι).
- **Phrygian**: two forms are attested, both with a preverb, i.e. prs.3sg.act. αδδακετ and prs.3sg.med. αδδακετορ. These reflect a (secondary) zero-grade thematic present.

Previously, the connection Lat. *fēcit* ≡ Gr. ἔθηκα was taken for granted (e.g. Sihler 1995: 582),[57] but the Greek state of affairs is problematic: a suffixed -κ- appears also in the somewhat productive κ-perfect (e.g. πεπαίδευκα), where it most likely is not direct inheritance from PIE. There is, thus, good grounds for questioning the equation (Harðarson 1993: 148f; Untermann 1993); yet, a morphological archaism can be expected to survive in a small, conservative and archaic class of verbs, where analogical modification is unlikelier than elsewhere (and what could the model for ἔθηκα etc. be?). In any case, considering that the only inherited formation, where the *k*-extension appears, is the root aorist sg. (and if we take ἔθηκα etc. as archaisms rather than innovations or renovations), it is probable that it originated from there. All other IE-formations that contain the extension must hence be secondary (i.e. either innovative formations based on the root aorist sg. or analogical extensions or renovations based on that form).

2.2.7.2. Proto-Italic formations

The Proto-Italic reconstruction of this verb plays a pivotal role in tracing its development from PIE to Latin. The reconstruction is based on the following Italic material:[58]

- Latin: 1) Present stem *faci-*, reflecting a zero-grade *i̯e/o*-present of the extended root (PIE transponat **$d^{h}h_{1}k$-i̯é/ó-*). 2) A reduplicated present stem is indirectly reflected in the *condere*-type compounds; it continues the plain root. 2) Perfect stem *fēc-*, reflecting an e-grade root aorist injunctive (PIE **$d^{h}eh_{1}k$-*) with the extended root. 3) *Praeneste Fibula* has a reduplicated perfect FHE∶FHAKED, reflecting a zero-grade reduplicated perfect of secondary origin (PIE transponat **$d^{h}e$-$d^{h}h_{1}k$-*) with the extended root. 4) Old Latin future *faxō* and pf.sbj. *faxim*, *faxīs*, etc. 5) Various nominal derivatives, such as the PPP *factus* (< PIE? **$d^{h}h_{1}k$-tó-*), adj. *facilis* ‘doable, easy’, *faciēs* ‘appearance’,[59] etc. – all based on the zero-grade extended root. 6) The unextended root is continued in several nominal forms, e.g. *fānum* ‘shrine’ (< **$d^{h}h_{1}$-s-no-*), *fēriae* ‘religious festival’ (< **$d^{h}eh_{1}$-s-i̯o-*), *fēstus* ‘festive’ (< **$d^{h}eh_{1}$-s-to-*), *fētiālis* ‘college of priests’ (← **fētis* < **$d^{h}eh_{1}$-ti-*), *sacerdōs* ‘priest’ (< **sakro-dōt-s* < **-$d^{h}oh_{1}$-t-*),[60] reflecting the plain root with various

[56] I will henceforth refer to the *k*-less root as the *plain root* and to the *k*-extended root as the *extended root*.
[57] To my knowledge, this was suggested for the first time by Christian Bartholomae (1885: 355).
[58] Sabellic forms are collected from *WOU*, s.v. *fakiiad*, unless otherwise noted.
[59] *EDLIL*, s.v. *facio, -ere*.
[60] *EDLIL*, s.v. *fānum*, *fēriae*, *fētiālis*, *sacerdōs*; *WOU*, s.v. *fakiiad*.

extensions (*-*s*-, *-*t*-), but all these belong to the religious vocabulary and are no longer connected with the original meaning of the root or with the verb *facere*.

- Faliscan: pf.ind.3sg. **faced** (Berenguer Sánchez and Luján Martínez 2005; Wallace 2005), reflecting the zero-grade extended root.[61]
- Oscan: 1) Present stem forms prs.sbj.3sg. **fakiiad**, fut.imp.3sg. *factud*. 2) Perfect stem forms pf.sbj.3sg. *fe⟨f⟩acid*, fut.pf.3sg. *fefacust*, pf.ind.3sg. ανα:fακετ (from Lucania).[62] 3) The pf.ind.3sg. **prúffed** 'has approved' is probably from a preverb compound of a *k*-less reduplicated present (the closest Latin counterpart would be *prōdidit*). 4) PPP nom.sg.m. *facus* (in a fut.imp.3sg.pass. periphrasis *facus estud* ≡ Lat. *factus estō*). 5) The action noun **fakinss** acc.pl. 'actions, doings' (< **fak-i̯ŏ̆n-*).
- Umbrian: 1) Present stem forms prs.sbj.3sg. **façia** (< **fak̯iād*), **feia** (see below), fut.imp.3sg. **fetu**, **feitu**, *feetu* (< **fa̯itu* < **faχtōd* < **fakitōd*, Meiser 1986: 124), inf. **façiu**, **façu** (< **fak̯iom*). 2) Perfect stem forms Paleo-Umb. pf.ind.3sg. **face**, fut.pf.3sg. **fakust**, fut.pf.3pl. **fakurent**, *facurent*. 3) PPP nom./acc.sg.n. **fetu**, acc.sg.f. **feta** (< **fa̯itā* < **faχtā* < **faktā*).
- Marsian (Umbrian group): pf.ind.3pl. *fecront* (< **fēkeront*).
- Marrucinian (Oscan group): pf.ind.3sg. *fec*(*ed*?).
- Cf. also the Venetic *s*-aorist 3sg. **VHA.XS.ΘO** (< **fak-s-to*).

The Sabellic forms require closer examination. According to Untermann (*WOU*, s.v. *fakiiad*), some present forms reflect the extended zero-grade root **dʰh₁k-i̯é/ó-*, while others reflect the non-extended full grade root **dʰeh₁-i̯é/ó-*, e.g. Osc. *factud* vs. Umb. *feitu*, Umb. **façia** vs. **feia**, respectively. This is also the case in the PPP, i.e. Osc. *facus* (< **dʰh̥₁k-tó-*) vs. Umb. **fetu** (< **dʰeh₁-tó-*). Although it is possible to derive Umb. *feitu* and **fetu** from the full-grade plain root, they can also be derived from the extended root by regular sound change (cf. Meiser 1986: 124; 2003: 200), and Umb. **feia** is probably a renovation of **façia** (≡ Osc. **fakiiad**) on the basis of **feitu** and similar forms (Berenguer Sánchez and Luján Martínez 2005: 212); the PPP is a similar case. Hence, there is no unambiguous evidence for the continuation of the plain root in the Sabellic verb.

More relevant, however, is Untermann's observation that four different perfect stems occur in Sabellic: 1) reduplicated, full grade **dʰe-dʰeh₁k-* (Osc. **fifikus** – assuming it is related, which, however, is unlikely), 2) reduplicated, zero-grade **dʰe-dʰh̥₁k-* (Osc. *fefacust*, etc.), 3) unreduplicated, full grade **dʰeh₁k-* (Mars. *fecront*, Marr. *fec(ed)*), and 4) unreduplicated, zero-grade **dʰh̥₁k-* (Osc. ανα:fακετ, Paleo-Umb. **face**, Umb. **fakust**, etc.). There appears to be a distribution here: reduplicated stems are limited to Oscan, and the hapax ανα:fακετ may have lost its reduplication via haplology or syncope because of the preverb (cf. Lat. *reddō* < **re≂de-d-ō*, Ch. 2.3.4.5.), while the unreduplicated forms are the only attested ones in Umbrian. The Marsinian and Marrucinian forms (of which the Marrucinian one is in any case very unclear) may have been influenced by the corresponding Latin forms (see *WOU*, s.v. *fakiiad*). Without commenting on their origins any further, the Latino-Faliscan and Sabellic evidence reflects the following Proto-Italic verb formations (Table 10):

[61] Faliscan *fifiked* and *f[if]iqod* are from a different root (PIE **dʰei̯gʰ-*, see *LIV*²: 140–141).
[62] Osc. fut.pf.2sg. **fifikus** could reflect a full-grade extended root (if from **fe-fēk-us-s*), but is most likely unrelated (from the root PIE **dʰei̯gʰ-* instead; see *WOU*, s.v. *fifikus*).

TENSE STEM	FORMATION TYPE	LATIN (FALISCAN)	SABELLIC
Present stem	*i̯e/o*-present	*faciō*	Osc. **fakiiad** Umb. **façia**
	reduplicated present	*con-dere* etc.	-
Aorist stem	full grade	*fēcī*	Mars. *fecront* (?)
	zero-grade	Fal. **faked**	Paleo-Umb. **face** Umb. **fakust**
Perfect stem	full grade	-	(Osc. **fifikus**)
	zero-grade	FHE:FHAKED	Osc. *fefacust*
Participle stem	zero-grade	*factus*	Osc. *facus* Umb. **fetu**

Table 10: Latino-Faliscan and Sabellic formations based on PIE **dʰeh₁k-*.

At this point we should recall the original PIE form variety: a reduplicated present, a *sḱe/o*-present, a root aorist, and a desiderative. Considering that the extended root most likely belonged originally to the root aorist strong stem only, all present, perfect and participle forms that do reflect the extended root, must be later renovations or innovations. The only trace of the plain root in Italic is the Latin *condere*-type compounds, indicating that Proto-Italic did have a reduplicated present, which, albeit in a thematised form, was a continuation of the original PIE present formation. The root aorist with the full-grade root is also a direct continuation of the respective PIE formation, and it seems that precisely this form was pivotal in introducing the extended root into other Proto-Italic formations (by way of paradigmatic levelling, the *-*k*- was probably first extended into the aor.pl.). The innovative *i̯e/o*-present was based on the extended root appearing in the aorist (whether it was actually a renovation of an earlier *i̯e/o*-present based on the plain root is not clear). Another innovation produced the reduplicated perfect – since this formation was lacking in PIE, there was pressure to fill the gap based on a moderately productive model. These innovations can be dated to the Proto-Italic period, at the latest.

As for the Proto-Italic ablaut relations in these formations, the reconstruction is in some cases hampered by a lack of unambiguous reflexes:

As it is a thematic formation, no intraparadigmatic ablaut is expected in the *i̯e/o*-present, which clearly reflects the phonologically and morphologically expected zero-grade. It is difficult to decide, whether the zero-grade was taken as a basis because of the fact that PIE *i̯e/o*-presents are typically built to zero-grade roots, or whether the root shape was simply based on the zero-grade variant of the root aorist (and, as mentioned above, the spread of the extended root from the aorist sg. into other forms indicates the pivotal role of that formation in the build-up of the Proto-Italic paradigm).

The PIE reduplicated present had hysterokinetic accent/ablaut, with e-grade root in the act.sg. and zero-grade root elsewhere; it is possible that this pattern was continued until Proto-Italic, but the paucity of evidence (the formation is only reflected in Latin) makes a definite conclusion impossible. Considering that practically all inherited athematic present formations

had lost their intraparadigmatic ablaut by Proto-Italic (see above for *īre* and *velle*, for example), I consider it highly unlikely that this particular present would have been the only one to have retained this feature until the dissolution of the Italic linguistic unity. I also consider it likely that the formation was thematised early. It is possible that the reduplicated present was already in Proto-Italic a moribund formation, which was only used in compounds (e.g. PIt. **kom≠δi-δ-et* > **kom≠didet* > Lat. *condit*).

The PIE root aorist had hysterokinetic accent/ablaut. The Latin perfect stem *fēcī* is clear evidence for the continuation of the inherited e-grade. The Sabellic evidence is to some degree open to interpretations: the unreduplicated forms with *a*-vocalism (such as Paleo-Umb. **face**, Umb. **fakust**) may reflect the zero-grade weak stem of the root aorist, or they may be dereduplicated old perfect forms (likewise with zero-grade vocalism) (Meiser 2003: 104). I find Meiser's (*loc. cit.*) assumption for the preservation of the ablaut in the paradigm of a high-frequency basic verb until Proto-Italic quite plausible.[63] Since both Latin and Sabellic have renovated and regularized the endings of their neo-perfect categories (in which some inherited aorists are continued), it is difficult to determine if the Proto-Italic root aorist in general, or the aorist of this verb in particular, was already thematized. The Ven. **VHA.XS.ΘO** (< **fak-s-to* < **dʰh₁k-s-to*) may indicate that it was not; however, the Venetic form is not a reflection of a root aorist but of a secondary *s*-aorist (and Venetic is probably not a member of the Italic branch). With the exception of VOLat./OLat. -ED, Latin continues the old perfect endings (see above) and does not provide useful evidence for or against Proto-Italic thematisation. However, the secondary endings in Latin (-ED), Faliscan (**-ed**) and Paleo-Umbrian (**-e** < **-ed*) are based on thematized forms. Thus, a thematized aorist must be reconstructed for Proto-Italic.

The PIE perfect had o-grade in the act.sg. and zero-grade elsewhere, but considering that the reduplicated perfect of this verb must be a Proto-Italic innovation (see above), it is not reasonable to expect the continuation of the PIE perfect ablaut without further qualifications. The Oscan perfect forms and the Praenestine FHE:FHAKED are clear reflexes of the zero-grade extended root. The only indication of other than zero-grade vocalism would the Osc. **fifikus** (if actually from **fe-fēk-us-s*). According to the PIE rules, PIt. **-ē-* from PIE **-eh₁-* would be unexpected, since the expected PIE **-oh₁-* would result in PIt. **-ō-*, hence **fe-fōk-us-*. It is best to treat **fifikus** as a secondary formation: either it is not related to the paradigm of Latin *facere* (Meiser 2003: 154),[64] Osc. **fakiiad** etc. at all, or the e-grade of the root is a secondary modification (most likely after the root aorist sg. **fēk-*). According to Meiser (2003: 160), the prosodic sequence of two short syllables was preferred in Proto-Italic; for these reasons, I reconstruct only the zero-grade root as the invariable Proto-Italic perfect stem. This innovative perfect may have been based either on the aorist weak stem or on the likewise innovative *i̯e/o-*present, also of Proto-Italic date.

The Italic PPP's (Lat. *factus*, Osc. *facus*, Umb. **fetu**, etc.) have at least two almost perfect cognates: Gr. θετός and Ved. *hitá-*, from PIE *to*-participle **dʰh₁-tó-*. The ubiquitous presence of the extended root in the Italic forms, however, indicates that the forms are not directly inherited from PIE. The formation as such is the expected one with zero-grade root (cf. Lat. *dictus* < PIE **dik̂-tó-*). It is possible that the extended root was introduced from the aorist (or

[63] Also cf. Wallace 2005: 179.

[64] According to Meiser (2003: 158), it is a reduplicated perfect of the root **dʰei̯gʰ-* (or an aorist, according to *LIV*²: 140).

from the other forms of the paradigm) into a directly inherited form with the plain root (pre-PIt. **fatos* < PIE **$d^{h}h_{1}$-tó-*), renovating it into PIt. **faktos*.

These considerations allow us to reconstruct the following forms for Proto-Italic:

- Present stem: innovative *i̯e/o*-present with zero-grade root, e.g. PIt. prs.ind.3sg. **fakɨ̯-et*. This formation renovated the inherited PIE reduplicated present as the present stem formation.
- A residual reduplicated present, which probably only occurred in compounds, e.g. PIt. prs.ind.3sg. **kom≠δi-δ-et*. It is likely that this was already in Proto-Italic a regular, thematised third conjugation verb, as it is in Latin. Ultimately it is cognate with Gr. τίθημι and Ved. *dádhāti*, being the only residue of the plain root in the verb system of an Italic language.
- Aorist stem: the inherited root aorist, thematized, reflecting the PIE hysterokinetic ablaut, e.g. PIt. 3sg. **fēk-ed* : 3pl. **fak-ond*.
- Perfect stem: the innovative reduplicated perfect with zero-grade vocalism, formed after the *i̯e/o*-present or the aorist pl. stem, e.g. PIt. 3sg. **fe-fak-ei̯(t)*.
- Past participle: the inherited plain root was renovated with the extended root, PIt. **fak-tos*.

2.2.7.3. Perfect and aorist in Latin and Italic

The *i̯e/o*-present *faciō* is continued in Latin as a regular third conjugation *-iō* present, but the post-Proto-Italic merger of the inherited aorist and perfect into the Latin neo-perfect needs an explanation: which of the three available forms (PIt. **fēk-*, **fak-*, **fe-fak-*) was continued as the Latin perfect stem and for what reason?[65]

The early attestation of both Praenestine FHE:FHAKED and Urban Latin FECED of the *Duenos*-inscription indicates that these root shapes were inherited by Latin, while Fal. **faked** shows that all possible forms occurred until the dissolution of the Latino-Faliscan linguistic unity: Faliscan generalised the old zero-grade aor.pl. stem, while Latin eventually preserved only the full grade aor.sg. stem. The Sabellic languages also have a mixed distribution: Oscan generalised the old reduplicated perfect stem, Umbrian the old aor.pl. stem. There is also an areal aspect involved: Faliscan territory (north of Rome) is closer to Umbrian-speaking areas, while Praeneste (situated about 35 km east of Rome) is closer to Oscan-speaking Campania; Urban Latin (Rome) lies between these two. Considering that the speakers of these languages/dialects were certainly in continuous interaction with each other, it is not surprising that the isogloss boundaries overlap. Since the merger of aorist and perfect is a rather massive change in the verb system, it is not unexpected that the process took hundreds of years to come into completion and that there was diatopical and diastratal variation during the transitory period.

We need to examine the Praenestine FHE:FHAKED more closely, since it can reveal relevant information on the development of the perfect and aorist in the (pre-)history of Latin. As is well known, Latin eventually generalised the old perfect endings for its neo-perfect, while the Sabellic languages generalised the old aorist endings; Proto-Italic had two separate sets of endings for the two categories. The pre-Latin endings were **-ai̯*, **-istai̯*, **-ei̯t*, **-(o)mos*, **-istes*,

[65] The most comprehensive account of this problem is Meiser 2003: 199–200.

*-*ēri* (Meiser 1998: 217), but for 3pl. two other endings were innovated: *-*ěront*, an amalgamation of *-*is*- (a "perfect formative" according to Weiss 2011: 393) and the inherited aorist ending *-*ont*, and *-*ēront*, an amalgamation of the inherited perfect ending *-*ēri* and the aoristic *-*ont*. The three endings are reflected as the Latin endings *-ēre*, *-ĕrunt* and *-ērunt*, of which the latter eventually becomes the standard form. The continuation of the pf.3sg. is guaranteed by such attested forms as POSEDEIT /possēdḗt/ (*CIL* I² 584, 28), *ēmīt* (Plaut. *Capt.* 34), *vīxīt* (Plaut. *Pseud.* 311), etc.[66] However, some Very Old Latin pf.3sg. forms have the ending *-ĕd*, formerly an aorist ending: FECED (*Duenos* inscription, etc.). In an old aorist form, such an ending may simply be an archaism (soon to be replaced by the generalised neo-perfect ending), but this is not the case in FHE:FHAKED, which continues an old perfect form (how did the inherited *aorist* ending end up in an inherited *perfect* form?). This indicates that during the transitory period not only old perfect and aorist stems but also old perfect and aorist endings were used in parallel as mixed paradigms. However, the proximity of Praeneste to Oscan-speaking territory (where the aorist endings were generalised) may also be responsible for the mixture (but this does not explain the Urban-Latin FECED). In any case, even in Praeneste and Faliscan territory the Urban Latin *fēcit* replaces the older forms by approximately the fourth century BC (e.g. FECED *CIL* I² 2437 from the vicinity of Falerii, and FECID *CIL* I² 561 from Praeneste), signalling the end of the transitory period – this is probably due to the expanding Roman political and cultural influence in the areas in and around Latium.

Direct continuation of the Proto-Italic reduplicated perfect stem **fe-fak*- would in Urban Latin have resulted in *˟febak*- (or even *˟fedak*-, if this perfect formation was pre-Proto-Italic), rendering the reduplication non-iconic and the relation with the present stem less natural (Meiser 2003: 174, 200). This explains the non-continuation of the Proto-Italic reduplicated perfect as the Latin neo-perfect; the choice thus fell on the Proto-Italic aorist stem **fēk-*/**fak*-. Here, the original athematic ablaut relation was, however, not continued: the paradigm was levelled by using the singular stem as the model, according to the 1M1F-principle. How long the inherited ablaut contrast was retained, is difficult to determine in exact terms, since the first ever pf.pl. form of this verb is attested (to my knowledge) not until the third or second century BC (there are no Very Old Latin epigraphic attestations) – and Classical Latin no longer has any trace of the aor.pl. stem **fak*-. It is likely that *fēc*- was generalised early on within the history of Latin.

The Old Latin residual future forms *faxō* (etc.) and pf.sbj. *faxim* (etc.) reflect inherited Proto-Italic future perfect formations (indicative and subjunctive, respectively). However, historically these forms are not actual perfect stem forms, but they are built to the uncharacterised present stem (Meiser 1998: 183).[67] In any case, such forms are only rarely used after the Old Latin period and are replaced by the regular perfect stem forms, i.e. *fēcerō* and *fēcerim*, respectively.

2.2.7.4. Functional considerations

The (pre)history of the verb *facere* has interesting implications for the theory of morphological change. In particular, it is useful to examine which functional factors have influenced the

[66] See also Kümmel 2007. For a collection of long-vocalic attestations, see Neue 1897: 426–427. A later source of *-īt* is the contraction of *-iit* or *-īvit*. The original *-ī-* of pf.sbj. *-erīt* is from the optative marker *-*ih₁*-.
[67] For list of attestations, see Neue 1897: 512f.

development, and which function (if any) do the ablaut alternations serve in the various diachronic stages.

As has been stated above, early Proto-Italic inherited a reduplicated athematic present without the *k*-extension (**d^hi-d^hē-/d^hi-d^ha-*) and an athematic root aorist with the *k*-extension in the sg. (**d^hēk-*) but not in the pl. (**d^ha-*) – the situation was exactly the same as in the Greek cognate. The extension of the extended root into the aor.pl. probably took place very early, so that by Proto-Italic, at the latest, the aorist had two stems: strong stem **fēk-*, weak stem **fak-* (the development PIE **d^h-* > PIt. **f-* is regular in the word-initial position). This corresponds to the 1M1F-principle, as motivated by the strive towards paradigmatic uniformity. The phonological form may also have influenced the development, since CVC- was probably a preferred root structure of the two available candidates. The early age of this development is guaranteed by the fact that the weak stem **fak-* was used as a basis for other Proto-Italic formations (see below). Note also that at this point the paradigmatic levelling did not neutralise the ablaut relations, indicating that by that time they were still functionally relevant.

The reduplicated present would as a simplex have resulted in PIt. ***fi-δ-e/o-* by regular sound change: PIE **d^h* > PIt. **f* /#_, PIt. **δ* /V_V (Meiser 1998: 101–104; Stuart-Smith 2004: 223; Weiss 2011: 75). But the reconstructable consonantism (PIt. **δi-δ-e/o-*) and the paradigm constellation indicate that this formation was early on restricted to compounds, for example with the prefix PIE **k̂o(m)≠* > PIt. **ko(m)≠* (whence Lat. *co(n)≠*).[68] Such preverb compounds must have been so old and so conventionalised that the consonants evolved according to the regular sound change in medial position; thus, post-PIE **kom≠d^hi-d^h-e/o-* > PIt. **kom≠δi-δ-e/o-* > **kon≠di-de/o-* > [syncopated] Lat. *condere*. Lack of analogical levelling (from the simplex aor. **fēk-/*fak-* and neo-present **fak̯i-e/o-*) indicates that such forms were functionally and formally removed from the paradigmatic proximity of the simplex variants. At some point (probably in Proto-Italic), a reduplicated perfect was built to accompany this present formation. Originally, the present and perfect forms differed probably by the reduplication vowel (**-i-* for the present, **-e-* for the perfect) and the set of endings (primary endings for the present indicative, perfect endings for the perfect indicative). However, during the history of Latin, the perfect forms did not undergo syncope, hence PIt. **kom≠δe-δ-e̯i(t)* > **kon≠də-d-e̯it* > Lat. *condidit*. This state of affairs can be explained by a functional factor: while the Proto-Italic perfect stem was not explicitly marked vis-à-vis the present stem, a more prototypical markedness contrast was created in Latin by blocking syncope (or by restoring the non-syncopated form) in the more marked perfect stem. The result was Lat. prs. *condit* : pf. *condidit*.

The innovative Proto-Italic *i̯e/o*-present, attested in all major Italic languages, was based on the zero-grade aorist weak stem; thus, this formation reflects the common PIE *i̯e/o*-present with accented thematic vowel and unaccented zero-grade root. At the time of this innovation, the formation mechanism of the *i̯e/o*-present must still have been somewhat productive, including the ablaut alternation, since the regular zero-grade root was chosen instead of the full grade root of the aor.sg. (cf. Meiser 1998: 196). Before the first round of Latin vowel weakening in the fifth century BC (see Ch. 3.2.3. and Appendix II), this simplex present was also accompanied by a number of preverb compounds, e.g. **kom≠fak̯i-ō* > **kon≠fakiō* > **kon≠fəkiō* > *cōnficiō*. In this way, the old reduplicated present *condere* and the neo-present *cōnficere* are

[68] See *LIPP* II: 422f.

actually built out of the same PIE elements but in different periods and under different morphophonological conditions. Synchronically, of course, the verbs are entirely different lexemes with no formal or semantic connection whatsoever at the paradigmatic level.

Regarding the choice of the neo-perfect stem, the Italic languages recruited different forms of the Proto-Italic perfect and aorist stems for this role, as discussed above: Latin continued the full grade aorist strong stem, Oscan (and originally some dialects of Eastern Latium) the reduplicated zero-grade perfect stem, and Umbrian and Faliscan the zero-grade aorist weak stem. How can we explain the fact that each group preferred one of the inherited forms, while others preferred the other ones? A satisfactory answer must take several phonological, morphological and functional factors into account.

As argued by Meiser (2003: 174, 200), the Proto-Italic perfect stem **fe-fak-* was avoided in Latin on phonological grounds, since regular sound change would have yielded ***febak-* > **febic-*, a form which would no longer have been isomorphic and transparent as a reduplicated perfect of *fac-* (contrary to, e.g., *cecinī* from *can-*). Of course, analogical modification into **fefic-* would not have been impossible, considering the existence of *fefellī* (not **febellī*) ← *fallere* (Meiser 2003: 176f), but for a high-frequency verb ('to make') this kind of modification would have been less likely. Other factors may also have influenced the choice: for example, it is possible that the aorist stem enjoyed more frequent use than the present stem at the time of selection of the neo-perfect stem, but this is impossible to verify empirically. While the avoidance of the Proto-Italic perfect stem is an important negatively conditioning factor, it is also useful to search for other factors: first, positively conditioning factors which favoured the eventual selection of the Proto-Italic aorist strong stem **fēk-* as the Latin neo-perfect, and second, negatively conditioning factors blocking the selection of the Proto-Italic aorist weak stem **fak-*.

The Proto-Italic aorist stems **fēk-* and **fak-* are not segmentally coded with a marker for the perfect stem. However, the vocalism of the strong stem **fēk-* builds a contrast with the vocalism of the present stem (≠ **fakᵢ̯-*); the forms of the weak stem **fak-* are differentiated from the present forms only by the lack of the present marker **-i̯-* and the use of the perfect endings (instead of primary endings in the present). It is easy to identify an important negatively conditioning factor against the selection of the weak stem **fak-*: it is not differentiated enough vis-à-vis the present stem to build a proper functional contrast. The strong stem **fēk-*, however, differs in its vocalism from the present stem and carries thus more functional weight than **fak-*. Additionally, the extension of the vocalism of the sg. into the pl. (due to 1M1F) is more natural than the extension of the pl. into the sg. – all other conditions being equal. It is possible that the weak stem **fak-* was already given up early, at a time when the reduplicated **fe-fak-* still existed as a separate category, making **fēk-* the only rational choice after **fe-fak-* was deemed unsuitable on phonological grounds or as a frequency-induced selection.

But why was the aorist weak stem **fak-* generalised in Umbrian and Faliscan? The first thing to note is that Faliscan and especially Umbrian underwent different sound changes and feature several notable differences in inflectional morphology compared to Latin. Additionally, Umbrian seems to tolerate non-transparent paradigms better than Latin: for example, Umbrian present stem alloforms include *façi-* and *fe(i)-*, perfect stem is the invariable *fak-*, and PPP *fet-* – apart from the initial *f-* there is very little phonological overlap between the different stem forms (as opposed to corresponding Latin forms: prs. *faci-* : pf. *fēc-* : PPP *fact-*). The difference

between present (= primary) and neo-perfect (= secondary) endings is clearer in Umbrian than in Latin: in Umbrian, the secondary endings (*qua* aorist endings) were continued as neo-perfect endings (as well as in other functions), while in Latin the secondary endings are limited to non-past and non-indicative moods (where other TAM-markers also occur). Although only a handful of the Umbrian forms have been attested (see above), several forms of the Proto-Italic and Umbrian paradigm can be reconstructed with reasonable accuracy (cf. Buck 1904: 151f; Meiser 1998: 194f). These and the corresponding Latin forms are shown in Table 11.[69]

	Latin		**Umbrian**		**Proto-Italic**	
	prs.ind.	pf.ind.	prs.ind.	pf.ind.	prs.ind.	aor.ind.
1sg.	*faciō*	*fēcī*	*façiu**	*facum**	**fakį̂ō*	**fēkom*
2sg.	*facĭs*	*fēcistī*	*façies**	*faces**	**fakį̂es*	**fēkes*
3sg.	*facĭt*	*fēcit*	*façie**	*face*	**fakį̂et*	**fēked*
3pl.	*faciunt*	*fēcēre* *fēcērunt*	*façient**	*facens**	**fakį̂ont*	**fakond*

Table 11: Latin, Umbrian and Proto-Italic present and aorist indicative of *facere*.

The Umbrian palatalisation (see Meiser 1986: 200f) resulted in the reshaping of the present stem from **fakį̂-* to *façi-*, occasioning no homophony between any forms of the present and perfect stem forms; such homophony would have occurred in Latin, if the aorist weak stem **fak-* would have been selected as the neo-perfect stem (e.g. prs.ind.3sg *facit* = pf.ind.3sg. *˟facit*). It is not unthinkable that in Umbrian the "irregular" *ē*-vocalism of the aor.sg. was avoided and the "regular" *a*-vocalism of the aor.pl. was preferred and further motivated by the occurrence of *-a-* also in the Proto-Italic reduplicated perfect **fe-fak-*. This selection occurred before the Umbrian palatalisation of *-*k-* and the change *-*ak*C- > *-*aχ*C- > *-*aį̂*C- > -*eį̂*C- (see Meiser 1986: 124f), which resulted in such forms as imp.3sg. **feitu** (≡ Lat. *facitō*).

2.2.7.5. Summary

Facere is synchronically irregular only in the sense that its passive infectum forms are supplied by *fierī* (e.g. prs.3sg. *fit* instead of **facitur*) – otherwise *facere* is a completely regular third conjugation *-iō* verb. Historically, however, its development is not straightforward: the verb had an athematic reduplicated present and a root aorist in PIE. The Latin present stem *faci-* is a Proto-Italic innovation, a *į̂e/o*-present based on the zero-grade root aorist weak stem. The synchronic Latin vowel contrast between the present stem *faci-* and the perfect stem *fēc-* has its origins in the ablaut relation of the PIE root aorist: the Proto-Italic aor.pl. stem **fak-* was lost in favour of the aor.sg. stem **fēk-* in order to unify the paradigm (1M1F) and to maintain a proper contrast with the present stem, as the Latin neo-perfect stem was not otherwise marked. The original PIE reduplicated present (with direct Greek and Old Indic cognates) is only indirectly reflected in the *condere*-type compounds.

[69] As Meiser (1998: 195) has observed, it is unclear whether the development of 2sg. **-į̂es* and 3sg. **-į̂et* in Latin is phonologically regular, or rather a reflection of a Proto-Italic "half-thematic" paradigm, i.e. **-is* and **-it*, respectively. For further discussion, see Ch. 2.2.2.

2.3. Athematic formations

This section presents the historical analysis of such Latin verb formations that originate from PIE athematic verbs.

2.3.1. Root presents

PIE root present was an athematic formation built directly to the verbal root, which alternated according to the amphikinetic pattern, i.e. accented e-grade root in the strong stem, unaccented zero-grade root with accented endings in the weak stem. Ablauting secondary TAM-markers, when present, alternate instead of the root, which then defaults to zero-grade. There was no overt present marker. The development of two important PIE root presents into Latin, namely **h₁es-* 'to be' > Lat. *esse* (Ch. 2.3.4.1.) and **h₁e̯i-* 'to go' > Lat. *īre* (Ch. 2.3.4.2.), will be discussed in a separate section. These two verbs have preserved relics of the old athematic conjugation and are synchronically irregular. Other inherited athematics, however, were thematised and ended up as members of the regular conjugations.

2.3.1.1. *Carpere*

Carpere (*cărpō*, *carpsī*, *carptus*) 'to pick, pluck' originates from the PIE root **(s)kerp-* 'to cut off, pluck off' (*LIV*²: 559), verbal formations of which are only attested in Latin and the Balto-Slavic and Anatolian branches. There is comparative evidence for a PIE athematic root present **(s)kérp-/(s)kr̥p-* in Lith. *kerpù* 'to cut', Latv. *cìrpt*, and possibly in OCS *po-črъpǫ* 'to create'. Other cognates include Hitt. *karp(i̯e/a)-^{zi}* 'to take (away), lift, pluck', and Lyd. *fa-korfid* 'to undertake' (cf. *EDHIL*, s.v. *karp(i̯e/a)-^{zi}*). Nouns derived from this root include Gr.(Myc.) *ka-po*, Gr. καρπός 'fruit', OHG *herbiest* 'autumn', OE *hærfest* > PDE *harvest*, and OIc. *harfr, herfi* 'harrow'. In the Italic branch, the verb and the root are not attested in other languages than Latin.

The present stem *carp-* is inflected like a regular third conjugation verb (the inflection of which ultimately goes back to the PIE simple thematic formation), but it very likely originates from the PIE athematic root present, as there is not enough conclusive comparative evidence for a PIE simple thematic present. If this is the case, the stem *carp-* cannot reflect the e-grade strong stem variant **(s)kerp-*; however, the zero-grade weak stem variant would produce Lat. ˣ*corp-* by regular sound change (see Ch. 3.1.3.). Unless one wishes to accept Schrijver's (1991: 429–430) theory, i.e. PIE **ke-* > Lat. *ca-* (which is not a generally accepted sound law), the options are limited: *LIV*² (p. 559) resorts to a "Reduktionsstufe" **kₐrp-* instead of a regular zero-grade **kr̥p-* (cf. Meiser 2003: 112; Bock 2008: 188), while de Vaan (*EDLIL*, s.v. *carpō, -ere*) proposes that **r̥ > ar* is regular in front of two consonants (following Schrijver 1991: 495f), e.g. **kr̥p-tó-*, **kr̥p-s-* > *carptus*, *carpsī*, implying an analogical modification of the present stem based on these forms.

The perfect stem *carps-ī* originates, according to *LIV*² (p. 560), possibly from a PIE *s*-aorist. I consider this less likely, due to the fact that PIE *s*-aorists ablauted according to the Narten pattern, meaning that a reflex of an ē-grade (> Lat. ˣ*cērpsī*) or an e-grade (> Lat. ˣ*cerpsī*) would be expected. It is, of course, possible that these forms existed at some point, but the vocalism was modified already in the prehistory to match the present and/or participle stem.

If Schrijver's (1991: 495f) sound change *C$_{\text{̥}}$rCC- > *C*ar*CC- is correctly postulated, the PPP *carptus* can be regularly derived from the PIE *to*-participle, i.e. **(s)kr̥p-tó-* > PIt. **karp-to-* > Lat. *carptus*. Otherwise, a modification of the vowel based on the present stem needs to be presumed.

2.3.1.2. *Molere*

Molere (*mŏlō, mŏluī, mŏlĭtus*) 'to grind (in a mill)' originates from the PIE root **melh₂-* 'to grind', which is relatively well attested in the IE languages (*LIV*²: 432-433). Most pieces of comparative evidence point towards a PIE athematic root present **mélh₂-/mḷh₂-*, reflected in Arm. *malem* 'to pound, squash', OIr. *melid* 'to grind', ON *mylja* 'to grind, pulverise', and OCS *meljǫ* 'to grind'.[70] There was probably an *s*-aorist, reflected in OIr. *-melt* 'ground' and OCS *mlěchъ* 'I have ground'. Sabellic evidence is composed of Umb. imp.3sg. **kumaltu**, **kumultu**, *comoltu* (≡ Lat. *commolitō*), PPP abl.pl. **kumates**, **kumate**, *comatir* (≡ Lat. *commolitīs*).

The present stem *mol-* continues the PIE root present strong stem form, with e-grade root, in a thematised form, i.e. 3sg. **melh₂-ti* > **mela-ti* → [thematised] PIt. **mel-et* > [colouring due to *l pinguis*] OLat./CLat. *molit*. Unlike presumed by de Vaan (*EDLIL*, s.v. *molō, -ere*), Bock (2008: 299), and Garnier (2010: 367), thematisation must have taken place before Proto-Italic, and the change **e > o /_ɬ* only after Very Old Latin. The continuation of the zero-grade athematic weak stem **mḷh₂-(ti)* can be ruled out; this would have resulted in PIt. ˣ**mlā-(t)*. Instead, the Umbrian evidence indicates early thematisation, wherefore post-PIE **mḷh₂-e/o-* > PIt. **mal-e/o-* > Umb. °*mal-* (e.g. **kumaltu** < **kon-mal-etōd*). However, Latin evidence supports the reconstruction of an e-grade root post-PIE **melh₂-e/o-* > PIt. **mel-e/o-* > Lat. *mol-*, but the renovation of the present stem vocalism by the perfect stem (old *s*-aorist) is a possibility (see next paragraph).

Proto-Italic probably had a *s*-aorist, possibly a continuation of an earlier PIE formation. This was in Latin replaced by an innovative *u*-perfect (Meiser 2003: 123-124); hence neo-perfect stem *molu-*. The vocalism is probably a continuation of the *s*-aorist ē-grade or e-grade root (the quantitative contrast would have been neutralised early by Osthoff's Law); the original vocalism of the Latin present stem may have been renovated by the e-grade(-looking) root of the old *s*-aorist.

The PPP *molitus* is a later innovative form. Regular continuation of a PIE *to*-participle is not an option, i.e. **mḷh₂-tó-* > PIt. ˣ**mlā-to-* > Lat. ˣ*(b)lātus* (?). *Molitus* is either based directly on the present stem, or reflects – irregularly – an e-grade root PIE transponat **melh₂-tó-* > PIt. **mela-to-* > **molə-to-* > *molitus* (or, following Garnier 2010: 365, **melh₂-e-to-* > **mela-to-* > *molitus*).

2.3.1.3. *Nēre*

Nēre (*neō, nēvī, nētus*) 'to spin' originates from the PIE root **(s)neh₁-* 'to spin'. There is comparative evidence for an athematic root present **(s)néh₁-/(s)n̥h₁-* in Gr.(Aeol.) ipf.3sg. ἔννη 'spun' (cf. prs.3sg. νῆ 'spins'), OIr. *sníid* 'to bind, strive', and OHG *nāen* 'to sew'. This was

[70] Garnier (2010: 365) reconstructs an acrostatic root present with e/o-ablaut, i.e. **mélh₂-/mólh₂-* (now accepted as a PIE construction in *LIV*²⁺, but not explicitly for this root). This indeed provides an adequate explanation for the vocalism of some IE forms, but is not required for Latin.

paired with an *s*-aorist **(s)nḗh₁-s-/(s)néh₁-s-*, as reflected in Gr. ἔνησα ‘have spun’. There are no attestations in other Italic languages than Latin.

The present stem *nē-* may reflect either the PIE root present directly (having been thematised), or a secondary *i̯e/o*-present: both would produce the phonologically and morphologically expected results. However, considering that there is comparative evidence for a root present and that Latin/Proto-Italic secondary *i̯e/o*-presents are usually built out of root aorists (which in this case is not a possibility), I interpret *neō* as a thematised continuation of the PIE root present. Outside 1sg., thematisation is not even required, since both thematised and inherited athematic forms produce the same results, e.g. athematic PIE **(s)néh₁-ti* > PIt. **nē-t* > Lat. *net*, thematised PIt. **nē-et* > Lat. *net*. The vocalism is clearly aligned to the original e-grade strong stem (not, e.g., 1pl. PIE **sn̥h₁-mé* > PIt. ˣ***snā-me* or PIE **nh₁-mé* > PIt. ˣ***nă-me*), due to analogical pressure towards 1M1F.

The *v*-perfect *nēv-* is probably a renovation of an earlier *s*-aorist (cf. Meiser 2003: 123–124). Due to the lengthening effect of **-h₁-*, the ē-grade of the strong stem and the e-grade of the weak stem coalesced in post-PIE by regular sound change, producing PIt. (?) **(s)nē-s-(e/o-)*. The vocalism of *nēvī* may thus be a continuation from the *s*-aorist or just a copy from the present stem.

The PPP *nētus* cannot be a phonologically regular continuation of a PIE *to*-participle **sn̥h₁-tó-* > PIt. ˣ***snā-to-* or **nh₁-tó-* > ˣ***nă-to-*. Instead, it may be based on the e-grade root (**(s)neh₁-tó-* > **nē-to-* > *nētus*), or an earlier **snā-to-/nă-to-* has been analogically renovated by the vocalism of the present and perfect/aorist stems.

2.3.1.4. *Vomere*

Vomere (*vŏmō*, *vŏmuī*, *vŏmitus*) ‘to puke’ originates from the PIE root **u̯emh₁-* ‘to regurgitate’ (*LIV*²: 680). The PIE athematic root present **u̯émh₁-/u̯m̥h₁-* is reflected in Ved. *avamīt* ‘spewed out’, Skt. *vámiti* ‘to spew out’, YAV. *auui…vaṇti* ‘spits upon’, and indirectly in Gr. ἐμέω ‘to puke’ and Lith. *vemiù* ‘to puke’. There are no attestations in other Italic languages than Latin.

The present stem *vom-* continues the PIE root present strong stem form with thematisation (Bock 2008: 433): thus, e.g., 3sg. PIE **u̯émh₁-ti* > **u̯ema-ti* → [thematised] PIt. **u̯em-et* > [**u̯e-* > *vo-* regularly] Lat. *vomit*. Garnier (2010: 374) reconstructs an athematic paradigm for Proto-Italic; I consider this unlikely, given that there is no trace of athematic inflection in Latin.

The perfect stem *vomu-* is a productive Latin *u*-perfect, probably introduced as a replacement of a lost Proto-Italic *s*-aorist (Meiser 2003: 125). The vocalism is based on the present stem.

The PPP *vomitus* cannot be a regular continuation of a zero-grade PIE *to*-participle **u̯m̥h₁-tó-* (*pace* Bock 2008: 434): this would have produced PIt. **umă-to-* or **(u)mā-to-*. A derivation from a secondary (post-)PIE e-grade form **u̯emh₁-tó-* is possible (hence regularly PIt. **u̯emă-to-* > **u̯eməto-* > Lat. *vomitus*), but it may also be based directly on the present stem.

2.3.2. Nasal presents

Nasal presents were in PIE an athematic formation built to the zero-grade root, inside of which (before the root coda consonant) an ablauting marker **-én-/-n-* was inserted. The accent/ablaut alternation was hysterokinetic, i.e. the accent and e-grade alternated between the infix and the endings. The root stays in zero-grade in all forms, while secondary TAM-markers alternate (e.g.

opt. *-i̯éh₁-/-ih₁-), in which case the infix defaults to zero-grade. In Latin (and very likely already in Proto-Italic), the formation was entirely thematised; in fact, there is no trace whatsoever remaining of the original athematic inflection in the Italic branch.

Regarding ablaut, a central topic in this section is to investigate which of the PIE root variants is continued in Latin, when the selection occurred and how it was motivated. This will be clarified in the discussion of *iungere* (Ch. 2.3.2.4.), as it represents a prototypical case.

2.3.2.1. *Fingere*

Fingere (*fingō, fīnxī, fictus*) 'to mold, shape, fashion' originates from the PIE root *d^heig^h- 'to knead, daub' (*LIV*²: 140–141). PIE had two parallel present formations: a simple athematic root present *$d^héig^h$-/d^hig^h-, reflected as Ved. sbj.3sg. *pári…déhat* 'will cover', YAv. inj.3sg.mid. *uz-dišta* 'stratified', and indirectly in Armenian, Gothic, Lithuanian, Latvian, Old Church Slavonic and Tocharian B (see *LIV*²: 140 for details and references); and a nasal present *d^hi-né-g^h-/d^hi-n-g^h-, reflected outside the Italic branch as Arm. *dizanem* 'to heap up', Celtib. inf. *ambi-tinkounei* 'to build' and OIr. *con·u-tainc* 'builds, constructs'. Comparative evidence for a PIE *s*-aorist and a reduplicated perfect is only available from the Italic branch (see below).[71] Italic material (only verbal formations listed) includes Fal. pf.3sg. **fifiked**, **f⟨if⟩iqod** 'produced', PreS. fɛfικεδ 'has made', Osc. fut.pf.2sg. **fifikus**, Umb. fut.imp.3sg. **fiktu**, **afikta**.

The Latin present stem *fing-* is the thematised continuation of the PIE nasal present weak stem. (For the selection principles between the two original stem forms, see the discussion of *iungere* in Ch. 2.3.2.4. below.)

The perfect stem *fīnx-* continues the Proto-Italic *s*-aorist, while the Faliscan, Pre-Samnite and Oscan neo-perfect forms continue the Proto-Italic reduplicated perfect. The *s*-aorist is probably a continuation of the original PIE formation, with the nasal infix imported from the present stem, and it was also probably thematised in Proto-Italic, i.e. PIE 3sg. *$d^hé\underline{i}g^h$-s-t : 3pl. *$d^hĕ\underline{i}g^h$-s-$\underline{n}$t > [ablaut contrast neutralised by Osthoff's Law, nasal added] PIt. *fe̯inχ-s-ed : *fe̯inχ-s-ond > OLat. [neo-perfect endings introduced, monophthongisation] *fēnksit : *fēnksēre > [long vowel tensening] CLat. *fīnxit* : *fīnxēre, -ĕrunt*.

The PPP *fictus* is a regular phonological continuation of the PIE *to*-participle *d^hig^h-tó-. Note that the nasal suffix is not extended into the PPP (unlike in *iūnctus*).

2.3.2.2. *Frangere*

Frangere (*frangō, frēgī, frāctus*) 'to break (tr.), shatter' originates from the PIE root *b^hreg- (or *b^hreg-) 'to break (intr.)' (*LIV*²: 91-92). A PIE *i̯e/o*-present *$b^hr\underline{i}g$-i̯-é/ó- is reflected in OIr. *braigim* 'to fart', a reduplicated perfect *b^he-$b^hróg$-/b^he-$b^hr\underline{i}g$- in MIr. *ro-bebraig* 'has farted' and Go. pret. *brak* 'broke', while the Go. prs. *brikan* (< PIE transponat *$b^hrég$-e/o-) is classified as an innovative formation in *LIV*². The Latin present stem is the only evidence for a PIE nasal present *b^hr-né-g-/b^hr-n-g-. Due to the relative paucity of comparative evidence, it is quite unclear, what the original PIE formation constellation was. There are no attestations of this root in other Italic languages than Latin.

[71] De Vaan (*EDLIL*, s.v. *fingō, -ere*) disagrees with *LIV*²'s reconstruction and proposes that a root aorist paired with a nasal present was the original form constellation. However, considering that PIE had a root *present*, a parallel root aorist ought not to be reconstructed (Meiser 2003: 112).

It has been suggested (Klingenschmitt 1982: 184–185; *EWAia* II: 243) that the root **bʰreg-* is closely connected with a synonymous (but transitive) root **bʰeg-* (*LIV*²: 66). For this root, a PIE nasal present **bʰ-né-g-/bʰ-n̥-g-* (> Ved. *bhanákti* 'to break (tr.)') and a root aorist **bʰég-/bʰg-* (> Arm. *ebek* 'broke') can be reconstructed.

The Latin present stem *frang-* has the looks of a nasal present, but it cannot be a regular phonological continuation of a PIE nasal present (provided that such existed): PIE strong stem **bʰr-né-g-* would have produced Lat. *×fornig-* and the PIE weak stem **bʰr-n-g-* Lat. *×freng-*. According to Schrijver (1991: 478), PIE had a (root?) present, on which both Latin and Celtic presents are based. *LIV*² (p. 92) presumes the existence of a PIE root aorist instead – this would indeed be an expected pairing with a nasal present, and the presumed intimate connection with the root **bʰeg-* (which demonstrably had this pairing) supports this reconstruction. Even if a PIE nasal present can be taken as the starting point, the *a*-vocalism of the Latin present stem requires – as per heredity principle – an explanation. *LIV*² (p. 92) presumes a "reduced grade" **bʰrₑng-* instead of a regular zero-grade, but a reduced grade in a root containing a syllabic resonant would be very unique: there are no phonotactic restrictions as to why the regular zero-grade form could not have been continued. A comparison with other Latin forms derived from this root (the PPP *frāctus*, *fragmen, -inis* 'a piece broken off', *frăgilis, -is, -e* 'fragile', compounds in *°frăgium* 'the breaking of …' and *°frăgus* '…breaker', etc.) reveals that the pre-Latin root, of which all these forms are derived, must have been **frăg-* (cf. Garnier 2010: 114); this was probably the Proto-Italic form of the root, but without Sabellic evidence, the reconstruction remains unsecure. In any case, the root **frăg-* cannot be a regular phonological continuation of PIE **bʰreg-* or **bʰr̥g-* (> Lat. *×freg-* and *×forg-*, respectively). A further comparison can be made with the Lat. verb *trahere* (see Ch. 2.2.1.14.), the *a*-vocalism of which is also problematic, if it indeed originates from the PIE root **dʰregʰ-*. All this seems to indicate that in roots containing the sequence C*r*VG (where G = any voiced plain velar), the original vowel is changed into *-a-* before Proto-Italic. This can be compared with the vocalisation of **r̥/l̥* into *ar/al* in **bʰl̥g-r-eh₂- > flagrāre* (Meiser 1998: 64). The *a*-vocalism of the present stem *frang-* may thus be a result of a renovation based on the *n*-less forms of the root; however, the vowel of *frang-* is in any case not a regular phonological reflection of a PIE ablaut grade (cf. Garnier 2010: 116).

The perfect stem *frēg-* cannot be a regular phonological continuation of a PIE preform either. The PIE root aorist **bʰreg-/bʰr̥g-* was continued in Proto-Italic: probably in thematised form based on the PIE strong stem variant, i.e. PIt. **freg-e/o-*. Due to lacking any overt tense stem marker and being phonologically incommensurate with the present stem **frang-e/o-*, the aorist was abandoned in Latin (Meiser 2003: 200–201). The long vowel originates from the Proto-Italic longvocalic perfect **frēg-*, which is a pre-PIt. replacement for the reduplicated perfect weak stem **bʰ(r)e-bʰr̥g-* (Leumann 1977: 589; Meiser 2003: 155).

The PPP *frāctus* continues the PIt. form **frag-to-*, which is based on the root form with *a*-vocalism (see above). The length is due to Lachmann's rule. The PPP is thus not a phonological continuation of a PIE *to*-participle **bʰr̥g-tó-*, as this would have resulted in Lat. *×forctus*. The renovation of the vocalism was motivated by the restoration of paradigmatic uniformity.

2.3.2.3. *Fundere*

Fundere (*fŭndō, fūdī, fūsus*) ‘to pour, shed’ originates from the PIE root **g^{h}eu̯(d)-* ‘to pour’ (*LIV*²: 179–180). Most IE languages reflect a root without **-d-*; a dental element seems to be limited to Italic and Germanic, suggesting a Northwest-Indo-European isogloss (perhaps a root extension of sorts). The most important cognates reflect a PIE root aorist (Gr.(Hom.) χύτο), an athematic reduplicated present (Ved. *juhóti*), a simple thematic present (Gr. χέω), and a desiderative (Gr. χέω, Gr.(Hom.) χεύω) – all without the dental. The dental is attested in Germanic cognates (e.g. Go. *giutan* < PGerm. **geutan*; *EDPG*, s.v. **geutan*). The only Italic cognate is Umb. imp.3sg. *hondu* (< **hund-e-tōd* ≡ Lat. *funditō*; Meiser 1986: 168).

Apart from *-d-*, the Latin present stem corresponds phonologically and morphologically to the familiar pattern: continuation of the PIE nasal present weak stem **g^{h}u-n-d-*, thematised into PIt. **χund-e/o-*, whence Lat. *fund-ō* (cf. Meiser 2003: 201–202).[72] (As to why the strong stem **g^{h}u-né-d-* was shunned, see discussion in Ch. 2.3.2.4.)

The perfect stem *fūd-* continues the PIE root aorist strong stem **g^{h}éu̯d-*, which was probably thematised early, thus PIt. **χou̯d-e/o-* (Meiser 2003: 202; Garnier 2010: 141). Within Latin, the stem underwent two relatively late regular sound changes, i.e. the monophthongisation of **fou̯d-* into **fōd-* (third century BC) and tensening into *fūd-* (second century BC). As to why the intraparadigmatic ablaut of the (originally) athematic root aorist was lost, the main motivation may have been the avoidance of phonologically too short aorist/neo-perfect stems (i.e. not Lat. ˣ*fŭdī*) at some point (before *tetulī* was dereduplicated).

The PPP *fūsus* is a regular continuation of a PIE(?) *to*-participle, i.e. **g^{h}ud^{s}-tó- > *χud^{s}-to- > *fūssus > fūsus*.

2.3.2.4. *Iungere*

Iungere (*iungō, iūnxī, iūnctus*) ‘to join’ originates from the PIE root **i̯eu̯g-* ‘to harness (an animal), yoke’ (*LIV*²: 316). The PIE nasal present **i̯u-né-g-/i̯u-n-g-* is reflected as Ved. *yunákti* ‘to yoke’, YAv. *yuṇjiṇti* ‘they yoke’, and in thematised form in Latin (see below) and as Lith. *jùngiu* ‘to connect’. PIE also had a root aorist **i̯éu̯g-/i̯ug-*, which is continued as Ved. *yójam* (1sg.mid. *áyuji*), OAv. *yaogət* ‘to yoke’. The Gr. *nu*-present ζεύγνυμι and the *s*-aorist ἔζευξα are secondary modifications of the inherited nasal present and root aorist, respectively. Neither the verb nor any other form based on this root is attested in other Italic languages than Latin.
The Latin present stem *iung-* is conjugated exactly like a regular simple thematic verb of the third conjugation. The Proto-Italic preform was most likely **i̯ung-e/o-*, which in turn is the original nasal-infixed weak stem variant (PIE **i̯u-n-g-*) furnished with the regular thematic endings. The strong stem variant (PIE **i̯u-né-g-* > PIt. ˣ**i̯uneg-* > Lat. ˣ*iunig-*?) fell completely out of use. Typically, the generalisation of the semantically less marked singular strong stem would have been expected, if all other factors were equal. But all factors were not equal:

– The strong stem variant occurred only in the singular active indicative forms, while the weak stem occurred everywhere else; thus, the weak stem had a higher type frequency

[72] The sound change PIt. **χ-* > Lat. *f-* is actually problematic, as the expected outcome is *h-* (Leumann 1977: 165; Sommer and Pfister 1977: 141; Meiser 1998: 103); **χu-* > *fu-* may be a case of “labial assimilation” (*EDLIL*, s.v. *fundō, -ere*).

(but the strong stem forms must have still enjoyed a relatively high token frequency) and was more prominent in the inflectional system.

– The strong stem is disyllabic, the weak stem monosyllabic. Typically, verb stems are monosyllabic (at least in the indicative mood), meaning that the weak stem was preferred due to having a more prototypical phonological structure for a verb stem. In fact, disyllabic stems were only tolerated as reduplicated perfects in Proto-Italic.
– Due to being disyllabic, the strong stem was not only an atypical verb stem, but it was also morphologically more marked vis-à-vis a monosyllabic verb stem. This resulted in a discrepancy: the less marked category singular was expressed by the more marked form, resulting in an increased total markedness. Now, by Proto-Italic at the latest (and probably already back in late-PIE), the nasal infix did no longer carry a specific grammatical function, but it was rather reduced into a mere tense/aspect stem marker; thus, the formations of which the nasal infix was part were not semantically marked. In order to enhance the overall naturalness of the construction, the generalisation of the morphologically less marked weak stem into all forms resulted not only in the ideal 1M1F-coding but also in more natural singular forms.

In light of these factors, the continuation of the PIE weak stem **i̯u-n-g-* and the elimination of the stem alternation (including the associated ablaut relation) have received a rational explanation.

The perfect stem *iūnx-* continues an earlier *s*-aorist, but if Gr. ἔζευξα is indeed secondary, then the formation cannot be of PIE pedigree. Instead, it is most likely a Proto-Italic replacement for the PIE root aorist (see above; Meiser 2003: 112). PIE *s*-aorist had acrostatic Narten ablaut, but this need not have been the case in Proto-Italic, considering the secondary nature of the formation. Proto-Italic most likely had just an invariant **i̯oṷg-s-* as the aorist stem. However, the nasal infix was at some point extended from the present stem (from where it originates) to the aorist/neo-perfect stem (to which it originally did not belong). This extension is difficult (if not impossible) to date precisely: the Proto-Italic aorist may have already contained the nasal (**i̯oṷnχ-s-*).

Apart from the extension of the nasal infix, the PPP *iūnctus* is phonologically regular; it also has undergone Lachmann's rule, provided that the PIE *to*-participle **i̯ug-tó-*, with zero-grade root, was the starting point (and not, e.g., the aorist stem with e-grade reflex **-oṷ-*). If the nasal was extended in or before Proto-Italic, the long vowel can be explained by NS-lengthening (see Ch. 3.1.4.), i.e. **i̯ŭng-to- > *i̯ŭnχ-to- > *i̯ūnχ-to- > *i̯ūnk-to- > iūnctus*.

2.3.2.5. *Linquere*

Linquere (*lĭnquō, līquī, lĭctus*) 'to leave' originates from the well-attested PIE root **le̯i̯k^{w}-* 'to leave, retreat' (*LIV*²: 406–408). For PIE, a typical constellation consisting of a nasal present and a root aorist can be reconstructed. The nasal present **li-né-k^{w}-/li-n-k^{w}-* is reflected in Ved. *riṇákti* 'to leave', YAv. *irinaxti* 'to leave', OIr. *-léici* 'to let go', Arm. *lk'anem*, and in Gr. λιμπάνω 'to leave'. The root aorist is reflected in Ved. 2sg. *prá…rikthās* 'thou protrudest over', *árraik* 'has left', Arm. *elik'* 'left', and Gr. ἔλιπον 'left'. Additionally, a reduplicated perfect **le-lói̯k^{w}-/le-lik^{w}-* can also be reconstructed on the basis of Ved. *rireca* 'has left', Gr. λέλοιπε 'is away from', Go. *laihu* 'lent', OPr. inf. *po-lāikt* 'to stay', and OLith. *liekti* 'to stay'. There are no Italic cognates attested.

The Latin present stem is a straightforward continuation of the PIE nasal present weak stem, i.e. **li-n-kʷ-* > [thematised] PIt. **linkʷ-e/o-* > Lat. *linqu-ō*. (As to why the strong stem **linekʷ-* disappeared, see the discussion in Ch. 2.3.2.4.)

The perfect stem *līqu-* probably continues the PIE root aorist strong stem, i.e. 3sg. **leḭkʷ-t* > [thematised] PIt. **leḭkʷ-ed* > Lat. *līquit*. Alternatively, it may also continue the PIE reduplicated perfect, as the reduplication syllable of liquid-initial roots is lost (Meiser 2003: 203); hence, strong stem PIt.(?) **loḭkʷ-* > Lat. *līqu-*. This, however, would be a rare case of an old perfect strong stem being continued as the Latin neo-perfect for a nasal present. The origin as a (thematised) root aorist strong stem is, in light of parallels, the more likely option. In any case, the neutralisation of the ablaut contrast in the preform (notwithstanding its precise origin) must have taken place before the *einzelsprachlich* history of Latin.

The PPP is a phonologically regular continuation of the PIE *to*-participle, i.e. PIE, PIt. **lik⁽ʷ⁾-tó-* > Lat. *lictus*.

2.3.2.6. *Pandere*

Pandere (*pandō, pandī, pănssus/pānsus*) 'to spread out, extend' originates from the PIE root **peth₂-* 'to spread out'. PIE had a familiar constellation consisting of a nasal present (reflected in Gr. πίτνημι 'to spread out, open' and in the Italic branch, see below) and a root aorist (in Greek renovated into an *s*-aorist ἐπέτασ(σ)α 'spread out, opened'). The Latin verb *patēre* 'to be open' is related. Sabellic cognates include a single verb form: Osc. sbj.ipf.3pl. **patensíns** 'should open'.

The historical phonology of the present stem is problematic: the reconstructed ablauting forms of the original PIE nasal present **pt-né-h₂-/pt-n̥-h₂-* would have resulted in Lat. ˣ*(p)tnā-*. Comparison with *patēre* indicates that Proto-Italic must have had a nasalless zero-grade root **pat-*; this must be a kind of secondary zero-grade (cf. Gr. πίτ-νη-μι from **pət-n-ā-*, Vine 1999: 19). Weiss (2011: 168) suggests that a secondary **-tn-* metathesizes regularly into *-nd-* (with voicing of the stop). Presuming this, the stem-final **-(n)ā-* (< **-(n)eh₂-*, **-(n̥)h₂-*) of the not-yet-thematised pre-PIt. nasal present **pat-nā-* must have been replaced by the thematic vowel; hence PIt. thematic **pat-n-e/o-*. This metathesised then into **pand-e/o-*, hence Lat. *pand-*. If this scenario is correct, the Latin present stem is a more-or-less direct, phonologically regular continuation of the PIE nasal present that has undergone thematisation.

As for the perfect stem *pand-*, the same problem with the root phonology is evident. According to Meiser (2003: 213), Proto-Italic had (or could have had) both a reduplicated perfect **pepat-* and a root aorist **peta/e-* (I would reconstruct a fully thematised **pet-o/e-*), the latter of which would have typically been renovated into a Latin *u*-perfect ˣ*petuī*; but since both of these formations shared very little phonological substance with the present stem, they were shunned and the present stem was adopted as the neo-perfect stem (Meiser 2003: 249).

The PPP *pănssus* is probably the original, while *pānsus* can be explained as a modification based on the present stem *pand-*. It goes without saying that *pănssus* cannot be a regular phonological continuation of a PIE *to*-participle **pth₂-tó-* (this would have produced Lat. ˣ*tatus*, or perhaps ˣ*patitus* < ˣˣ*pətn̥₂-tó-*). The *a*-vocalism is probably adopted from the present stem. The *-ss-* is regular from **patˢ-to-*.

2.3.2.7. *Pellere*

Pellere (*pĕllō, pepŭlī, pŭlsus*) ‘to beat, push, drive, impel’ originates from the PIE root **pelh₂-* ‘to approach’ (*LIV*²: 470). The PIE formations include a nasal present **pl̥-né-h₂-/pl̥-n-h₂-*, reflected in YAv. *pərəne* ‘to approach’, Gr.(Hom.) πίλναμαι ‘to approach’, OIr. *ad·ella* ‘to visit’, and possibly in Arm. *elanem* ‘to go out, go up’. The nasal present was expectedly paired with a root aorist **pélh₂-/pl̥h₂-*, reflected in Gr. πλῆτο ‘approached’ and possibly in Arm. *eli* ‘went out, went up’. Sabellic cognates include Umb. fut.imp.3sg. **ampentu**, **apentu**, **ampetu**, fut.3sg. **anpens**, and fut.pf.3sg. **apelust**, **apelus**. Note also the Ven. PPP nom.sg.m. **poltos**.

The Latin present stem *pell-* cannot be a regular phonological continuation of either of the PIE nasal present stems (strong stem **pl̥-né-h₂-* > PIt. ***polnā-*, weak stem **pl̥-n-h₂-* > PIt. ***plān(a)-*). The only feasible starting point is the PIE full-grade root **pelh₂-* > PIt. **pel(a)-*; but the form is still difficult to explain without assuming spontaneous metatheses, and a full-grade root is out of place in a nasal present, anyway. As there is no positive evidence for a Proto-Italic athematic inflection of nasal presents, a fully thematised present stem can be reconstructed. Thus, the preform of Lat. *pellō* must be **pel-n-ō*, as agreed on by the previous research. This is a plausible presumption, as the nasal infix ended up early as the coda consonant, the laryngeal having been lost, and the *a*-vocalism induced by **-h₂-* or **-l̥₂-* was probably lost or replaced by the thematic vowel (cf. Meiser 2003: 53). Klingenschmitt (1982: 176–177 n. 21) suggests that the full-grade root is due to contamination from the root aorist, which may have existed in Proto-Italic. Due to the fact that *pellō* is phonologically and morphologically almost identical with *tollō* (see Ch. 2.3.2.9.), we would also expect **pollō*.

There are also certain semantic difficulties in connecting the PIE root **pelh₂-* to *pellere* (Weiss 2010: 168 n. 113). For this reason, *pellere* has recently (*LIV*²⁺) been interpreted as a dental present of the PIE root **pel-* (not in *LIV*²), i.e. **pél-de/o-*, cognate of OHG *falcit* ‘strikes’ (< PGerm. **felt*) and OE *onfilti* (> PDE *anvil*).

The Latin perfect stem *pepul-* continues a Proto-Italic reduplicated perfect (Meiser 2003: 185), which must be a secondary innovation, considering that a PIE reduplicated perfect cannot be reconstructed for this root. The Proto-Italic root aorist **pel-e/o-* was abandoned due to lacking overt marking (Meiser, *loc. cit.*), for which reason the reduplicated formation was continued as the Latin neo-perfect. The root vocalism is submerged, as all non-high vowels in medial syllables were in any case reduced into *-ə-*, which was subsequently strengthened (via *-ɵ-*) into *-u-* due to the following *l pinguis*; thus, the Proto-Italic form can have been **pe-pel-* or **pe-pol-* (the latter possibly from an earlier weak stem **pe-pl̥(l)-*).

The PPP *pulsus* cannot be a phonologically regular continuation of a PIE *to*-participle **pl̥h₂-tó-* (> Lat. **plātus*). If Weiss’s and Kümmel’s (*LIV*²⁺) analysis is correct, then *pulsus* can be seen as a phonologically regular outcome of a secondary *to*-participle built to the present stem; thus **pel-dˢ-to-* > **pelssos* > *pulsus*.

2.3.2.8. *Tangere*

Tangere (*tăngō, tetĭgī, tāctus*) ‘to touch’ originates from the PIE root **teh₂g-* (or **teh₂g-*) ‘to touch, grasp’ (*LIV*²: 616–617). It is not quite clear, what the PIE paradigm constellation exactly looked like (see, e.g., *LIV*², *loc. cit.*; Meiser 2003: 190–191; *EDLIL*, s.v. *tangō, -ere*; *EDPG*, s.v. **takan* ~ **tēkan*). The most important comparanda include Gr. ptc. τεταγών ‘grasping’, Go.

pret. *taitok* ‘touched’ (< reduplicated aorist?), and Go. prs. *tekan* ‘to touch’, Toch B *ceśäṃ* ‘to touch’ (< Narten present?). Italic verbal cognates include Marr. sbj.3sg. *taa* (< **tag-a-d*) and Vols. fut.pf.3sg. *atahus* (< **ad-tag-us-t*). Note also the Umb. adjective abl.pl. **antakres**, **antakre** ‘untouched’ (≡ Lat. *integrīs*). Old Latin has a number of sbj.prs./preventive forms without the nasal, e.g. *tagās*, *at-tigās*.

Whatever the original PIE present formation was, the Latin present stem *tang-* clearly reflects a nasal present weak stem, i.e. PIE(?) **th₂-n-g-* > [thematised] PIt. **tang-e/o-* > Lat. *tang-ō*. (As to why the strong stem **th₂-né-g-* > PIt. ˣ***taneg-* was abandoned, see the discussion in Ch. 2.3.2.4.)

The perfect stem *tetig-* continues an earlier (PIE or Proto-Italic) reduplicated perfect weak stem with zero-grade vocalism, i.e. PIE(?) 1sg. **te-th₂g-h₂e(i̯)* > PIt. **te-tag-ai̯* > **tetəgəi̯* > Lat. *tetigī* (Meiser 2003: 191). The root vocalism is submerged due to vowel weakening, but **-a-* is the only feasible preform. Alternatively, *tetigī* may reflect a PIE reduplicated aorist (*LIV*²: 616–617), but this is less likely, considering that Proto-Italic (and PIE) most likely had a root aorist rather than a reduplicated one (see next paragraph).

The Old Latin sbj.prs./preventive forms and the Marrucinian and Volscian cognates (cf. Gr. τεταγών) can be derived from a Proto-Italic root aorist, very likely of PIE origin; thus PIE 3sg. **téh₂g-t* : 3pl. **tḫ₂g-ént* > [thematised] PIt. **tāg-ed* : **tăg-ond* (cf. Meiser 2003: 191), but it is unclear how long the ablaut alternation survived. In any case, apart from the occasional preventive form, the PIt. root aorist was lost in Latin, and the reduplicated perfect was continued as the neo-present stem, as this was morphologically more explicitly marked of the two (Meiser 2003: 169–170, 191).

The PPP *tāctus* can be regularly derived from the PIE *to*-participle, i.e. **th₂g-tó-* > PIt. **tag-to-* > [Lachmann’s rule] *tāctus*.

2.3.2.9. *Tollere*, *tulī*, *lātus*

Tollere (*tollō*, *sustŭlī*, *sublātus*) ‘to raise, lift’ and the suppletive perfect stem and PPP of *ferre* (*(te)tŭlī*, *lātus*) originate from the PIE root **telh₂-* ‘to lift’ (*LIV*²: 622–623). Synchronically, the simplex perfect stem and PPP belong as suppletive components to the paradigm of *ferre* (see Ch. 2.2.1.7. for the present stem forms), while *tollere* has grammaticalised (renovated) suppletive preverb compounds as its perfect stem and PPP (which are shared by *sufferre*). In the IE languages, extensive modifications have taken place. Nonetheless, a paradigm constellation consisting of a nasal present, root aorist and a reduplicated perfect can be reconstructed for PIE. The nasal present **tl̥-né-h₂-/tl̥-n-h₂-* is reflected in Gr. ἀνα-τέλλω ‘to bring forth’, Arm. *t‘ołowm* ‘to allow’, OIr. *tlenaid* ‘to take away, steal’, and Toch. B *tallaṃ* ‘to raise, bear’. The root aorist **télh₂-/tl̥h₂-* is reflected in Gr. ἔτλην ‘bore, dared’ and possibly in Toch. B [*t*]*lava* ‘?’. There is evidence for a reduplicated perfect **te-tólh₂-/te-tl̥h₂-* in Gr. τέτλαμεν ‘we bear, suffer’ and OIr. *ro-thíuil* ‘has taken away’. Italic cognates include Fal. pf.1sg. **tulom**, Umb. fut.imp.3sg. *andendu*, **antentu**, **atentu** ‘to lay onto’, fut.imp.3sg. *endendu*, **ententu**, fut.pf.3sg. *entelust*, **entellus** ‘to lay into’, fut.imp.3sg. **pertentu** ‘to spread out’, fut.imp.3sg. **sutentu** ‘?’. We should also note Ven. **tolar**, **toler**, **tuler** prs.3sg.mid. ‘to offer’ (perhaps originally a causative). Old Latin includes an overtly reduplicated perfect stem *tetulī*, and a prs.sbj. *abs-tulās*, *at-tulat* – these were replaced in Classical Latin by a dereduplicated perfect stem *tul-* and the regular third conjugation sbj.prs. *tollam*, *tollās*, etc.

The Latin present stem *toll-* is a phonologically regular continuation of a thematised nasal present, based on the original weak stem form, i.e. PIE **tl̥-n-h₂-* > pre-PIt. **tol-n(a)-* → [presuming that thematisation is Proto-Italic] PIt. **tol-n-e/o-* > Lat. *toll-ō*. (How the strong stem PIE **tl̥-né-h₂-* > **tol-nā-* was lost in the wake of thematisation, see the discussion in Ch. 2.3.2.4.) Umbrian has generalised *e*-vocalism for its present stem, probably from the Proto-Italic aorist (cf. Meiser 1986: 164–166), not unlike Lat. *pellere* (see Ch. 2.3.2.7.).

The Latin perfect stem *(te)tul-* is a phonologically regular continuation of the PIE reduplicated perfect. Due to the submersion of the vowel quality, it is not certain, which ablauting form the Latin stem exactly continues; in any case, both PIE **te-tolh₂-* and **te-tl̥h₂-* would coalesce into PIt. **te-tol(a)-*, meaning that, whatever ablaut contrast may have been present at one time, was neutralised by a regular sound change in Proto-Italic. The reduplication is attested in Old Latin and Early Classical Latin (until Catullus and Lucretius).

Proto-Italic also had a root aorist (probably thematised), reconstructable as **tel-e/o-*. This is reflected in Fal. neo-perfect **tulom** (< PIt. **tel-om*), Umb. fut.pf. *en-tel-us-t*, and in OLat. prs.sbj. °*tulās* (< PIt. aor.sbj. or preventive **tel-ā-s*).

The PPP *lātus* is a phonologically regular continuation of the PIE *to*-participle with zero-grade root, i.e. PIE **tl̥h₂-tó-* > PIt. **tlā-to-* > Lat. *lātus*.

2.3.2.10. *Vincere*

Vincere (*vĭncō, vīcī, vĭctus*) ‘to conquer’ originates from the PIE root **u̯eiḱ-* ‘to overcome, conquer’ (*LIV*²: 670–671). There are many nominal derivatives scattered around in the IE languages, but only a handful of verb formations which reflect – directly or indirectly – the original PIE formations. The Latin forms are the only evidence for a typical pairing of a nasal present with a root aorist, but there is also evidence for a zero-grade thematic present PIE **u̯ik-é/ó-* (OIr. *-fich, -fechad* ‘to fight’, ON *vega* ‘to fight, kill’; and Go. *weihan* ‘to fight’ with a secondary e-grade), and perhaps for a reduplicated perfect **u̯e-u̯óiḱ-/u̯e-u̯ik-* (OIr. *fích* ‘fought’, ON *vá* ‘fought’). The only Sabellic verbal cognate is Osc. prs.3sg.pass. *uincter* ‘to prove someone’s guilt’, but this may be a Latin loanword (*EDLIL*, s.v. *vincō, -ere*).

The Latin present stem *vinc-ō* continues (and is the only evidence for) a PIE nasal present **u̯i-né-k-/u̯i-n-k-*. Typically, the zero-grade weak stem form has been generalised and thematised, thus PIE **u̯i-n-k-* → [presuming Proto-Italic thematisation] PIt. **u̯ink-e/o-* > Lat. *vinc-ō*. (As to why the weak stem form was generalised, see the discussion in Ch. 2.3.2.4.)

The perfect stem *vīc-* most likely continues (and is the only evidence for) a PIE root aorist **u̯eiḱ-/u̯ik-*.[73] It is not clear when the athematic ablaut relation was lost, but the Lat. long *ī* can only originate from the e-grade strong stem variant. Presuming that thematisation took place in Proto-Italic, the reconstruction would be, e.g., 3sg. **u̯eiḱ-ed* : 3pl. **u̯ik-ond* (but **u̯eiḱ-ond* is as likely). In any case, the neutralisation of this ablaut contrast could only have taken place by paradigmatic levelling (towards 1M1F), not by way of regular sound change.

The PPP *vĭctus* is a regular phonological continuation of the PIE *to*-participle, i.e. **u̯ik-tó-* > PIt. **u̯ik-to-* > Lat. *victus*.

[73] This is the preferred origin for *vīcī* (Meiser 2003: 206–207). Theoretically, it may also continue a PIt. reduplicated perfect zero-grade weak stem **u̯i-u̯ik-* > **u̯i(u̯)ik-* > *vīc-*, or an o-grade dereduplicated strong stem **(u̯i-)u̯oiḱ-* > **u̯ēk-* > *vīc-*.

2.3.3. Desideratives

PIE had two different desiderative formations, both characterised by the non-ablauting desiderative marker *-*s*-: an amphikinetic athematic desiderative with accented e-grade root in the strong stem and unaccented zero-grade root and accented endings in the weak stem, and a mesostatic reduplicated thematic desiderative with *i*-reduplication, zero-grade root and an accented thematic vowel. In Latin, the only verb that originates from the latter type is *discere*, which, however, has been modified into a *sḱe/o*-present and is better classified as such. The former type is only continued in two present stem formations, which have been thematised and are synchronically inflected as regular third conjugation verbs.

The desiderative marker *-*s*- found many important uses elsewhere in the Latin verb system. Already in Proto-Italic, it was generalised as a future marker and used to build various Italic future formations (of which the Lat. sbj.ipf. *-sē*- is an extension). In this section, I will examine the two old desideratives, in which the desiderative marker was grammaticalised as a component of the verb root.

2.3.3.1. *Quaerere*, *quaesere*

The etymologies of *quaerere* (*quaerō, quaesīvī, quaesītus*) 'to seek' and *quaesere* (*quaesō, quaesīvī, quaesītus*) 'to ask' are not entirely clear. According to an earlier proposal by Szemerényi (1960: 232), the verb is an old compound, composed of the preverb **ko(m)*- and a simple thematic present of the root **h₂eis*- 'to ask, seek' (*LIV*²: 260), thus **ko-ais-e/o*-. But this etymology is phonologically problematic, as the sound change **ko-a*- > *qua*- is not regular (cf. **ko(m)-ag-e/o*- > *cōgō*; cf. Bock 2008: 337, *pace* Garnier 2010: 419). More recently, Nussbaum (2007, quoted in *EDLIL*, s.v. *quaerō, quaesō*) proposes that *quaerere* originates from a desiderative built to a *i̯*-present of the root **kʷeh₂*- 'to acquire' (*LIV*²: 375). A comparandum is Gr.(Dor.) πέπᾱμαι πᾱ́σομαι 'to possess, acquire'. Thus, **kʷeh₂-i-s-e/o*- > PIt. **kʷai̯s-e/o*- > Lat. *quaerō*. The close cognate *quaesere* can then be explained as a recharacterized desiderative, once *quaerere* (or its preform) was already reanalysed as an opaque verb stem; thus PIt.(?) **kʷai̯s-s-e/o*- > **kʷai̯ss-e/o*- > *quaesō*. Whatever the exact prehistory of these forms is, they seem to have been based on PIE desiderative formations with e-grade root generalised. Thematisation has most likely occurred in Proto-Italic.

The perfect stem *quaesīv*- and PPP *quaesītus*, shared by the two verbs, are innovations based on the present stem (also cf. Meiser 2003: 126).

2.3.3.2. *Vīsere*

Vīsere (*vīsō, vīsī, vīsus*) 'to behold, visit' originates from the PIE root **u̯ei̯d*- 'to see' and is thus a cognate with Lat. *vĭdēre* 'to see' (for which see Ch. 2.2.5.10.). The only evidence for a PIE desiderative, in addition to the Latin present stem, is Go. *ga-weison* (Meiser 2003: 65). An Italic cognate is Umb. imp.3sg. **revestu** (< **re-u̯eid-s-e-tōd*) (*EDLIL*, s.v. *videō, -ēre*).

If the present stem *vīs*- is inherited from PIE, it reflects the strong stem of the athematic desiderative **u̯éi̯d-s-/u̯id-s*-, which has subsequently been thematised (Bock 2008: 428). Otherwise the development is phonologically regular, i.e. PIE transponat, PIt. **u̯ei̯d-s-e/o*- > **u̯ēss-e/o*- > **vīssō* > *vīsō* (continuation of the weak stem would have produced Lat. ˣ*vissō*). As was noted in Ch. 3.2., the thematisation of most inherited athematic verbs caused the

generalisation of the e-grade root. This may be the reason, as to why the invariable e-grade root was continued in the thematised formation.

The perfect stem *vīs-* is attested only twice in Cicero (*Verr.* 4, 127; *Att.* 1, 4, 1), and may thus be an improvised creation (Sommer 1914: 502 n. 17; Meiser 2003: 216).

The PPP *vīsus* is shared with *vidēre*, for which see Ch. 2.2.5.10.

2.3.4. Special cases

Although most PIE athematic verbs were more or less regularized in Latin, a small group of high-frequency basic verbs are synchronically highly irregular and thus continue some features of their original inflection. It is, namely, a generally observed tendency that items in irregular and/or very frequently used categories preserve regular sound changes and inherited morphophonological alternations more faithfully than items in regularly inflected and less frequently used categories. In this section, I will examine the development of five Latin irregular (or partially irregular) verbs: *esse* 'to be', *īre* 'to go', *velle* 'to want', *ēsse* (*edere*) 'to eat' and *dare* 'to give', all of which ultimately originate from PIE athematic formations. A characteristic of them is the strong stem vs. weak stem ablaut alternation (typically e-grade vs. zero-grade, respectively).[74] The investigation of the factors for the eventual preservation and/or loss of this alternation will be a central topic in this section.

2.3.4.1. *Esse*

The verb *esse* (*sum, fuī, futūrus*) 'to be' shows typical traits of a grammaticalised, very-high-frequency basic verb:

- Its inflection is irregular in both intraparadigmatic and transparadigmatic terms (see below).[75]
- It is suppletive: synchronically, it has four root variants: *es-*, *s-*, *er-* and *fu-/fo-*.
- It is defective: it lacks a PPP and a paradigmatic present participle.
- It is synchronically opaque, i.e. its inflection is not amenable to synchronic morphological analysis in the same way that regular and productive formations are.

The various root forms originate ultimately from two PIE roots, namely **h_1es-* 'to be' (*LIV*²: 241–242) and **b^huh_2-* 'to be(come)' (*LIV*²: 98–101),[76] but the exact history of the individual forms is complicated. Various explanations have been proposed in the literature, as very few of the attested Latin forms can be directly derived from their PIE ancestors by regular sound change or by straightforward analogical modifications.

We will begin by examining the Latin present stem forms of *esse*, which are presented in Table 12 (cf. Sjöstrand 2014[1953]: 112–113):[77]

[74] A further partly irregular verb, *ferre*, has occasionally been interpreted as a relic of the athematic conjugation. There are, however, good reasons to presume that *ferre* is a continuation of a simple thematic present of PIE date (see Ch. 3.3.1.5.).

[75] Cf. Ernout (1953: 175): "La verbe signifiant 'être' est le plus irrégulier de la langue latine."

[76] On the reconstruction of this latter root, see Ch. 3.2.1.2. below.

[77] I use Sjöstrand (2014[1953]) here as an example of a classical "school grammar", which provides a coherent descriptive (and prescriptive) account of the structure of literary Classical Latin.

	Prs.ind.	Ipf.ind.	Fut.	Prs.sbj.	Ipf.sbj.	Imp.
1sg.	*sum*	*eram*	*erō*	*sim*, OLat. *siem*	*essem*, OLat. *forem*	-
2sg.	*es(s)*	*erās*	*eris*	*sīs*, OLat. *siēs*	*essēs*, OLat. *forēs*	*es*, *estō*
3sg.	*est*	*erat*	*erit*	*sit*, OLat. *siet*	*esset*, OLat. *foret*	*estō*
1pl.	*sumus*	*erāmus*	*erimus*	*sīmus*	*essēmus*	-
2pl.	*estis*	*erātis*	*eritis*	*sītis*	*essētis*	*este*, *estōte*
3pl.	*sunt*	*erant*	*erunt*	*sint*, OLat. *sient*	*essent*, OLat. *forent*	*suntō*

Table 12: Present stem forms of *esse*.

All Classical Latin present stem forms of this verb originate from the PIE root ***h₁es***-. The prs.ind. forms are the most irregular ones and require special attention. While it would be plausible to presume that the forms with *es*- continue the e-grade root ***h₁es***- and the ones with *s*- the zero-grade root ***h₁s***-, the distribution does not match the original PIE forms of a simple athematic root present (Table 13).

1sg.	***h₁és-mi***	1pl	***h₁s-més***
2sg.	***h₁és-(s)i***[78]	2pl	***h₁s-té(s)***
3sg.	***h₁és-ti***	3pl	***h₁s-énti***

Table 13: PIE present indicative of **h₁es*-.

It seems that only some of the Latin forms (i.e. 2sg. *es* and 3sg. *est*) can be explained by regular phonological development, i.e. as direct inheritance from PIE. To account for the rest of the forms or for the paradigm as a whole, the two main theories that have been proposed in the literature are 1) the direct continuity hypothesis, and 2) the de-enclitisation hypothesis.[79] The main tenets of these approaches are as follows:

– The **direct continuity** hypothesis presumes that direct inheritance (i.e. regular phonological development with minimal morphological changes) of the PIE forms is the default case. If – and only if – direct inheritance cannot be conclusively shown for a given form, an alternative explanation is sought for that particular form. This is the oldest and perhaps the current mainstream view, followed, among others, by Buck (1933: 273), Palmer (1961: 269), Monteil (1970: 282), Leumann (1977: 522), Garnier (2010: 298), and Weiss (2011: 425–426). Coincidentally, this is essentially the same as the heredity principle (Ch. 2.3.1.).

[78] Geminates were regularly simplified in PIE. Ved. *ási*, Av. *ahi*, Lith. *es* and Gr. εἶ < ***ehi* continue the simplified form (Leumann 1977: 522; Sihler 1995: 548; Weiss 2011: 423). On the Plautine scansion *ess*, see below.

[79] Additionally, several other theories have been proposed, which I will disregard here. For example, those of van Wijk (1905), Bonfante (1932) and Schmalstieg (1972), who do not take the regular PIE athematic paradigm as the starting point, but reconstruct the whole PIE paradigm or certain by-forms of it on the basis of the Latin forms. It is true that the mainstream PIE reconstruction is based heavily on Old Indic and Greek evidence, but it is not very plausible to presume that these conservative branches would have innovated or levelled one of the most frequent basic verbs. Rather, we ought to presume that the verb inflected as a regular athematic present in PIE and that the subsequent modifications have taken place during the *einzelsprachlich* history of Latin. A recent proposal (Schrijver 2016) traces the origin of the present forms of *esse* to certain Italo-Celtic modal forms.

– The **de-enclitisation** hypothesis presumes that all (or almost all) directly inherited prs.ind. forms were at some point renovated by forms extracted from a parallel *enclitic* paradigm. Parts of this theory originate from Szemerényi (1946), it was fully elaborated by Nyman (1977), and accepted by Sihler (1995: 549f) and partly by Joseph and Wallace (1987) and Meiser (1998: 221).

Both approaches have their strengths and weaknesses. While it is reasonable to presume that the Latin forms are by default directly inherited from Proto-Italic and ultimately from PIE, the paradigm as a whole is clearly not (see below). As for such forms that cannot be the result of regular phonological development, proponents of the direct continuity hypothesis must resort to a collection of ad hoc explanations (for example, by assuming irregular sound changes or elaborate analogies). Competing approaches may be superior in that – although they complicate the explanation by assuming additional intermediate stages even for the regularly continued forms – they avoid potentially uncompelling ad hoc propositions at the same time. Furthermore, there is evidence that *esse* (and its immediate ancestors) had a set of enclitic, vowelless by-forms (at least in the singular), of which 2sg. *'s(s)* and 3sg. *'st* are particularly frequent in the archaic literature. The de-enclitisation hypothesis requires the assumption that these particular forms served as the basis for renovating the fully accented forms, which may not be the most plausible option.

The only forms of prs.ind. of *esse* that can be explained by entirely regular sound change are 2sg. *es* (Plautine *ess*, see below) and 3sg. *est*, from PIE **h₁és-(s)i* and **h₁és-ti*, respectively.[80] The 3pl. *sunt* seems to reflect the expected zero-grade of the weak stem, with the original athematic ending having been replaced by the thematic one, as is the case also elsewhere in the Latin verb system (see below on *eunt*, *volunt* and *edunt*); this is, thus, in agreement with the heredity principle. However, in this case thematisation has not altered the ablaut grade of the root; in fact, a full-grade thematic-looking form **esont* already existed in the paradigm as the subjunctive (→ Lat. future) **h₁és-ont(i) > *esont > erunt*. Thus far is entirely in line with the direct continuity hypothesis; but for *sum*, *sumus* and *estis*, alternative explanations are needed, and this may also complicate the interpretation of *es*, *est* and *sunt*.

We will start with 1sg. *sum*. After the loss of laryngeals and **-i* of the primary ending, the phonologically regular Proto-Italic form would be **esm̥*; this would regularly develop into **esem* (cf. **dek̂m̥(t) > decem*) and finally into Latin ˣ*erem* (via Rhotacism), but none of these forms is attested. Instead, we find, very early, ESOM in the *Garigliano Bowl* (early fifth century BC),[81] the reconstructed form *esum* by Varro (*Ling.* 9, 100),[82] and finally, of course, *sum*. Relevant for the Proto-Italic reconstruction are also the Sabellic forms, namely SPic. **esum**, PreS. **esum**, **sum**, **sim**, Osc. **sum**, **súm**, Hern. **esu**, Umb. **esu** (*WOU*, s.v. *ezum*).[83] Thus, the

[80] Olav Hackstein (p.c.) points out that even *est* may be a product of analogical restoration. He proposes that the regular development is **st > *ss* / _# in Latin, as in the noun *ŏs*, *ŏssis* 'bone' from PIE **h₂ost* (cf. Toch. B *āy* < **ost* < **h₂ost*).

[81] Being a relatively recent finding, the attestation of ESOM was not available for pre-1996 literature (e.g. Nyman 1977, Joseph and Wallace 1987, and Sihler 1995).

[82] The Varronian reconstruction is based on the comparison with such sets of forms as *eram* : *eras* : *erat* :: *ero* : *eris* : *erit* :: X : *es* : *est*, where X = *esum* (Leppänen 2012: 52–53). It is possible, however, that Varro has actually seen the form *esum* in an inscription, but the sources do not allow us to confirm this possibility.

[83] These 1sg. forms should not be confused with the similar-looking Sabellic infinitives, of which we have three different attested forms: Osc. *ezum*, Umb. **eru**, *erom*. These are regular Sabellic infinitives built to the e-grade root with the suffix *-om*/*-um*.

oldest testimonies point towards the comparative reconstruction of PIt. **esom*. It is obvious that **esm̥* cannot regularly yield any of the attested forms, and that an *e*-less form ought to be seen as a secondary modification (unless one wishes to explain the appearance of *e* in some of the above forms). However, the VOLat. ESOM does not result regularly in OLat./CLat. *sum*, either (an entirely regular continuation would be ˣ*erum*). This means that there is a twofold continuity problem: the PIt. **esom* cannot be a regular continuation of PIE **hₗés-mi* on the one hand, and the VOLat. (*Garigliano*) esom and the Sabellic cognates cannot be direct ancestors of OLat./CLat. *sum* and the Sabellic **sum**, **sim**, etc. on the other.

In order to understand the paradigmatic aspect, we need to examine the histories of the other forms as well. To the benefit of the direct continuity hypothesis, 2sg. *es(s)*[84] and 3sg. *est* can be entirely regularly derived from the respective PIE forms without additional assumptions or complications. Sabellic cognates for the 3sg. include Osc. **est**, **íst**, Umb. **est**, *est* (these are also regular) – no 2sg. forms have been attested (*WOU*, s.v. *ezum*). Thematisation has not occurred. However, enclitic variants 2sg. *-s(s)* and 3sg. *-st* are attested since Old Latin, e.g. *non iratass?* (Plaut. *Cas.* 1007) < *irata es*, *idem mihīst … vitium* (Plaut. *Cist.* 120) < *mihī est* (see Nyman 1977: 42, 45 for more examples). Traditionally, such forms have been explained as cases of *aphaeresis*, i.e. loss of word-initial vowel due to enclisis (e.g. Sjöstrand 2014[1953]: 446), but there is no evidence that aphaeresis was an actual phonological process in Latin (Nyman 1977: 44f), as only these two forms of *esse* are affected. This leads to the conclusion (as correctly pointed out by Nyman 1977: 42–43) that at least for 2sg. and 3sg. there existed two variant sets: a fully accentuated and vocalized set (*es(s)*, *est*) and an enclitic set (’*s(s)*, ’*st*). Now, it is possible to argue that every other prs.ind. form of *esse* underwent similar enclitisation at some point, but the problem is that we lack any evidence for all the other forms (e.g. no 2pl. ˣ*factīstis* for *factī estis*, or the like, is attested).[85] However, we do not lack Italic and IE cognates of univerbated and enclitic forms or even entire enclitic paradigms of the verb ‘to be’ (also from the PIE root **hₗes-*):

- In Osc., there are two secure examples: **destrst** ‘dexter est’ and **teremnatust** ‘terminatus est’ (*WOU*, s.v. *ezum*; cf. Wallace 2007: 32).
- The Greek cognate εἰμί is enclitic throughout (except for the 2sg. εἶ) in the copulative function and in clause-initial position, but receives orthotonic (i.e. regular recessive verbal) accentuation in the existential function.
- Germanic languages, e.g. Go. *nist* for *ni ist* ‘is not’, *þatist* for *þata ist* ‘that is’.
- Ved. *nā́sti* ‘is not’ for *na asti*.[86]

The enclitisation of the copula – or, indeed, of any highly-grammaticalised auxiliary verb – is by no means a singular occurrence (cf. Eng. *I’m*, *you’re*, *he’s*, *we’ll*, etc.), and ought not necessarily to be traced to a common origin. For the sake of argument, let us presume that an enclitic paradigm existed very early in Proto-Italic alongside a fully accentuated paradigm (see Table 14; cf. Meiser 1998: 221). The enclitic forms most likely arose in such collocations as **ne esm̥* ‘I am not’ > **nēsm̥*, **egō esm̥* ‘I am’ > **egō’sm̥* (cf. Szemerényi 1964: 195; Nyman 1977: 53), or in use as grammaticalized auxiliaries (see Ch. 4.3.6. for grammaticalisation and

[84] In Pl., 2sg. *ess* scans always as a heavy syllable (Weiss 2011: 426).
[85] This may be due to the fact that 1pl. and 2pl. are disyllabic, whereas all other forms of the present paradigm are monosyllabic. Perhaps enclitization affected only monosyllabics.
[86] For more examples of reflexes of PIE **ne≠hₗésti*, see Hackstein (2012b).

the process of coalescence), e.g. **faktom est* 'was done' > **faktom'st* (cf. Garnier 2010: 298 n. 2). The accented plural forms were inherited without the initial **e-*, wherefore the enclitic parallels do not differ from the fully accentuated ones (apart, of course, from being unaccented).

	Early PIt.		**Late PIt.**		**Very Old Latin**	
	Full	**Enclitic**	**Full**	**Enclitic**	**Full**	**Enclitic**
1sg.	**ésm̥*	**-sm̥*	**ésom*	**-som*	*ésom*	**-som*
2sg.	**éss*	**-ss*	**éss*	**-ss*	**éss*	**-ss*
3sg.	**ést*	**-st*	**ést*	**-st*	**ést*	**-st*
1pl.	**smós*	?	**sómos*	?	**sómos*	?
2pl.	**stés*	?	**stés*	?	**éstes*	?
3pl.	**sént*	?	**sént*	?	**sónt*	?

Table 14: Proto-Italic and Very Old Latin paradigms of **es(o)m*.

To return to the 1sg., since PIt. **m̥* is vocalized as *em* in Latin (see Ch. 3.2.2.),[87] the development **esm̥* > **esom* cannot be as late as post-Proto-Italic; this *terminus ante quem* is also supported by the Sabellic cognates with *e-*. In any case, the early PIt. 1sg. forms were most likely felt anomalous by the speakers, and a remedy was required (see the rationality scheme in Nyman 1977: 52). Most inherited athematic 1sg. forms were in Latin replaced by their thematised variants, but recall that a "regular" thematisation was in this case blocked by the existence of this form elsewhere in the paradigm: full thematisation would have produced PIt. **ésō*, which would have been identical with the subjunctive (→ Lat. future) form, i.e. PIE **h₁és-oh₂(e)* > PIt. **ésō* > Lat. *erō*;[88] moreover, this would not explain the irregularity of **ésom*. As has been suggested by Ernout (1953:176) and Nyman (1977: 50), a partial thematisation along the lines of **ésm̥* → *és-o-m*, i.e. by inserting the thematic vowel but at the same time retaining the athematic ending **-m* < **-mi* (or perhaps it was secondarily imported from the imperfect/aorist paradigms), is a more plausible scenario.[89] The enclitic **-sm̥* was also modified into **-som*. As an effect, the resulting paradigm was fairly regular and uniform, and all important contrasts were distinctly expressed. The development thus far has been Proto-Italic. Later – and separately within the histories of Latin and Sabellic – the fully accentuated form was dropped entirely from use, and the originally enclitic form was generalised in all contexts. Since rhotacism occurred during the fourth century BC (see Ch. 3.2.5.), this replacement must have taken place before that (cf. Umb. infinitive **eru**, *erom*, and the Latin future forms **esō* > *erō*, etc.).

[87] Weiss (2011: 426) suggests that **esmi* > **esm̥* > **esom* is a case of "enclitic weakening", but this is not quite accurate, and would involve an irregular sound change.

[88] The situation is the same in other persons as well, meaning that explaining any of the prs.ind. forms as old subjunctives is not possible (*pace* Dunkel 1998; Schrijver 2006: 57).

[89] It is also possible that the vowel was originally some sort of weakly articulated prop vowel (perhaps *ə*), which was then vocalised into **o* due to the following labial (Szemerényi 1964: 191). This may have been an areal feature, since there is both literary and epigraphic evidence for a Latin parallel form *simus* (Suet. *Aug*. 87, *CIL* IX 3473, cited in Weiss 2011: 426 n. 5).

As pointed out by Szemerényi (1964: 193), early PIt. 1pl. **smós* was also problematic (it would regularly have yielded Lat. ×*mus*) and needed to be replaced.[90] Like with 1sg. **esm̥* → *esom*, 1pl. **smós* also underwent partial thematisation into **s-o-mos* – an unspectacular change as such, which falls in line with the heredity principle, since almost all inherited PIE athematic 1pl. forms are thematised in Latin (with the exception of *īmus*, for which see below).[91] Without Sabellic comparative evidence, the chronology is highly speculative. However, the development of **sómos* is mostly parallel with that of **ésom*, which means that both changes probably took place during the Proto-Italic period.

During the prehistory of Latin, PIt. 3pl. **sent* was modified into *sont* (sont, *CIL* I² 1529, third century BC), probably by replacing the inherited athematic ending with the now-ubiquitous thematic 3pl. ending (Meiser 1998: 221; recall that full thematisation was not available due to the existence of **esont* as the subjunctive/future form). However, the replacement was also motivated by paradigmatic factors: the forms with the stem variant **s-* or with a nasal component in the ending (i.e. 1sg. *esom* : **-som*, 1pl. **somos*) were closely associated with each other, and the outlying exception **sent* was contaminated into **sont* as an enhancement of the paradigmatic uniformity (cf. Nyman 1977: 56).

The form ESOM in the *Garigliano Bowl* is solid evidence for the fact that the fully accented Proto-Italic 1sg. form was continued in Very Old Latin. However, eventually the fully accented form was renovated by the enclitic **-som*, and this renovation must have taken place before the onset of rhotacism in the fourth century BC; [92] there is no evidence for a rhotacised **erom*. Let us assume, for argument's sake, that *esom* was actually rhotacised. The resulting paradigm would have been nonuniform in two dimensions, as the rhotacised **erom* would 1) contrast with the nonrhotacised **-som*, and 2) be the only rhotacised form in the prs.ind. paradigm. Note that all future (old subjunctive) forms rhotacised, but this did not create paradigmatic inconsistency, since all forms of that subparadigm were equally effected. To eliminate the non-uniformity in the present paradigm, the originally enclitic **-som* was generalised (cf. Nyman 1977: 51). This change was also beneficial in that the singular paradigm became more iconic: now all singular forms were monosyllabic (**som*, **es(s)*, **est*), while the plural forms were either polysyllabic (**somos*, **(e)stes*) or somehow phonologically longer (**sont*). Sometime after this change (probably during the third century BC), the enclitic **-som* fell out of use, since no trace of it remains in the attested Latin data.

The 2pl. form is still in need of explanation. PIt. **stes* would have resulted in Lat. ×*stis*, had it developed regularly; instead, the inherited **stes* was renovated into **estes*. The motivation for this was threefold: 1) enhancement of iconicity (more phonological substance in the plural forms), 2) analogy from 2sg. *es(s)* and 3sg. *est* (Leumann 1977: 310???), and 3) analogy from the 2pl. imperative *este* (Meiser 1998: 221), where the e-grade root is original. Without Sabellic and VOLat. epigraphic evidence, it is not possible to date this renovation precisely.

---

[90] Languages (and their speakers) react differently in this kind of situations. As Nyman (1977: 50) points out, PIE **hₓs-mós(i)* was regularly continued in Avestan as *mahi* and in Sanskrit as *smaḥ*.

[91] Alternatively, the addition of a prop vowel *ə* is also a possibility (Meiser 1998: 221).

[92] Nyman (1977: 50–51) discusses several possible chronological scenarios. However, the securely attested ESOM (which, of course, was not discovered until 1996) means that all scenarios which assume that **esm̥* → **esom* postdates rhotacism are no longer sustainable.

After the VOLat. period, the paradigm undergoes regular sound changes: **som* > *sum*, **somos* > *sumus*, **estes* > *estis*, *sont* > *sunt*.

To conclude the examination of prs.ind. forms of *esse*, I find de-enclitisation necessary for the adequate historical explanation of the paradigm, even though direct evidence for the existence of the enclitic forms is limited to 2sg. (*-s(s)*) and 3sg. (*-st*). However, as per heredity principle, there is no need to presume (*pace* Nyman 1977) that the development of such forms as 2sg. *es(s)*, 3sg. *est* and 2pl. *estis* depends crucially on the parallel enclitic forms. The development of the individual forms from pre-Proto-Italic into Classical Latin are summarized as follows:

- 1sg. full **ésm̥*, enclitic **-sm̥*: the former first renovated into *ésom* (which is attested as VOLat. esom), the latter then into **-som*; finally, enclitic **som* > OLat./CLat. *sum* generalised.
- 2sg. full **éss*, enclitic **-ss*: both are continued at least until OLat., afterwards *ess* > CLat. *es*.
- 3sg. full **ést*, enclitic **-st*: both are continued into Classical Latin as *est* : *-st*.
- 1pl. **smós* partially thematized into **sómos*, then regularly into OLat./CLat. *sumus*.
- 2pl. **stés* extended with *e-* on the analogy of *es(s)*, *est* and 2sg. imperative *este* into **estes*, then developed regularly into OLat./CLat. *estis*.
- 3pl. **sént*, partially thematized into OLat. *sont*, whence regularly into CLat. *sunt*.

I will now sum up the development of the prs.ind. forms of *esse* and relate the results to the framework of morphological change in this study. Starting from the left (= most general) end of the generality continuum (see Ch. 4.4.), the only form that is directly and regularly inherited from PIE by Latin is the 3sg. *est*. Comparative evidence points out that the PIt. 3pl. **sent* was modified by Old Latin into *sont* (and then regularly into CLat. *sunt*) by replacing the inherited athematic ending with the corresponding thematic ending. Various analogical factors were identified as a motivation, but in general the change is in line with the heredity principle. OLat. 2sg. *ess* was the result of re-characterisation (a form of recomposition) of the inherited **es* (< **esi* < **$h_1$es-si*) with the 2sg. ending *-s*: this falls within the 1M1F principle. Word-final *-ss* was simplified during the second century BC, yielding the CLat. *ĕs*. All singular forms developed an enclitic paradigm in Proto-Italic – this was a specific change, motivated by the grammaticalized status of the verb and its very frequent use. The 1sg. **esm̥* was during Proto-Italic partially thematised into **esom*. The enclitic 1sg. form survived until Very Old Latin along the fully accented form (VOLat. ESOM), but eventually the enclitic **-som* ousted the inherited full form; this became – by regular sound change – OLat./CLat. *sum*. The inherited 1pl. **smos* was also partially thematised into **somos*, which then regularly developed into OLat./CLat. *sumus*. The 2pl. **stes* was furnished with an initial *e-* on the analogy of 2sg. *es*, 3sg. *est* and 2pl.ipv. *este*; **estes* then regularly became OLat./CLat. *estis*.[93]

As a result of these changes, the original distribution of ablaut grades, i.e. e-grade in the strong (singular) stem vs. zero-grade in the weak (plural) stem, was replaced by an irregular distribution of the stem variants *es-* : *s(u)-* unparalleled elsewhere in Latin morphology. This was not due to any particular analogical modification, but rather a collective result of various

[93] An aspect that would provide further insights into the development of the paradigm would be the analysis of the frequency profile of the different functions (e.g. *verbum existentiae*, copula, auxiliary) of the verb.

individual changes that took gradually place during the (pre)history of Latin. The development of the forms shows a complicated interplay of regular sound change, analogical modifications and frequency-induced effects. In this case, the very high frequency of the copula did not result in preservation of the inherited ablaut pattern.

The prs.sbj. (*sim*, *sīs*, etc.) continues the PIE athematic optative, formed with the ablauting suffix **-i̯éh₁-/-ih₁-* added to the invariable zero-grade root (Sihler 1995: 552; Meiser 1998: 201; Weiss 2011: 416). The PIE paradigm and its Latin, Homeric Greek and Vedic reflexes are shown in Table 15 below:

	PIE	**Latin**	**Homeric**	**Vedic**
1sg.	**h₁s-i̯éh₁-m̥*	*siem*, *sim*	εἴην	*syā́m*
2sg.	**h₁s-i̯éh₁-s*	*siēs*, *sīs*	εἴης	*syā́s*
3sg.	**h₁s-i̯éh₁-t*	*siet*, *sit*	εἴη	*syā́t*
1pl.	**h₁s-ih₁-mé*	*sīmus*	εἶμεν	*syā́ma*
2pl.	**h₁s-ih₁-té*	*sītis*	εἶτε	*syā́ta*
3pl.	**h₁s-ih₁-ént*	*sient*, *sint*	εἶεν	*syúr*

Table 15: PIE athematic optative of **h₁es-* and its IE reflexes.

The Homeric forms are phonologically regular (in plural, **h₁s-ih₁-* > **esī-* > **ehī-* > **eī-* > ει- is regular; see Rix 1992: 231), but, later in the history of Greek, analogical formations such as 3sg. εἴοι (extension of the productive optative suffix) and 1pl. εἴημεν (reanalysis of the sg. stem as ειη- and its subsequent extension into plural) appear and some of them even become paradigmatic forms in the Classical varieties (Sihler 1995: 553). In the Vedic paradigm, the e-grade form of the suffix is extended from sg. into 1pl. and 2pl., while the 3pl. ending has been renovated and brought into line with regular optatives. Sabellic cognates include Umb. 2sg. *sir* (rhotacised from **sīs*), *sei*, *si*, 3sg. **si** (< **sit*), 3pl. **sis**, *sins* (< **sint*). Of the Latin forms, only 3sg. SIED has been attested in Very Old Latin (*Duenos*-inscription), and in OLat. inscriptions 3sg. SIET/SIT and 3pl. SIENT/SINT alternate (see Neue 1897: 595–596 for a list of attestations). This is the state of affairs also in the comedies of Plautus and Terence, where the variants with *-ie-* are almost exclusively limited to the verse-final position (Hodgman 1907: 108; Meiser 1998: 201; Weiss 2011: 426).[94] Cicero accepts both variants in Classical Latin literary use.[95] The forms with *-ie-* must be considered to be the older, more archaic ones, while *sim*, *sīs*, *sit* and *sint* are later renovations.

The generally accepted explanation for the more recent forms is analogical levelling on the model of *sīmus* and *sītis*, whereby the stem variant *sī-* was generalised (e.g. Weiss 2011: 417). Apparently, the Umbrian forms resulted from a similar, but genetically unrelated levelling process. But this is a problematic analogy: it is unlikely that less frequent, more marked forms (pl., 1. and 2. pers.) of the paradigm serve as models for more frequent, less marked forms (sg., 3. pers.). However, other options are limited. Sihler (1995: 553) suggests that *siēt* > *sīt* > *sĭt*

[94] See Neue 1897: 596–600 for list of attestations.

[95] *Siet plenum est, sit imminutum; licet utare utroque* (Cic. *Orat.* 157) '*Siet* is full, *sit* is weak; it is permitted to use both.'

may be a regular sound change; however, the sequene *-iē-* is in fact normally preserved in Latin, e.g. fut. **kapi-ē-t > capiĕt*, acc.sg. **diēm > diem*. Possible parallels are the forms *fīs*, *fĭt* (of *fīō*, *fierī* 'be made'): the origin is the PIE root **bʰuh₂-* 'be(come)', from which a thematic *i̯e/o-* present was built; thus, PIt. 3sg. **fūi̯et > *fīi̯et* (by Pius-rule, see Ch. 3.1.4.) > **fīt > fĭt*, or **fui̯i̯et > *fui̯īt > fit* (Schrijver 2003: 77; Kortland 2007: 136; *EDLIL*, s.v. *fīo, fierī*). This would mean that the preservation of *siet* etc. until and beyond Old Latin is an exceptional phonological archaism – this may be related to the fact such forms occur mainly in verse-final position in the archaic comedies.

Let us have a closer look at the distribution of the 1pl. *sīmus* and 2pl. *sītis* in Old Latin, taking Plautus as the reference corpus: *sīmus* occurs 14 times (of which 2 times *possīmus*), *sītis* 6 times (of which once *possītis*);[96] none of these occurrences is in verse-final positions, and in verse-internal position the *ī*-forms are the expected ones even for *sim*, *sīs*, *sit* and *sint*. Let us also presume, for argument's sake, that the *-iē-* suffix was extended from the singular stem to 1pl. and 2pl., yielding ˣ*siēmus* and ˣ*siētis* (these would be expected analogical forms, had the paradigm been levelled according to the usual direction of analogical change). The existence of such forms cannot, of course, be verified, but at least the Plautine distribution of *sīmus* and *sītis* (which are in any case the earliest testimonies for these forms) indicates that the lack of ˣ*siēmus* and ˣ*siētis* may be a matter of historical coincidence.[97] If this is the case, we can assume the existence of a full paradigm of forms with *-iē-*; however, we still lack a proper explanation for the appearance of *-ī-* in the singular and 3pl. But let us recall that early Latin had a sbj.prs. paradigm, which was characterised by *-ī-* (which also originates from the zero-grade PIE optative marker **-ih₁-*): e.g. *velim*, *edim*, etc. (for detailed analysis of these forms, see below). The formation of *sim*, *sīs*, *sit*, *sīmus*, *sītis*, *sint* is exactly like this, with the stem *s-* extracted from such present stem forms as *sum*, *sumus* and *sunt*, and furnished with the sbj.prs. marker *-ī-*. This scenario, if it could be verified, would mean the newer forms with *-ī-* are not analogical extensions of the inherited 1pl./2pl. stem into the singular and 3pl., but they rather originate from an innovative paradigm. It is possible that *siē-* and *sī-* originally had a functional or stylistic differentiation, but the forms were eventually forced into the relatively symmetrical Latin verb system (cf. Ch. 2.1.3.). Eventually, the innovative paradigm *sī-* became the standard form, probably because *-iē-* is in Old and Classical Latin nothing like a subjunctive marker (in fact, *-iē-* occurs as a future marker in the third and fourth conjugations, e.g. *faciēs*, *audiēs*), while the *-ī-* existed as a sbj.prs. marker at least in some irregular paradigms.

A further consideration involves the naturalness of the marker *-iē-*. As was pointed out, this was a very atypical present subjunctive suffix in Old Latin, hence less natural. This fact may have acted as a factor for levelling the paradigm against the common tendencies: the marker *-ī-* of 1pl. and 2pl. was considered more natural in system-wide terms, and this fact determined the direction of the analogical levelling, which was then carried out according to the 1M1F principle.

---

[96] Searches were conducted on the *Packard Humanities Institute Latin Texts* database (https://latin.packhum.org/) [13.04.2019].

[97] The fact that ˣ*siēmus* and ˣ*siētis* do not occur in the later literature either, is not a valid counterargument. The forms with *-iē-* were in Classical and Late Latin felt as archaisms and special stylistic varieties for the normal forms. Furthermore, Gerhard Meiser (p.c.) points out that both the attested *sīmus/sītis* and the hypothetical ˣ*siēmus*/ˣ*siētis* are metrically incompatible with the iambic senarius at verse ends, making them unlikely (or impossible) to occur in that position.

We will now examine the remaining present stem forms of *esse* that originate from the PIE root **h₁es-*. The ipf.ind. forms *eram*, *erās*, etc. are not directly inherited. The PIE imperfect/injunctive of **h₁es-* was built regularly with the e-grade/zero-grade alternation in the root and secondary endings, i.e. **(e-)h₁es-m̥*, **(e-)h₁es-s*, **(e-)h₁es-t*, etc., but this formation was lost very early in Italic.[98] The function of past-imperfective was probably expressed in Proto-Italic by various periphrastic constructions, which involved a nominal form of the main verb and a conjugated form of the verb 'be'. One of these constructions was grammaticalized as the productive Latin *bā*-imperfect (see below); thus, it may be said that, in the long run, the PIE imperfect was renovated by the innovative *bā*-formation, even though there most likely never existed an uninterrupted continuity. However, this renovation was not extended into *esse* (it is, in fact, the only Latin verb that does not have a *bā*-imperfect).[99] The ipf. of *esse* consists of an invariant e-grade root with the modal suffix *-ā-* (< PIE **-eh₂-*?) and secondary endings, as from PIE transponat **h₁es-eh₂-m̥* > **esām* > *eram*. This paradigm is probably relatively old, but due to paucity of cognate Sabellic imperfect forms, it is impossible to verify, if it actually existed already in Proto-Italic. According to Schrijver (2016), the *ā*-subjunctive **es-ā-m* (kin to the sbj.prs. of second, third and fourth conjugation in *-am*) was a thematic formation, which renovated the inherited PIE imperfect/injunctive already in Proto-Italo-Celtic. The athematic paradigm of *esse* already included a subjunctive (→ Latin future, see next paragraph), but if the functional shift towards the future function was old enough, it is no surprise that an innovative modal form was created to fill the resulting functional gap (i.e. the missing subjunctive). These observations would indicate that the development of PIE subjunctives into Latin futures took place sometime earlier than the functional extension of the PIE optative to include subjunctive functions in Latin.

As for the Latin future forms (*erō*, *eris*, etc.), this paradigm is a direct continuation of the PIE athematic subjunctive, built to the invariable e-grade root with the thematic vowel and primary or secondary endings (both are attested in Vedic); thus, **h₁és-oh₂(e)* > *erō*, **h₁és-es(i)* > *eris*, **h₁és-et(i)* > *erit*, etc. (cf. Weiss 2011: 414–415). The form ESED in the Forum Inscription (see Ch. 1.4.) may be either a future (= old subjunctive) with a secondary ending (i.e. /esed/ > CLat. *erit*) or an ipf.sbj. (i.e. /essēd/ > CLat. *esset*) (cf. Wachter 1987: 69), since neither vowel nor consonant quantities were systematically notated in VOLat. scribal conventions.[100]

There also exist remains of another set of forms with future function, namely the sparsely attested OLat. *escit*, *escunt*.[101] The forms in question are relics of a PIE thematic *sk̂e/o*-present (*LIV*²: 19; Ch. 2.4.1.), also attested in the imperfect function as Gr.(Hom.) ἔσκε < **h₁(s)-sk̂e-t* and in present function as Toch. B *star°*/*skentar°* (see Hackstein 1995: 272f). Since the PIE ancestor took the root in zero-grade, the e-grade of *escit/escunt* must be secondary, perhaps due to analogical renovation (cf. *LIV*²: 241–242), meaning that the forms are not directly inherited.

[98] The only possible trace of the PIE imperfect is in some longvocalic perfect stems (i.e. old imperfects of Narten presents), for which see Chs. 2.2. and 2.3. *passim*, above.

[99] The *bā*-imperfect of *esse* would probably have looked like ˣ*ēbam* (< ˣ***es-bā-m*, on the model of *ībam* < **eį̄-bā-m*) or ˣ*erēbam* (< ˣ***es-ē-bā-m* on the model of *dīcēbam*, etc.); unless it was formed from the root **bʰuh₂-*, then the result would have been ˣ*fūbam* or ˣ*fuēbam*.

[100] Within the context of the inscription (SAKROS ESED), the future interpretation ('will be sacred') may be more probable. Considering the antiquity of the text, an ipf.sbj. *foret* would have been more likely (< VOLat. **fusēd*).

[101] The most famous attestations are in *Lex XII*, e.g. *si morbus aevitasve escit, iumentum dato* (Gell. 20, 1, 9–29) 'if there will be sickness or old age [involved], a carriage shall be provided with'.

Elsewhere in Latin, PIE *sk̂e/o*-presents are continued in some present stem formations (e.g. *crēscō* 'grow', *albēscō* 'become white', see Weiss 2011: 407 and Ch. 2.2.3. in this volume);[102] the formation must at one time have been somewhat productive.

The ipf.sbj. *essem, essēs,* etc. is an innovative formation of a more recent date, formed regularly from the e-grade root with the suffix *-sē-* and secondary endings. This is the regular, productive Lat. ipf.sbj., which is probably based on an *ē*-optative (of unknown origin) built to an original *s*-aorist or desiderative in **-s-* (Sihler 1995: 600).[103] The formation is also well attested in Sabellic, but nowhere outside the Italic branch (Christol 2005: 25), meaning that it most likely is a Proto-Italic innovation.[104] In this particular verb, Sabellic uses the stem *fu-* (Osc. **fusíd** < **fu-sē-d*), which is also attested in the Latin alternative ipf.sbj. paradigm *forem, forēs*, etc. (see below). It seems that the construction with *fu-* is older, and Latin has innovated a new, more regular formation, which is based on analogies with other irregular (i.e. old athematic) verbs (cf. *īrem* < **e̯i-sē-m*, *vellem* < **u̯el-sē-m*) and with the inf. (*esse* : *essem*, cf. *īre* : *īrem*, *velle* : *vellem*, etc.).

The imperatives are regular and present no particular difficulties (Sihler 1995: 553). An endingless e-grade present stem is used as 2sg. form, i.e. *es*; elsewhere regular endings are suffixed to this stem. 3pl. *sunto* (OLat. SVNTOD, *CIL* I² 366) is formed from the prs.ind.3pl. *sunt*, on the analogy of regular verbs, e.g. *dīcunt* : *dīcuntō* :: *sunt* : X, where X = *suntō* (cf. Meiser 1998: 221).

As for the continuation of ablaut alternations, directly inherited formations (such as the Latin future) preserve the inherited grade in the root. Secondary or innovative formations (such as the imperfect indicative, the *sk̂e/o*-present, and the imperfect subjunctive) tend to generalise the e-grade form of the root. There is, thus, a clear tendency to standardise the e-grade root variant *es-* (occasionally rhotacised into *er-*) in the non-present forms.

The other categories of *esse*, including the perfect stem and the future participle, are supplied by the PIE root **bʰuh₂-* 'be(come)', which is very well attested in the IE-languages (see *LIV*²: 98f). The root is variously interpreted and the identity of the laryngeal questioned: for example, Garnier (2010: 224) reconstructs **bʰuH-* and Weiss (2011: 426) **bʰuhₓ-*. The most conservative Greek and Vedic testimonies indicate that the root may have originally occurred exclusively in the zero-grade and that the e-grade forms (e.g. Ved. *bhávati* < transponat PIE **bʰéu̯h₂-e-ti*) may be later innovations.

The Latin *bā*-imperfect (< PIt. **-βā-*) originates from this root, and the *ā*-vocalism may be due to the effect of **h₂*. The Osc. 3pl. **fufans** has been interpreted as a past-tense form of a reduplicated perfect (i.e. a pluperfect), reflecting PIt. **fu-fā-* or **fu-βā-* (< PIE transponat **bʰu-bʰu̯eh₂-*); the reanalysis of the reduplicated syllable *fu-* as the root led to the *-fa-* being reinterpreted as a past-suffix (Meiser 1998: 197). However, the problem is that there is no secure indication that an e-grade form of this root ever existed in PIE (although it may have been analogically created at a later date, as in Old Indic and Greek); in any case, an o-grade or a zero-grade root would be the expected grade in a reduplicated perfect, i.e. PIE transponat **bʰu-bʰu̯oh₂-/bʰu-bʰuh₂-* > PIt. ***fu-βō-/fu-βū-*. Thus, **fufans** would rather be an imperfect

[102] For Tocharian cognate formations, see Hackstein 1995: 167f.
[103] See Hoffmann 1968: 246 n. 4; Jasanoff 1991; Meiser 1993: 181f; Christol 2005; as well as Meiser 1993: 167 n. 1 for more references.
[104] Or, with Schrijver (2016), a Proto-Italo-Celtic innovation.

(cognate with the Latin *bā*-imperfect) or an *ā*-subjunctive of a perfect (possibly reflecting a corresponding Proto-Italic formation) (cf. Wallace 2007: 28, 30).[105]

Due to regular sound changes, the root appears in Latin as synchronic morphophonological variants in the form of *fŭ̄-*, or as *fŏ-* before *r*.

The perfect stem of *esse* is OLat. *fū-* > CLat. *fŭ-*, where the short vowel is due to regular hiatus shortening (all perfect endings begin with a vowel). The OLat. long vowel is implied by metric evidence, e.g., *fūī* (Enn. *Ann.* 525). The stem is based on the PIE root aorist, which – quite exceptionally – occurred only in the zero-grade, as evidenced by Gr. ἔφῡ : ἔφῡσαν and Ved. *ábhūt* : *ábhūvan* (cf. *LIV*²: 98–99; Meiser 2003: 201). In Sabellic, a reduplicated perfect (Osc. **fufens**, PreS. fʋfƑo(n)δ; also cf. Gr.(Hom.) πεφύᾱσιν) was continued as the neo-perfect stem. The Latin neo-perfect is a direct continuation of the PIE and PIt. zero-grade root aorist, to which the regular perfect endings are added; the perfect inflection of *esse* is perfectly regular.

Latin also has a number of present stem formations built to the stem *fŭ̄-*. These are archaic (mostly attested in Old Latin) and of archaizing stylistic value, and all are eventually lost or renovated by parallel or innovative forms built to the stem *es-/s-*, which, by Classical Latin is generalised as the present stem morpheme of *esse*.

The prs.sbj./preventive *fuam, fuās, fuat, fuant* (< **fŭ̄-ā-m,* etc.) is relatively well attested in Plautus and Terence, and two times as archaisms in Classical Latin poetry.[106] In the archaic comedies, it is mostly limited to prohibitions (*nē fuās*). This formation reflects the PIt. preventive (see Ch. 2.1.2.), which has its origins in the root aorist injunctive (*LIV*²: 98–99), or, alternatively, it may be an Italic *ā*-subjunctive of more recent date (cf. Meiser 1998: 184). In Classical Latin, prohibitions are expressed with the pf.sbj. (*nē fuerīs*), and in other prs.sbj. functions the paradigm of *sim, sīs*, etc. (see above) is used. As a part of the harmonising effort of the Latin verb system, *fuam* etc. were thus considered superfluous and they eventually fell out of use.

A demonstrably ancient formation is the ipf.sbj. *forem, forēs*, etc. This is of PIt. pedigree, evidenced by the Osc. cognate **fusíd** ≡ Lat. *foret* (Meiser 1998: 201–202), and it is built to the zero-grade root **bʰuh₂-* with the Italic subjunctive suffix **-sē-* and secondary endings, whence regularly PIE transponat **bʰuh₂-sē-t* > PIt. **fū-sē-d* > Osc. **fusíd**. But the Lat. *f<u>o</u>ret* < **f<u>ŭ</u>-sē-t* must reflect a proto-form with a short root vowel (the lowering *u* > *o* /_*r* is possible only with a short vowel). Several explanations have been proposed to account for this discrepancy. As pointed out above, Meiser (1998: 197) suggests that *fŭ-* originates from a reduplication syllable, which was abstracted and generalised from PIt. reduplicated forms and then re-interpreted and reused as a tense stem. Weiss (2011: 427) derives the short-vocalic variant *fŭ-* (occurring not only in *forem* but also in *fore* and *fŭtūrus*, for which see below) from a prevocalic form, where *fū-*V- > *fŭ-*V- would be a regular sound change (Hiatus shortening, see Ch. 3.2.5.). This prevocalic stem would then have been generalised also in preconsonantal position. The problem is that hiatus shortening is a relatively late sound change (occurring approximately during the third century BC), and certainly postdates rhotacism, which, in turn, is a precondition for *u* > *o* /_*r*. And since the formation existed already in Proto-Italic, the remodelling **fūrēt* → **fŭrēt* >

[105] However, Gerhard Meiser (p.c.) points out that a subjunctive is on syntactic grounds unplausible.

[106] *Quod aliis cibus est aliis fuat acre venenum* (Lucr. 4, 637) 'what is food for some, would be bitter venom for others', *Tros Rutulusne fuat, nullo discrimine habebo* (Verg. *Aen.* 10, 108) 'whether it is the Trojan or the Rutulian [cause], I shall not make a distinction'.

foret would have been relatively recent.[107] Whatever the exact origin was, it is clear that in Latin the short-vocalic variant was generalised in all forms but the perfect (for which there is evidence for *fū-*). The *forem*-paradigm is relatively frequent in Old Latin (see, e.g., Neue 1897: 606f), but by the beginning of Silver Age Latin, at the latest, it has been replaced by *essem* as the Classical Latin ipf.sbj. (for example, Caesar does not use *forem* at all, and Cicero only extremely sparingly).

Finally, the root **b^{h}uh$_{2}$-* appears also in the fut.ptc. *fŭtūrus* and the fut.inf. *fore* (which in Classical Latin often occurs for the regular paradigmatic *futūrum esse*). The origin of the fut.ptc. morpheme *-tūrus* is somewhat problematic, and the short vowel of the stem *fŭ-* is here as difficult to explain as in *forem*-forms above. The fut.inf. *fore* is formed with the regular Latin infinitive ending *-re* (< **-si*) attached directly to the generalised short-vocalic stem.

As for the development of ablaut alternations, those forms of the paradigm of *esse* that originate from the PIE root **b^{h}uh$_{2}$-* hardly provide any relevant evidence. This is due to the fact that the root itself was probably lacking the familiar e-grade vs. zero-grade alternation already back in PIE. Additionally, most of the Latin formations are of secondary or innovative nature, and are thus unlikely candidates for preservation or loss of inherited alternations.

2.3.4.2. *īre*

The verb *īre* (*eō*, *iī*, *itus*) ‘to go’ originates from the PIE root **h$_{1}$ei̯-* ‘to go’, which is very well attested in the IE languages (see *LIV*²: 232f). Synchronically, *īre* is one of the very few Latin irregular verbs that do not belong to any conjugation. Some forms (such as the present indicative paradigm) appear to be suppletive: there is stem alternation between *ĕ-*, *ĭ-* and *ī-*. This, however, is mostly due to an effect of regular sound change, and seldom reflects any inherited PIE morphophonological alternations. Nonetheless, although the paradigm of *īre* is certainly built out of very archaic PIE elements, most forms have undergone some kind of analogical modification; unlike the cognate verbs in Old Indic and Greek, only a handful of the forms of *īre* (most notably present indicative 2sg. *īs* and 3sg. *it*) are direct, regular continuations of the inherited forms.

Synchronically, the present stem paradigm of *īre* exhibits certain similarities with the third conjugation in some forms and with the first two conjugations in others, while the occasional *ī*-vocalism is reminiscent of the fourth. The Classical Latin present stem forms are shown in Table 16 (cf. Sjöstrand 2014[1953]: 116):

[107] A possible alternative scenario is to take the inf. *fore* as the starting point, from which *forem*, etc. are derived by analogy. As for *fore* itself: its use as a grammaticalized auxiliary and as copula subjected it to occasional enclitisation, whereby original **fū-si* > **fŭ-si* by “Kürzung durch Tonanschluss” (Weiss 2011: 128), like **k^{w}am-sei̯* > **quāsī* > *quăsĭ*, and finally > *fore*. One can also invoke an *allegro*-shortening, due to the assumedly high frequency of these forms.

	prs.ind.	ipf.ind.	fut.	prs.sbj.	ipf.sbj.	imp.
1sg.	*eō*	*ībam*	*ībō*	*ĕam*	*īrem*	-
2sg.	*īs*	*ībās*	*ībis*	*ĕās*	*īrēs*	*ī*
3sg.	*ĭt*, OLat. *īt*	*ībat*	*ībit*	*ĕat*	*īret*	*ītō*
1pl.	*īmus*	*ībāmus*	*ībimus*	*ĕāmus*	*īrēmus*	-
2pl.	*ītis*	*ībātis*	*ībitis*	*ĕātis*	*īrētis*	*īte*
3pl.	*eunt*	*ībant*	*ībunt*	*ĕant*	*īrent*	*euntō*

Table 16: Present stem forms of *īre*.

The ultimate origin of these forms, the PIE root **h₁e̯i-*, had a simple athematic root present, characterized by an e-grade strong stem in ind.act.sg. and sbj., and a zero-grade weak stem in all other ind. forms and in other moods. Of the PIE present forms, only the present indicative is directly continued in Latin – other forms are either lost or replaced by innovative formations. The PIE and Latin forms are shown in Table 17 with the Old Indic and Greek cognates:

	PIE	Latin	Vedic	Greek[108]
1sg.	**h₁éi̯-mi*	*eō*	*émi*	εἶμι
2sg.	**h₁éi̯-si*	*īs*	*éṣi*	εἶ
3sg.	**h₁éi̯-ti*	*īt* > *ĭt*	*éti*	εἶσι
1pl.	**h₁i-mós*	*īmus*	*imás(i)*	ἴμεν
2pl.	**h₁i-té(s)*	*ītis*	*ithá*	ἴτε
3pl.	**h₁i̯-énti*	*eunt*	*yánti*	ἴᾱσι, ἶσι

Table 17: PIE root present of the root **h₁e̯i-* and its Latin, Vedic and Greek reflexes.

Various forms of this verb are attested in the Sabellic languages. The present stem forms include imp.2sg. Umb. *ef* (< PIE transponat **h₁e̯i-dʰi*, with full-grade root; cf. Gr. ἴθι < PIE **h₁i-dʰi*), imp.2pl. Pael. *eite* (≡ Lat. *īte*), imp.3sg. Umb. **etu**, *etu*, *eetu* (≡ Lat. *ītō*), imp.3pl. Umb. **etuta**, **etutu** (cf. Lat. *euntō*), fut.3sg. Umb. *est*, *eest* (< **e̯i-s-et*). SPic. **enet** is probably a prs.3sg. with the prefix *en-* (< **en-e̯it*, cf. Lat. *init* of *inīre*) (*WOU*, s.v. *eite*).

As pointed out above, only two Latin forms (2sg. *īs* and 3sg. *īt*) are products of regular phonological development: they are first affected by the loss of unaccented **-i* before Proto-Italic, then by the monophthongisation of VOLat. *e̯i* into OLat. *ē̯*, and finally by the raising of OLat. *ē* into CLat. *ī*; the vowel of the 3sg. *īt* is also shortened into *ĭt*. Other forms of the paradigm deserve closer examination:

1sg. *ĕō* has replaced the inherited athematic ending **-m(i)* with the regular thematic **-ō*. Otherwise the form is phonologically regular, thus **h₁éi̯-mi* > **e̯i-m(i)* → **e̯i-ō* > *eō*. Dunkel (1998: 97) interprets 1sg. **e̯iō* and 3pl. **e̯iont* (see below) as continuations of PIE subjunctive

[108] In Greek, these forms have (secondarily) developed a future function, while the actual present forms are supplied by ἔρχομαι.

forms, which found their way into the indicative paradigm. But why were only 1sg. and 3pl. forms affected?

1pl. *īmus* and 2pl. *ītis* have replaced their inherited zero-grade by the e-grade imported from the singular forms (Meiser 1998: 222): such paradigmatic levelling, i.e. the extension of the e-grade stem from more frequent/less marked forms (here the singular) into less frequent/more marked forms (1pl., 2pl.), is perfectly natural and requires no further comment. Thus, coupled with regular sound change, **h₁i-mós* > **ǐ-mos* → **e̯i-mos* > *īmus*, **h₁i-tés* > **ǐ-tes* → **e̯i-tes* > *ītis*. Note that the athematic inflection remains, i.e. no thematic vowel is inserted.

3pl. *eunt* is a result of thematisation and ablaut levelling, both rational and straightforward morphological modifications. Thus, **h₁i̯-énti* > **i̯-ent* → **e̯i-ont* > *eunt*. Thematisation itself *may* motivate the ablaut levelling (see below), but it may also be a case of trivial paradigmatic levelling, same as with *īmus* and *ītis* (in fact, it would not be implausible to presume that all plural forms underwent levelling at the same time). If this is so, then the levelling is very likely as old as Proto-Italic (considering that Sabellic has generalised the e-grade stem in all forms), and the replacement of the ending is a specific Latin development (cf. the development of PIt. **sent* → Lat. *sunt*).

There is strong pressure to generalise the e-grade stem variant **e̯i-* > *ē-* > *ī-* in the present stem. Judging from the comparative Latin and Sabellic evidence, this levelling – which goes entirely along the lines of the 1M1F principle – must have taken place in Proto-Italic. Other forms of the Latin present paradigm are innovations or renovations and show traits of regular inflection:

Imperfect indicative is the innovative Latin *bā*-imperfect, built to the e-grade root **e̯i-* (which by the time of creation of this formation had established itself as the prototypical form). Thus, regularly, **e̯i-βā-m* > *ībam*, etc. This formation renovated the inherited PIE imperfect/injunctive **(e-)h₁e̯i-m*, etc.

Future is also an innovative one, namely the Latin *b*-future that also appears in the first and second conjugations, and in Old Latin also in the fourth (Leumann 1977: 578). The basis is, again, the prototypical e-grade root: thus, regularly, **e̯i-β-ō* > *ībō*, etc. The Latin future generally continues the PIE subjunctive (as in *dūcēs*, *dūcet* < **do̯uk-ē-s(i)*, **do̯uk-ē-t(i)*), but in this case, regular phonological development of the subjunctive paradigm (with e-grade root and thematic vowel) would result in a formal overlap with the thematised forms (1sg. *eō* and 3pl. *eunt* in particular). Avoiding this confusion probably motivated the introduction of the innovative future forms.

Present subjunctive is the innovative Italic *ā*-subjunctive, which replaces the inherited optative forms in the regular inflection of the second, third and fourth conjugations. Here, the prototypical e-grade root serves as the base: thus, **e̯i-ā-m* > *eam*, etc. All other old athematic verbs in Latin preserved the inherited athematic *ī*-subjunctive (PIE **-i̯eh₁-/-ih₁-*optative); a regular continuation of this formation would have resulted in forms such as 1sg. **i-i̯eh₁-m* > **i̯i̯ēm* > ˣ*iem*, 1pl. **i̯-ih₁-me* → **i̯īmos* > ˣ*īmus* (cf. OLat. *siem*, *sīmus*), partially overlapping the present indicative forms – a probable factor motivating their renovation.

Imperfect subjunctive is the perfectly regular Latin *sē*-subjunctive, built to the e-grade root: thus, **e̯i-sē-m* > *īrem*, etc.

The imp.2sg. *ī* is synchronically regular: Latin 2sg. imperatives are regularly formed of the bare present stem (with *-e* extension in the third conjugation). Gr. ἴθι and Ved. *ihí* reflect

the original PIE athematic imperative with zero-grade root and the ending *-*dʰi*. Umb. *ef* preserves the athematic ending but reflects the e-grade root. Other Latin imperative forms are regular and require no special comment.

The prs.inf. *īre* is also regular, built to the e-grade root: thus, **eḭ-s-i* > *īre*.

It is not at all surprising that once the e-grade stem variant **eḭ-* was generalised for the present stem in Proto-Italic, this stem was then used as a basis for the levelling of the paradigm on the one hand, and for the creation of the innovative forms on the other.

The Classical Latin perfect forms are regularly built to the perfect stem *ĭ-*: thus, *iī*, *iistī* (*īstī*), *iit* (*īt*), *iimus*, *iistis*, *iērunt*.[109] The stem *īv-* (*īvī*, *īvistī*, etc.) also occurs already since Plautus, but it is very rare and definitely secondary (Sihler 1995: 542; Meiser 1998: 222–223; cf. Weiss 2011: 429).[110] The standard form *iī* does not have any overt marker for the perfect stem. In Sabellic, one perfect stem form is attested: Umb. fut.pf.3sg. *iust*, which is composed of the stem *i-*, the regular Umb. (< PIt.) fut.pf. marker *-us-* and the person ending; forms of the PIE root **bʰuh₂-* > PIt. *fŭ-* were also used as suppletive perfect forms for this verb (*OUW*, s.v. *eite*). The perfect (or aorist?) stem **i-* probably existed already in Proto-Italic. The history of the stem is in many ways problematic (the only plausible origin must be the PIE root **hₓeḭ-*), since this root did not have aorist and perfect formations in PIE (Sommer 1914: 567; *LIV*²: 232–233). In fact, this root shows suppletive character in many IE languages (e.g. for Greek, see Kölligan 2007: 134f). Four hypotheses can be proposed:

It is possible to derive the stem from purely Latin elements, i.e. from the e- or zero-grade root, the former of which was – as argued above – established early on as the standard present stem. The zero-grade also occurs in the present participle *i-ēns*, the PPP *i-tum* and nominal derivatives such as *i-ter*. This, however, should be our last resort, after all other possibilities (including inheritance from previous language stages) have been shown to be inconclusive. Additionally, such markerless perfect stems are by no means productive in the history of Latin: an innovative formation would very likely have utilized the productive *v*-perfect (resulting, precisely, in the attested *īvī*-perfect). To my knowledge, no scholar has thus far proposed that *iī* would be an entirely novel innovation within Latin.

Brugmann (1912: 102-103) connects *iī* to the Ved. cognate pf. 3sg. *iy-āy-a*, 3pl. *īy-uḥ* (with "Attic reduplication", cf. Gr. ὄλωλα from ὄλλυμι): a proto-form **iḭ-aḭ* would match the Ved. strong stem stem, **īḭ-aḭ* the weak stem. But this explanation is difficult on phonological grounds, and the exact origin of the Latin and Vedic forms would still remain unknown. However, since PIE did not have a perfect formation for this root (Ved. *iyāya* is demonstrably secondary, see Kümmel 2000: 100, 614), there is no necessity to take a PIE formation as a basis.

A proposal by Sommer (1914: 567, 589), who disagrees with Brugmann, takes the full grade form **(hₓ)eḭ-* as the starting point, with the following proto-paradigm: **eḭ-aḭ*, **eḭ-istaḭ*, **eḭ-eḭt*, etc. After *ḭ*-loss and vowel weakening, 1sg. results first into **eeḭ* and is then assimilated

[109] The contracted forms are phonologically trivial and can as such be derived from the forms with *ii-*, but they may also be results of regular morphological and phonological development (see below). Note that since each perfect ending begins with a vowel, it is not possible to derive the original length of the perfect stem vowel by internal reconstruction: hiatus shortening causes vowel quantity of the stem to submerge. The assumed long vowels in *īerō* (Plaut. *Capt.* 194) and *īerant* (Ter. *Ad.* 27) are not reliable sources for the quantity (Sommer 1914: 567).

[110] I would analyse this as the productive Lat. *v*-perfect, built regularly to the (e-grade) present stem, perhaps by such analogy as *amā-re* : *amā-vī* :: *ī-re* : X, where X = *ī-vī*. Thus, the long *ī* there does not count as evidence for the quantity of the stem vowel in *iī*.

[sic!] into *iī*, like *mihī* from *mehei*. Regular contraction and vowel change in 2sg. and 3sg. yields **e̯istae̯ > īstī* and **e̯it > īt*, respectively (i.e. the attested "contracted" forms). But **e̯istai* and **e̯it* are also recharacterized by an additional *e-* from the prs.ind.1sg. *eō* into **eee̯istee̯* and **eee̯it*, which are then treated in the same way as 1sg. **eee̯ > iī*, resulting in *iīstī* and *iīt*. As for this explanation, several problems arise. First, the origin of the e-grade form **(h₁)e̯e̯-* as a perfect stem remains unclear. Second, the explanation involves *ad hoc* sound changes, such as the **e…e̯e̯ > *i…ī* assimilation. Third, it also involves unlikely analogical modifications (why would the *e-* of the prs.1sg. be a relevant model for the recharacterisation of the perfect stem?).

More recently, Meiser (1998: 222–223; 2003: 217–218; accepted in *LIV*²: 233, but not in Weiss 2011: 429 n. 20) derives *iī* from a post-PIE reduplicated perfect in the following way (I have slightly modified Meiser's original notation to match the conventions of this work): the starting point is the pre-PIt. paradigm (of which I only mention the 3sg. and 1pl. forms for the sake of brevity) **h₁i-h₁oe̯-ee̯ > *i̯oe̯ee̯ > *i̯o'e̯e̯*, **h₁i-h₁i-me > *īme*. With assumed contractions in the singular forms, the PIt. forms are **i̯ee̯*, **īmos*. Finally, the regular Latin perfect endings attached, yielding **i̯ee̯ → *iē-t > iĭt*, **īmos > *īmus* (which is not attested)[111] → *iimus*. According to Meiser, the epigraphically attested OLat. forms interieisti (*CIL* I² 1603, first century BC, CLat. *interiistī*), redieit (*CIL* I² 626, CLat. *rediit*), and ADIESE ADIESET ADIESENT (*SCdB*, CLat. *adiisse*, *adiisset*, *adiissent*), where <EI> and <E> stand for *ē*, are testimonies of the intermediate stages (e.g. **h₁i-h₁oe̯-ee̯(-t) > *(red-)i-ēt* = redieit).[112]

To start with, Meiser's theory is based on entirely plausible assumptions: the PIE absence of other than present stem forms for this root was most likely somehow compensated in early Proto-Italic, and a regularly formed innovation, i.e. a reduplicated perfect – at a time when ablaut alternations were still a part of the grammar – would certainly fill this need adequately (i.e. the theory has a rational motivation). Most attested forms can be directly derived from this schema, and others, most importantly the "uncontracted" forms such as *iistī*, *iit* and *iimus*, can then be explained as secondary regularisations, once the paradigm (and the perfect stem *ĭ̄-*) was established. This means that Proto-Italic still had ablaut-induced stem alternations, e.g. 1sg. **i̯i̯-ae̯* : 1pl. **ī-mos*.

The Umbrian evidence indicates that forms of the paradigm of PIt. **fŭ̄-* 'to be(come)' were also involved in a suppletive relation: **fŭ̄-* was most likely associated with **e̯i̯-/i-* as the missing perfect stem. This makes sense semantically ("I have come [here], therefore I am [here]"). In Latin, the suppletion was abandoned and the neo-aorist was adopted as the Lat. neo-perfect stem, while Sabellic retained (at least traces of) this Proto-Italic suppletive relation.

After these considerations, we are now in a position to reconstruct a fragment of the Proto-Italic paradigm of the verb 'to go' (Table 18).

[111] The non-attestation of **īmus* may be a historical accident; the form itself is in any sense plausible and expected.
[112] The problem, of course, is that OLat. orthography was never quite consistent: *ĭ*, *ī*, *ē*, *ē̆* are all occasionally written <I, EI, E>, meaning that, for OLat. -IEI-, /ĭē̆/ is only one possible reading, but still the most probable one.

	Prs.ind.	Pf.ind. (1)	Pf.ind. (2)
1sg.	**eḭ-ō*	**iḭ-aḭ*	**fū-aḭ*
2sg.	**eḭ-s*	**iḭ-(i)staḭ*	**fū-istaḭ*
3sg.	**eḭ-t*	**iḭ-eḭ(t)*	**fū-eḭ(t)*
1pl.	**eḭ-mos*	**ī-mos*	**fū-(i)mos*
3pl.	**eḭ-ont*	**i(ḭ)-ēri*	**fū-ēri*

Table 18: Present and perfect formations of PIt. **eḭ-*.

The present participle *iēns*, *euntis* deserves closer examination, since the stem forms are neither synchronically regular nor diachronically straightforward to explain. The PIE present participle of simple athematic verbs had hysterokinetic inflection: R(Ø)-S(é)-E(Ø) in the strong stem, R(Ø)-S(Ø)-E(é) in the weak stem; the suffix was **-ent-/-nt-* (cf. Sihler 1995: 615; Tichy 2006: 108).[113] Synchronically, Latin present participles are always built to the present stem – historically, this may be whatever grade was generalised in the present stem. For a high-frequency verb we would expect a regular phonological continuation of the PIE forms. We may analyse the history of the Latin stem forms as follows:

The nominative form *iēns* can be derived from an immediate preform **ī-ĕnt-s* by internal reconstruction, of which it is a regular continuation: the root vowel may have been short or long (by way of hiatus shortening it would have been shortened in any case), and the long vowel in the suffix arises from NS-lengthening after the stop was lost and consequently has nothing to do with PIE ablaut. The root *i-* could possibly represent either the e-grade form **(hₗ)eḭ-* or the zero-grade form **(hₗ)i-*; but considering that the former would lead to a dispreferred *ee*-sequence (cf. Weiss 2011 429; and see below), i.e. **hₗeḭ-ent-s* > **eḭents* > **eents*, I incline to interpret it as a zero-grade. This implies morphophonological continuity, as a PIE zero-grade root is expected for this particular verb (cf. direct cognates Gr. ἰών, Ved. *yánt-*). For the present stem, however, it has already been shown that the e-grade was generalised relatively early – but the preservation of an inherited archaic feature in a form of a high-frequency basic verb is a plausible working hypothesis. The suffix, then, is both a direct continuity of the strong stem e-grade form and the regular, productive Latin present participle suffix – this, in turn, results in a discrepancy with the cognate Greek form, as the two cannot be derived from a single proto-form (but note that -ων, -οντ- is the regular Greek participle suffix). I suggest that *iēns* is actually a continuation of the inherited athematic present participle with zero-grade root and e-grade strong stem, the latter of which happens to coincide with the productive Latin present participle. The Greek form ἰών has been renovated with the suffix that became the productive one in that language.

The oblique stem *eunt-* seems to be built out of the e-grade root and the o-grade suffix: thus, e.g., acc.sg.m. **(hₗ)eḭ-ont-m̥* > **eḭontem* > *euntem*. This form is, in fact, a complete morphological match with the Greek *thematic* present participle, e.g. acc.sg.m. φέρ-οντ-α < **bʰer-ont-m̥*, but not with the actual cognate form of this verb, i.e. ἰ-όντ-α < **hₗi-ont-m̥*. In any

[113] In PIE, other verb classes had different accent/ablaut paradigms for the participle, as evidenced by such Greek comparanda as φέρ-ων, φέρ-οντ-ος and διδ-ούς, διδ-όντ-ος. The regular Latin suffix *-ēns*, *-ĕntis* reflects probably a zero-grade form or a paradigm with e-vocalism (Weiss 2011: 436).

case, as mentioned above, an e-grade suffix would be expected for a simple athematic verb, meaning that the matching o-grade of the Latin and Greek forms may be a coincidence. There are several avenues of explanation available to account for the participles in both languages. First, the introduction of the e-grade root in the Latin participle is expected (cf. above). Second, the o-grade of the Greek suffix is most likely secondary, i.e. imported from other formations (o-grade seems to have been generalised in Greek). Third, the o-grade of the Latin suffix (which is elsewhere attested only in the residual adjective *sōns*, *sontis* 'guilty' ← *esse*) can be explained away by several *ad hoc* assumptions. If the e-grade was indeed original, the o-vocalism must be secondary, perhaps imported by analogy from the 3pl.: e.g. *habent* : *habent-em* :: *eunt* : X, where X = *eunt-em* (cf. Weiss 2011: 429) – but this is a weak analogy, although it works for the first and second conjugation verbs and possibly for *sōns* (VOLat. *sont* : *sont-em*) as well. As pointed out by Weiss (2011: 429), a regular formation **(h₁)e̯i̯-ent-m̥* would result into **e̯i̯entem* > ˣ*eentem*, which would include a phonotactically dispreferred *ee*-sequence (cf. voc.sg. *deus* 'god' instead of regular ˣ*dee*). If, however, the o-grade was original, the stem *eunt-* would (along with *sōns*) count as a relic of an otherwise lost paradigm.

The PPP *ĭtus* is a regular continuation of the PIE *to*-participle with zero-grade root: thus, regularly, **h₁i-tó-* > **ĭto-* > *ĭtus*. The zero-grade is also attested in various nominal derivations of the root (which often are in a morphophonological relation to the PPP), e.g. *exĭtus*, *-ūs* 'departure' and *ĭter*, *ĭtineris* 'journey'. The adverb *simītū* < **sem(i)-e̯i̯-tūd* 'at one go' may reflect an archaic e-grade (Weiss 2011: 429), but it can also be explained in another way and need not concern us here.

2.3.4.3. *Velle*, *nōlle*, *mālle*

The paradigm of *velle* 'to want' (and of its derivatives *nōlle* 'to want not' and *mālle* 'to prefer') shows remarkable irregularities in the synchronic grammar, most of which are due to regular sound changes. The source of this verb is the relatively well attested PIE root **u̯elh₁-* 'to choose' (*LIV*²: 677–678).[114] The root-final laryngeal is required by the Indo-Iranian and Greek comparanda, but it was apparently lost early in the Western languages (Harðarson 1993: 84–86). Following Meiser (1998: 224) and Weiss (2011: 430), I will leave the laryngeal out of the reconstructions in the following analysis, since its reconstruction is not required for the Latin reflexes.

The Classical Latin present stem paradigm of these verbs is shown in Table 19 (cf. Sjöstrand 2014[1953]: 120–121):

[114] The semantic development from 'choosing' to 'wishing' and 'wanting' is not problematic and will not be discussed here.

velle	**prs.ind.**	**ipf.ind.**	**fut.**	**prs.sbj.**	**ipf.sbj.**	**imp.**
1sg.	*vŏlō*	*vŏlēbam*	*vŏlam*	*vĕlim*	*vĕllem*	-
2sg.	*vīs*	*vŏlēbās*	*vŏlēs*	*vĕlīs*	*vĕllēs*	-
3sg.	*vŭlt*	*vŏlēbat*	*vŏlet*	*vĕlit*	*vĕllet*	-
1pl.	*vŏlŭmus*	*vŏlēbāmus*	*vŏlēmus*	*vĕlīmus*	*vĕllēmus*	-
2pl.	*vŭltis*	*vŏlēbātis*	*vŏlētis*	*vĕlītis*	*vĕllētis*	-
3pl.	*vŏlunt*	*vŏlēbant*	*vŏlent*	*vĕlint*	*vĕllent*	-
nōlle	**prs.ind.**	**ipf.ind.**	**fut.**	**prs.sbj.**	**ipf.sbj.**	**imp.**
1sg.	*nōlō*	*nōlēbam*	*nōlam*	*nōlim*	*nōllem*	-
2sg.	*nōn vīs*	*nōlēbās*	*nōlēs*	*nōlīs*	*nōllēs*	*nōlī*
3sg.	*nōn vŭlt*	*nōlēbat*	*nōlet*	*nōlit*	*nōllet*	*nōlītō*
1pl.	*nōlŭmus*	*nōlēbāmus*	*nōlēmus*	*nōlīmus*	*nōllēmus*	-
2pl.	*nōn vŭltis*	*nōlēbātis*	*nōlētis*	*nōlītis*	*nōllētis*	*nōlīte*
3pl.	*nōlŭnt*	*nōlēbant*	*nōlent*	*nōlint*	*nōllent*	*nōluntō*
mālle	**prs.ind.**	**ipf.ind.**	**fut.**	**prs.sbj.**	**ipf.sbj.**	**imp.**
1sg.	*mālō*	*mālēbam*	*mālam*	*mālim*	*māllem*	-
2sg.	*māvīs*	*mālēbās*	*mālēs*	*mālīs*	*māllēs*	-
3sg.	*māvŭlt*	*mālēbat*	*mālet*	*mālit*	*mallet*	-
1pl.	*mālŭmus*	*mālēbāmus*	*mālēmus*	*mālīmus*	*māllēmus*	-
2pl.	*māvŭltis*	*mālēbātis*	*mālētis*	*mālītis*	*māllētis*	-
3pl.	*mālunt*	*mālēbant*	*mālent*	*mālint*	*māllent*	-

Table 19: Present stem forms of *velle*, *nōlle* and *mālle*.

As these forms already indicate, the basis for the inflection is the simplex *velle*, of which the other two are compounds: *nōlle* < **ne-velle*, *mālle* < **mag(i)s-velle*.

The root **u̯el-* had a Narten present with ē-grade in the strong stem and e-grade in the weak stem.[115] This is best evidenced by the Gothic indicative forms, which reflect the inherited PIE optative; thus, 2sg. *wileis* < **u̯él-ih₁-s*, 1pl. *wileima* < **u̯él-ih₁-me*, etc. (cf. Weiss 2011: 430). The Latin present stem forms are ultimately based on this PIE Narten formation, which is shown in Table 20:

[115] Garnier (2010: 299) provides an entirely different interpretation: he derives the present forms of *velle* from a PIE root aorist subjunctive paradigm furnished with primary endings. The root aorist is indeed attested in Vedic and Avestan for this root (see *LIV*²: 677–678), and the Gothic case is clear evidence that modal forms can end up as indicative forms (especially in a verb, whose meaning is inherently modal).

1sg.	**u̯ḗl-mi*	1pl.	**u̯ĕl-mes*
2sg.	**u̯ḗl-si*	2pl.	**u̯ĕl-te(s)*
3sg.	**u̯ḗl-ti*	3pl.	**u̯ĕl-n̥ti*

Table 20: PIE Narten present of **u̯el(h₁)-*.

This verb is scarcely attested in Sabellic, since the basic verb 'to want' is provided by the PIE root **g^{h}er-* 'to desire', e.g. Umb. **heri**, Osc. **heriiad** (*WOU*, s.v. *heriiad*). Umb. fut.imp.2sg. *veltu* (< PIt. **u̯el(e)-tōd*) is the best trace of PIt. **u̯el-* in Sabellic. (*WOU*, s.v. *veltu*). Of the inherited Latin forms, only 3sg. and 2pl. show entirely regular phonological development, while other forms are modified with typical morphological adjustments. The examination of the individual forms can begin from the attested Latin forms:

1sg. *vŏlō* is from an earlier **u̯ĕłō* (vowel colouring due to *l pinguis*). That form, in turn, results from the thematisation of **u̯ēl-n̥*: apparently, the thematisation has had effect not only on the ending itself but also on the ablaut grade of the root (i.e. not **u̯ēl-ō*). Latin verb morphology abounds in examples of e-grade roots of thematised and otherwise unmarked verb formations (regardless of the original grade of the inherited formation), e.g. *eō* < **ei̯-ō* < **h₁éi̯-mi*, *edō* < **h₁ḗd-mi* (see below), *ferō* < **b^{h}ér-o-h₂(e)*, etc. – similarly **u̯ḗl-m(i)* → **u̯ĕl-ō*. The only Proto-Italic trace of the athematic 1sg. ending is **esom* (see above), which, however, is already partly thematised even there; we would thus not expect that the athematic ending would have survived in **u̯el-* that far. The conclusion is that the thematisation of **u̯ēl-n̥* into **u̯ĕl-ō* must have taken place before Proto-Italic, since it shows the attraction towards an e-grade root (signalling a partial abandonment of the Narten ablaut pattern), and it is paralleled by a similar early thematisation of **ei̯-* (i.e. **ei̯-m* → **ei̯-ō* already by Proto-Italic, as argued above) and of **ed-* 'to eat' (i.e. **(h₁)ḗd-m(i)* → **ed-ō*, see below).

2sg. *vīs* is very likely not from the root **u̯el(h₁)-* at all, but supplanted from another root of related meaning, i.e. PIE **u̯ei̯h₁-* 'to pursue': hence, PIE **u̯ei̯h₁-si* > PIt. **u̯ei̯s* > *vīs*. This root is also attested in the adjective *in-vī-tus* 'unwilling' (Meiser 1998: 224). The inherited form **u̯ēl-s* was early grammaticalised, resulting in the conjunction *vĕl* 'or': **u̯ēl-s* was first assimilated into **u̯ēll*, then degeminated and the vowel shortened in a proclitic context, as in *sēd* > *sĕd* (Hackstein 2011: 197). As an alternative interpretation, Cowgill (1978) argues that *vīs* originates from a recharacterized form of **u̯ell*: thus, **u̯ell-s* > **u̯ei̯s* > *vīs*, but I fail to see how this recharacterisation (which in itself is, of course, an entirely plausible assumption) would regularly result in the attested form.

3sg. *vult* is a product of regular phonological development from PIE **u̯ḗl-ti*, first via Osthoff's Law (Ch. 3.1.4.) and *i*-loss into PIt. **u̯ĕlt*, then into **u̯ołt* because of the adjacent *l pinguis*, and finally into *vult* (Ch. 3.2.7.).

1pl. *volumus* cannot be a regular reflex of a bisyllabic PIE **u̯él-mos*. Rather, the medial syllable results from thematisation, thus PIE **u̯él-mos* → PIt. **u̯el-o-mos* > **u̯elumos* (via vowel weakening, see Ch. 3.2.3. and Appendix II)[116] > *volumus* (where *e* > *o* in the first syllable is due to *l pinguis*). The thematisation of this form probably predates Proto-Italic, as in 1sg.

[116] I argue that this is the regular outcome of a reduced medial vowel in a labial environment (i.e. before the 1pl. ending *-mus*). The regular thematic (third conjugation) *-imus* must be analogical from *-is*, *-it* and *-itis*.

2pl. *vultis* appears to be regular from PIE **u̯él-tes*, with root vocalism altered due to *l pinguis*. Note that this form is not thematised. There is the possibility that it was indeed thematised, along with 1sg. **u̯el-ō* and 1pl. **u̯el-o-mos*, into **u̯el-e-tes*, and this form syncopated later into **u̯el-tes* again. However, I don't think this assumption is necessary, even though it would fit the pattern that all plural forms were thematised in one fell swoop.

3pl. *volunt* is – same as every 3pl. form in Latin – a thematized renovation of the inherited athematic form, thus PIE **u̯él-n̥ti* → PIt.(?) **u̯el-ont* > Lat. *volunt* (with *l pinguis* -induced vowel colouring). It is likely (though difficult to prove) that this thematisation also took place before Proto-Italic.

The Proto-Italic present paradigm (provided that 2sg. was at that time not yet suppletive) can be reconstructed as follows: 1sg. **u̯ĕl-ō*, 2sg. **u̯ēl-s*, 3sg. **u̯ĕl-t*, 1pl. **u̯ĕl-o-mos*, 2pl. **u̯ĕl-tes*, 3pl. **u̯ĕl-ont*.

The imperfect *vŏlēbam* etc. and the future *vŏlam*, *vŏlēs* etc. are formed like regular third conjugation forms. They are of course no inherited forms from PIE, but are nonetheless relatively ancient, probably going back to such Proto-Italic formations as **u̯el-ē-βā-m*, **u̯el-ā-m*, **u̯el-ē-s*, etc. (and the Latin forms are regular phonological continuations). The *o*-vocalism in Latin is due to the familiar colouring caused by the *l pinguis*. The present subjunctive continues the old PIE athematic optative, which, in case of a Narten formation, takes the root in the e-grade and the suffix in the zero-grade, thus: **u̯ĕl-ih₁-m* > **u̯ĕlīm* > *vĕlim*, **u̯ĕl-ih₁-s* > *vĕlīs*, **u̯ĕl-ih₁-t* > **u̯ĕlīt* > *vĕlit*, **u̯ĕl-ih₁-me* → **u̯ĕlīmos* > *vĕlīmus*, **u̯ĕl-ih₁-te* → **u̯ĕlītes* > *vĕlītis*, **u̯ĕl-ih₁-nt* > **u̯ĕlīnt* > *vĕlint*. Due to the *i*-vocalism of the optative suffix, the root contains an *l exilis*, and hence the *e*-vocalism of the root is preserved. The imperfect subjunctive *vĕllem* etc. and the infinitive *vĕlle* are formed by suffixing the e-grade root with **-sē-* or **-si*, respectively, which assimilate to the root and result in the attested forms by otherwise regular sound changes (again, the long *-ll-* is an *l exilis* and the root vocalism does not change). As was the case with *īre* (PIt. **e̯i-*), the e-grade root serves as the basis for all innovative and productive formations. Note, however, that due to the Narten conjugation of **u̯ēl-/u̯ĕl-*, the generalisation of the e-grade root is relationally different than in the case of **h₁e̯i-*, which had a normal athematic present: structurally, the e-grade of **u̯el-* is commensurate with the zero-grade of **h₁e̯i-*.

Velle and its compounds *nōlle* and *mālle* exhibit regular (and innovative) *u*-perfects, i.e. *voluī*, *nōluī*, *māluī*. In other forms the verbs are defective.

The verbs *nōlle* and *mālle* are relatively recent compounds of the simplex *velle*. Their conjugation is for the most part precisely identical with the simplex.

Nōlle is an univerbation of the phrase **nĕ̆ u̯elō* 'I don't want', thus regularly 1sg. **neu̯elō* > **nou̯olō* > **noolō* > *nōlō*; similarly *nōlumus*, *nōlunt*, *nōlēbam* (etc.) and *nōlam* (etc.). The vocalism of *nōlim* (etc.), *nōllem* (etc.), and *nōlle* (all from **nou̯el-* with *l exilis*) is probably analogical, once the stem *nōl-* was generalised from those forms where the vocalism developed regularly. The forms of 2sg. *nōn vīs*, 3sg. *nōn vult* and 2pl. *nōn vultis* do not univerbate.[117] Plautus still has *ne vīs* (*Curc.* 82) and *ne volt* (*Epid.* 42), indicating that the forms with *nōn* are very recent. The imperative *nōlī*, *nōlīte* is based on the subjunctive present (Meiser 1998: 224),

[117] The phonologically regular univerbated forms would probably have been **neu̯e̯is* > **nou̯e̯is* > ˣ*novīs*, **neu̯elt* > **nou̯olt* > **noolt* > ˣ*nōlt*, **neu̯eltes* > **nou̯oltis* > ˣ*nōltis*.

probably by such analogy as ind.2sg. *audīs* : imp.2sg. *audī!* :: ind.2sg. *nōlīs* : imp.2sg. X, where X = *nōlī!*.

Mālle is an univerbation of the phrase **magis u̯elō* 'I want more'. In order to arrive at the attested forms, we need to assume a slightly precarious syncope, thus: **magz-u̯elō* > *māvŏlō* (Plaut. *Asin.* 835) > *mālō* (already Plaut. *Persa* 602). Other forms follow suit. Finally, a stem *māl-* is extracted, into which all forms are built.

Nōlle and *mālle* do not provide any further evidence for the development of ablaut that was not already provided by the simplex *velle*.

2.3.4.4. *Ēsse* (*edere*)

The verb *ēsse/ĕdĕre* 'eat' (*ĕdō, ēdī, ēsus*) descends from the PIE root **hₗed-* (*LIV*²: 230–231), and its paradigm includes both regular forms of the third conjugation and some more archaic ones, which reflect the original PIE athematic present formation. The regular third conjugation present stem forms involve no difficulties: they reflect the PIE simple thematic type with full grade root, a common subclass of the Latin third conjugation, e.g. PIE transponat 3sg. **hₗéd-e-ti* > PIt. **edet* > Lat. *edit*, etc. As for the origin of the perfect stem *ēd-*, several proposals have been made. The PPP *ēsus* appears to have been recomposed with a full grade root, thus **hₗedˢ-tó-s* > **edˢ-to-* > **ēssos* > *ēsus* (see below).

The OLat./CLat. present stem active paradigm with alternative forms is shown in Table 21 (forms that are not standard third conjugation forms are in bold):[118]

	prs.ind.	**ipf.ind.**	**fut.**	**prs.sbj.**	**ipf.sbj.**	**imp.**
1sg.	*ĕdō*	*ĕdēbam*	*ĕdam*	*ĕdam,* ***ĕdĭm***	*ĕděrem,* ***ēssem***	-
2sg.	*ĕdis,* ***ēs***	*ĕdēbās*	*ĕdēs*	*ĕdās,* ***ĕdīs***	*ĕděrēs,* ***ēssēs***	*ĕdĕ,* ***ēs***
3sg.	*ĕdit,* ***ēst***	*ĕdēbat*	*ĕdet*	*ĕdat,* ***ĕdīt***	*ĕděret,* ***ēsset***	*ĕditō,* ***ēstō***
1pl.	*ĕdimus*	*ĕdēbāmus*	*ĕdēmus*	*ĕdāmus,* ***ĕdīmus***	*ĕděrēmus,* ***ēssēmus***	-
2pl.	*ĕditis,* ***ēstis***	*ĕdēbātis*	*ĕdētis*	*ĕdātis,* ***ĕdītis***	*ĕděrētis,* ***ēssētis***	*ĕdĭtĕ,* ***ēstĕ***
3pl.	*ĕdunt*	*ĕdēbant*	*ĕdent*	*ĕdant,* ***ĕdĭnt***	*ĕděrent,* ***ēssent***	*ĕduntō*

Table 21: Present stem active forms of *ēsse/edere.*

The non-standard forms are actually the original ones, and they occur exclusively in Old Latin and pre-Imperial Classical Latin: the parallel (regular) third conjugation forms are Imperial Latin regularisations, which ultimately oust the older forms (Weiss 2011: 431–432). In this section, we will examine the non-standard forms.

The PIE root **hₗed-* had a Narten present with ē-grade root in the strong stem and e-grade root in the weak stem.[119] Sabellic comparanda for this root are scarcely attested: we only have the Oscan inf. **edum** 'to eat' (a regular Oscan infinitive; can represent both /ēdum/ and /ĕdum/),

[118] Forms having *-ss-* or *-st-* cause the quantity of the preceding vowel to submerge, rendering metrical evidence useless. But there are also other kinds of evidence for the quantities, for which see Meiser 1998: 224; Weiss 2011: 431.

[119] See Kümmel 1998 and *LIV*²: 230, contra *EDLIL*, s.v. *edō, ēsse*.

and possibly an Umbrian derivative noun **ezariaf** ‘certain oblation’. The PIE, pre-Latin and Old Latin inflection is shown in Table 22:

	PIE	**Pre-Latin**	**Old Latin**
1sg.	**h₁éd-mi*	**ĕd-ō*	*ĕdō*
2sg.	**h₁éd-si*	**ēs-(s) < **ēd-s*	*ēs*
3sg.	**h₁éd-ti*	**ēs-(s) < **ēdˢ-t*	*ēst*
1pl.	**h₁ĕd-mes*	**ed-mos*	*ĕdimus*
2pl.	**h₁ĕd-te(s)*	**ēs-tes < **ēdˢ-tes*	*ēstis*
3pl.	**h₁ĕd-n̥ti*	**ed-ont*	*ĕdunt*

Table 22: Present indicative inflection of the present of the root **h₁ed-*.

The 1sg., 1pl. and 3pl. forms show the effects of thematisation in their endings. As was the case with PIt. **e̯i-* and **u̯ēl-*, the thematisation of these forms probably took place in Proto-Italic. The root vocalism of *ĕdimus* and *ĕdunt* reflect the inherited e-grade weak stem, but *ĕdō* appears to have been levelled: e-grade would be expected for a simple thematic third conjugation present, but it is unexpected in the sense that thematisation has apparently not only replaced the inherited athematic ending with a thematic one, but has also modified the ablaut of the root (**h₁ēd- → *h₁ĕd-e/o-*). The thematisation must, then, have taken place during a relatively early period, when some of the inherited morphophonological alternations where still active components of the morpho(phono)logical system.

As will be discussed below (Appendix I), Lachmann’s rule cannot be classified as a regular sound change, but is rather limited to lengthening the root vowel of PPPs under certain phonological and morphological conditions. This means that the long vowel in *ēs(s)*, *ēst*, *ēstis* and *ēsse* cannot be explained by a regular lengthening rule. As to the singular forms, continuation of the ē-grade of the Narten present strong stem is the likeliest explanation; 2pl. *ēstis* is analogical to these forms (cf. 2pl. *estis* ‘you are’ ← **stes* due to *es*, *est* and *este!*, see Ch. 2.3.4.1.). These changes took place before Proto-Italic. The inf. *ēsse* is a Latin innovation (cf. Osc. inf. **edum**), and is based on the already existing forms with the long vowel.

The 2sg. imperative *ēs* is probably not a regular continuation of a PIE athematic imperative **h₁éd* or **h₁ĕdˢ-dʰí*. Weiss (2011: 431) suggests that it was analogically formed after the relation of ind.3sg. and imp.2sg. of *ferre* ‘carry’, i.e. *fert* : *fer!* :: *ēst* : X, where X = *ēs!*. But I consider this development unlikely – the analogical relationship mentioned by Weiss seems to be a pure coincidence, not the result of a historical process. I would rather suggest that *ēs* was abstracted from the prs.2sg. and 3sg. forms (the most frequently used ones), where it functions as a kind of stem, thus *ēs-s*, *ēs-t* → *ēs!*. Analogical pressure from the paradigm of *ĕsse* ‘to be’ may also be a factor, considering that some forms of these two verbs differ only in vowel quantity, thus *ĕs* ind. : *ĕs!* imp. :: *ēs* ind. : X, where X = *ēs!* imp.

The original prs.sbj. paradigm (*ĕdĭm*, *ĕdīs*, etc.) continues the PIE athematic optative of Narten presents (cf. *velim* above) with e-grade root and zero-grade suffix, thus PIE **h₁ĕd-ih₁-n̥* > PIt. **ĕd-īm* > OLat. *ĕdĭm*, PIE **h₁ĕd-ih₁-s* > PIt., **ĕd-īs* > OLat. *ĕdīs*, etc. In Imperial Latin, these forms are replaced by regular third conjugation subjunctives, i.e. *ĕdăm*, *ĕdās*, etc. (Weiss

2011: 432). The old sbj.ipf. (*ēssĕm*, *ēssēs*, etc.) had a regular relation to the inf. *ēsse*, and it was formed either of the extracted present stem *ēs-* (i.e. *ēs-sē-m*, etc.) or directly from the original ē-grade strong stem **(h₁)ēd-*, i.e. **ēd-sē-m* > *ēssĕm* (using the e-grade weak stem **(h₁)ĕd-* as a basis is less preferable, as the long vowel would be difficult to explain; this falls out of the scope of Lachmann's rule). These forms were also later replaced by the regular third conjugation formation (*ĕdĕrĕm*, *ĕdĕrēs*, etc.) (Weiss 2011: 432).

The perfect stem *ēd-* can be explained in two ways: 1) either it continues a regular PIE reduplicated perfect (**h₁e-h₁od-/h₁e-h₁d-*, etc.), or 2) it belongs together with other longvocalic perfects that possibly descend from old Narten imperfects (**h₁ḗd-/h₁ĕd-*).

The reduplicated perfect theory rests on the root-initial laryngeal (of which there is direct evidence). This formation can be reconstructed for PIE, as there are cognates: Gr.(Hom.) ἐδηδώς 'having eaten' (reduplication with δ is secondary), OIr. *dúaid* 'has eaten', Go. *et* (*LIV*²: 230). The Latin stem *ēd-* can be regularly derived from the weak stem PIE **h₁e-h₁d-h₂e(i̯)* > PIt. **ēd-ai̯* > Lat. *ēdī*.

The Narten imperfect theory is also phonologically possible and morphologically plausible, since this very root has a Narten present. Thus, the basis for the perfect stem would be the PIE imperfect/injunctive with ē-grade root, thus PIE **h₁ḗd-* > PIt. **ēd-* > Lat. *ēd-*. If de Vaan's claim (*EDLIL*, s.v. *edō, ēsse*) that the PIE root **h₁ed-* did not have a Narten present, but a normal athematic root present, would turn out to be correct, then the Narten behaviour for this root could no longer be sustained, meaning that a derivation from the reduplicated perfect would be more likely. If, however, the Narten behaviour can be sustained, there is no compelling reason to reject the imperfect-theory, barring any theoretical considerations. Grouping *ēd-* together with similar long-vocalic perfect stems, such as *lēg-* (*legere*), *rēg-* (*regere*) and *ēg-* (*agere*), for which a Narten imperfect has also been proposed, is not unproblematic.

The solution could perhaps be sought by investigating the function of Narten imperfects in Proto-Italic: since Latin perfect stems are based either on Proto-Italic aorist or perfect stems, it would be reasonable to presume that Narten imperfects served already in Proto-Italic in the function of either aorist or perfect stems (the original PIE imperfect was by then fallen out of use). Since the root **h₁ed-* demonstrably had a reduplicated perfect (possibly inherited by Proto-Italic), but not an aorist (apart from the ancient root aorist, on which the original participle **h₁dont-* 'tooth' is based, *LIV*²: 230), the Narten imperfect must have been used as an aorist stem in Proto-Italic (note also that PIE imperfect and aorist share the same set of secondary person endings). Thus, Proto-Italic may have had two formally identical tense stems: the aorist stem **ēd-* from the Narten imperfect, and the perfect stem **ēd-* from the inherited reduplicated perfect.

Finally, the PPP *ēsus* is derived from a regular PIE *to*-participle built to the e-grade root, thus PIE **h₁edˢ-tó-* > PIt. **edˢ-to-* > Lat. *ēsus* (here, the long vowel is due to Lachmann's rule).[120] We can compare this with **h₂g-tó-* > **ag-to-* > *āctus*, PPP of *agere* (see Ch. 2.2.1.1.). Thus, zero-grade **h₁dˢ-tó-* would similarly have resulted in PIt. ×**adˢ-to-*; perhaps this was levelled on the model of the *e*-vocalism, which prevails in other forms of the paradigm.

[120] On the long vowel of the related noun *ēsca* 'dish, bait', see Opfermann 2016: 249.

2.3.4.5. *Dare*

The verb *dăre* 'give' (*dō*, *dedī*, *dătus*) originates from the root PIE **deh₃-*, but the history of the forms (especially those of the present stem) is highly problematic, and several different solutions have been proposed in the literature. The PPP presents no particular problems: it derives in a phonologically and morphologically expected way from a PIE **-to-* participle with zero-grade root, i.e. PIE **dh₃-tó-* > PIt. **dă-to-* > Lat. *dătus*; regular cognates include Gr. δοτός and Ved. *ditá-* (Sihler 1995: 623). Other forms, especially the present indicative and the perfect stem, deserve closer investigation. The discussion is rounded up by a brief examination of *dare*-compounds, the residual imperatives *cedo*/*cette*, and the attested nominal and verbal derivatives of *dare* and of the root **deh₃-*.

Synchronically, the present paradigm of *dare* can basically be assigned to the first conjugation due to the prevailing *a*-vocalism, with the additional remark that the stem exhibits a short vowel in all forms (except prs.ind.2sg. *dās* and imp.2sg. *dā*) unlike regular verbs of that conjugation (cf. Sjöstrand 2014[1953]: 122), where the long vowel occurs in medial syllables and before word-final *s* (on regular word-final vowel shortening, see Ch. 3.2.5.). This irregularity as well as the atypical perfect stem (reduplicated perfects are rare in the first conjugation) indicate that *dare* is not a regular member of this productive class and, thus, has potentially preserved archaic morpho(phono)logical features. The Old Latin and Classical Latin present stem forms are shown in Table 23:

	prs.ind.act.	**prs.ind.pass.**	**ipf.ind.**	**fut.**	**prs.sbj.**	**ipf.sbj.**	**imp.**
1sg.	*dō*	*dŏr*	*dăbam*	*dăbō*	*dĕm*	*dărem*	-
2sg.	*dās*	*dăris*	*dăbās*	*dăbis*	*dēs*	*dărēs*	*dā*
3sg.	*dăt* OLat. **dāt*?	*dătur*	*dăbat*	*dăbit*	*dĕt*	*dăret*	*dătō*
1pl.	*dămus*	*dămur*	*dăbāmus*	*dăbimus*	*dēmus*	*dărēmus*	-
2pl.	*dătis*	*dăminī*	*dăbātis*	*dăbitis*	*dētis*	*dărētis*	*dăte*
3pl.	*dănt* OLat. *dănunt*?	*dăntur*	*dăbant*	*dăbunt*	*dĕnt*	*dărent*	*dăntō*

Table 23: Present stem forms of *dare*.

The vowel of the prs.ind.act.3sg. is certainly short in Classical Latin, and scans unambiguously short at least twice in Plautus.[121] It is unclear whether the vowel was originally long, as no case of Plautine scansion requires an unambiguously long vowel for this form (Meiser 2003: 105 n. 26; Questa 2007: 18; *pace* Lindsay 1894: 457),[122] and all passive forms have short *-ă-*. In contrast, regular first conjugation verbs have long *-ā-* where it is etymologically expected (e.g. CLat. *servātur* vs. *servăt* < OLat. *servāt*, Enn. *Ann.* 78). If *dăt* is indeed original, then the long vowel in the prs.ind.act.2sg. *dās* requires special explanation (also cf. 2sg.pass. *dăris* vs. regular *servāris*), provided that the stem vocalism was quantitatively uniform in the singular until the

[121] Plaut. *Cas*. 44, *Trin.* 847 (Neue 1897: 295; Weiss 2011: 434 n. 36).
[122] For regular first conjugation verbs, the long vowel (*-āt*) is amply attested in Plautus and elsewhere in Old Latin texts, see Neue 1897: 294f.

application of the word-final shortening rule. For the prs.ind.3pl.act., *danunt* also occurs. Additionally, there exist prs.sbj. forms (possibly old aorist optatives) with the stem *dui-* (Weiss 2011: 434–435), e.g. OLat. *perduim* (Plaut. *Aul.* 672), *perduīs* (Plaut. *Amph.* 845), which also occur in frozen expressions in Classical Latin,[123] also cf. Umb. *purdouitu*. In sum, the present forms of *dare* are isolated in the Latin synchronic grammar: the a-vocalism is reminiscent of the first conjugation, but the exceptional stem vowel lengths indicate its irregular status.

Latin also has a number of *dare*-compounds, which synchronically belong to the third conjugation and are regularly inflected (°*dō*, °*didī*, °*ditum*). These forms are examined in more detail below, but at this point it is important to observe that the verb *reddere* 'to give back' provides evidence for a pre-Latin reduplicated present, i.e. *reddō* < **re-didō*. The particle *cedo/cette* 'give here!', which will also be discussed further below, provides evidence for a pre-Latin aorist imperative with ablaut contrast between 2sg. and 2pl.

In the Sabellic languages, the following present stem forms that are cognate with *dare* are attested: ind.3sg.act. Vest. *didet*; ind.3sg.pass. Umb. **teřte**; sbj.3sg.act. Pael. *dida*, Umb. **teřa**, *dirsa*, *dersa*; sbj.3pl. Umb. *dirsans*, *dirsas*; imp.3sg. Umb. **titu**, **tetu**, *ditu*, **teřtu**, **te⟨ř⟩tu**, *dirstu*; fut.3sg. Osc. *didest*. As far as we can tell, all these are regular third conjugation forms. We will return to the Sabellic evidence and to the Proto-Italic reconstruction shortly.

The difficulty of explaining the history of the present conjugation lies in the fact that, for this verb, PIE did not have a present formation, from which the Latin forms could be regularly derived: *LIV*² (p. 105) reconstructs only a reduplicated present **dé-doh₃-/de-dh₃-* (Ved. *dádāti*, YAv. *daδāiti*, Gr. δίδωμι, etc.; but see below for the reconstruction), as well as a root aorist **déh₃-/dh₃-* (Ved. *ádāt*, etc.) and a possible desiderative **di-dh₃-sé-* (Ved. *dítsati* 'would like to give'). The Latin paradigm, then, must ultimately originate either from the reduplicated present (via dereduplication), preferred by Weiss (2011: 434) and Leumann (1977: 527f), or from the root aorist (via change in function), preferred by Meiser (1998: 188; 2003: 105). The PIE reconstructions of these paradigms are shown in Table 24.[124] Both options involve complicated analogical modifications in order to explain the unexpected and irregular changes. The desiderative origin of the Latin forms can be excluded on formal criteria (even though some inherited desideratives occasionally end up as present stems, see Ch. 2.3.3.).

[123] *Utinam tibi istam mentem di inmortales duint!* (Cic. *Catil.* 1, 22) 'If only the immortal gods would have given you such a mentality!' and *Di te perduint, fugitive!* (Cic. *Deiot.* 21) 'May gods ruin you, you runaway!'.

[124] There is disagreement about the reconstruction of the present formation of this verb. *LIV*² had originally an *e*-reduplicated o-grade/zero-grade formation, but this type was later discarded (*LIV*²⁺). Weiss (2011: 433) reconstructs an *e*-reduplicated e-grade/zero-grade formation, Zahn (2014: 137) an *i*-reduplicated e-grade/zero-grade formation, while Leumann (1977: 527f) and Meiser (1998: 188) prefer an *i*-reduplicated o-grade/zero-grade formation. The *e*-reduplication seems to be limited to two cases in Indo-Iranian (of the roots PIE **dʰeh₁-* and **deh₃-*, i.e. Ved. *dhā-* → *dádhāmi* and *dā-* → *dádāmi*, respectively), while in all other cases (e.g. Ved. *bíbharmi*) and in Greek (δίδωμι, τίθημι, ἵστημι) *i*-reduplication is attested within the present system; for this reason, I reconstruct *i*-reduplication. As for the Latin outcomes, the quality of the reduplication syllable and of the root vowel in the strong stem are irrelevant, since the former was in any case lost and both **-eh₃-* and **-oh₃-* result in PIt. **ō*.

	prs.ind.	prs.imp.	aor.ind./inj.	aor.imp.
1sg.	**di-déh₃-mi*	-	**déh₃-m̥*	-
2sg.	**di-déh₃-si*	**di-dh₃-dʰí* or **di-déh₃*	**déh₃-s*	**dh₃-dʰí* or **deh₃*
3sg.	**di-déh₃-ti*	-	**déh₃-t*	-
1pl.	**di-dh₃-mós*	-	**dh₃-mé*	-
2pl.	**di-dh₃-té(s)*	**di-dh₃-té*	**dh₃-té*	**dh₃-té*
3pl.	**di-dh₃-énti*	-	**dh₃-ént*	-

Table 24: PIE reduplicated present and root aorist of **deh₃-*.

The immediate result of the regular phonological development of this paradigm would have been the loss of laryngeals and the change of the root vocalism into **-ō-* (< **-eh₃-*) and **-ă-* (< **-h₃-*), as reflected by *cedo* < **ke≠dō* < **k̂e≠deh₃* and *cette* < [syncopated from] **ke≠date* < **k̂e≠dh̥₃-te*. It is obvious that the Italic present stem forms have not preserved any trace of such ablaut contrast. In addition, the Latin paradigm shows that *a*-vocalism (which can regularly originate only from **-h̥₃-*) was generalised at some point. The existence of thematic conjugation in the Sabellic present forms and Latin *dare*-compounds, both of which originate from an earlier reduplicated present (which was athematic), indicates that the reduplicated present was thematised in Proto-Italic. It follows that the Latin forms with prevailing *a*-vocalism cannot be derived from an earlier reduplicated present (which was continued in *dare*-compounds). Thus, following Meiser (see above), the aoristic origin of the Latin present paradigm seems more likely.

The Proto-Italic reconstruction is still problematic. The Latin present paradigm with the prevailing *a*-vocalism cannot be a regular continuation of an earlier paradigm with an ablaut contrast between the strong and weak stem forms; and, apart from 1sg. *dō*, there is no indication of thematisation. The conclusion is that the Proto-Italic aorist paradigm must have been (at least partially) athematic. Without Sabellic evidence, it is not possible to conclusively prove whether the levelling of the stem vocalism (**-ō-* → **-ă-*) had already taken place in Proto-Italic, but as per heredity principle, I presume that the alternation was there still in Proto-Italic (see Ch. 2.2.7.3. on PIt. **fēk-ed* : **fak-ond* for a comparable case), considering the probability that the relatively high frequency of occurrence of this basic verb.

The resulting reconstruction is in line with our general picture of the Proto-Italic verb: the PIE reduplicated present was thematised and continued as the present stem, and the PIE root aorist was continued as the PIt. aorist; additionally, there was the reduplicated perfect, which is also reflected in the Italic languages (see below). The reconstruction of the Proto-Italic present and aorist forms are shown in Table 25.

	prs.ind.	prs.imp.	aor.ind.	aor.imp.
1sg.	**de-d-ō*	-	**dō-m*	-
2sg.	**de-d-es*	**de-d-e*	**dō-s*	**dō*
3sg.	**de-d-et*	**de-d-etōd*	**dō-d*	-
1pl.	**de-d-omos*	-	**dă-mos*	-
2pl.	**de-d-etes*	**de-d-ete*	**dă-tes*	**dă-te*
3pl.	**de-d-ont*	**de-d-ontōd*	**dŏ-nd* (or **dă-nd*?)	-

Table 25: Proto-Italic present and aorist of **dō-/dă-*.

The PIE ablaut contrast was lost in the present stem as a consequence of thematisation in Proto-Italic. The root originally ended in a laryngeal, and, after the loss of laryngeals, in a vowel. Subsequently, the root vowel was probably removed or replaced by the thematic vowel, e.g. post-PIE 1pl. **de-da-mos* → **de-d-o-mos*, whereby the original root was reduced into the consonant **-d-*. The present stem most likely had a full array of regular temporal and modal forms, e.g. ipf. PIt. **de-d-ē-βā-d* > Lat. (*re-*)*ddēbat*, fut. PIt. **de-d-es-et* > Osc. *didest*, sbj. PIt. **de-d-ā-d* > Umb. **teřa** (etc.). After Proto-Italic, the reduplicated present was continued in the Sabellic languages as a regular third conjugation present stem. In Umbrian, regular phonological development destroyed the iconicity of the reduplication without any functional consequences (e.g. prs.sbj.3sg. PIt. **de-d-ā-t* > Umb. **teřa**, etc.). In Latin, it only survived residually in *dare*-compounds.

The Proto-Italic aorist probably also had a number of modal forms, of which there is hardly any evidence. In Sabellic, the aorist was completely lost and the Proto-Italic reduplicated perfect was continued as the Sabellic neo-perfect. In Latin, the aorist paradigm renovated the present paradigm, and was thus continued as a new (simplex) present stem – the ultimate motivation for this functional shift is not evident, as in all other cases a Proto-Italic aorist formation is continued as a Latin *perfect* stem. However, in this case the Proto-Italic reduplicated perfect was continued as the Latin neo-perfect, leaving the inherited aorist forms in a kind of functional vacuum. Formally, the aorist-present was modified by levelling the inherited ablaut contrasts and by introducing the present stem endings. The attestations of the indicative forms of the present stem are so recent that it is not possible to infer, when the inherited secondary endings were replaced by the primary ones – this may have taken place at the same time than the reassignment of the formation into the present system (the most plausible presumption) or sometime afterwards. In attested Latin, we only find the regular present endings.

While the levelling of the root vowel of the present stem can be explained as analogical levelling towards 1M1F, an adequate explanation requires exposing the motivation for why the vowel PIt. **-ă-* was generalised instead of the more frequently occurring PIt. **-ō-*, which occurred in the less marked (= more natural) forms. Affinity towards the first conjugation could be evoked as a factor, but I think the resemblance is rather the *result* of the modifications, not their *cause*. 1sg. Lat. *dō* is the only form that does not include the characteristic *a*-vocalism; theoretically, one can reconstruct a preform **dă-ō*, which then assimilates regularly into *dō*.

1pl. *dămus* and 2pl. *dătis* are direct continuations of the corresponding Proto-Italic aorist forms and require no further explanation (heredity principle). 3pl. *dănt* can be explained as an extension of the vocalism of the other plural forms (1M1F).[125] But most problematic are ind.2sg. *dās*, imp.2sg. *dā!* and ind.3sg. *dăt*, since the expectation would have been that the vocalism of these forms would have been extended into the other forms, not vice versa (it would *not* have been surprising to have found 1pl. ˣ*dōmus* and ind.2pl. ˣ*dōtis*, imp.2pl. ˣ*dōte!*, inf. ˣ*dōre*, etc.).[126] The motivation can be sought in the immediate paradigmatic environment: outside the occasional present forms, the vowel *-ă-* occurred also in the PPP *dă-tus* and the inf. (old aor.inf.?) *dă-re*. From all these forms, the present stem *dă-* was generalised; the concurrent stem variant **dō-* was blocked by its existence as the ind.1sg. form – and in terms of (pre-)Latin morphology, no present stem is based directly on the 1sg., and this is why the *ō*-vocalism was eventually shunned away from the paradigm (of course, apart from 1sg. *dō*, where it acted as the person ending). Once the stem was reanalysed as being the invariable *dă-* (and there is no reason why in the post-Proto-Italic period an alternating stem would have been chosen as the present stem), all other forms could be built to it, including the productive *bā*-imperfect (*dăbam*, etc.), the *b*-future (*dăbō*, etc.), an *ē*-subjunctive (*dem*, etc.), and so on. The passive forms 2sg. *dăris* and 3sg. *dătur* may reflect an original weak stem vocalism (with zero-grade) of the PIE middle inflection (Meiser 2003: 105 n. 26), but as there is no evidence for the existence of a Proto-Italic aorist passive, this assumption is less likely.

The long vowel in ind.2sg. *dās* and imp.2sg. *dā!* still requires a special explanation: the discussion above would yield Lat. ˣ*dăs* and ˣ*dă!*, respectively, and the lengthening in these forms is not phonologically regular. In my view, the most plausible explanation involves two components:

1. "Minimal word requirement", as originally proposed by Havet (1891: 311): "Le latin, qui allonge d'office tous les monosyllables brefs quand ils sont terminés par une voyelle (*tū*, *dā*, *nē*), a conservé la voyelle brève dans *is*, *quis*, *bis*, probablement parce qu'on ne disait jamais *ĭ*, *quĭ*, *bĭ* (*dās* est dù à l'analogie de *dā*)." This theory receives support from Sommer (1914: 123), Leumann (1977: 527f), and Weiss (2011: 433–434).
2. Analogical influence from the inherited (but paradigmatically isolated) aorist imperative **dō!* into the renovated present imperative, i.e. **dō* → [generalisation of the present stem] **dă!* → [lengthening on the model of **dō!*] *dā!*. This was then extended into the indicative, i.e. **dăs* → *dās* (Havet 1891: 311), but the passive form *dăris* was unaffected and still reflects the more archaic stem vocalism.

As pointed out above, all other forms of the present stem paradigm follow a regular pattern and are built to the zero-grade variant of the root: e.g. ipf. **dă-βām* > *dăbăm*, fut. **dă-βō* > *dăbō*, prs.sbj. **dă-ēm* > **dēm* > *dĕm*, ipf.sbj. **dă-sēm* > **dărēm* > *dărĕm*, imp.2pl. **dă-te* > *dăte*, inf. **dă-si* > *dăre*. The PPP *dătus* is most likely directly inherited from the PIE **dh₃-tó-* (see above).

[125] As to why the form (and the whole aorist paradigm) was never fully thematised, one can presume a functionally-motivated restriction on the shape of Latin present stems: at least one vowel need to have been included (cf. *es-/su-* of *esse*, and *e-/ī-* of *īre*); thus, mere ˣ**d-ont* > ˣ*dunt* was dispreferred, and a *dă-* adopted instead. Note that the thematisation of PIt. **sent* into VOLat. *sont* > OLat./CLat. *sunt* is not a counterexample, as the stem variant *so-* occurred elsewhere in the paradigm (see Ch. 2.3.4.1.).

[126] The Venetic aorist form **doto** (< **dō-to* < PIE transponat **deh₃-to*?) may be evidence for pre-Proto-Italic survival of the e-grade root.

I have no explanation for the OLat. prs.3pl. *danunt*. Perhaps it is a mixed form of *dant* and *dōnant*, or a relic of yet another but otherwise unattested neo-present (the ending *-unt* indicates affinity to the third conjugation). Morpheme boundary is also not quite clear (*dan-unt* or *da-nunt*?), as the ending *-nunt* (more accurately -V̄*nunt*) is attested also in other verbs. I find none of the proposed solutions very convincing.[127]

Old Latin has parallel forms also from the stem *du-*: prs.sbj.2sg. *(ne) duās* (Plaut. *Aul.* 238), prs.sbj.1sg. *duim* (Plaut. *Aul.* 672), 2sg. *duis* (Plaut. *Capt.* 947, etc.), 3sg. *duit* (Plaut. *Asin.* 460, etc.), 3pl. *duint* (Plaut. *Aul*. 62, etc.), *concreduo* (Plaut. *Aul.* 581, although this should rather be understood as a compound of *crēdere* < **k̂red-dʰeh₁-* rather than as a *dare*-compound).[128] According to Weiss (2011: 434), the *duim*-forms may continue a PIE aorist optative, e.g. 1pl. **deh₃-ih₁-me*, while the *u*-vocalism would be "the weakening product of an earlier *o*", as compared to the Umb. *purdouitu*. An *ī*-subjunctive is certainly an archaism in Latin, and the isolated *duās* may simply be an attempt to replace the archaic subjunctive with a more productive formation, but under these phonological circumstances *o* (actually, more likely would be a long *ō* from the full grade **-eh₃-*) does not get weakened into *u* (cf. Ch. 3.2.3. and Appendix II). Thus, these forms more likely belong to a different root, namely PIE **deh₃u̯-* 'to give', which probably is just an enlargement of **deh₃-* (see *LIV*²: 107; Meiser 2003: 182–183; *EDLIL*, s.v. *duim*). Later on, occasional semantic confusion led to a partial suppletion with the standard *dare*-paradigm – and eventually such forms were dropped from use entirely.

The perfect stem *ded-* does not present any serious difficulties. Since the PIE root **deh₃-* did not have a perfect formation, all attested perfects, such as Ved. *dadáu*, OAv. *dadā*, Gr.(Hom.) δέδοται (*Il.* 5, 428, cf. Gr.(Att.) act. δέδωκα), and the Italic forms are secondary innovations (*LIV*²: 105–106; Meiser 2003: 182). All Latin and Sabellic forms can be derived from a Proto-Italic reduplicated perfect stem **de-d-*, which in all likelihood lacked any ablaut alternations. The oldest Latin attestation of *dare* is of the perfect stem: dedet (Scipio-epitaph). Italic cognates include pf.ind.3sg. Osc. **deded**, δεδετ, Mars. *ded.*, Umb. **dede**, 3pl. Osc. **dedens**, δεδενς, pf.fut.3sg. Umb. **teřust**, *dirsust*. Contrary to the reduplicated present, the perfect forms of *dare*-compounds (e.g. *reddidī*) do not undergo dereduplication, since it would lead to the loss of the only formal perfect marker, rendering some present and perfect forms homophonous. Synchronically, nothing of the (originally probably zero-grade) root vocalism remains, and only the initial consonant of the root **deh₃-* remains, *de-d-ī* being the etymologically correct morpheme division.

Like many basic verbs, *dare* occurs often also in preverb compounds. The historical analysis of these compounds involves the following problems: 1) compounds are clearly formed in different periods and the resulting forms are consequently different in their phonological and morphological composition (still, the exact chronology is sometimes difficult to determine), 2) the formal origin of the verbal component and its relationship with the simplex *dare* is not always clear, and 3) some apparent *dare*-compounds are most likely not derivatives of the root PIE **deh₃-* 'to give' but of **dʰeh₁-* 'to put, set, make'. Aspects of these problems are discussed below:

[127] See Sommer 1914: 132; Leumann 1977: 514; Sihler 1995: 544–545; Livingston 2004: 13-16; Weiss 2011: 386 n. 38; de Vaan 2012. The issue does not concern this study, since this ending hardly reveals anything interesting for the development of ablaut.
[128] See Neue 1897: 311, Leumann 1977: 528 and *EDLIL*, s.v. *duim* for fuller lists of attestations.

The diachronic layering of *dare*-compounds is in some cases problematic. Clear cases are forms which show no vowel weakening whatsoever such as *cirumdăre* 'to put around, enclose' and *interdăre* 'to place between' (both attested since Plautus): these are synchronically transparent compounds of a preverb and the simplex *dare* and must be of relatively recent date (post-fifth century BC, but possibly much younger). To the oldest layer belongs at least *reddere* 'to give back', synchronically a regular third conjugation verb.[129] The most convincing explanation for the double *-dd-* is that it reflects the PIt. reduplicated present **de-d-ō, *de-d-es, *de-d-et,* etc.: e.g. PIt. **re≠de-d-et* > [vowel weakening] **re≠də-d-et* > [syncope] **re≠dd-et* > OLat./CLat. *reddit*.[130] Other compounds (e.g. *dēdere* 'surrender', *dīdere* 'distribute', *ēdere* 'eject', *prōdere* 'project, betray', and *trādere* 'hand over', *EDLIL*, s.v. *dō, dare*), do not show consonant gemination (but notice that their prefix constitutes a heavy syllable) and are thus probably younger than *reddere* (and hence with total dereduplication) or younger compounds of a preverb and the compound base °*dere* extracted from such earlier compounds as *reddere*; the *circumdare*-type is the youngest and is based on the simplex *dare*.

Other third conjugation compounds in °*dō*, °*didī*, °*ditum* are most likely not compounds of *dare/*deh₃-* at all but of the root **dʰeh₁-* 'put', which in the Latin verb system is otherwise attested exclusively with the *k*-extension (cf. *facere* and related forms) (Leumann 1977: 527; Sihler 1995: 545; in this work Ch. 2.2.7.). Apparently, the reduplicated present of **dʰeh₁-* (cf. Gr. τί-θη-μι) survived long enough (certainly until Proto-Italic) to function as the basis for a large number of compounds, some of which may, however, be secondary analogical creations. The history of these forms is largely similar to the "genuine" *dare*-compounds (Weiss 2011: 434). These compounds (*abdere* 'conceal', *addere* 'add', *condere* 'establish', *indere* 'apply', *perdere* 'destroy' and *subdere* 'place under', *EDLIL*, s.v. *-dō, -dere*) were also regularised as members of the third conjugation (Meiser 1998: 192).

The existence of a Proto-Italic root aorist of the root **deh₃-* is corroborated by a relic: the adverb/particle *cĕdŏ* 2sg. / *cĕttĕ* 2pl. 'give (here)!'. These forms have long since been recognized as univerbated phrases consisting of the following segments (so already Lindsay 1894: 457 and Sommer 1914: 539):

- The deictic particle *ce* < PIE **k̂e*, which in the Italic languages mostly appears attached to pronouns, e.g. *hic* (from **hi-ce*), *istīc*, *illīc*, cf. Osc. *ionc* < **eom-ce* (cf. Sommer 1914: 449; Leumann 1977: 467–470; *LIPP* II: 396f).
- Aorist imperative 2sg. and 2pl. forms of **deh₃-*/**dh₃-*, i.e. 2sg. **deh₃* > **dō*, 2pl. **dh₃-te* > **dăte* (Leumann 1977: 528).

As argued in light of Tocharian and Russian parallels by Hackstein (2001), the phrase **k̂e≠deh₃ /k̂e≠dh₃-te* 'give here' can be reconstructed for PIE. In Latin, the univerbation may have taken place quite early; in any case, the inherited aorist imperatives – including the PIE strong vs. weak stem ablaut distinction – are preserved as relics in these forms (Sihler 1995: 544): PIE

[129] In Plautus, a *b*-future *reddibō* (*Cas.* 129, *Men.* 1038) is attested, indicating still a clear affinity (or, perhaps, confusion) with the simplex *dare* and its future *dăbō*; the regular third conjugation future being *reddam*, *reddēs*, etc., of which the 1sg. form also has a Plautine attestation (*Amph.* 207) (Sihler 1995: 545; Weiss 2011: 434).

[130] As was argued above, the thematisation of the reduplicated present took place already in Proto-Italic, and the regular third conjugation inflection is a continuation thereof. Thus, there is no need to assume that a confusion in the wake of vowel weakening (e.g. 3sg. **°dat# > °dit*) resulted in the reinterpretation of these *dare*-compounds as third conjugation verbs (*pace* Meiser 1998: 192; Weiss 2011: 434).

**k̂e≂deh₃* > PIt. **kedō* > Lat. *cedŏ* (via iambic shortening), PIE **k̂e≂dh₃-te* > PIt. **kedate* > **kedte* (via syncope) > Lat. *cette* (via voice assimilation).

The root **deh₃-* has numerous nominal and verbal derivatives in Latin (see *EDLIL*, s.v. *dō, dare*), some of which are very old, some more recent:

- The verb *dătāre* 'to be in the habit of giving' is a regular first conjugation frequentative derivative of the simplex *dăre* (cf. *can-ere* 'to sing' → *can-tāre*). Synchronically most frequentatives can be derived directly from the participle stem (e.g. *canere*: *cant-um* → *cant-āre*), so perhaps here, too (*dăre*: *dăt-um* → *dăt-āre*). On the PPP of this frequentative is also based the adverb *dătātim* 'giving in turn'.
- Closely related to the participle stem *dăt-um* are the nominalisation *dătum* 'gift, present', *dător* 'giver', *dătus, -ūs* 'the act of giving', *dătiō* 'the act of giving'. These are all straightforward, synchronically regular derivations, although at least *dător* is of a very ancient type (cf. Gr. δώτωρ 'giver').
- The noun *dōnum* 'gift' shows a more archaic morphology, and probably descends from the PIE full grade form **deh₃-no-*/*doh₃-no-* (cf. Gr. δῶρον). The verb *dōnāre* 'give (as a present)' is a regular denominative derivative of *dōnum*.
- The noun *dōs* (< **dōt-s*), gen.sg. *dōtis* 'dowry' is also archaic, probably from PIE **dĕh₃-t-*/*dŏh₃-t-*.

2.3.4.6. Summary

The examination of the Latin irregular verbs revealed important facts about the development of ablaut. In this section, I will summarize the most important observations concerning the individual verbs.[131]

Esse, the "most irregular" verb in Latin, has retained several archaic features such as the athematic inflection of some of its prs.ind. forms and the Old Latin sg. vs. pl. ablaut relation in the sbj.prs. However, despite being an extremely frequent verb, only a handful of the Classical Latin forms are the results of entirely regular phonological development from PIE and/or Proto-Italic: most notably prs.ind.2sg. *es*, 3sg. *est*, prs.sbj.1pl. *sīmus*, 2pl. *sītis*, and the future paradigm (old subjunctive) can be derived from their PIE origins by way of regular sound change. Other forms either belong to innovative categories (such as ind.ipf. *eram* etc., sbj.ipf. *essem* etc.) or are otherwise modified. Thematisation occurs only sporadically and partially; most notably, the PIt. 3sg. **sent* is replaced by VOLat. *sont* > OLat./CLat. *sunt*. Such modifications remain irregular and unpredictable, and, although they can be explained with reasonable certainty by various plausible phonological and morphological factors, they rarely strive towards full paradigmatic regularity. As a result, little remains in the Classical Latin forms of *esse* that reflects the inherited PIE ablaut relations: the best paradigmatic residue of a PIE alternation is the present stem allomorphy between *es-* (full grade) and *s-* (zero-grade) in some forms, but even here the Latin distribution does not necessarily correlate with the original PIE state of affairs.

Īre has preserved several clearly archaic features such as the athematic inflection of some prs.ind. forms (namely 2sg. *īs* and 3sg. *it*), while regularisations and modifications are commonplace, e.g. 1pl. PIE **h₁i-mós* → **e̯i-mos* > *īmus*, and the thematisation of 1sg. PIE

[131] For a detailed description about the mechanisms of morphological change, see Ch. 4.

h₁éi̯-mi* → **ei̯-ō* > *eō* and 3pl. PIE **h₁i̯-énti* → **ei̯-ont* > *eunt*. Also noteworthy is the levelling of the PIE athematic strong stem vs. weak stem ablaut relation: while the grade change in 3pl. may be associated with the thematisation of the form, such explanation does not apply for 1pl. and 2pl., which retain the athematic inflection, e.g. 2pl. PIE **h₁i-tés* → **ei̯-tes* (not ×*ei̯-e-tes*) > *ītis*. Some of these developments can be attributed to the 1M1F-principle, but *īre* is nonetheless never fully regularized. The stem alternations between *e-/ī-* of the present stem and *ĭ-* of the perfect stem and the PPP are ultimately reflections of PIE inter- and transparadigmatic ablaut relations.

Velle, originally a verb with Narten present, has a very irregular conjugation in Latin, resulting mostly from lack of paradigmatic levelling of the products of regular sound change. But these changes, such as the colouring of the root vowel of 3sg. **u̯el̥t* into *volt* > *vult*, are mostly relatively late, and the Classical Latin allomorphy does not reflect any PIE ablaut relation (such as the strong stem vs. weak stem alternation). *Velle* seems to have undergone three distinct stages of modification: 1) Pre-Proto-Italic neutralisation of Narten ablaut by Osthoff's Law, 2) Proto-Italic thematisation of some forms, and 3) *einzelsprachlich* Latin sound changes. There was no pressure to restore paradigmatic transparency or to thematise the verb in its entirety (these are probably high-frequency-induced effects).

Ēsse (*edere*), also originally a Narten present, has preserved the athematic and Narten character only in 2sg. *ēs* and 3sg. *ēst*, while most other forms have been thematized, e.g. 1sg. PIE **h₁éd-mi* → *ĕdō*, indicating that thematisation not only affected the ending but could also alter the ablaut grade of the root (and simple thematic formations prototypically take the e-grade root). Until the Classical Period, the verb remained somewhat irregular, but the old athematic-looking forms with the stem *ēs-* were slowly ousted in favour of the more regular third conjugation forms built to the stem *ed-*.

Dare is a problematic verb: even after two centuries of scholarship, it is not entirely clear, on which PIE and Proto-Italic ancestors its Latin forms are based. Originally an athematic reduplicated present, the only reflection of the PIE formation is preserved in the preverb compound *re<u>dd</u>ere* (< PIt. **re≠δi-δ-e/o-*). Due to the *a*-vocalism (from **-h₃-*), *dare* can be associated with the first conjugation, but the prevailing short quantity of the *ă* indicates that it actually belongs there neither synchronically nor historically. A long root vowel appears only in the prs.ind.2sg *dās* and imp.2sg. *dā* and can be explained as semanto-phonological lengthenings, not as reflections of PIE ablaut. The PIE strong stem vs. weak stem ablaut of the root aorist is best reflected in the particle *cedo, cette*, which is based on the root aorist imperative with e-grade in the singular and zero-grade in the plural. The Proto-Italic root aorist was continued – unexpectedly – as the Latin present stem, and the Proto-Italic innovative reduplicated perfect was selected as the basis for the Latin neo-perfect (*dedī*).

These verbs illustrate that multiple phonological and morphological factors contributed towards both the preservation and loss of the inherited ablaut alternations. More importantly, the chronological dimension, often somewhat neglected in previous studies, is crucial to understanding not only the history of ablaut but also the development of Proto-Italic, Latin and Sabellic verb systems. In Latin irregular verbs, the most important factors that affect the development of ablaut are the following:

– **Frequency:** preservation of such archaic and inherited features as occasional ablaut contrasts in these verbs can be attributed to their high frequency of use, favouring the

preservation of inherited forms at the expense of resulting, by regular sound change, in synchronically non-uniform and non-iconic paradigms.

- **Paradigmatic naturalness:** where renovations do take place, this is mostly an attempt to create or restore paradigmatic unity and transparency. This is often achieved by renovating inherited paradigms towards increasing isomorphism, typically by levelling a non-isomorphic ablaut contrast.
- **Innovative paradigms:** from PIt. onwards, innovative paradigms generally do not exhibit intraparadigmatic ablaut alternations. With time, the prominence of innovative and renovated categories increases at the expense of the inherited ones, marginalizing the role of ablaut in the verb system in general (also cf. the following discussion on regular verb formations).
- **Thematisation:** in some cases, only individual forms are thematized, usually 1sg. and 3pl., while in other cases an entire category receives thematic endings and the thematic vowel. Three degrees of thematisation can be distinguished: 1) partial thematisation, i.e. renovation of an athematic ending with a thematic one, e.g. 1sg. **-m(i)* → **-ō*, without changes to the morphological boundary between stem and ending, 2) standard thematisation, i.e. the thematic vowel is inserted between the stem and the ending in addition to renovating the ending itself, e.g. 1pl. **-mos* → **-o-mos*, and 3) total thematisation, i.e. the ablaut grade of the root/stem is also modified according to the morphophonological preference of the system – typically, the short e-grade is selected regardless of the original grade, e.g. 1sg. **h₁éd-mi* > **ēd-m̥* → *ĕd-ō*.
- **Functional factors:** in some cases, an inherited ablaut contrast is preserved if it serves a distinguishing function in or between the paradigms. There seems to exist a tendency that functionally non-significant relations are levelled early, especially within a TAM-category (e.g. the e-grade of the prs.ind.sg. forms of *īre* was most likely extended into the pl. already in Proto-Italic), while inter- and transparadigmatic relations remain (e.g. present stem *faci-* vs. perfect stem *fēc-*), unless they are levelled as a result of the spread of innovative categories. In few cases, intraparadigmatic contrasts remain until Proto-Italic (aorist stem sg. **fēk-* vs. pl. **fak-*) or even until Old Latin (prs.sbj.1sg. *siem* vs. 1pl. *sīmus*) in *marked* categories; these, too, are eventually levelled, as per 1M1F, by Classical Latin.
- **Regular sound change:** the role of regular sound change is twofold in irregular verbs: on the one hand, they do neutralize some contrasts (e.g. PIE 3sg. **u̯é̆l-ti* : 3pl. **u̯ĕl-n̥ti* → pre-Lat. 3sg. **u̯ĕl-t* : 3pl. **u̯ĕl-ont*), but on the other, their effect is often strictly local and does not extend into neighbouring forms, let alone neighbouring paradigms. As is typical in irregular paradigms, the "irregularising" effect of regular sound change is in most cases not levelled.

2.4. Summary and assessment

The examination of the development of ablaut in such Latin verb formations that were inherited from PIE and/or Proto-Italic will be summarised in this section. The summary is presented from two complementary perspectives: first, the continuation of PIE ablaut alternations (including

their loss, as the case may be) is summarised, and second, the mechanisms of morphological change that were operational during these developments is discussed.[132]

The first thing to note about the regular present stem formations is that they do not exhibit any kind of intraparadigmatic vowel alternations in Latin. This may or may not reflect the condition of the original (PIE or PIt.) formation. In the following clear cases, the present stem reflects the original PIE formation and its vocalism by regular sound change, as per heredity principle (Table 26):[133]

Verb	Ch.	Form.	Exp. V	Act. V	PIE	PIt.	Lat.
agere	2.2.1.1.	ThPr	*e*	*e* (*h_2e > *a*)	*$h_2$ég-e/o-	*ag-e/o-	ag-ō
bibere	2.2.6.1.	ReThPr	Ø	Ø	*pi-ph$_3$-é/ó-	*pib-e/o-	bib-ō
capere	2.2.2.1.	*i̯e/o*	Ø	Ø (*h_2 > *a*)	*kh$_2$p-i̯é/ó-	*kap-i̯e/o-	capi-ō
colere	2.2.1.3.	TPr	*e*	*e* (*k^we>*quo*)	*k^wélh$_1$-e/o-	*k^wel-e/o-	col-ō
cupere	2.2.2.2.	*i̯e/o*	Ø	Ø	*kup-i̯é/ó-	*kup-i̯e/o-	cupi-ō
dīcere	2.2.1.4.	ThPr	*e*	*e* (*ei̯ > *ī*)	*déi̯k̂-e/o-	*dei̯k-e/o-	dīc-ō
docēre	2.2.4.1.	Caus	*o*	*o*	*dok̂-éi̯e/o-	*dok-ē-	doce-ō
emere	2.2.1.6.	ThPr	*e*	*e*	*h$_1$ém-e/o-	*em-e/o-	em-ō
ferre	2.2.1.7.	ThPr	*e*	*e*	*b^{h}ér-e/o-	*fer-e/o-	fer-ō
fīdere	2.2.1.8.	ThPr	*e*	*e* (*ei̯ > *ī*)	*b^{h}éi̯d^h-e/o-	*fei̯d-e/o-	fīd-ō
fierī	2.2.2.3.	*i̯e/o*	Ø	Ø (*ūi̯ > *īi̯)	*b^{h}uh$_2$-i̯é/ó-	*fū-i̯e/o-	fī-ō
legere	2.2.1.9.	ThPr	*e*	*e*	*lég-e/o-	*leg-e/o-	leg-ō
monēre	2.2.4.2.	Caus	*o*	*o*	*mon-éi̯e/o-	*mon-ē-	mone-ō
poscere	2.2.3.2.	*sk̂e/o*	Ø	Ø (*r̥ > *or*)	*pr̥(k)-sk̂é/ó-	*porsk-e/o-	posc-ō
sequī	2.2.1.12.	ThPr	*e*	*e*	*sék^w-e/o-	*sek^w-e/o-	sequ-or
sentīre	2.2.2.8.	*i̯e/o*	Ø	Ø (*n̥t > *en*)	*sn̥t-i̯é/ó-	*sn̥t-i̯e/o-	senti-ō
sīdere	2.2.6.3.	ReThPr	Ø	Ø	*si-sd-é/ó-	*sizd-e/o-	sīd-ō
spondēre	2.2.4.3.	Caus	*o*	*o*	*spond-éi̯e/o-	*spond-ē-	sponde-ō
stāre	2.2.5.6.	Ess	Ø	Ø (*h_2 > *a*)	*sth$_2$-(e)h$_1$i̯é/ó-	*stā-	st-ō
tacēre	2.2.5.7.	Ess	Ø	Ø (*h_2 > *a*)	*th$_2$k-(e)h$_1$-i̯é/ó-	*tak-ē-	tace-ō
tegere	2.2.1.13.	ThPr	*e*	*e*	*(s)tég-e/o-	*teg-e/o-	teg-ō
tenēre	2.2.5.8.	Ess	Ø	Ø (*n̥ > *en*)	*tn̥(n)-(e)h$_1$i̯é/ó-	*tn̥(n)-ē-	tene-ō
terrēre	2.2.4.4.	Caus	*o*	*o* (*r̥$_2$ > *er*)	*tros-éi̯e/o-	*tr̥$_2$s-ē-	terre-ō
tondēre	2.2.4.5.	Caus	*o*	*o*	*tond-éi̯e/o-	*tond-ē-	tonde-ō
°*uere*	2.2.1.16.	ThPr	*e*	*e* (*eu̯>*ou̯)	*h$_3$éu̯-e/o-	*ou̯-e/o-	°u-ō
vehere	2.2.1.18.	ThPr	*e*	*e*	*u̯ég^h-e/o-	*u̯eχ-e/o-	veh-ō
vertere	2.2.1.19.	ThPr	*e*	*e*	*u̯ért-e/o-	*u̯ert-e/o-	vert-ō
vidēre	2.2.5.10.	Ess	Ø	Ø	*u̯id-(e)h$_1$i̯é/ó-	*u̯id-ē-	vide-ō

Table 26: Directly inherited Latin present stem formations.

[132] For a detailed description about the mechanisms involved in the analysis, see Ch. 4.

[133] Abbreviations for this and the following tables: Ch. = chapter in this work. Form. = PIE formation type (ThPr = simple thematic present, *i̯e/o* = *i̯e/o*-present, *sk̂e/o* = *sk̂e/o*-present, Caus = causative-iterative, Ess = essive, RoPr = athematic root present, NaPr = Narten present, RePr = reduplicated athematic present, NPr = nasal present, Des = athematic desiderative, ReThPr = reduplicated thematic present, RoA = root aorist, SA = *s*-aorist, ThA = thematic aorist, ReA = reduplicated aorist, RePf = reduplicated perfect). Exp. V = expected root vocalism (PIE). Act. V = actually reflected vocalism with associated sound changes. Neutr. = neutralisation of ablaut contrasts. SCh = regular sound change.

In another group of present stems (which are based on PIE athematic formations), the original intraparadigmatic ablaut was levelled in the wake of the thematisation process (Table 27). In most cases the weak stem (typically with zero-grade root, or e-grade root in Narten presents) was continued, but occasionally the strong stem (typically with e-grade root) was taken as the basis.

Verb	**Ch.**	**Form.**	**Exp. V**	**Act. V**	**PIE**	**PIt.**	**Lat.**
dūcere	2.2.1.15.	RoPr	*e* : Ø	*e* (**eu̯* > **ou̯*)	**déu̯k-/duk-*	**dou̯k-e/o-*	*dūc-ō*
fingere	2.3.2.1.	NPr	Ø + *e* : Ø	Ø + Ø	**dʰi-né-gʰ-/dʰi-n-gʰ-*	**fing-e/o-*	*fing-ō*
fundere	2.3.2.3.	NPr	Ø + *e* : Ø	Ø + Ø	**gʰu-né-d-/gʰu-n-d-*	**χund-e/o-*	*fund-ō*
gignere	2.2.6.2.	RePr	*e* : Ø	Ø	**gi-génh₁-/gi-gnh₁-*	**gign-e/o-*	*gign-ō*
iungere	2.3.2.4.	NPr	Ø + *e* : Ø	Ø + Ø	**i̯u-né-g-/i̯u-n-g-*	**i̯ung-e/o-*	*iung-ō*
linquere	2.3.2.5.	NPr	Ø + *e* : Ø	Ø + Ø	**li-né-kʷ-/li-n-kʷ-*	**link̑ʷ-e/o-*	*linqu-ō*
molere	2.3.1.2.	RoPr	*e* : Ø	*e* (**e* > *o*)	**mélh₂-/mḷh₂-*	**mel-e/o-*	*mol-ō*
regere	2.2.1.10.	NaPr	*ē* : *e*	*e*	**h₃rḗg-/h₃rég-*	**reg-e/o-*	*reg-ō*
sistere	2.2.6.4.	RePr	*e* : Ø	Ø	**sti-stéh₂/sti-sth₂-*	**s(t)ist-e/o-*	*sist-ō*
tangere	2.3.2.8.	NPr	Ø + *e* : Ø	Ø + Ø	**th₂-né-g-/th₂-n-g-*	**tang-e/o-*	*tang-ō*
tollere	2.3.2.9.	NPr	Ø + *e* : Ø	Ø + Ø	**tl̥-né-h₂-/tl̥-n-h₂-*	**toln-e/o-*	*toll-ō*
tremere	2.2.1.15.	RoPr	*e* : Ø	*e*	**trém-/tr̥m-*	**trem-e/o-*	*trem-ō*
vīsere	2.3.3.2.	Des	*e* : Ø	*e* (**ei̯* > *ī*)	**u̯éi̯d-s-/u̯id-s-*	**u̯ei̯ds-e/o-*	*vīs-ō*
vincere	2.3.2.10.	NPr	Ø + *e* : Ø	Ø + Ø	**u̯i-né-k-/u̯i-n-k-*	**u̯ink-e/o-*	*vinc-ō*
vomere	2.3.1.4.	RoPr	*e* : Ø	*e* (**u̯e* > *vo*)	**u̯émh₁-/u̯m̥h₁-*	**u̯em-e/o-*	*vom-ō*

Table 27: Inherited Latin present stem formations with levelled vocalism.

There exists a small group of verbs, in which the present stem formation (a *i̯e/o*-present) is based on the root aorist (Table 28). As these are thematic formations, there is no intraparadigmatic ablaut. The *a*-vocalism in some of these verbs is from a syllabic laryngeal.

Verb	**Ch.**	**Exp. V**	**Act. V**	**PIE** (RoA)	**PIt.**	**Lat.**
facere	2.2.7.	*e* : Ø	Ø	**dʰéh₁(k)-/dʰh₁(k)-*	**fak-i̯e/o-*	*faci-ō*
fugere	2.2.2.4.	*e* : Ø	Ø	**bʰéu̯g-bʰug-*	**fug-i̯e/o-*	*fugi-ō*
iacere	2.2.2.5.	*e* : Ø	Ø	**Hi̯éh₁(k)-/Hih₁(k)-*	**i̯ak-i̯e/o-*	*iaci-ō*
parere	2.2.2.6.	*e* : Ø	Ø	**pérh₃-/pr̥h₃-*	**par-i̯e/o-*	*pari-ō*
°*plēre*	2.2.2.7.	*e* : Ø	*e*	**pléh₁-/plh₁-*	**plē-(i̯)e/o-*	°*ple-ō*

Table 28: Latin present stem formations based on root aorists.

The verbs discussed thus far reflect the inherited vocalism according to the known regular sound changes. There is also a not insignificant number of verbs, whose root vocalism does not correspond to the regular reflex of the expected ablaut grade or is in some other way difficult to explain (Table 29).

Verb	Ch.	Form.	Exp. V	Act. V	Problem
canere	2.2.1.2.	ThPr	*e*	*a*	If from root **kan*-, falls outside regular PIE ablaut schema.
carēre	2.2.5.1.	Ess	Ø	*a*	Problematic *a*-vocalism, if from root **ḱes*-.
carpere	2.3.1.1.	RoPr	*e* : Ø	*a*	Root vocalism inexplicable: e-grade (morphologically expected) would have yielded ˣ*cerpere*, zero-grade ˣ*corpere*.
decet	2.2.5.2.	Ess	Ø	*e*	Reflects e-grade root, unexpected for essive.
frangere	2.3.2.2.	NPr	Ø + *e* : Ø	*a* + Ø	-*a*- inserted between the resonants.
habēre	2.2.5.3.	Ess	Ø	*a*	If from root **g*^{h}*eb*^{h}-, *a*-vocalism inexplicable; vowelless zero-grade replaced by -*a*-. Regular only if from root **g*^{h}*eHb*- (**H* > *a*).
manēre	2.2.5.4.	Ess	Ø	*a*	Root vocalism problematic.
pandere	2.3.2.6.	NPr	Ø + *e* : Ø	*a* + Ø	Vowelless zero-grade **pt*- replaced by **pat*-, otherwise regular
scabere	2.2.1.11.	ThPr	*e*	*a*	If from root **skab*^{h}-, falls outside regular PIE ablaut schema.
sedēre	2.2.5.5.	Ess	Ø	*e*	Reflects e-grade root, unexpected for essive. Vowelless zero-grade in *sīdere* < **si-sd*-.
specere	2.2.2.9.	*i̯e/o*	Ø	*e*	Reflects e-grade root, unexpected for *i̯e/o*-present.
tepēre	2.2.5.9.	Ess	Ø	*e*	Reflects e-grade root, unexpected for essive.
trahere	2.2.1.14.	ThPr	*e*	*a*	If from root **d*^{h}*reg*^{h}-, *a*-vocalism inexplicable. Regular e-grade would have yielded ˣ*trehere*, zero-grade ˣ*forgere*.

Table 29: Inherited Latin present stem formations with problematic vocalism.

The problem is connected with the origin of *a*-vocalism not of laryngeal origin in Latin verb roots (cf. Bock 2008: 44–45), but in some cases even an *e*-vocalism is unexpected.[134] It is evident that many cases can be explained as vowel insertions, which are employed so as to avoid phonotactically disallowed sequences – a rational explanation (ease of pronunciation). Seeing this, some scholars (e.g. *LIV*²) often reconstruct "prop vowels" or "reduced grades", i.e. C$_e$C- or C$_a$C- (or even C*ə*C-),[135] to circumvent the problem, but the correlation between these reduced grades and the actual Latin reflexes (*a* or *e*) remains unclear. Moreover, sequences containing nasals or liquids are, in the majority of cases, vocalised as per regular sound changes, and thus the reconstruction of any prop vowels (other than those originating from the vocalisation process) is difficult to justify in these cases.

Additionally, there are two groups of two verbs, in which some other kind of modification has taken place. First, the present stem vocalism of *nōscere* (Ch. 2.2.3.2.) and *pellere* (Ch. 2.3.2.7. – unless it is a dental present) has been renovated from the expected zero-grade into an e-grade-looking reflex on the model of the root aorist, which once belonged to the paradigm of these verbs. Second, *discere* (Ch. 2.2.3.1.) and *quaerere/quaesere* (Ch. 2.3.3.1.) are composite formations: *discere* is an *sḱe/o*-present built to a zero-grade *i*-reduplicated root, *quaerere* is an

[134] *Pace* Vine (2011: 261–262), I would hardly formulate such cases as **pt-né-h₂*- > **pətn*- > **patn*- as outcomes of *regular* sound change. The issue certainly deserves further investigation. Perhaps this kind of phenomenon concerns morphology as much as phonology and phonotactics.

[135] This *ə* ought not to be confused with the *ə* arouse by Latin vowel weakening, see Ch. 3.2.3. and Appendix II.

e-grade desiderative built to an earlier *i̯(e/o)*-present, and *quasere* is a reinforced desiderative of *quaerere*.

Further two present stems, *unguere* (Ch. 2.2.1.17.) and *nēre* (Ch. 2.3.1.3.) are ambiguous as to which inherited formation they continue.

Notwithstanding a few problematic exceptions (e.g. *ēgī*, Ch. 2.2.1.1.), all inherited Latin neo-perfect stems originate from earlier aorist or perfect formations. Those of PIE origin, namely root aorists, *s*-aorists and reduplicated perfects (there is little evidence for the continuation of other perfect and aorist formations), are all formations with intraparadigmatic ablaut. No Latin perfect stem has preserved such alternations at the intraparadigmatic level. The neutralisation took place in prehistoric Latin either by regular sound change or by paradigmatic levelling (1M1F); in some cases, the evidence is ambiguous as to which mechanism was ultimately responsible for the neutralisation. To what extent the inherited alternations were still present in Proto-Italic is also unclear due to the paucity of Sabellic evidence. The inherited aorist formations are summarised in Table 30.

Neo-perfect	**Ch.**	**Form.**	**Exp. V**	**Act. V**	**PIE**	**PIt.**	**Neutr.**
dīxī	2.2.1.4.	SA	*ē* : *e*	*e* (**eu̯* > *ī*)	**dḗi̯k-s-/déi̯k-s-*	**deiksˇ-*	SCh
dūxī	2.2.1.5.	SA	*ē* : *e*	*e* (**eu̯* > **ou̯*)	**dḗu̯k-s-/déu̯k-s-*	**douksˇ-*	SCh
fīnxī	2.3.2.1.	SA	*ē* : *e*	*e* (**eu̯* > *ī*)	**dʰḗi̯gʰ-s-/dʰéi̯gʰ-s-*	**feinχsˇ-*	SCh
fūgī	2.2.2.4.	RoA	*e* : Ø	*e* (**eu̯* > **ou̯*)	**bʰéu̯g-/bʰug-*	**fou̯g-*	analogy
fūdī	2.3.2.3.	RoA	*e* : Ø	*e* (**eu̯* > **ou̯*)	**gʰéu̯d-/gʰud-*	**χou̯d-*	analogy
iēcī	2.2.2.5.	RoA	*e* : Ø	*e*	**Hi̯éh₁(k)-/Hih₁(k)-*	**iēk-*	analogy
līquī	2.3.2.5.	RoA	*e* : Ø	*e* (**eu̯* > *ī*)	**léi̯kʷ-/likʷ-*	**leikʷ-*	analogy
spĕxī	2.2.2.9.	SA	*ē* : *e*	*ē* or *e*	**spḗk-s-/spék-s-*	**spĕksˇ-*	analogy
rēxī	2.2.1.10.	SA	*ē* : *e*	*ē*	**h₃rḗg-s-/h₃rég-s-*	**rēgsˇ-*	analogy
sēnsī	2.2.2.8.	SA	*ē* : *e*	*ē*	**sḗnt-s-/sént-s-*	**sĕntsˇ-*	SCh
tēxī	2.2.1.13.	SA	*ē* : *e*	*ē*	**(s)tḗg-s-/(s)tég-s-*	**tēgsˇ-*	analogy
vēxī	2.2.1.18.	SA	*ē* : *e*	*ē*	**u̯ḗgʰ-s-/u̯égʰ-s-*	**u̯ēχsˇ-*	analogy
vīcī	2.3.2.10.	RoA	*e* : Ø	*e* (**eu̯* > *ī*)	**u̯éi̯k-/u̯ik-*	**u̯ei̯k-*	analogy

Table 30: Inherited Latin neo-perfect stems of aoristic origin.

In some verbs, the inherited (Proto-Italic) root aorist was renovated by an innovative *v/u*-perfect. The vocalism is generally taken from the root aorist strong stem (e-grade): *coluī* (← **kʷélh₁-*, Ch. 2.2.1.3.), *°plēvī* (← **pléh₁-*, Ch. 2.2.2.7.), *(g)nōvī* (← **gnéh₃-*, Ch. 2.2.3.2.), and *genuī* (← **génh₁-*, Ch. 2.2.6.2.).

The origin of Latin neo-perfects based on inherited reduplicated perfects is summarised in Table 31. In some cases, the exact origin is impossible to determine due to the submersion of the vocalism as a result of sound change.

Neo-perfect	Ch.	Exp. V	Act. V	PIE	PIt.	Neutr.
didicī	2.2.3.1.	*o* : Ø	*o* or *e* (for Ø)	**de-dok̂-/de-dk̂-*	**dedok-* or **dedek-*	SCh
ēmī	2.2.1.6.	*o* : Ø	Ø (**eh₁ > ē*)	**h₁e-h₁óm-/h₁e-h₁m-*	**ēm-*	analogy
frēgī	2.3.2.2.	*o* : Ø	*ē* (for Ø)	**bʰ(r)e-bʰróg-/ *bʰ(r)e-bʰr̥g-*	**frēg-*	analogy
lēgī	2.2.1.9.	*o* : Ø	*ē* (for Ø)	**le-lóg-/le-lg-*	**lēg-*	analogy
meminī	2.2.4.2.	*o* : Ø	submerged	**me-mon-/me-mn-*	**mem*V*n-*	SCh
peperī	2.2.2.6.	*o* : Ø	submerged	?	**pepar-*	SCh
pepulī	2.3.2.7.	*o* : Ø	submerged	?	**pepol-* or **pepel-*	SCh
sēdī	2.2.6.3.	*o* : Ø	Ø (**ez*D > *ē*D)	**se-sód-/se-sd-*	**sēd-*	analogy
spopondī	2.2.4.3.	*o* : Ø	*o*	**spe-spond-/ *spe-spn̥d-*	**spespond-*	analogy
stetī	2.2.5.6.	*o* : Ø	lost before endings	**ste-stóh₂-/ste-sth₂-*	**ste(s)t-*	analogy
tetigī	2.3.2.8.	*o* : Ø	Ø	**te-tóh₂g-/te-th₂g-*	**tetag-*	analogy
tetinī	2.2.5.8.	*o* : Ø	submerged	**te-tón-/te-tn̥(n)-*	**tet*V*n-*	SCh
(te)tulī	2.3.2.9.	*o* : Ø	submerged	**te-tólh₂-/te-tl̥h₂-*	**tetol-*	SCh
totondī	2.2.4.5.	*o* : Ø	*o*	**te-tónd-/te-tn̥d-*	**tetond-*	analogy
vertī	2.2.1.19.	*o* : Ø	*o* (**u̯o- > *u̯e-*) or Ø (**r̥ > or*)	**u̯e-u̯órt-/u̯e-u̯r̥t-*	**(u̯e)u̯ort-*	SCh

Table 31: Inherited Latin neo-perfect stems of perfect origin.

Perfect stems not listed in the previous tables are either secondary or etymologically problematic, and thus do not convey any useful evidence for the continuation of PIE ablaut.

Most Latin PPPs are either phonologically regular continuations of inherited PIE *to*-participles (reflecting the expected zero-grade root) or later innovations. However, a small number of PPPs, which clearly are of PIE inheritance, have a modified (i.e. non-zero-grade) vocalism (Table 32).

PPP	Ch.	Exp. V	Act. V	PIE	Expected Latin form
cultus	2.2.1.3.	Ø	*e* (**kʷeł > cul*)	**kʷl̥h₁-tó-*	**clātus*
fīsus	2.2.1.8.	Ø	*e* (**ei̯ > ī*)	**bʰidʰˢ-tó-*	**fissus*
(g)nōtus	2.2.3.2.	Ø	*e* (**eh₃ > ō*)	**gn̥h₃-tó-*	**(g)nātus*
iactus	2.2.2.5.	Ø	modified	**Hih₁-tó-*	**ītus*
lēctus	2.2.1.9.	Ø	*e*	**l̥g-tó-*	**olctus*
nētus	2.3.1.3.	Ø	*e*	**(s)nh₁-tó-*	**natus*
passus	2.3.2.6.	Ø	modified	**pth₂-tó-*	**tatus*
rēctus	2.2.1.10.	Ø	*e*	**h₃rg-tó-*	**orctus*
sessus	2.2.6.3.	Ø	*e*	**sdˢ-tó-*	?
spectus	2.2.2.9.	Ø	*e*	**spk̂-tó-*	?
spōnsus	2.2.4.3.	Ø	*o*	**spn̥dˢ-tó-*	**spēnsus*
tēctus	2.2.1.13.	Ø	*e*	**(s)tg-tó-*	?
tōnsus	2.2.4.5.	Ø	*o*	**tn̥dˢ-tó-*	**tēnsus*
vectus	2.2.1.18.	Ø	*e*	**ugʰ-tó-*	**uctus*

Table 32: Inherited Latin PPPs with modified vocalism.

The modifications took place at different periods between PIE and historic Latin. They are motivated by the restoration of paradigmatic uniformity (1M1F).

The sound changes and mechanisms of morphological change that were operative in the development of these verb paradigms will be examined in detail in the following sections.

3. The effect of sound changes

Sound change plays a crucial role in language change. As was pointed out in the introduction (Ch. 1.2.), it is often stated or implied in the secondary literature that regular sound change was a key *causal* factor in the reduction and/or loss of ablaut patterns in the prehistory of Latin. Such a statement is a hypothesis, which needs closer examination and, eventually, verification or falsification according to the relevant empirical data. The examination must consider the effect of sound changes not only on individual linguistic units (words and morphemes) but also on inflectional paradigms and morphophonological patterns. It is maintained here that grammar change (including the change of morphophonological patterns such as ablaut) can occur only via *analogy* (see Ch. 4.3.). These aspects were already alluded to during the examination of the development of morphological categories.

In this section, I will examine the effect of sound changes in ablaut-sensitive phonological contexts. Such changes include, most importantly, vowel changes (including changes in sequences involving laryngeals next to vowels), changes in syllabic resonants and laryngeals (and sequences thereof) and prosody-induced changes (i.e. syncope and apocope). The examination is divided into two chronological stages: first, from PIE to Proto-Italic (Ch. 3.1.), and then, from Proto-Italic to Classical Latin (Ch. 3.2). Lastly, I will evaluate the effect of sound changes for the development of morphological categories in order to determine their significance for the preservation or loss of ablaut (Ch. 3.3.).

Although Latin and Italic historical phonology is by no means an underresearched subject, comprehensive accounts on the Italic historical phonology (despite important contributions such as Meiser 1998; Weiss 2011) on the one hand, and on the absolute and relative chronology of Latin sound changes on the other, are at present still desiderata. In the context of this study, so exhaustive an examination is not attempted, and, consequently, sound changes not connected with ablaut (for example, most consonant changes) are not discussed. The most important secondary literature on the subject includes Sommer (1914), Kieckers (1930), Buck (1933), Kuryłowicz (1968a), Safarewicz (1969), Sommer and Pfister (1977), Leumann (1977), Allen (1978), Meillet and Vendryes (1979), Bammesberger (1984a), Mayrhofer (1986), Meiser (1986), Schrijver (1991), Sihler (1995), Meiser (1998) and Weiss (2011).

3.1. From Proto-Indo-European to Proto-Italic

The earliest reconstructable ancestor of Latin is Proto-Indo-European; thus, the starting point for the analysis of Latin sound changes is the PIE sound system. The following relevant and with reasonable certainty reconstructable stage is Proto-Italic. In this section, the sound changes that lead from PIE into Proto-Italic, i.e., until the separation of the Latino-Faliscan and Sabellic branches, are examined in a roughly chronological order. In order to measure the effect of each change (or set of changes) on ablaut, the sound changes are grouped according to the type of change in question.

3.1.1. Proto-Indo-European vocalism

According to the current mainstream view,[136] the following vowel phonemes can be reconstructed for PIE:

- Short vowels: **i*, **u*, **e*, **o*, **a*
- Long vowels: **ē*, **ō*, **ā*(?)
- Syllabic resonants: **m̥*, **n̥*, **r̥*, **l̥*, **h₁*, **h₂*, **h₃*

The short vowels **i* and **u* had consonantal allophones **i̯* and **u̯*, respectively, in certain phonological environments (Meier-Brügger 2010: 215).[137] These two vowels are as such not part of the ablaut alternations, but they do form diphthongs with the ablauting vowels **e* and **o* (Fortson 2010: 67); for example, a full grade root C*ei̯*C- contrasts with a zero-grade in C*i*C-, etc. Occasionally, **ī* and **ū* are also reconstructed (e.g. Meier-Brügger 2010: 213–214), although these may also be reflexes of **iH* and **uH*, respectively. The syllabic resonants are allophones of their consonantal counterparts, and they also form sequences with the ablauting vowels; for example, the zero-grade of a root C*em*C- is C*m̥*C-, etc. Such sequences are in certain contexts relevant for the development of ablaut: in Latin – like in many other languages – syllabic resonants are vocalised (i.e. either they turn into vowels or a vowel appears adjacent to them), resulting in an increase in possible ablaut patterns at the surface level.

The vowels **e*, **ē*, **o* and **ō* are the proper ablaut vowels.[138] Despite several counterarguments mostly of theoretical or dogmatic nature, there is comparative evidence that **a* was an independent phoneme in certain roots.[139] In any case, **ă* was an untypically rare vowel in PIE: more common was the laryngeal-coloured allophone of **e*, e.g. **h₂e* = [χɑ] (see below).

In some contexts, **ē* and **ō* are probably of secondary origin (for example, PIE nom.sg. **ph₂tḗr* 'father' < ***ph₂tér-s*, via Szemerényi's Law; Fortson 2010: 70), but they nonetheless have phonemic status in PIE (Byrd 2015: 8). These lengthened grades contrast paradigmatically with the full-grade variants **e* and **o* in certain formations, for example, in the acrostatic root presents, or Narten presents: **u̯ḗl-mi* 1sg. vs. **u̯ĕl-mes* 1pl. from the root **u̯el(h₁)-* 'want' (see Ch. 2.3.4.3.).

3.1.2. Laryngeal-related changes

Important in several ablaut contexts is the development of the PIE laryngeals: although laryngeals disappear completely in Latin (in fact, already before Proto-Italic),[140] their effects in

[136] E.g. Tichy (2006: 22f), Fortson (2010: 62f), Meier-Brügger (2010: 202f). There are also other interpretations that slightly deviate from the mainstream view. For example, the Leiden school does not reconstruct a PIE **ă* (e.g. Beekes 2011: 141–142). According to a now-obsolete view, there was only one laryngeal but the additional vowels **ə*, **ī* and **ū* (Szemerényi 1996: 37f).

[137] From the point of view of the PIE phonology, the reverse is true: **i* and **u* are vocalic allophones of **i̯* and **u̯* (Byrd 2015: 7–8).

[138] See Ch. 1.4. above on PIE ablaut.

[139] For example, the root **(h₁)ai̯-* 'be warm, hot' and its Hitt. reflex *a-a-ri* (from **(h₁)ái̯-ori*; Melchert 2016, contra *EDHIL*, s.v. *ā(i)-*^{ari}*/i-*) confirm the PIE *a*-vocalism independent of **h₂* (which would have resulted in Hitt. *ḫ-*). Another example is Hitt. *alpa-* 'cloud' and Lat. *albus* 'white', which cannot originate from **h₂e-*. See Melchert 1984: 38; *LIV*²: 229; Meier-Brügger 2010: 213; Zair 2012: 10.

[140] But the development of some laryngeal contexts is different in Italic and Celtic, which indicates that at least some laryngeals were present in Proto-Italo-Celtic (cf. Schrijver 1991: 419). However, I am not convinced of

the immediate phonetic environment are evident (see Schrijver 1991 for Latin data and discussion). In PIE, any laryngeal can appear consonantal (**H*), but also "syllabic" (**H̥*) as the syllable nucleus between two non-syllabic sounds in the absence of a full vowel.[141] They also appear in sequences, namely with the ablaut vowels **e/ē*, **o/ō*, as **He/eH*, **Hē/ēH*, **Ho/oH*, **Hō/ōH*, with **i*, **u*, **r̥*, **l̥*, **m̥* and **n̥* (mostly in zero-grade contexts) as **Hi/iH*, **Hu/uH*, **Hr̥/r̥H*, etc., and with the ablaut vowels and resonants in various combinations.

PIE had several rules that caused the laryngeals to be omitted in certain phonological environments (this was most likely due to sound changes that had occurred earlier in the history of PIE; cf. Fortson 2010: 69). Since such rules operate within PIE and thus concern all Indo-European languages and not just Latin specifically, a short overview of the most important developments will suffice:

Saussure effect, or "Saussure's o-grade laryngeal loss rule" (Rasmussen 1989: 175f; Meier-Brügger 2010: 249; Weiss 2011: 113; for Latin specifically, see Schrijver 1991: 326f; Nussbaum 1997): (#/C)HR*o*-/-*o*RHC > (#/C)R*o*-/-*o*RC, that is, a laryngeal between a consonant, or in word-initial position, and a sonorant consonant disappears when the syllable is in o-grade. E.g. **h₃meigʰ-* > Gr. ὀμείχω 'to piss' vs. (Ø)μοιχός 'adulterer'; **terh₁-* > Gr. τέρ<u>ε</u>τρον 'gimlet' vs. τόρ(Ø)μος 'mortise'; **solHu̯o-* > **sol*(Ø)*u̯o-* > Lat. *sollus* 'whole', Ved. *sárva-* 'all', Gr.(Att.) ὅλος, Gr.(East Ion.) οὖλος (<**holu̯os*) vs. **sl̥Hno-* > OIr. *slán* 'sound (adj.)'. The existence of "Saussure effect" as a PIE phenomenon has, however, been questioned by van Beek (2011) and Pronk (2011) on various grounds, while positive evidence is provided from Lithuanian by Yamazaki (2009) and, more recently, Byrd (2013) has plausibly refuted the claims against the PIE existence of the phenomenon.

Neognos rule (Fritz 1996; Weiss 2011: 113): H > Ø /R_V in non-initial syllables of compounds and reduplicated forms, e.g. **genh₁-* 'to be born' → **neu̯o-gn̥h₁ós* 'newborn' > **neu̯ognos* > Gr. νεογνός, Go. *niuklahs* (with secondary dissimilation and **-ko-* suffix); cf. Lat. *benīgnus*, *prīvīgnus*, etc.

Weather rule (Peters 1999: 447; Weiss 2011: 113–114; Neri 2011): H > Ø /V_TL (or /V_DR), that is, a laryngeal following a vowel and before a stop plus liquid (or before a voiceless stop plus sonorant) is lost, e.g. **h₂u̯eh₁dʰrom* 'weather' > ON *veðr*, OCS *vedro* 'clear weather', Gr.(Hsch.) ἀ(ϝ)ετμόν· τὸ πνεῦμα 'breath'; **méh₁trom* > μέτρον 'measure'. The existence of the Weather rule is not universally accepted: there is, for example, evidence in Celtic (Zair 2012: 159–160) and Germanic (Müller 2007: 134–136) against it.

Laryngeal metathesis (Weiss 2011: 114): CHIC > CIHC, that is, a sequence of laryngeal plus **i/i̯* or **u/u̯* between consonants metathesizes, e.g. **peh₃-* 'to drink' > Lat. *pōtus*, Gr. πῶμα 'drink', Ved. *pā́tram* 'cup', but **peh₃-i-* was reanalysed as **peh₃i-*, with a zero-grade **ph₃i-*, which then underwent metathesis e.g. in the PPP: **ph₃i-tó-* > **pih₃-tó-* > Ved. *pītá-*; cf. also Gr. πῖθι aor.imp.2sg.; other examples include **dʰeh₁-i-* 'to suck' > (metathesised) Ved. *dháyati* prs. vs. (non-metathesised) *ádhāt* aor., (metathesised) Lyc. *tideimi* 'son' vs. (non-metathesised) Gr. θῆλυς 'female', (metathesised) Lat. *fīlius* 'son' vs. (non-metathesised) *fēmina* 'woman'.[142]

Schrijver's claim (1991: 510) that laryngeals "must still have been present in Proto-Italic as distinct phonemes", since this is not supported by any comparative Latin and Sabellic data.

[141] Such sequences would violate universal phonotactic rules. The actual phonological realisation of **H* was probably via a prop vowel (Fortson 2010: 62), e.g. **əH* or **Hə*.

[142] But *fīlius* may have another etymology as well. See Weiss 2011: 114 n. 40.

Jasanoff's Law (Jasanoff 1988: 73; thusly named in Weiss 2011: 114). It has two components: first, *-*òHe#* > *-*oH#* > *-*ō#*, that is, word-final *-*e* is lost after an unaccented *-*oH-*, e.g. the thematic 1sg. ending (following Jasanoff's interpretation of this ending; see Ch. 2.4.1. above) **u̯édʰ-o-h₂e* > **u̯édʰō* > Lith. *vedù* 'I lead'; thematic nom./acc.du. **h₁éḱu̯-o-h₁e* > **ékuu̯ō* > Gr. ἵππω. Second, *-*óHe#* > **óHu#* > *-*ōu̯#*, that is word-final *-*e* turns into *-*u* after an accented *-*óH-*, which then develops into *-*ōu̯*, e.g. **du̯óh₁e* 'two' > Ved. *dváu*; **dʰedʰóh₁-h₂e* > Ved. *dadháu*.

Stang's Law (Kieckers 1930: 37; Fortson 2010: 70; Weiss 2011: 114–115): V(H/I)N# > VN#, that is, in a final syllable, of a postvocalic sequence of laryngeal or glide, followed by a nasal, the laryngeal or glide is lost with compensatory lengthening of the preceding vowel, e.g. ***teh₂i̯m* 'this' acc.sg. > **tām* > Gr. τήν, Ved. *tā́m*, OCS *tọ*; ***di̯eu̯m* acc.sg. 'day(light), heaven' > **d(i)i̯ēm* > Lat. *diem*, Gr. Ζῆνα ← Ζήν, Ved. *dyā́m*. This indicates that subphonemic laryngeal colouring must be relatively old: if Stang's Law would have operated before any colouring effect, ***teh₂m* would have developed into ˣ**tēm*. Thus, the correct chronological sequence must be ***teh₂m* > [coloring] ***tah₂m* > [Stang's Law] **tām*.

Laryngeal loss in pausa (Weiss 2011: 115): a postvocalic word-final laryngeal was lost (after colouring, see below) at the end of a prosodic phrase. This is best seen in the vocative of the *-*eh₂*-stems: the vocative constituted its own prosodic unit (it was most likely unaccented in PIE, as in Vedic; Tichy 2006: 44–45), hence *-*eh₂*## > *-*ah₂*## > *-*ă*##, e.g. Gr. νύμφᾰ (Hom. *Il.* 3.130) to νύμφη 'nymph; OCS *žena* 'woman' nom.sg. < **gʷen-eh₂* vs. *ženo* < **gʷenă*; Umb. **muta**, **mutu** 'a fine' nom.sg. < *-*ā* < *-*eh₂* vs. *Tursă* (a name of a goddess < *-*ă*.

Schmidt-Hackstein's Law (Hackstein 2002a): CH.CC > C.CC, that is, a syllable-final post-consonantal laryngeal is lost when the following morpheme begins with a double consonant, e.g. nom.sg. **dugh₂-tḗr* 'daughter', but gen.sg. ***dugh₂-tr-és* > **dug-tr-és*: the variant with *-*h₂-* was generalised in Celtib. *tuwate[r]es*, Gr. θυγατήρ, Ved. *duhitā́*, Toch. A *tkā́cer*, Toch. B *ckācar*, and the variant without *-*h₂-* in Lith. *dukte*, Go. *daúhtar*, Osc. **futír**, Arm. *dowstr* (Hackstein 2002a: 5; see also Rix 1996). This change results, in certain environments, in a loss of a laryngeal, which under other circumstances would receive a vocalic reflex in Latin and elsewhere, e.g. iterative PIE ***dʰh₁-sḱe-* > **dʰ-sḱe-* > Hitt. *zikkizzi*, PIE ***ḱé≠dʰh₁-sḱe-* > **ḱé≠dʰ-sḱe-* > **kə≠t-sk-* > Toch. B *kätk-* (Hackstein 2002a: 6–10).

Some laryngeals also affected adjacent non-laryngeal consonants (these changes are not relevant for ablaut, but are mentioned here for the sake of completeness):

- **Voicing by **h₃*** (Weiss 2011: 115): T > D /_*h₃*, that is, voiceless stops followed by **h₃* are voiced (and the laryngeal is later lost), e.g. **pi-ph₃-e-ti* 'drinks', a reduplicated thematic present (from the root **peh₃-*) > **pibeti* > Ved. *píbati*, OIr. *ibid*, Lat. *bibit* (with the initial *b-* by assimilation). This change is probably of assimilatory nature, provided that **h₃* was a voiced consonant (Weiss 2011: 51).[143]
- **Aspiration by **h₂*** (Weiss 2011: 115): T > Tʰ /_*h₂*, that is, voiceless stops followed by **h₂* are aspirated (and the laryngeal lost), e.g. 2sg.prf. *-*th₂e* > *-*tʰa* > Ved. *vét-tha*, Gr. οἶσ-θα 'thou knowest' (< **u̯oidˢ-tʰa*). This change is probably due to the fact that **h₂* was

[143] However, this particular change is one of the very few indicators for the voiced articulation of **h₃*, meaning that a circular argumentation is evident.

a voiceless fricative (Weiss 2011: 50), the acoustic effect of which is transferred into an aspiration, i.e. a prolonged voice-onset time.

One of the oldest vowel changes that concern ablaut and the vowel system, datable into the PIE period, is **laryngeal colouring**. This change, which actually only affects the vowel **e*, arouse as allophonic variation when laryngeals occurred next to vowels (cf. Weiss 2011: 49–50):[144]

- **h₁* has no coloring effect, e.g. PIE **h₁és-ti* > Gr. ἐστί, Lat. *est*; PIE **seh₁mn̥* > Lat. *sēmen*.
- **h₂e/eh₂* > **h₂a/ah₂*, e.g. PIE **h₂eg-* > **h₂ag-* > Lat. *agere*, Gr. ἄγω; PIE **bʰeh₂-meh₂-* > **bʰah₂-mah₂-* > Lat. *fāma*, Gr.(Dor.) φᾱ́μᾱ.
- **h₃e/eh₃* > **h₃o/oh₃*, e.g. PIE **h₃ekʷ-* > **h₃okʷ-* > Lat. *oculus*, Gr. ὄψομαι fut.; PIE **gneh₃-* > **gnoh₃-* > Lat. *nōtus*.

The long vowel **ē* seems to have been immune to laryngeal colouring; this phenomenon is known as Eichner's Law, after Eichner (1973) (Meier-Brügger 2010: 250–251). There is also no evidence that **ō* or **ā* would have been affected by laryngeal colouring.

Taking **e* : **o* : Ø as the standard ablaut pattern, laryngeal colouring results in two modifications: first, roots with **h₂* develop an *a*-coloured e-grade, which, however, still remains as a separate form and does not coalesce with any existing form; second, roots with **h₃* loose the surface distinction between e-grade and o-grade, as the vowel **e* is coloured into **o*. All changes thus far belong to PIE; in the following, I will examine primarily such changes that concern Latin and the other Italic languages (even though some of these changes are surely shared by other Indo-European languages as well).

The next chronological step (and the first one after the dissolution of the PIE linguistic community) involves the **loss of consonantal laryngeals** and the resulting compensatory lengthening of pre-laryngeal vowels. The importance of this change is highlighted by the fact that the originally allophonic colouring effect is now **phonologized**, resulting in an *increase* in the number of possible ablaut patterns. These changes are certainly datable to the post-PIE period, and most of them probably took place before Proto-Italo-Celtic (cf. Bakkum 2009: 58–61):

- **h₁e* > **e*, for which sequence secure, direct evidence is available e.g. in the root **h₁es-* 'to be' (Ved. ipf.3pl. *ā́san* < PIE **(e-)h₁s-ént*), **h₁ed-* (HLuw. *á-ta-/á-za-*; Kloekhorst 2004: 38), and in few other cases, where the Luwian sign *á* may reflect PIE **h₁e-* (see Kloekhorst 2004: 38f; Simon 2013).[145] Other cases remain conjectural, based on the canonical PIE root structure (Sihler 1995: 38; Meiser 1998: 106); very likely candidates include PIE **h₁e̯i-* > Lat. *īre*, and PIE **h₁e̯u̯s-* > Lat. *ūrere*, etc., which are reconstructed with a laryngeal in Meiser (1998) and Weiss (2011) – a practice followed here. The same problem concerns **Ho* as well.
- **eh₁* > **ē*, e.g. PIE **pleh₁-* > Lat. *plēnus*, Ved. *áprāt* aor.
- **h₂a* > **a*, e.g. PIE **h₂erg-* > **h₂arg-* > Lat. *argentum*, Gr. ἀργός, ἄργυρος, Hitt. *ḫarkiš*.
- **ah₂* > **ā*, e.g. PIE **su̯eh₂du-* > **su̯ah₂du-* > Gr.(Dor.) ᾱδύς, Gr.(Att-Ion.) ἡδύς; cf. Lat. *suāvis*.
- **h₃o* > **o*, see above.

[144] See, e.g., Tichy 2006: 28; Fortson 2010: 63; Meier-Brügger 2010: 242f.
[145] This interpretation is not universally accepted (see, e.g., Rasmussen 2007; Melchert 2010).

– **oh₃ > *ō*, see above. Lat. *dōnum*, Gr. δῶρον, Ved. *dā́na-*, etc. can either be from original PIE **deh₃-* or **doh₃-*. Considering that the e- and o-grade forms of this root had long since had an identical surface value, it means that there was no formal surface-level distinction between these grades in roots containing **h₃* adjacent to the ablaut vowel.
– **Ho > *o*, but there are very few reliable reconstructions, and actually scanty evidence for **h₂o > *o* only, namely PIE **h₂oḱ-* > Lat. *ocris*, Gr. ὀξύς next to PIE **h₂eḱ-* > Lat. *acus, acūtus*, Gr. ἄκρις, ἀκρο- (Sihler 1995: 45-46).
– **oH > *ō*, e.g. PIE **-o-h₂*, the traditional interpretation of the 1sg. primary ending of thematic verbs, e.g. PIE **bʰer-o-h₂ >* Lat. *ferō*, Gr. φέρω, etc. (cf. above for Jasanoff's alternative reconstruction).
– **Hi > *i*, e.g. PIE **h₁i-tó-* > Lat. *itus*, PIE 1pl. **h₁i-més* > Ved. *imáḥ*.
– **iH > *ī*, e.g. PIE **u̯iH-s-* (zero-grade of **u̯eiH-*) > Lat. *vīs*, Gr. (ϝ)ῑς; **gʷih₃-u̯o- > *gʷīu̯o- > vīvus*, Osc. **bivus** nom.pl., Ved. *jīvá-*, etc.
– **Hu > *u*, no examples.
– **uH > *ū*, e.g. PIE **dʰuH-mo-* > Lat, *fūmus*, Gr. θῡμός, Ved. *dhūmá-*.

At approximately the same time, syllabic laryngeals (**h₁ *h₂ *h₃*) are vocalized:

– In most IE languages (including Latin), the reflex is always **a*, e.g. **dʰh₁k-tó- > factus*, **sth₂-tó- > status*, **dh₃-tó- > datus*.
– In Indo-Iranian the reflex is **i*, e.g. **dʰh₁-tó-* > Ved. *hitá-*, **ph₂ter-* > Ved. *pitar-*, etc.
– In Greek, each laryngeal is vocalized differently, namely **h₁* > ε, **h₂* > α, **h₃* > ο (Beekes 1969; Rix 1992: 71-72), e.g. **dʰh₁-tó-* > θετός, **sth₂-tó-* > στατός, **dh₃-tó-* > δοτός.

After these changes had taken place, the effect of sound change on ablaut is still limited to laryngeal contexts. In particular, the loss of laryngeals results in a local increase in ablaut patterns in three environments: 1) roots that contain the sequence *-e*H-, 2) when **e* is coloured into **o* or **a*, and 3) when zero-grade alternants of *-ei̯*H-/*-i̯e*H- and *-eu̯*H-/*-u̯e*H- receive a long vowel (**ī* and **ū*, respectively).

First, in roots which contain the sequence *-e*H- the original short full-grade vowel is replaced by a long one, and therefore the surface difference between full and lengthened grades is neutralised locally. Let us examine some forms of the root **dʰeh₁-* 'put' (Table 33):

GRADE	FORM	PIE	POST-PIE	IE REFLEX
e-grade	prs.3sg.	**dʰi-dʰéh₁-ti*	**dʰi-dʰé̄-ti*	Gr. τίθησι
o-grade	prf.2sg.	**dʰóh₁-th₂e*	**dʰó̄-tʰa*	Hitt. *dāiti* (Sihler 1995: 122)
zero-grade	**to*-participle	**dʰh₁-tó-* **dʰh₁k-tó-*	**dʰe-tó-* **dʰak-tó-*	Gr. θετός Lat. *factum*

Table 33: Ablauting forms of the root **dʰeh₁-*.

Apart from the change of root structure (CVH- > CV-, CH-(C-) > CV-(C-)), the ablauting vowels also change: the short full-grade vowel is replaced by a long vowel (formally coalescing with the existing lengthened grade), and the absence of a full vowel in the zero-grade is replaced by the presence of a full vowel (which, depending on language, may be identical with the full-grade vowel). This kind of ablaut pattern is similar (but not identical) to the PIE Narten pattern. These neutralisations have a local effect in roots that contain the sequence **-eh₁-*, but they

diminish the transparency and uniformity of the overall system of ablaut relations, which results in the increase of markedness of these exceptional forms. Despite the change of surface forms, the relations *within the system* still hold: the local contrast with the renovated full-grade (**-ē-*) and zero-grade (**-ĕ-* or **-a-*, etc.) is not lost.

Second, the full grade vowel **e* now has variants **a* and **o* in certain contexts, which makes the system more complex: in addition to the basic **e* : **o* : Ø pattern, we now have also **a* : **o* : Ø and **o* : **o* : Ø. Coupled with the laryngeal-induced lengthening discussed above, the patterns are multiplied by two with the addition of **ē* : **ō* : Ø, **ā* : **ō* : Ø and **ō* : **ō* : Ø.[146] This development is demonstrated by a selection of forms of the root **b^heh_2-* 'say' (Table 34):

GRADE	FORM	PIE	POST-PIE	IE REFLEX
e-grade	prs.1sg.	**b^héh₂-mi*	**b^hā́-mi*	Gr.(Dor.) φᾱμί, Gr.(Att.-Ion.) φημί cf. Lat. *fārī*
o-grade	noun	**b^hoh₂-n-éh₂*	**b^hoh₂-n-ā́*	Gr. φωνή
zero-grade	prs.1pl.	**b^hh₂-més*	**b^ha-més*	Gr. φαμέν, cf. Lat. *fātērī*

Table 34: Ablauting forms of the root **b^heh_2-*.

Not unlike the roots with the sequence **-eh₁-*, the vowels undergo quantitative change here as well. Also evident is the expansion of the ablaut patterns by the addition of prominent *a*-vocalism, which, recall, originally was not part of the PIE ablaut system at all.

Third, zero-grades of roots containing the sequence *-e̯iH-/-i̯eH-* or *-e̯uH-/-u̯eH-* now have a long vowel, resulting in an increase in possible zero-grade patterns. For example, the e-grade of the root PIE **mleu̯h₂-* 'say' is reflected in Ved. sbj.3sg.act. *brávat* < **mléu̯h₂-e-t*, while the zero-grade appears in ind.3sg.mid. *brūté* < **mluh₂-tói̯*. A more relevant example for the present discussion is the development of the optative suffix PIE **-i̯éh₁-/*-ih₁-*, which in PIE exhibited a perfectly transparent ablaut contrast between the accented full-grade and unaccented zero-grade: as a result of laryngeal-induced lengthening, the suffix now acquires the form **-i̯ē-/*-ī-*, which no longer bears a one-to-one resemblance with the original pattern (again, recall that **ī* was not part of the PIE ablaut system).

The regular loss of laryngeals can be interpreted as an *increase* of the complexity of possible ablaut patterns.[147] At this point, the most salient development is in the zero-grade: the *absence* of a full vowel is replaced by the presence of a vowel, which, however, in this case is **a*, **ī* or **ū*, none of which reflect the original full or long grade vowels **e/ē*, **o/ō*. Only in roots containing **h₂* adjacent to the vowel do e-grade and zero-grade become homophonous. The overall result is that despite the multiplication of possible surface forms, the system does not change. It does, however, lose transparency and iconicity, meaning that the formations which have paradigmatic alternations exhibit reduced naturalness vis-à-vis non-alternating formations.

[146] After the vocalisation of syllabic laryngeals in Latin, the resulting patterns are **ē* : **ō* : **a*, **ā* : **ō* : *a* and **ō* : **ō* : **a* in laryngeal-containing, non-diphthongal roots.

[147] In fact, the post-PIE ablaut patterns resemble those that once were reconstructed for PIE proper before the adoption of the Laryngeal theory (cf. Sihler 1995: 110).

3.1.3. Syllabic resonants

Practically simultaneously with the vocalisation of syllabic laryngeals occurs also the vocalisation of syllabic liquids **r̥*, **l̥* and of the sequences of syllabic resonants and laryngeals, that is, **-r̥H-*, **-l̥H-*, **-n̥H-*:

Vocalisation of syllabic liquids (Kieckers 1930: 38–39; Safarewicz 1969: 67; Sommer and Pfister 1977: 44–45; Leumann 1977: 57; Meiser 1986: 37; 1998: 63f; Weiss 2011: 95): **□ > *or*, **l̥ > *ol* /_C, e.g. **mr̥tí-* 'death' > pre-Lat. **mortis* > Lat. *mors*, YAv. *mərəti-*, cf. OE *morþ*, OHG *mord*; **k̂r̥d-* 'heart' > *cor*, *cordis*, Gr. καρδ-ία, OCS *srĭd-ĭce*, Lith. *širdìs*, OIr. *cride* – all from zero-grade (cf. e-grade **k̂erd-* in Go. *haírtō*, OE *heorte*); **tl̥-n-h₂-* 'to lift' → **tol-n-e/o > tollō*, cf. OIr. *tlenaid* 'to steal' < **tlinati* < **tl̥-n-h₂-* ← **telh₂-* 'to lift'; **r̥ > *ar*, **l̥ > *al* /_V, e.g. **kr̥-ōn* 'meat' (← **(s)ker-* 'to cut') > **kr̥rō > carō*; **k̂l̥-éh₁-i̯e/o-* 'to be warm' > **kl̥l-ē- > calēre*. But sometimes **r̥ > *ur* /_C occurs preconsonantally instead of **r̥ > *or*, e.g. **kʷr̥-tó-* 'cut' > *curtus*; **k̂r̥s-e/o-* 'to run' > **kurs-ō > currō* (Kieckers 1930: 39; Leumann 1977: 57; Weiss 2011: 95). The exact conditioning factors and other details of this irregularity remain unclear. In some cases, a preceding **u̯* or a labiovelar **kʷ*, **gʷ*, **gʷh* may have been a conditioning factor, e.g. **u̯r̥g-éi̯-e/o-* 'to press, to urge' > *urgēre* (Meiser 1998: 63).

Vocalisation of CRHC- (Kieckers 1930: 41; Buck 1933: 106; Sommer and Pfister 1977: 46; Leumann 1977: 59; Weiss 2011: 100): **r̥H > rā*, **l̥H > lā*, **n̥H > nā* (there are no examples of **m̥H > *mā*), e.g. **gʷr̥H-tó- > grātus* 'pleasing', Ved. *gūrtá-* 'praised', Osc. **brateis** 'favor' gen.sg.; **str̥h₃-tó- > strātus* 'spread', Gr στρωτός, Ved. *stīrtá-*; **tl̥h₂-tó-s > (t)lātus* 'carried', Gr.(Att.-Ion.) τλητός, Gr.(Dor.) τλᾱτός; **gn̥h₁-tó- > (g)nātus* 'son', Gr. κασί-γνητος 'brother', Ved. *jātá-*, Go. *aírþa-kunds** 'of earthly descent'.

Vocalisation of #HRC- (Schrijver 1991: 56f; Meiser 1998: 106; 2003: 31): **h₁RC- > eRC-*, **h₂RC- > aRC-*, **h₃RC- > oRC-*,[148] e.g. **h₁n̥gʷni-* 'fire' > **engni- > *eŋni-* > Lat. *ignis*; **h₂m̥bʰi* 'around' > Lat. *amb-*, Gr. ἀμφί, Ved. *abhí*, OHG *umbi*; **h₃n̥gʰ-* 'nail' > **ong-* > Lat. *unguis*. This change must be very old, since Latin shows the triple reflex of the laryngeals (Meiser 1998: 106).

Vocalisation of #RHC-, or Beekes' Law (Beekes 1988; Schrijver 1991: 161f; Meiser 1998: 107; Weiss 2011: 100): **#l̥H > la* (apparently no other cases attested for Latin), e.g. **l̥h₁d-tó-* 'slack' > *lassus* 'tired' (but note that this is the only Latin example for this change), cf. **léh₁d-* > Go. *lētan** 'let', OE *lǣtan*.

These changes are especially relevant for the continuation of the zero-grade: in roots containing -R̥- or -R̥H-, an epenthetic vowel arises. In case of roots with **R̥*, this secondary zero-grade contains the vowel *o* in addition to the resonant (which now acquires consonantal value), being thus identical with the inherited o-grade. Roots with **R̥H* receive a secondary zero-grade in *-Rā-*, turning the originally vowelless zero-grade into a syllable with a long vowel. These forms nonetheless contrast with other forms in the paradigm, e.g. **sterh₃- > ster-*, **storh₃- > stor-*, **str̥h₃- > strā-*, so any further observed levelling is of analogical, not of phonological, nature.[149] We observe, again, the increase of possible zero-grade reflexes, which, in turn, results

[148] Similar to Rix's Law in Greek (Rix 1969).

[149] There exists at least one case, where e-grade and zero-grade of a CRE*h₂*C-root become *lautgesetzlich* homophonous: L *rādīx* 'root' < **u̯reh₂d-ih₂-(k-)* or **u̯r̥h₂d-ih₂-(k-)*, provided that it actually is a *devī*-formation based on a root noun (Schrijver 1991: 183; Sihler 1995: 179; Vine 1999: 7).

in the decrease of naturalness in the paradigms of those roots that had PIE zero-grades in -R̥- or -R̥H-.

3.1.4. Vowel changes

We will now turn to specific, non-laryngeal related sound changes that alter vowel quality:

PIE *$e\underline{u}$ > post-PIE (Proto-Italo-Celtic?) *$o\underline{u}$ (Kieckers 1930: 33, 51; Buck 1933: 81, 89; Safarewicz 1969: 66; Sommer and Pfister 1977: 42; Leumann 1977: 46f; Meiser 1986: 37; 1998: 59; Weiss 2011: 103): e.g. PIE **déu̯k-e-ti* 'leads' > post-PIE **dou̯k-et(i)* > Lat. *dūcit* (OLat. ABDOVCIT, *CIL* I^2 7). This change eliminates the distinction between e- and o-grade in CE*u̯*C- roots and in other environments containing the sequence *-*eu̯*-. There is no indication of **eu̯* ever being restored by analogy – this diphthong is simply lost from the phoneme inventory.[150]

Pius rule: (*-*uu̯i̯*V- >) *-*ū̯i̯*V- > *-*ī̯*V-, e.g. **pū-i̯-os* 'pious' > **pīos* > *pius*, Osc. **piíhiúí** dat.sg.m.; **endo-struu̯i̯a* > *industria* 'diligence, activity' (cf. Meiser 1998: 86). This change is Proto-Italic (Meiser 1986: 37) or even earlier, possibly shared with Celtic (Weiss 2011: 142, 191). It potentially affects zero-grade roots containing the sequence **uH$i̯$* (if there are any relevant ones in the verbal system), but no distinction is lost.

Vine's raising (Vine 2012): *-*è̯i̯*V- > -*ì̯i̯*V-, that is, unaccented **e* turns into **i* before **i̯* and a vowel, e.g. PIE **su̯ó̯p-ei̯e-* (ō-grade causative from the root **su̯ep-* 'sleep') > PIt. **su̯ó̯p-i̯i̯e-* > *sōpīre* 'lull',[151] PIE acrostatic *i*-stem nom.pl. **-ei̯-es* > PIt. **-i̯i̯es* > (with syncope in the final syllable) *-īs*. Accented **-é̯i̯*V- remains, e.g. PIE **mon-é̯i̯-e/o-* > early PIt. **mon-é̯i̯-e/o-* > late PIt. **món-ē-* > *monēre* 'remind'. As demonstrated by Vine (2012), early Proto-Italic still retained the PIE mobile accentuation.

The change ****ōu̯* > **āu̯*** is also Proto-Italic, e.g. **h₃eḱtoHu̯o-* 'eighth' > **oktōu̯o-* > Lat. *octāvus*, cf. Osc. PN **úhtavis** (Leumann 1977: 55, 70–71; Sihler 1995: 432; Meiser 1998: 86; Weiss 2011: 467), but it is less relevant for ablaut. In fact, the word *octāvus* and its derivatives and Sabellic cognates are the only good examples of this change.

These qualitative changes concern local neutralisations here and there, and consequently do not affect the overall system of ablaut relations in any significant way.

We will now examine changes that affect the quantity of vowels, including prosodic changes such as syncope and apocope:

Osthoff's Law (here Weiss's (2011: 125–126) "Round A"; see also Sommer and Pfister 1977: 42–43; Fortson 2010: 70–71): VRC > VRC, that is, long vowels are shortened before resonants followed by a consonant, e.g. *o*-stem ins.pl. (later dat./abl.pl.) PIE **-ō̯i̯s* > **-o̯i̯s* > **-e̯i̯s* > OLat. *-ē̯s* > Lat. *-īs* (Sihler 1995: 58). Properly, Osthoff's Law belongs to Greek, e.g. PIE **di̯ē̯u̯s* 'day(light), heaven' > Gr. Ζεύς (cf. Ved. *dyáus*, which reflects the long diphthong), but it is operational also in other branches, including Italic, and in Latin the similar effect takes place additional times later in the history of the language (Weiss 2011: 126). This early change eliminates the distinction between full and long grades in specific environments. This is salient,

[150] Much later, *-eu-* returns, for example, in Greek loanwords into Latin (e.g. *eugenēus* 'noble', Colum. 3, 12, 16) and in the interjection *heus!* 'hey there!'.

[151] However, Michael Weiss has more recently (2016) shown that *sōpīre* is not an inherited causative, but rather a Latin innovation of denominative origin. This does not falsify Vine's theory, but merely eliminates a piece of supporting evidence.

e.g., in the *s*-aorist (on which a number of Latin perfect stems are based, see below), which originally had ē-grade in sg., e-grade in pl. (*LIV*²: 20; Tichy 2006: 129; cf. Kieckers 1930: 36), e.g. PIE **dḗi̯k̂-s-t* 'pointed out' : **dḗi̯k̂-s-n̥t* > post-PIE **dḗi̯k̂-s-t* : **dḗi̯k̂-s-n̥t* → Lat. *dīxit* : *dīxērunt*. Thus, in *s*-aorists of C*e*RC- roots, the ablaut contrast is neutralised by this change, and there is no trace of it being ever restored by analogy.

Dybo's shortening (Meiser 1998: 75; Weiss 2011: 99): pretonic long vowels are shortened. This change most likely concerns not only Italic but also Celtic and Germanic. The best example is the word for 'man': Lat. *vĭr*, Umb. *ueiro*, OIr. *fer*, Go. *waír* < **u̯ĭros* < **u̯īrós* < PIE **u̯iHrós*, cf. Ved. *vīrá-*, Toch. A *wir*. This change has the potential of shortening long vowels of long grades, secondary full grades (with long vowels) and zero-grades (e.g. from R□H sequences), thus locally eliminating these quantitative distinctions. The scope, however, is limited, since long vowels (e.g. those that result from full grade *-e*H- sequences or reflect the original long grades) are relatively rare in pretonic position: originally, the PIE full grade was limited to accented syllables.

Loss of unaccented word-final **i* (Kieckers 1930: 75; Bakkum 2009: 61; Weiss 2011: 468):[152] e.g. PIE **hₓég-e-ti* 'drives' > **ageti* > **aget* > *agit*.[153] In certain accent/ablaut paradigms, an unaccented **-i* was preserved due to analogy from such paradigms, in which it was accented, e.g. *s*-stem loc.sg. (> Lat. abl.sg.) **génh₁-es-i* > **genesi* > *genere* 'birth, race', analogical to the hysterokinetic **ped-í* > *pede* 'foot' (Meiser 1998: 73–74). Since this change depends on the position of the PIE accent, it must have taken place before the Proto-Italic initial-syllable accentuation was in effect (also cf. Joseph and Wallace 1987: 688 n. 636). For ablaut, this change is largely irrelevant, as it does not affect any ablauting morphemes, but it is significant for the development of the verb inflection.

NS-Lengthening: V > V /_N(*s*, *f*, *χ*) (Buck 1933: 94; Safarewicz 1969: 76; Leumann 1977: 112–113; Sommer and Pfister 1977: 100; Weiss 2011: 129f), e.g. **kom-sod-* (?) > *cōnsul*, **i̯unχsai̯* > **i̯ūnχsai̯* > *iūnxī* 'joined'. The vowel was in all likelihood nasalized during this process, followed by the loss of the nasal proper, as evidenced by inscriptional forms such as cosol, cesor for *cōnsul*, *cēnsor* (*CIL* I² 8), the optional orthographic variants *viciē(n)s* '20 times', *totiē(n)s* 'so many times', and Romance developments (e.g. *mēnsa* 'table' > *mēsa* > Sp. *mesa*). However, in Classical Latin the nasal was normally restored in the standard orthography (e.g. *cōnsul*) (cf. Meiser 1998: 78). This lengthening occurs for the first time in Proto-Italic, as in **sanχto-* 'sacred' > **sānχto-* > Osc. *saahtúm*, Umb. *sahatam* /*-ā-*/, Lat. *sānctus* (cf. Meiser 1998: 78), although the exact chronology is unclear (see Weiss 2011: 468–469). It remains as a synchronic phonological rule until Classical Latin. As seen in *iūnxī*, this change has effect on the morphophonological development of some paradigms (see Ch. 2.3.2.4.).

[152] In my view, this early apocope is a different change from, and therefore unrelated to, the later (ca. third century BC) apocope, see below.

[153] The only possible counterexample to the early dating of this change is the form *tremonti* in *Carmen Saliare* (Fest. 205M). However, this form, which occurs in a scarcely understandable and poorly transmitted text, should be approached with extreme caution (Joseph and Wallace 1987: 688). The emended passage reads *prae ted tremonti*, but this reading is not attested in any manuscript (Sarullo 2014: 50), and is, in fact, a scholarly conjecture. No piece of Latin and Sabellic data necessitates the reconstruction of Proto-Italic 3pl. **-onti* (or any primary ending with **-i* for that matter).

Quantitative changes discussed thus far have strictly local consequences. In the end, however, they do contribute towards the gradual decrease in symmetry, transparency and uniformity of the inherited ablaut patterns.

3.1.5. Other changes

There are two other changes that are *sensu stricto* not vowel changes, but they affect the development of vowels in an important way and hence need to be mentioned here:

Loss of intervocalic *-i̯- (Meiser 1986: 38; 1998: 91): *i̯ > Ø /V_V, e.g. PIE *treḭ-es 'three' > L *trēs*, Osc. **trís** /trẹ̄s/, cf. Ved. *tráyas*. The change itself does not affect any vowels, but the resulting contractions create new long vowels. This results in long-vocalic sequences which reflect etymological full or zero-grades, and are not directly related to original lengthened grades.

Accentuation: the inherited PIE free accentuation was replaced by a regular word-initial dynamic accent (Sommer and Pfister 1977: 73; Sihler 1995: 239; Meiser 1998: 53; Baldi 2002: 269; Fortson 2010: 278; Weiss 2011: 109). As shown by Vine (2012), this is a relatively late innovation within Proto-Italic: there exists evidence that early Proto-Italic still had a mobile accent of PIE type.

3.2. From Proto-Italic to Latin

The above changes took place during the period from PIE into Proto-Italic. The following changes – apart from a few changes that are shared by Faliscan – belong to the *einzelsprachlich* history of Latin.

3.2.1. Proto-Italic vocalism

The Proto-Italic vowel system consisted of the following phonemes (Table 35; cf. Bakkum 2009: 56):

	front		central		back	
	short	long	short	long	short	long
close	*i*	*ī*			*u*	*ū*
mid	*e*	*ē*			*o*	*ō*
open			*a*	*ā*		
diphthongs	*ai̯, āi̯, au̯, āu̯, ei̯, ēi̯, oi̯, ōi̯, ou̯, ēu̯*					
syllabic nasals	*m̥, n̥*					

Table 35: The Proto-Italic vowel system.

Unlike PIE, Proto-Italic was not restricted to having just *e*, *ē*, *o* and *ō* as ablaut vowels. Due to the sound changes discussed in the previous sections, the potential distribution of these vowels into different PIE ablaut grades was the following:

- e-grade: **e*, **o*, **a*, **ei̯*, **ou̯*, **ē*, **ā*, **ō*
- o-grade: **o*, **oi̯*, **ou̯*, **ō*

– zero-grade: **i*, **u*, **e*, **a*, **o*, **m̥*, **n̥*, **ā*, *Ø*
– ē-grade: **e*, **ē*, **ei̯*, **ēi̯*, **ēu̯*, **ou̯*
– ō-grade: **ō*, **oi̯*, **ōi̯*, **ou̯*, **āu̯*

The distribution indicates that, compared to the PIE origin, different grades are in Proto-Italic represented by a multitude of different vowels and that the overlap between the grades is significant (for example, the PIt. **e* can, depending on context, represent the original PIE e-, ē- and zero-grades, while the PIE **e* was strictly limited to e-grade). What is more, the number of involved entities is also reduced: compared to PIE, Proto-Italic lacks the laryngeals, the syllabic resonants, and sequences thereof with the basic ablaut vowels.

3.2.2. Latino-Faliscan changes

We will first examine post-Proto-Italic, specifically Latino-Faliscan sound changes (cf. Meiser 1998: 54; Bakkum 2009: 70f):

– **Vocalisation of syllabic nasals**: as a general rule, *N > *e*N, that is, **m̥* > *em* and **n̥* > *en*,[154] e.g. PIE **dék̂m̥* '10' > PIt. **dekm̥* > Lat. *decem*, cf. Gr. δέκα, Ved. *dáśa*, Go. *taíhun*; PIE/PIt. **tn̥-tó-* > Lat. *tentus* 'stretched', cf. Gr. τατός, Ved. *tatá-*, OIr. *tét* 'string', Lith. *tìnti* (< **tn̥ti*) 'swell' (Meiser 1998: 65). Phonetically unproblematic assimilation **m̥* > **n̥* occurs in some environments (such as before dentals and **i̯*), e.g. PIE **(d)k̂m̥tóm* '100' > PIt. **kn̥tom* > Lat. *centum*, cf. Ved. *śatám*, etc.; PIE/PIt. **gʷm̥-i̯é/ó-* > **gʷn̥-i̯e/o-* > Lat. *venīre* 'come' (similarly Gr. βαίνω < *βανjω). Additionally, there are two special environments.
– *N > *e*N occurs also before a vowel, e.g. PIE **ten-* → **tn̥-(e)hɪ-i̯e-* > **tn̥n-ē-* > Lat. *tenēre* 'hold' (Meiser 1998: 65). More correctly, however, this concerns the Lindeman variant *NN, which means that the sound change can also be formulated *NN > *e*N.
– *N > N*a* /_DC, that is, **m̥* > *ma* and **n̥* > *na* before a voiced stop in a closed syllable, e.g. PIE **meg-* 'large' (cf. G μέγα, Ved. *máhi*) → **m̥g-no-* > Lat. *magnus* (Meiser 1998: 65).

These changes lead to yet another increase in possible zero-grade forms, since the syllabic nasals (which could enter zero-grade formations such as CNC- vs. e-grade C*e*NC-) are vocalised. As a result, several inherited zero-grade forms coalesce with existing full-grade forms (provided that the full-grade form itself has not been transformed by another sound change).

The sound changes that have been examined thus far lead to the state of affairs attested in the earliest preserved Latin inscriptions.

3.2.3. Vowel weakening and deletion

Vowel weakening (VW) and vowel deletion (VD) are characteristic sound changes of Latin that set it apart from other related languages. The descriptive facts are clear enough: according to the traditional view, all short medial vowels are reduced to *i* or *e* during the fifth to third centuries BC; at approximately the same time, some short vowels are lost (syncopated) in medial syllables. The outcome of VW is not random: the outcome is *i* in open syllables and *e*

[154] The Proto-Sabellic outcomes, i.e. *a*N in the first syllable, *e*N elsewhere (Meiser 1986: 69), indicate that this change is indeed post-Proto-Italic. Cf. e.g. **n̥-ter* > Osc. **anter**, Umb. **ander** vs. Lat. *inter*.

in closed syllables and before *r*. For example, the original vocalism of *facere* (*faciō*, *fēcī*, *factus*) remains unchanged, as VW only concerns medial (and, in some formulations, final) syllables. However, many preverb compounds of *facere* (e.g. *cōnficere*) undergo VW so that the present stem vocalism changes to *-i-* (**con-faciō > cōnficiō*, due to open syllable), the PPP into *-e-* (**con-factus > cōnfectus*, due to closed syllable), while the perfect stem vowel remains as *-ē-* (**con-fēcī > cōnfēcī*, VW only affects short vowels). An example of VD is the syncope of the reduplication vowel in the perfect stem *rettuli* of *referre*: the original perfect of *ferre* was *tetulī*, which in preverb compounds syncopates into *°ttulī* (thus, **re-tetulī > rettulī*). It is obvious that both VW and VD may exert an effect on inherited ablaut vowels, as they may get weakened into *i* or *e* – or deleted altogether.

While the descriptive facts are mostly unproblematic, an adequate linguistic explanation for VW and VD has been lacking. In the last decade, however, Kanehiro Nishimura has proposed many novel insights into the topic.[155] Moreover, in a co-authored article (Leppänen and Alho 2018) I suggest that Latin VW is connected with the "periferalisation" of the Classical Latin vowel system and, ultimately, to the development of the vocalism of the Romance languages. As these themes are only tangential to the development of ablaut and the Latin verb system, the up-to-date exposition of Latin VW and VD will be presented in Appendix II. At this point, a summary of the most relevant findings will suffice.

The changes encompassing VW and VD in chronological order are the following:

- Non-high medial weakening: reduction of medial *a*, *e* and *o* into *ə* (which developed a rounded allophone *ɵ* in labial environments).
- Final *a*-weakening: reduction of word-final *a* into *ə*, then into *e*.
- Open-syllable syncope, round 1: deletion of short vowels in open medial syllables.
- Final-syllable syncope: deletion of *i*, *o* after *t* or *r* and before word-final *s*.
- Final raising, round 1: raising of word-final *e* into *i* and of *o* into *u* before a consonant.
- Schwa-strengthening: raising of medial *ə* into *i* (and of *ɵ* into *u*) in open syllables, and fronting into *e* in closed syllables.
- *u*-fronting: fronting of medial *u* into *i* in certain environments.
- Open-syllable syncope, round 2: deletion of short vowels in open medial syllables.
- Final-raising, round 1: raising of word-final *-o*C into *-u*C.
- Sporadic syncope: occasional deletion of word-final vowels.

These changes took place from the fifth to the first century BC.

While these changes seem to neutralise many potential ablaut contrasts, their effect is still strictly local: 1) VW in this formulation concerns only verb stems with *a*, *e* or *o* as stem vowel, 2) the changes affect only medial syllables of polysyllabic verb stems, i.e. the vocalism of initial syllables remains unaffected, and 3) vowel quantities are untouched by these changes, meaning that VW has no effect on the continuation of quantitative ablaut contrasts.

However, the most salient effect of VW is the **submersion** of vocalism in certain morphological formations, especially in reduplicated perfects and preverb compounds. The root vocalism of simplex, non-reduplicated verbs remain untouched. It is important to note that the effects of VW are eventually phonologized, i.e. the process does not remain as a productive phonological mechanism after the change to Penultimate rule.

[155] See references in Appendix II.

3.2.4. Monophthongisations

Latin historical phonology includes a number of monophthongisations that eventually affect the ablaut relations of the verb system. The first – and more significant – set of monophthongisations occurred after the first round of VW, during the third century BC (Meiser 1998: 57f; cf. Antkowski 1956: 21). The development concerns initial, medial and final syllables, and the first component of a diphthong in non-initial syllables can be said to behave identically with short vowels in closed syllables. Hence, we get, e.g., medial and final **aį̯* > **əį̯*, **eį̯* > **əį̯*, **oų̯* > **əų̯*; **eį̯* and **oį̯* are indeed reduced even in final syllables. But **aį̯* and **aų̯* remain in initial syllables – elsewhere they were already regularly reduced into **əį̯* and **əų̯*, which, in turn, show entirely regular development. As a rule, in initial syllables all *e*I-diphthongs change into *ē* [eː] and all *o*I-diphthongs into *ō* [oː], while in non-initial syllables all V*į̯*-diphthongs change into *ē* [eː] and all V*ų̯*-diphthongs into *ō* [oː], e.g.

Initial syllables: PIt., VOLat. **eį̯* > OLat. *ē*, e.g. PIt. **deį̯ų̯os* 'god' > VOLat. DEIVOS (*CIL* I² 4) > **dēų̯os* (cf. OLat. DEVAS 'divae' *CIL* I² 975) > CLat. *dĕus* 'god' (after loss of intervocalic *ų̯* and hiatus shortening) and *dīvus* 'divine'; PIt., VOLat. **oų̯* > OLat. *ō*, e.g. PIE **hₓeų̯s-e-* 'to burn' > PIt., VOLat. **oų̯se-* > OLat. **ōrere* > CLat. *ūrere*; PIE, PIt., VOLat. **loų̯ko-* 'grove' > OLat. *lōcom* acc.sg. (still written LOVCOM in *CIL* I² 366, early second century BC, Meiser 1998: 60) > CLat. *lūcus*. The case of PIt., VOLat. **oį̯* > OLat. **ō/ē* is more complex, as the change is conditioned by the phonetic environment: *ō* (> CLat. *ū*) is the expected regular outcome, e.g. PIt., VOLat. **loį̯dos* 'play' > OLat. **lōdos* > CLat. *lūdus* (Meiser 1998: 86), while before a labial the result is *ē* (> CLat. *ī*), e.g. VOLat. **loį̯beros* 'free' > **loį̯bɾ̥ˑs* > OLat. **lēberr* > CLat. *līber*,[156] and after *p* and *f* **oį̯* remains (i.e. *oe* in classical orthography), e.g. Gr. ποινή → OLat. **poį̯na* > CLat. *poena* 'punishment', unless an **i* follows, e.g. VOLat.(?) **poį̯nikos* 'Punic, Carthaginian' > OLat. **pōnɪkos* > CLat. *Pūnicus* (vs. *Poenus*).[157]

Medial syllables: **əį̯* (of whatever origin) > OLat. *ē*, e.g. **kaį̯dō* 'to cut down' (> CLat. *caedō*) → **en-kaį̯dō* 'to cut into' > **enkəį̯dō* > OLat. /inkẹ̄dō/ (INCEIDERETIS, *SCdB*) > CLat. *incīdō*, Gr.(Dor.) ἐλαίϝα 'olive' → **olaį̯ų̯a* > **oləį̯ų̯a* > OLat. **olēų̯a* > CLat. *olīva*,[158] **deį̯kō* 'to say' → **eks-deį̯kō* 'to declare' > **eksdəį̯kō* > OLat. /e(k)sdẹ̄kō/ (EXDEICATIS, EXDEICENDVM, *SCdB*) > CLat. *ēdīcō*; **əų̯* (of whatever origin) > OLat. *ō*, e.g. **klaų̯dō* 'to close' → **en-klaų̯dō* 'to shut in' > **enkləų̯dō* > OLat. **inklōdō* > CLat. *inclūdō*, **doų̯kō* 'to lead' → **ab-doų̯kō* 'remove' > **abdəų̯kō* > OLat. /abdōkō/ (ABDOVCIT, *SCdB*) > CLat. *abdūcō*. The case of **oį̯* > **əį̯* (?) is problematic, mostly due to lack of representative examples. The 2sg. perfect form INTERIEISTI (*CIL* I² 1603) = /interiẹ̄stẹ̄/ (> CLat. *interiīstī* 'thou wentst among'), i.e. **-iį̯-oį̯-staį̯* (from PIE reduplicated **hₓi-hₓoį̯-*, root **hₓeį̯-*) > **-iį̯-əį̯-stəį̯* > **-iį̯-ē-stē* > CLat. *-iistī*, seems to reflect the expected development (see Ch. 2.3.4.2.), while most exceptions, such as *commūnis* 'common' (OLat. comoine, *SCdB*) and *impūnis* 'unpunished' (← *in-poena*) may be analogical to the underived *mūnia* 'duties', *pūniō* 'to punish', etc., and the CLat. *pōmērium*

[156] The PIE source is **hₓleų̯dʰ-ero-* (> Gr. ἐλεύθερος, cf. Lith. *liáudis*, OCS *ljudъje*, OHG *liut*), which becomes regularly PIt. **loų̯bero-*, changing into Proto-Lat.-Fal. **loį̯bero-*. This vocalism is secured by the written forms Fal. *loifirtato*, OLat. *loebertatem* (Paul. Fest.). See Meiser 1998: 87, and *EDLIL*, s.v. *līber* (with partially differing views).

[157] Additionally, Classical Latin has some word forms, in which *-oe-* was not a tautosyllabic diphthong at the time of the monophthongisation, e.g. *proelium* 'battle' < **pro-ų̯elium*, *Cloelia* < **kloų̯e-liā-* (Meiser 1998: 87).

[158] Cf. Gr.(Dor.) ἔλαιϝον 'oil' → **olaį̯ų̯om* > **oləį̯ų̯om* > **olē(ų̯)om* > CLat. *olĕum* (Meiser 1998: 70).

'city border' < **post-moi̯riom* (cf. *mūrus* 'wall') most likely just retains the archaizing orthography (and pronunciation?) due to the religious nature of the term (instead of regularly becoming ˣ*pōmīrium*) (cf. Meiser 1998: 71; *EDLIL*, s.v. *mūrus*).

Final syllables: **-əi̯* (from **-ai̯*) > *-ē*, e.g. 1sg.perf. PIE **-h₂e* → **-h₂e-i̯* > VOLat. **-ai̯* (cf. Fal. **peparai**) > **-əi̯* > OLat. *-ē* (FECEI, *CIL* I² 638) > CLat. *-ī*, 1st decl. dat./abl.pl. post-PIE **-āi̯s* > PIt. **-ăi̯s* (shortening via Osthoff's Law, see Ch. 3.1.1.5.) > OLat. *-ēs* (EEIS REBVS, *SCdB*) > CLat. *-īs*; **-ei̯* > *-ē*, e.g. 3rd decl. dat.sg. PIt. **-ei̯* > VOLat. *-ei̯* (CASTOREI, *ILLRP* 1271) > OLat. *-ē* (IVNONE *CIL* I² 359), 3sg.perf. PIE **-e* → **-e-i̯* → PIt.(?) **-ei̯t*[159] > OLat. *-ēt* (POSEDEIT *CIL* I² 584) > *-īt* (*ēmīt* Plaut. *Cap.* 34) > CLat. *-ĭt*, 2nd decl. nom.pl. PIt. **-oi̯* > VOLat. **-oi̯* (perhaps reflected in *pilumnoe poploe* 'to the pilum-armed people' of the *Carmen Saliare*, Fest. 224) > OLat. *-ē* (VIREI, *SCdB*; PLOIRVME, *CIL* I² 9) > CLat. *-ī*; **-oi̯* > *-ē*, e.g. 2nd decl. dat./abl.pl. PIE **-ōi̯s* (originally ins.pl.) > PIt. **-ŏi̯s* (Osthoff's Law) > VOLat. SOKIOIS in the *Garigliano Bowl* inscription > OLat. *-ēs* (FALERIES, Zimmermann 1986; castreis, *CIL* I² 614, 189 BC) > CLat. *-īs*; **-ou̯* > *-ō*, e.g. fourth decl. dat.sg. PIt. **-ou̯* > OLat. **-ō* > CLat. *-ū* (i.e. *cornū* 'horn' < PIE **k̂ǵrneu̯*), fourth decl. gen.sg. PIt. **-ou̯s* > OLat. **-ōs* > CLat. *-ūs* (i.e. *cornūs* < PIE **k̂ǵrneu̯s*).

The exact sound values of the new long vowels *ē* and *ō* are of course not subject to exact measurements, but, judging from the fact that they (at first) neither merged with the corner high vowels *ī* and *ū* and that they remained separate from the mid long vowels *ē* and *ō* as well, it can be inferred that they must have been close-mid vowels [eː] and [oː], respectively, as already anticipated above. It is possible, but not imperative, to assume that the original mid long vowels *ē* and *ō* were correspondingly more open, i.e. [ɛː] and [ɔː], respectively, but for the purposes of historical phonology it is adequate enough to simply state that they were less close than the new *ē* and *ō*, i.e. perhaps just [ẹː] and [ọː]. I have found no indication whatsoever that any of the Old Latin long vowels would have had environment- or accent-conditioned allophones – unlike their short counterparts. This may be attributed to the longer pronunciation time of these vowels.

The second set of monophthongisations changed *ae* and *au* into *ē* [ɛː] and *ō* [ɔː], respectively. These changes did probably not occur at the same time, but both were certainly of dialectal origin. The monophthongized *ae*, in particular, was considered "rustic" by the ancient grammarians (see Allen 1978: 60f). Both changes, however, must be relatively old (examples from Meiser 1998: 61–62), so e.g. CESVLA pro *Caesula* (*CIL* I² 376, early second century BC), CEDRE, CEDITO pro *caedere*, *caedito* (*CIL* I² 366, early second century BC), PRETOD DE pro *praetor dē* (*CIL* I² 365, late second century BC), POLA pro *Paula* (*CIL* I² 379, early second century BC), ORICVLAS pro *auriculas* (*CIL* I² 2520, first century BC). Note also the borrowing of Gr. σκηνή 'tent' as *scaena* 'stage (of a theatre)' – a hypercorrect orthography. It is possible that in some dialects the monophthongisation resulted in the merger of *ae* and *au* into (the already existing) *ē* and *ō*, respectively, but the later development of these sounds indicates that at least *ae* did not coalesce with *ē*, but a new vowel, an open long *ē* [ɛː], was created instead. Some monophthongised forms made their way into the standard language, e.g. *ōpiliō* 'shepherd' (< **ou̯i-polo-*), *prĕhendō* (< *praehendō*, with hiatus shortening).

The monophthongisations have a distinctive local effect on full-grade roots with diphthongs: the transparent ablaut vowel + glide structure gives way to an opaque long vowel

[159] See Kümmel 2007 for the history of this ending.

(in initial position either *ī* or *ū*), which no longer has resemblance with the original pattern. Now, recall that *ī* and *ū* were not part of the original PIE ablaut system and that these vowels also occur as reflexes of zero-grades of some roots. However, as we already saw and will see in the following summaries and conclusions, by the time of the monophthongisations in the third century BC, the most relevant changes in the Latin verb system had already taken place.

3.2.5. Quantitative changes

This section includes quantitative changes not mentioned elsewhere, in roughly chronological order.

Final *m*-shortening, that is, V > V /_*m*#, e.g. first decl. acc.sg. VOLat. **-ām* > OLat., CLat. *-ăm*, fifth decl. acc.sg. VOLat. **-ēm* > OLat., CLat. *-ĕm* (cf. nom.sg. *-ēs*), first conj. prs.sbj.1sg. VOLat. **-ēm* > OLat., CLat. *-ĕm* (cf. 2sg. *-ēs*). The shortening before *-m* is older than that before other word-final consonants, but it certainly occurred after Proto-Italic, e.g. PIt. **kʷām* > Osc. **paam**, Lat. *quăm* (Meiser 1998: 77).

Hiatus shortening (= *vocalis ante vocalem corripitur*), that is, V > V /_V, long vowels are shortened to their phonologically short counterparts in hiatus before another vowel, e.g. **flēō* 'to weep' > *flĕō* (vs. *flēs*, *flēmus*), *deiu̯os* > **dēos* > *dĕus* (cf. above) (Sommer and Pfister 1977: 102–103; Meiser 1998: 76). As indicated by these examples, both the inherited mid long vowels and the recently monophthongized close-mid long vowels were phonologically interpreted as long variants of *ĕ*, not of *i* [ɪ], in initial syllables, providing supportive our previous hypotheses about the qualities and allophonic conditioning of vowels in initial vs. non-initial syllables. In the Old Latin literature, preservation of *ī* and *ū* before a vowel is not uncommon, as per poetic license, so e.g. *fūimus* Enn. *Ann.* 377, *Dīāna* Enn. *Ann.* 62 (vs. *Dĭānae* Lucil. 104), and the verb *fierī* 'to become' has a long *ī* in some forms even in the Classical Latin paradigm, e.g. *fīō*, *fīunt*, *fīăm*, etc.

Iambic shortening affects disyllabic words with the prosodic form ∪–, where the last vowel becomes shortened, e.g. VOLat. **du̯ĕnēd* > OLat. **bĕnē(d)* > *bĕnĕ* (Sommer and Pfister 1977: 104–106; Meiser 1998: 76–77). In Plautus (and occasionally also afterwards), shortened and original variants remain side-by-side, e.g. *ĕgō* vs. *ĕgŏ*, *sĭbī* vs. *sĭbĭ*, *ŭbī* vs. *ŭbĭ* (note *sĭbĭ*, *ŭbĭ*, not ˣ*sĭbĕ*, ˣ*ŭbĕ*, cf. above). Paradigm forms are restituted by analogy, e.g. *mŏdō* dat./abl.sg. (of *modus* 'measure') vs. *mŏdŏ* adv. 'just now, only' (grammaticalized from the said abl.sg. *mŏdō*), but in the poetry of the Imperial period, new forms appear (e.g. 1sg. *vŏlŏ*, *dăbŏ*, nom.sg. *hŏmŏ*), also in non-iambic words (*nēmŏ*, *tollŏ*) (Meiser 1998: 77).

Littera rule (also known as Iuppiter rule; Weiss 2011: 144), VC > VCC: a long vowel in an open syllable is short while the following consonant is geminated, e.g. leiteras (*CIL* I² 583) > literai (*CIL* I² 595) > OLat., CLat. *lītera* ~ *lĭttera*, PIE voc.sg. **di̯eu̯ ph₂ter* (cf. Gr. Ζεῦ πάτερ) > **iū-pater* > OLat., CLat. *Iūpiter* ~ *Iŭppiter*. It is often the case that both forms occur concurrently in Old and Classical Latin, although there is tendency to regard the geminated (= later) forms as the correct ones.[160] The change must, then, be relatively late.

Final shortening, V > V /_(*t, nt, r, l*)#: in the final syllable of a polysyllabic word, all vowels are shortened before *t*, *nt*, *r* and *l*; in other words, length distinctions are only preserved in absolute word-final position and before word-final *s* (shortening before *-m* was older, see

[160] See, e.g., *LS*, s.v. *littera*, s.v. *Iuppiter* (the latter, however, erroneously "*Jūppiter*").

above), e.g. *arāt* ‘plows’ (Plaut. *Asin.* 874) > CLat. *arăt*, *morōr* ‘stay’ (Plaut. *Rud.* 1248) > CLat. *morŏr*, *pōnēbāt* ‘put’ (Enn. *Ann.* 371) > CL *pōnēbăt*, sied (*CIL* I² 4) → *sīt* (seit, *CIL* I² 756) > CLat. *sĭt*, **animāli* > (substantivized) CLat. *animăl* ‘animal’ (cf. gen.sg. *animāl-is*), *honōs* ‘honor’ → (analogically from *honōr-is* etc.) **honōr* > CLat. *honŏr* (some examples are from Meiser 1998: 77). Monosyllabic word forms ending in *-r* or *-l* are not affected, e.g. *sōl* ‘sun’, *cūr* ‘why’ (but note *sĭt* above).

These changes occasion several notable alterations in the verb system, especially in the 1sg. and 3sg. endings, which are shortened across the board (hence, a global effect). However, apart from Lachmann’s rule (see Appendix I), these changes are quite recent in the history of Latin, and have not decisively influenced the development of the verb system and the ablaut alternations in it.

3.2.6. Qualitative changes

This section includes qualitative changes not mentioned elsewhere in roughly chronological order.

Final *i*-lowering concerns those word-final *i*’s that were not apocopated previously or that were restored on morphological grounds, thus *i* > *e* /_#. This change occurs first and foremost in three morphological contexts: first, third decl. consonant-stem abl.sg. (from PIE loc.sg.) **-i* > *-e*, e.g. PIt. **pedi* ‘foot’ > OLat., CLat. *pede*; second, 3.decl. nom.sg. of i-stem adjectives and neuter nouns, e.g. PIt. **mari* ‘sea’ > OLat., CLat. *mare*, PIt. **fakili* ‘doable, easy’ > VOLat. **fakili* > OLat., CLat. *facile*; third, third conj. *-iō* imperative singulars are affected, e.g. **kapi* > CLat. *cape* ‘take!’. Considering that non-initial *i*’s were already laxed (see Appendix II), this change is rather trivial from the phonetic perspective.

***e*-backing** refers to the change *e* > *o*, which occurred in several phonetic environments (cf. Weiss 2011: 139). First, */k^w_k^w*, e.g. PIE **pek^{w}eti* ‘cooks’ > PIt. *k^{w}ek^{w}et* > OLat. **k^{w}ok^{w}it* (*quoquitur* Plaut. *Men.* 214) > CLat. *coquit*.[161] Second, **su̯e-* > **su̯o-* > *so-*, e.g. PIt., VOLat. **su̯epnos* ‘dream’ (Ved. *svápna-*, OE *swefn*) > **su̯opnos* > CLat. *somnus*. Third, */_ɬ* (*l pinguis*, see Ch. 3.1.2.3.), e.g. PIt. **elōr* ‘swan’ > **eɬōr* > **oɬōr* > CLat. *olor*, PIt. **u̯elō* ‘to want’ > **u̯eɬō* > **u̯oɬō* > CLat. *volō*. Fourth, */u̯*_NV$_{[-front/+back]}$ (Nussbaum 2017), e.g. VOLat. DVENOS ‘good’ (*Duenos*-inscription) > **du̯onos* (cf. *duonus* in the *Carmen Saliare*) > CLat. *bonus* (vs. **du̯enēd* ‘well’ > CLat. *bene*), PIt., VOLat. **u̯emō* ‘to puke’ > CLat. *vomō*.

While not a vowel change, **rhotacism**, that is, (*s* >) *z* > *r* /V_V, occurring at about 350 BC, deserves mention, since it affects the quality of the preceding vowel in some cases (see below).[162] This famous[163] sound change had one apparent, several conditioned and one true exception. First, Classical Latin forms such as *vīsus* ‘seen’, *caesus* ‘slain’ and *causa* ‘cause’ did originally (and during the completion of rhotacism) have *-ss-*, i.e. *vīsus* < **vīssos* < **u̯īd^s-to-*, *caesus* < **kai̯d^s-to-*, and the written form *caussa* occurs occasionally even in the Imperial period (Weiss 2011: 151). Second, *miser* ‘wretched’ escaped rhotacism due to the dissimilatory effect

[161] But this seems to be the only example of this particular environment, so it is questionable if this actually is a proper sound law.

[162] Cf. Fal. **carefo** ‘carēbō’ < **kazēβō* (fourth century BC). “Rhotacism appears to have been an areal feature that spread across Latin, Faliscan and Umbrian sometime in the 4th century BCE” (Weiss 2011: 151, n. 116).

[163] Rhotacism was used by Edgar Sturtevant as a parade example of a regular sound change, with a fanciful allegory to Prussian soldiers at the battle of Waterloo (as reported by Anttila 1989: 59f).

of the following *r*, but *soror* ‘sister’ < **su̯esor* did not, due to the preceding *s* (Anttila 1989: 60). Third, loanwords adopted after the fourth century, e.g. *cisium* ‘two-wheeled chariot’ (Gaulish), *basis* ‘foundation’ (Greek), *asinus* ‘ass’ (unknown origin), naturally remain unaffected by an earlier sound change. Lastly, *nāsus* ‘nose’ (and derivatives such as *nāsūtus* ‘largenosed’ and *Nāsō* PN) seems to be the only genuinely irregular exception (cf. the regularly rhotacised *nāris* ‘nostril’); it is also possible that *nāsus* is from **nāssus* (*WH*, s.v. *nāsum*).[164]

Rais-ING (named by Parker 1986), that is, *e* > *i* /_*ŋ*, *o* > *u* /_*ŋ* (Sommer and Pfister 1977: 54). The Latin *ŋ* appears only as an allophone of either *n* or *k/g* in certain environments: before a velar consonant *n* > *ŋ* (by way of assimilation) or *k/g* > *ŋ* before a following *n*, e.g. *incīdō* [ɪŋkiːdoː] ‘cut into’, **dek-no-* > *dignus* [dɪŋnʊs] ‘worthy’. When *e* or *o* preceded a *ŋ* of whatever origin, it was raised into *i* or *u*, respectively, e.g. PIt. **teŋgō* ‘to moisten’ (cf. Gr. τέγγω) > CLat. *tingō*, PIt. **sek-nom* ‘sign’ (< ‘a cut piece’) > **segnom* > **seŋnom* > CLat. *signum*, PIt. **oŋg*^{w}*en* ‘ointment’ > CLat. *unguen*. A similar effect is applied before *n* as well, most notably in the preverb/preposition PIE, PIt., VOLat. **en* > CLat. *in* and the privative prefix PIE **n̥-* > VOLat. **en* > CLat. *in*; word-initial *en-* remains only in *enim* ‘therefore’ (Meiser 1998: 81), from PIE **h₁e-no-* (*EDLIL*, s.v. *enim*). Unlike argued by Parker (1986: 158), these changes need not precede NS-lengthening, since the latter continued its existence as a synchronic rule. As for the relative chronology with VW, Rais-ING certainly follows non-high medial weakening, but it may also have remained in place as a synchronic rule (e.g. **ad-tangō* would yield CLat. *attingō* ‘to touch’ both ways). The raising *e* > *i* /_*mb* probably belongs here as well, e.g. VOLat. **lembos* > CLat. *limbus* ‘fringe’ (Weiss 2011: 137).

Long vowel tensening affects all mid and close-mid long vowels, i.e. *ēˑ*, *ēˑ*, *ōˑ*, *ōˑ*. Phonetically and phonologically, *ēˑ* > *īˑ*, *ōˑ* > *ūˑ*, that is, the Old Latin close-mid vowels *ēˑ* [eː], *ōˑ* [oː] merge with the already existing close vowels *īˑ* [iː], *ūˑ* [uː], respectively. The mid vowels *ēˑ* [e̞ː], *ōˑ* [o̞ː], then, become phonetically more close, that is [eː], [oː], respectively. This establishes all Classical Latin long vowels onto the peripheral axis, as visualized in Figure 1:

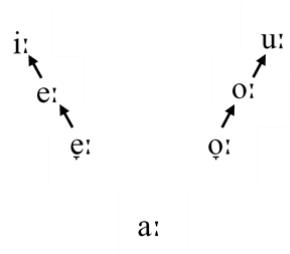

Figure 1: Long vowel tensening.

The change occurred during the earlier half of the second century BC. Traces of the close-mid value for *ēˑ* appear in Plautus (see Allen 1978: 54–55) and in *SCdB* (186 BC, e.g. deicerent most likely represents *-ēˑ-* rather than *-īˑ-* or *-e̞i̯-*), where it is consequently written <ei>. The spellings with <I> (pro *īˑ* < *e̞ː*) start to appear during the second century BC, e.g. PVRGATI nom.pl. (*CIL* I² 586, ca. 150 BC), while the now-obsolete digraph <EI> is used for an etymological *īˑ* in VEITAM (*CIL* I² 364, second century BC). As for the dating of the tensing of the mid vowels *ēˑ*

[164] But see Christol (1996) for a dialectal loan theory of *nāsus* – however, considering that rhotacism was an areal phenomenon in and around Latium, the loan must have come from quite afar! Also cf. *EDLIL*, s.v. *nāris*.

and *ō*, an exact date is difficult to determine, since such purely phonetic changes rarely surface in the written form. The evidence, thus, is indirect:

- Loss of contrastive vowel length in the fifth century AD (see Loporcaro 2011, 2015) is the definite *terminus ante quem*. Other pieces of evidence, however, indicate that mid-vowel tensening must be significantly older.
- Long vowels have a tendency to become more close with time (cf. Labov 1994: 176).
- The merger of *ē* into *ī* and of *ō* into *ū* are results of such tensening processes (Leppänen and Alho 2018). Together with the monophthongisation of *ae* (and possibly of *au* as well), which created a new long vowel in the open-mid sector, the whole process can be understood as a *chain shift*: to use the front vowels as an example, *ēˑ* > *īˑ*, *ēˑ* > *ēˑ*, *ae* > *ēˑ*.

Thus, there are good grounds to presume that the mid long vowels *ēˑ* and *ōˑ* became tense within this shift, that is, in the first half of the second century BC.

Raising of *e* between nasals, or more accurately, *e* > *i* /*m*_*n*V, e.g. **menes-u̯ā* 'mindful' > **meneru̯a* > CLat. *Minerva*, cf. Praenestine MENERVA (*ILLRP* 1198), **men-* 'jut out' > CLat. *minae* 'threats' (Weiss 2011: 137). This may nevertheless be a dialectal feature, since *e* > *i* is observed also before *-rk-*, e.g. STIRCVS pro *stercus* (*CIL* I² 401, Luceria), MIRQVRIOS pro *Mercurius* (*CIL* I² 553) (Meiser 1998: 81).[165]

***o*-fronting** refers to the change *o* > *e* /*u̯*_, that is, *o* is changed into *e* when preceded by a *u̯* [w] <V> and followed by *s*, *t* or tautosyllabic *r* (Meiser 1998: 84), e.g. OINVORSEI (*SCdB*, 186 BC) > CLat. *ūniversī*, ARVORSVM (*SCdB*) > CLat. *adversum*, ADVORTIT pf. (*CIL* I² 586), and the Plautine *voster*, *vorrō*, *votō* for CLat. *vester*, *verrō*, *vetō*. The change is blocked in an open syllable before *r*, thus *vorō* (not ×*verō*).

***ol*-raising**, *o* > *u* /_*l*C (but not before *-ll-*), that is, *o* was raised into *u* before *l pinguis* in a closed syllable (Meiser 1998: 84), e.g. OLat. MOLTAI 'fines, penalties' (*CIL* I² 366) > CLat. *multae* (cf. Osc. **múltasíkad** 'multaria'), **solko-* (cf. Gr. ὅλκος) > CLat. *sulcus* 'furrow', and the variation *stolidus* 'dull' : *stultus* 'stupid', *columen* 'column' : *culmen* 'summit, roof'. The apparent exceptions *solvō* 'to release' and *volvō* 'to roll' had vocalic *u*'s at the time of the raising, i.e. [sǫlʊ(w)oː], [wǫlʊ(w)oː].

***i*-fronting** refers to the change *u* > *i* in certain phonetic environments. First, the change occurs after *l* and before a labial consonant, e.g. *lubet* 'it pleases' (Plaut.+) > *libet*, *clupeus* 'shield' > *clipeus*. Second, superlatives in *-umus* are affected as well, e.g. *optumus* > *optimus* (although, as mentioned above, the epigraphic forms with *-u-* persist well into the Imperial Period). These changes may indicate that *u* had an unrounded and/or fronted allophone in some phonetic contexts or in certain areal/social variants. Note also the relatively confined articulatory space involved (cf. above).

Sometime before Classical Latin, short mid vowels *e* and *o* become more open. This can be called **mid vowel laxing**, i.e. *e* [ę] > [ɛ], *o* [ǫ] > [ɔ]. Dating this change with precision is problematic, since it only affects the phonetic realisation of these phonemes. However, considering that the changes affecting these vowels came to completion not until about 100 BC (as discussed above), I suggest that the laxing occurs only after that time. Again, some varieties of Latin may well have had more open allophones already much earlier, but direct evidence for

[165] For a more thorough discussion from the sociolinguistic perspective, see Adams 2007: 89f.

this is lacking. In any case, mid vowel laxing is the final step in the formation of the Classical Latin peripherality-based vowel system, which is visualized in Figure 2 (cf. Allen 1978: 47):

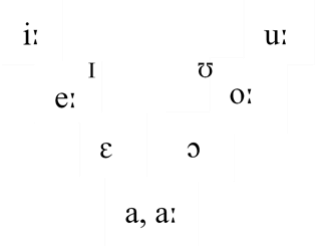

Figure 2: Classical Latin vowel system.

Apart from long vowel tensening and the resulting merger of OLat. *ē* and *ō* with and into CLat. *ī* and *ū*, respectively, the effect of these changes is very specific in that they apply only in limited phonological environments. Thus, the effect on the development of the verb system is minimal despite the change of an occasional surface form. Overall, the development of the peripherality system did not influence Latin verb morphology in a significant way.

3.2.7. Post-Old-Latin changes

As already noted, Old Latin phonology is very much like that of Classical Latin, since the most salient sound changes took place before or – at the latest – during the second century BC. It is also known that the Latin verb system changed very little after that time, but for completeness sake, a number of post-Old-Latin sound changes need to be mentioned.

Final raising, round 2 affects the sequence -*o*C(C)# that were not raised as a part of round 1 (p. 218), that is -*os* > -*us*, -*om* > -*um*, etc., also after -*u̯*- and -*qu*-, e.g. SERVOM ‘slave’ (*CIL* I² 686, 71 BC) > CLat. *servum*, SVOM (and SVVM, *CIL* I² 593, 45 BC), and the Old Latin literary forms *avonculus* ‘uncle’ pro *avunculus*, *volgus* ‘rabble’ pro *vulgus*, *sequontur* ‘they follow’ pro *sequuntur*, etc. (Meiser 1998: 84). OLat. **ek^{w}os* ‘horse’ resulted regularly in *ecus* (cf. above), but the morphophonemic alternation *ecus* nom.sg. ~ *equī* gen.sg., etc., was leveled in favour of the oblique variant; hence, CLat. *equus*. Whether this is an actual sound law or mere analogical leveling is difficult to determine, since almost all affected forms are inflectional endings (and *avunculus* may be modelled after *avus* ‘grandfather’). The epigraphic attestations indicate that the change was complete before the latter half of the first century BC.

By way of **sporadic syncope**, some vowels (especially in final syllables) are sometimes omitted, without any clearly discernible and phonologically regular pattern, e.g. *calĕfaciō* (cf. above) > *calfaciō*, *dīce* imp.2sg. > *dīc* ‘say!’,[166] **feris*, *ferit* > *fers*, *fert* (from *ferre* ‘carry’), etc. Such apocopes occur from time to time during the first few centuries BC: e.g. while *dīce* still appears in Plautus, *volup* adv. ‘agreeably’ (< **volupe*, cf. *voluptās* ‘pleasure’) has already been apocopated.

[166] For similar forms and their attestations, see Neue 1897: 305f.

3.3. Summary and assessment

In this section I will summarize the effects of regular sound change on ablaut patterns in the form of a concise overview from the phonological perspective, followed by a short discussion of typical cases in which regular sound change demonstrably did *not* contribute to the loss of ablaut and in which it has, in fact, acted towards the preservation of the inherited patterns. See also the summaries in Chs. 2.4. and 5.2.

As for qualitative vowel changes, the following effects are observed:

- Laryngeal colouring and loss (occurring between PIE and Proto-Italic) result in an increase of possible ablaut patterns. A new ablaut vowel, **a*, arises in some full-grade and zero-grade contexts. Laryngeal colouring also results in some local mergers and neutralisations (e.g. PIE **h₃e* : **h₃o* > PIt. **o* : **o*).
- In few cases – mostly in initial syllables – no change affecting short and long vowels (monophthongs) occurs between Proto-Italic and Classical Latin at all. In these cases, the inherited patterns are preserved (or are expected to be preserved) intact, unless an analogical modification has taken place.
- Vowel weakening affects first and foremost the medial vowels of polysyllabic word forms, in some cases resulting in almost total merger of every short vowel. The most salient effect of VW for ablaut patterns is *submersion*, that is, in the affected words it is no longer possible to identify the original ablaut grade on the basis of the OLat./CLat. forms. As an anticipation for the following discussion, we may note here that the categories that are affected by VW (reduplicated perfects and preverb compounds) are *marked* categories, whereas the *unmarked* simplex present tense forms remain, as a rule, unaltered.
- Almost all diphthongs monophthongize between Very Old Latin and Classical Latin, leading to several mergers with the existing (i.e. inherited) long vowels.
- Certain phonetic contexts (such as the adjacency of *r*, *l pinguis*, or a labial consonant) recolour vowels, resulting in a further submersion or coalescence of the inherited ablaut vowels and, thus, the occasional neutralisation of these ablaut contrasts.

As for quantitative vowel changes, the following effects are observed:

- Laryngeal-induced lengthening and Osthoff's shortening eliminate several local contrasts between full and lengthened grades.
- Vocalisation of syllabic laryngeals results in the occasional neutralisation of full and zero-grade vocalism. Overall, possible zero-grade surface forms multiply significantly.
- During Proto-Italic, the vocalisation of syllabic liquids neutralises local o- and zero-grade contrasts, while the post-Proto-Italic vocalisation of syllabic nasals neutralises local e- and zero-grade contrasts. Possible zero-grade realisations are again multiplied.
- Phonologically conditioned lengthenings and shortenings result in further confusion between full and lengthened grades. Almost all of these changes take place after the Very Old Latin period, and some (final shortening, for example) are very recent, occurring only within the literary period of Latin (i.e. during the first two centuries BC), and are thus far too recent to have had any effect on the development of the verb system.

The examination of the morphological categories will be carried out in the next section, but the effect of sound change on morphologically relevant ablaut alternations can be illustrated here by the following examples:

- The (pre-)PIt. change **eu̯* > **ou̯* is a concrete case of local ablaut neutralisation, but its global effect can be approximated by examining the prominence of this phonological shape in the verb system. As it happens, of the ca. 500 PIE verbal roots that are reflected in Latin (according to *LIV*²), 29 featured the diphthong **eu̯* and were thus liable to be affected by this change. However, only 13 of them continue e-grade formations, thus reducing the potential extent of the change. In the PIE verb system, the e-grade vs. o-grade contrast was relevant only in some perfect and aorist formations, further diminishing the overall effect. There is, thus, no conclusive evidence that the neutralisation of this ablaut relation in the 13 affected formations would have exerted a destructive effect on the development of the morphophonological alternations as a whole: the effect is strictly local.
- The Proto-Italic change *CRHC- > *CR*ā*C- affected several zero-grade formations, e.g. the PPP of the root **sterh₃-*: thus, PIE **str̥h₃-tó-* > PIt. **strā-to-* > Lat. *strātus*. It is certainly true that such changes destroy the phonological iconicity of the zero-grade in these formations, since the original absence of a fully sonorous vowel is replaced by the presence of a long vowel – but note that both are phonologically marked vowels vis-à-vis the unmarked short full vowel; thus, the markedness value of the vowel does not change. However, as will be argued in Ch. 5.3., such changes inadvertently enhance the naturalness of verbal paradigms, to which the PPPs were integrated. Moreover, the effect is, again, strictly local: in other contexts, phonologically regular zero-grade PPPs retain their iconic vowellessness, e.g. *dĭctus* vs. *dīcō*.
- Vowel weakening causes the root vocalism of compound verbs and reduplicated perfects to submerge, resulting in almost total neutralisation of qualitative ablaut contrasts in these cases. However, this change is relatively late in the history of Latin, meaning that the most radical changes that reshaped the verb system had already taken place. More importantly, simplex verbs, whose vocalism was not affected by VW, could retain (or could have retained) the inherited ablaut contrasts. Monophthongisation of most diphthongs during the third century BC had a similar, strictly local and non-systemic effect, in addition to also being a relatively late change.
- For the most part, the effect of regular sound change concerns individual words and word forms to a varying degree. We may illustrate this by two examples. From the root PIE **(s)teg-* 'to cover', Latin continues the following forms: a thematic present PIE **(s)tég-e-* > Lat. *tegere*, an *s*-aorist PIE **(s)tḗg-s-* > Lat. *tēxī*, a *to*-participle PIE **(s)t(e)g-tó-* > **tegtos* > Lat. *tēctus*, a *t*-stem noun PIE **(s)teg-t-* > Lat. *teges, tegetis*, an *ā*-stem noun PIE **(s)tog-eh₂-* > Lat. *toga*, and a further noun PIE **(s)tēg-l-eh₂-* > Lat. *tēgula*. In this word family, almost all relations and contrasts are preserved (e.g. the e-grade of the thematic present and the ē-grade of the *s*-aorist); only in the PPP does Lachmann's rule result in an uninherited long vowel (that is, an ē-grade looking root vowel). From the root PIE **deu̯k-* 'to lead', then, Latin continues a thematic present PIE **déu̯k-e/o-* > Lat. *dūcere*, an *s*-aorist PIE **dḗu̯k-s-* > Lat. *dūxī*, a *to*-participle PIE **duk-tó-* > Lat. *ductum*,

as well as an agent noun PIE **duk-s* > Lat. *dŭx*,[167] and a denominative/compound verb stem °*dŭcāre* (e.g. *ēdŭcāre* 'to bring up' vs. *ēdūcere* 'to lead out'). Here, the original distinctions between e-, ē- and the zero-grade are reduced to a purely quantitative *ŭ* : *ū* contrast by way of regular sound change, pointing towards the conclusion that sound change is indeed responsible for the loss of paradigmatic ablaut alternations. However, comparison with cases such as *tegere* above shows, once again, that the effect of sound change is limited to local contexts.

To conclude, the evidence presented here indicates quite clearly that the loss or preservation of certain ablaut relations and/or contrasts in the Latin verb system cannot be the result of regular sound change alone. Local neutralisations, however, are not infrequent, and their cumulative effect may have influenced the development of certain morphological categories: the gradual loss of iconic and uniform alternation patterns may have propitiated analogical modifications in the paradigms. These are examined in the following sections, where the focus will be shifted from historical phonology to historical morphology.

[167] Zero-grade is unexpected, meaning that the simplex noun is probably derived from compounds (*EDLIL*, s.v. *dūcō*).

4. Mechanisms of morphological change

As was pointed out after the discussion of Latin sound changes, regular phonological change is far from being able to provide an adequate explanation for the loss of ablaut in most cases (see Ch. 3.). Once the lowest level of grammar, phonology, can be excluded as an explanatory factor, the next level needs to be taken into consideration; hence, the most relevant context for the development of ablaut in the Latin verb system is *historical morphology*.[168] Before discussing the actual mechanisms of morphological change, short overviews of general properties of vowel alternations and of the interplay of sound change and analogy are provided in this chapter.

As was pointed out in the introduction (Ch. 1.1.), the framework of this study involves theoretical and metatheoretical levels, the latter of which involves important background assumptions that are connected to the normativity of language. However, the focus of this study is historical phonology and morphology, not philosophy of linguistics; therefore, an overview of normativity is provided in Appendix III. For most readers with linguistic education, the principles of normativity are more or less self-evident. They are nonetheless crucial for understanding the choice of theories and the explanatory principles employed in this study. The benefits of metatheoretical observations are summarised in Ch. 5.5.

4.1. Vowel alternations: synchrony, diachrony, typology

Ablaut is certainly a case of *vowel alternation*. In order to properly contextualise ablaut as a phenomenon, vowel alternations from the general perspective need to be examined as well. Unfortunately, to my knowledge, extensive typological studies on vowel alternations do not currently exist, despite the fact that such alternations are rather commonplace in the languages of the world. For this reason, my examination here is by no means meant to be exhaustive, and I will mostly refer to well-documented and well-understood examples.

In this section, I will pay special attention to two attributes of vowel alternations: 1) their position in the structure of the language, and 2) their ability to express grammatical functions with or without other exponents. I will also briefly examine Indo-European ablaut in the typological context as well as other types of Latin vowel alternations and how to distinguish them from ablaut.

[168] A historical note is appropriate here in order to contextualise my preference for particular morphological theories. The Neogrammarian theoreticians of the late 19th century attributed most morphological change either to regular sound change or to analogy, while the synchronic morphological analysis was based on the traditional grammar of the Classical languages. The role of analogy in language change was particularly emphasised by Hermann Paul (1920). Structuralists of the early 20th century established solid principles of not only phonological but also morphological analysis in the synchronic linguistics, while diachronic linguistics – including Indo-European studies – remained predominantly analogy-oriented in morphological matters until at least the 1970s. This constellation of data-oriented historical and comparative linguistics, structuralist morphology and analogy-based morphological change is at the core of functionalist linguistics. Meanwhile, since the 1950s, the number of alternative theories of morphology and morphological change has multiplied significantly, starting from the appearance of generative grammar. But the generativists were originally interested exclusively in synchronic linguistics, and in historical linguistics the functionalist framework never went out of fashion (see, e.g., Anttila 1977, 1989). Starting from the late 1960s, the functionalist scope was widened by the appearance of linguistic typology, grammaticalisation studies, and cognitive linguistics.

4.1.1. Internal modification

Itkonen (2008b) provides the following list of morphological operations that are utilised in the expression of grammatical functions in the languages of the world:

- Zero and removal.
- Ordering and juxtaposition.
- Semi-independent grammatical morphemes [i.e. clitics].
- Affixation.
- Reduplication.
- Internal modification.
- Gestalt.

Of these, all but the last two could be called *segmental* or *concatenative* operations, since they either add, remove or reorder segmental units within a syntagm. The last two involve changing the internal composition of a segment and are thus of different kind than the rest. Within this typology, vowel alternation (including ablaut) belongs under internal modification.

By internal modification, a phonological feature (or a set of features) of a morpheme is modified or changed, typically without adding or removing any segments of the morpheme. For example, in Finnish the stem-final consonant (or cluster of consonants) of certain lexemes changes depending on the following morphophonological context, e.g. *pöy<u>t</u>ä* nom.sg. : *pöy<u>d</u>ä-n* gen.sg. 'table'.[169] These operations contrast most sharply with affixation (prefixation, suffixation, infixation, circumfixation), where a segment with an independent, usually self-contained function, is added to another morpheme. Internal modification may involve changing a segmental phoneme of the morpheme (e.g. a vowel or a consonant) or a suprasegmental feature such as accentuation or tone. In languages that employ both affixation and internal modification, both may serve similar or different functions, or they may be complementary (Baerman and Corbett 2012). Since this study is about ablaut, I will focus solely on vowel alternation in the following sections.

4.1.2. Typology of vowel alternations

Vowel alternations exist in many languages, but thus far – to my knowledge – no extensive typological studies have been conducted on this topic,[170] even though specific vowel alternation patterns of individual languages have been studied to a considerable degree. Vowel alternations (same as any type of internal modification) can serve many different functions, and it is not a priori clear, which functions a certain vowel alternation pattern expresses and what causes (or *triggers*) it. In the following, I will present a concise typology of vowel alternations from various perspectives in order to provide a necessary typological contextualisation for Indo-European ablaut.

Perhaps the simplest classification of various vowel alternation patterns is based on the phonological process that the vowel undergoes:

---

[169] This is a part of the Finnish phonological consonant alternation system called *consonant gradation* (Karlsson 1999: 28f).

[170] However, already in the 19th century linguistic typology vowel alternations (as exemplified by the Germanic umlaut and Indo-European ablaut) were considered to be a feature of the inflected type – the most "advanced" language type according to the 19th century view (Arens 1969: 160f). The "less advanced" agglutinative and isolating languages lacked this feature.

- **Quantitative change** (i.e. lengthening or shortening): e.g. Gr. πατήρ nom.sg. : πατέρα acc.sg., Lat. *amās* 2sg. : *amăt* 3sg., *honŏr* nom.sg. : *honōr-is* gen.sg.
- **Fronting/raising**: e.g. PDE *foot* [u] sg. : *feet* [i] pl., NHG *Vater* [ɑː] sg. : *Väter* [ɛː] pl.
- **Backing/lowering**: e.g. PDE *sing* [ɪ] prs. : *sang* [æ] pret., *sing* [ɪ] (verb) : *song* [ɔ] (noun).
- **Roundedness change** (i.e. rounding or unrounding): e.g. OIc. *land* [ɑ] nom.sg. : *lǫnd* [ɔ] nom.pl.[171]

Another classification is based on the function that the alternation expresses (if any):

- **Lexical distinctions**: e.g. PDE *hat* : *hut*, Lat. *dīcō* 'I say' : *dūcō* 'I lead'. This is a trivial kind of alternation (or actually a "non-alternation"), since the involved vowels represent different phonemes (i.e. PDE /æ/ ≠ /ʌ/, Lat. /ī/ ≠ /ū/) and are coupled with different lexical meanings.
- **Expressive**: e.g. PDE *ding-dong*, *zigzag*, *King Kong* (Wescott 1970). These kinds of reduplicated pairs seem to occur in many languages, and they usually serve quite similar, often expressive, onomatopoetic and humoristic functions.
- **Grammatical-derivative**: e.g. PDE *sing* (verb) : *song* (noun), *sane* [eɪ□] (adjective) : *sanity* [æ] (noun), Lat. *tegō* 'to cover' (verb) : *toga* 'a cover, men's garment' (noun). This kind of alternation often serves similar functions as affixation (e.g. *sing* : *sing-ing*, Lat. *tegō* : *teg-(i)men* 'a covering') or occurs together with affixation (e.g. *sane* : *sani-ty*).
- **Grammatical-inflectional**: e.g. PDE *sing* prs. : *sang* pret., *foot* sg. : *feet* pl., Lat. *facit* prs. : *fēcit* pf. Again, this kind of alternation often serves similar functions as affixation (e.g. *walk* : *walk-ed*, *cat* : *cat-s*, Lat. *dīcit* : *dīxit* (= *dīc-s-it*)).
- **Non-functional**: e.g. Finnish vowel harmony (Karlsson 1999: 16–17), as in *talo-ssa* 'house' ine.sg. : *kylä-ssä* 'village' ine.sg. The vocalism of the inessive suffix *-ssA* changes ([ɑ] : [æ]) but its grammatical function remains exactly the same in both cases.

A further classification criterion is, which condition triggers the vowel alternation, i.e. causes a certain alternant to appear. This relates to a wider issue in morphological theory: linearity (Anderson 1988: 325). In a linear (or concatenative) model, each morphological word consists of linear segments (some of which can be non-segments or zeroes), whereas in a nonlinear (or nonconcatenative) model, non-segmental morphological features (such as suprasegmentals, e.g. accentuation and tone; and internal modification) are allowed in the description (cf. Bickel and Nichols 2007: 182f). With regard to vowel alternation, in a linear model the occurrence of each alternant must be triggered by another segment in the same syntagm, and if no other segments are present, zero morphemes can be added, while in a nonlinear model the alternation itself can be described as an independent exponent, which is not governed by any of the other involved segments. Regardless of model, the following potential cases of triggering can be identified:

- **Phonological**: e.g. Fin. *talo-ssa* : *kylä-ssä* (the exact form of the inessive suffix is determined by the vocalism of the lexeme that it attaches to), Lat. *amās* : *amăt* (before *s* a long vowel occurs, but before *t* a short one; but see below).
- **Grammatical**: e.g. PDE *sing* : *sang* and *foot* : *feet* (since no other segment seems to be present, the vocalism appears to be determined by the grammatical functions prs. : pret. and sg. : pl., respectively).

[171] Sound values are from Noreen (1903: 30–31). The phenomenon in question is the OIc. *u-umlaut* (Noreen 1903: 56f).

– **Syntactic**: Sanskrit features a phono-syntactic system of grammaticalized sandhi-phenomena. By some sandhi rules, the closing vowel of a word changes under the influence of the following word, e.g. *devaḥ paśyati* 'the good sees' : *devō gacchati* 'the god goes'. The syntactic context (whichever word happens to follow) seems to determine the vocalism.

Further qualifications are necessary. The Finnish vowel harmony is a clear case: the form of the inessive suffix is clearly triggered (triggering represented here by an arrow →) by the word that it attaches to, i.e. *talo* (back harmony) → *-ssa* (back harmony) : *kylä* (front harmony) → *-ssä* (front harmony). This is, thus, a case of distant assimilation. All other potential triggering factors (derivation, inflection, syntax, semantics) can be ruled out.[172] The Latin case mentioned above is less clear. One could argue that the long vowel in *amās* is triggered by the second person function and the short vowel in *amăt* by the third person function (not unlike the *-a-* vocalism of PDE *sang* is triggered by the preterit function). However, in the Latin verb system the long vowel is not limited to second person (cf. *amāmus* 1pl.) and the short vowel not to third person (cf. *facĭs* 2sg. in the third conjugation). Moreover, a long vowel appears in the corresponding 3sg. passive form *amātur*. Grammatical triggering can thus be ruled out. Instead, we are dealing here with a result of a regular sound change: during the second century BC, all long vowels in word-final syllables before *-t*, *-nt* and *-r* are shortened (Meiser 1998: 77); hence pre-Lat. **amā-t* > *amăt*, while the long vowel in 2sg. *amās* remains, because it is not affected by this change. The above considerations lead us to the conclusion that the vowel alternation is phonologically triggered.

The history of *i-umlaut* in English is not only instructive for how vowel alternation develops but it also provides an important perspective to the triggering issue at hand. A case in point is the plural formation of OE *mūs* 'mouse' (Anttila 1989: 63f): before Old English, the plural was formed by adding the suffix **-i* to the singular form, thus **mūs* sg. → **mūs-i* pl.[173] As a result of a regular sound change, the root vowel of the noun was fronted in the plural form in anticipation of the **i*-ending (i.e. partial distant assimilation), yielding **mūs* sg. : **mȳs-i* pl. – a case of vowel alternation. Now, it is quite clear that at this point the umlaut in the root was triggered by the following vowel, but before Old English certain unstressed, word-final vowels were dropped. This did not lead to the loss of umlaut in the plural form, but rather the umlauted vowel was *reanalysed* as a constituent of the plural formation; thus OE *mūs* sg. : *mȳs-Ø* pl. (here the loss of ending is represented by a zero-ending).

However, such umlaut plurals were not productive in Old English and occupied a marginal position in the grammar. The productive operation of forming plurals was suffixation, e.g. *stān* sg. → *stān-as* pl. (Hogg and Fulk 2011: 75). Taking this into consideration, it is possible to describe the umlaut plural as having been triggered by the zero-ending – just as the prehistoric **i*-ending used to trigger it before the ending was lost by regular sound change. This may seem like a viable description, but when more pieces of data are considered, the issue becomes more problematic.

[172] But note that this is not free variation: **talo-ssä* and **kylä-ssa* would be incorrect Finnish.

[173] This is a simplified presentation for illustrative purposes. Old English actually had four cases, and in this paradigm *i*-umlaut occurred in gen.sg., dat.sg. and acc.pl. in addition to nom.pl. (Hogg and Fulk 2011: 132f). All forms cited here are in the nominative. For more information on *i*-umlaut in the history of English, see Hogg (2011: 118f), Ringe and Taylor (2014: 222f), and Schrijver (2014: 62–63, 123f).

Modern German has four different plural formations: 1) suffixal, 2) umlauting, 3) suffixal-umlauting, and 4) no overt marking (i.e. singular = plural).[174] The relationship of types (2) and (4) is particularly interesting: since suffixation is clearly the only productive plural formation in German, we may take it as the default case (same as in Old English) and presume that types (2) and (4) are suffixed with a zero-ending, e.g. (2) *Vater* : *Väter*-Ø, (4) *Wagen* : *Wagen*-Ø (regarding type (3), we presume that the ending triggers the umlaut). In type (2), we can presume that the zero-ending triggers the umlaut, since no other triggering segments are present. But this is not an adequate description, since a morpheme ought to either trigger or not trigger the umlaut, all other things being equal (unless we want to assume that the occurrence or non-occurrence of umlaut is lexically rather than grammatically or phonologically conditioned). In order to be consequent, we need to assume two *different* zeroes for German, the one of which triggers umlaut, the other of which does not, e.g. *Vater* : *Väter*-Ø$_1$, *Wagen* : *Wagen*-Ø$_2$. While some morphological theories may prefer such descriptions, it is problematic from the functionalist perspective to assume that morphemes without actual concrete realisation (i.e. mere results of linguistic analysis) would be capable of triggering phonological changes in other morphemes.

Instead, a better approach has already been hinted at. As noted above, the loss of *-*i* in pl. **mȳs-i* did not lead to the reversion of the original non-umlauted vowel, but the vowel alternation was rather *morphologised* (Andersen 1988: 328f; Anttila 1989: 117–118), i.e. it became an independent morphological operation. In the German case, we need to presume that the plural type is lexically determined (this seems to be the most natural description). There is, thus, no need to resort to morphological zeroes or force a linear description of a phenomenon that does not warrant it (cf. Anttila 1977: 62f; Stump 2001: 9). In this respect, a nonlinear morphological model is more suitable than a linear one. I will thus draw the following conclusions:

- Vowel alternations can be phonologically or grammatically triggered – this, however, may not be a priori clear.
- If vowel alternation is grammatically triggered, the assumption of morphological zeroes is not necessary, unless their postulation is warranted by historical or structural analysis.
- Once morphologised, vowel alternation can be counted among the means of expressing grammatical functions, on a par with affixation and other morphological operations.

A noteworthy property of vowel alternation is that it not infrequently occurs together with other morphological operations (typically affixation). This has, in recent decades, been raised into the general typological discussion under the term *multiple exponence*, as more empirical evidence has been introduced (see Caballero and Harris 2012; Baerman and Corbett 2012; Harris 2017).[175] The basic idea behind multiple exponence is that a grammatical function is expressed by more than one constituent within a syntagm (typically a word or a similar self-contained phonological and morphological unit).[176] Multiple exponence thus involves a certain

[174] Examples: 1) *Tag* : *Tag-e*, 2) *Vater* : *Väter*, 3) *Buch* : *Bücher*, 4) *Wagen* : *Wagen*. Bavarian dialect actually has *Wagen* : *Wägen*, but this is beside the point here.

[175] Also cf. Matthews's (1972: 132f) analysis of "overlapping exponence" in Latin verb morphology.

[176] "Multiple (or extended) exponence is the occurrence of multiple realisations of a single feature, bundle of features, or derivational category in more than one position in a domain." (Caballero and Harris 2012: 165). Note that these authors concentrate exclusively on analysing *productive* patterns that show multiple exponence (Caballero and Harris 2012: 173) – such a restriction does not concern this study.

amount of *redundancy* in information-theoretical terms. As a general phenomenon, we can distinguish at least the following three types of multiple exponence (cf. Caballero and Harris 2012: 175):

- Total repetition: the same morphological marker for a given grammatical function occurs more than once (typically twice) in a syntagm. This appears to be a rather rare type (see Caballero and Harris 2012: 175–176 for examples).
- Functional repetition: a grammatical function is expressed by two or more *different* morphological operations, e.g. once by a suffix, once by stem alternation (internal modification of the stem to which the suffix attaches). The NHG umlaut+suffix plurals are a case in point (as discussed above), e.g. *Buch* sg. : *Bücher* pl.
- Partial functional repetition: a grammatical function is partly expressed by one morphological operation, partly by another one. In other words, the expression of the grammatical content is not symmetrical: typically, one of the two markers can be considered as the primary marker while the other one is secondary (and often less precise in information content that it delivers). For example, several PIE verbal accentuation paradigms (to be discussed below) involve both stem alternation (ablaut) and suffixation for the expression of person and number, but the former is imprecise in that in most cases it only differentiates singular and plural in the active, while the latter includes a separate marker for each function; this is reflected in the Ved. 2nd class verbs (which continue the PIE amphikinetic type), e.g. *é-mi* 1sg., *é-ṣi* 2sg., *é-ti* 3sg. : *i-más* 1pl., *i-thá* 2pl., *y-ánti* 3pl., from PIE **h₁ei̯-* ‘to go’.

Concerning the latter two cases, the triggering issue becomes relevant again. To what extent is the “secondary” exponent of a multiply exponent paradigm conditioned by the “primary” exponent? This surely varies from language to language and from case to case. Following the principle laid out above, I maintain that the notion of phonological triggering of vowel alternation (or of stem alternation and internal modification in more general terms) is plausible provided that the original conditioning environment is still present (this was the pre-OE **mȳs-i* stage discussed above). In this case, vowel alternation is certainly secondary to affixation regarding the expression of grammatical functions. However, in the absence of a synchronically identifiable conditioning environment (the OE *mȳs* stage), a more detailed structural analysis needs to be conducted in order to determine the functional hierarchy of the constituents. It follows that the appearance of vowel alternation in a multiply exponent environment ought not presumptively be dismissed as “secondary” or “redundant”. Furthermore, since some seemingly redundant features have been shown to facilitate the processing of linguistic material (see the psycholinguistic test conducted on Finnish nominal agreement in Vainio, Hyönä, and Pajunen 2003), a similar effect is possible for multiple exponence as well, even though – to my knowledge – such tests have thus far not been conducted. In any case, previous historical and functionalist analyses (such as Komárek 1964, Korhonen 1969) indicate that stem alternations do have functional significance even in multiple exponence.

As a final note on vowel alternation, a few observations on the verb inflection of Semitic languages are in order – I will use Modern Arabic as an example (Badawi et al. 2016). Basic verb stems consist of three (or sometimes four) radical consonants, which express the lexical content of the verb form, e.g. *K-T-B* ‘to write’, *Q-T-L* ‘to kill’. This consonantal skeleton is interspersed with vowels according to certain rules and paradigms, and the location and features

(quality and quantity) of the vowels determine the grammatical functions of the verb form, e.g. *KaTaBa* ‘he wrote’, *QaTaLa* ‘he killed’. By changing the vowels, different grammatical and derivational functions can be expressed, e.g. *KāTaBa* ‘he wrote to someone’, *KuTiBa* ‘was written’, *KiTāB* ‘a book’. This kind of extreme vowel alternation sits deep in the grammar of Arabic (and other Semitic languages), and – in contrast to many other vowel alternation patterns – is completely stable and productive. However, one should note that even in Arabic the vowel alternations themselves are not the only morphological operations, which are used to express grammatical functions: affixation (both prefixation and suffixation) occur as well, and often together with the aforementioned vowel alternations, e.g. *KaTaB-tu* ‘I wrote’, *ya-KTuB-u* ‘he writes’, *ya-KTuB-na* ‘she writes’.

To sum up, vowel alternations appear in different forms and functions in the languages of the world. Careful structural analysis is required to determine, which kind of position a certain vowel alternation pattern occupies in the grammar of that language. However, a broader point of view is useful to properly contextualise the phenomena that we observe in the individual languages.

In the general context of vowel alternations, as discussed in this section, we can make the following observations regarding PIE ablaut:

- PIE ablaut involves variation in both vowel quantity (**e/o* : **ē/ō* : Ø) and quality (**e/ē* : **o/ō*). The basic scheme only concerns the vowels **e* and **o*; other PIE vocalic segments (such as **i*, **u*, **m̥*, **n̥*, **h*, and probably **a* as well) take part in the alternations only as components of the roots or suffixes (e.g. the optative suffix **-i̯eh₁-/-ih₁-*) or as epiphenomena to the loss of **e/o* in some zero-grade roots (e.g. e-grade **terh₂-* : zero-grade **tr̥h₂-*).
- Some formations (such as the athematic conjugation) show correlation between e-grades on accented syllables and zero-grades on unaccented ones. As it happens, such correlations are most often found in more archaic or marginal paradigms, while newer and more productive ones tend to lack it (such as the thematic conjugation). This is good evidence for the origin of the alternations.
- The late-PIE alternations are no longer purely phonologically conditioned: morphological information (e.g. tense, person, conjugation type) is required to successfully predict, which grade occurred in which form. Additionally, standard reconstructions confirm that PIE did allow accentuated zero-grades on the one hand and unaccentuated full grades on the other. All these factors indicate that the nature of ablaut was *morphological* in PIE.

We should also note that PIE ablaut occurred together with suffixation and that suffixation was, in most cases, arguably the primary exponent of grammatical functions. In addition to these two operations, PIE also employed reduplication in its verb morphology.

Regarding the later development of ablaut in the daughter languages, a clear tendency is towards levelling and generalisation, which often lead to the outright disappearance of these vowel alternations. In those languages, where ablaut has been preserved or its role even augmented as a morphological operation (e.g. in the Germanic languages), this seems to have occurred as a result of a morphologisation, when the once-primary exponents, i.e. the suffixes and endings, were lost by regular sound change.

4.1.3. Latin vowel alternations

As demonstrated by Sihler (1995: 109), vowel alternation patterns that occur in a language do not necessarily originate from the same source – diachronic examination is necessary to determine the origin of each alternation. To clarify the issue and as a preparation for the upcoming analysis, this section is dedicated to examining such Latin vowel alternation patterns that are (possibly) not connected to PIE ablaut. These vowel alternations come in four varieties: 1) alternations due to positionally conditioned changes of vowel quantities, 2) qualitative alternations due to vowel weakening, 3) qualitative alternations due to other regular sound changes, 4) alternations caused by miscellaneous and/or unknown factors.

Latin underwent a number of shortenings and lengthenings during its prehistoric and historic stages; all of them were complete by the end of the Old Latin period (ca. 100 BC). As is typical for a regular, "blind" sound change, these changes affect all word forms in the language, not just certain word classes or inflectional paradigms. While such changes were mostly trivial in purely lexical morphemes, they left several traces in inflectional and derivational patterns as morphophonological alternations:

- Shortening of vowels in word-final syllables before all other consonants but *-s* (except in monosyllabics): e.g. *honōs* > *honŏr* : *honōr-is*; *amā-s*, *amā-mus*, *amā-tis* : *amă-t*, *amă-nt* (in all other forms the stem is always *amā-*).
- Compensatory lengthening, i.e. lengthening of a vowel due to the disappearance of the following consonant. Some cases are very old, e.g. **nĭ-sd-o-* 'down-sitting' > *nīdus* 'nest' (cf. Ved. *ní ṣad-* 'sit down'), some are more recent, e.g. prs.ptc. nom.sg. *-ēns* < **-ĕnt-s* : gen.sg. *-ĕnt-is*.
- NS-lengthening (see Ch. 3.1.4.) lengthens all short vowels before a nasal, when followed by a fricative (*s*, *f*), and before *-nct-* and *-nx-* (< **-nχt-*, **-nχs-*), e.g. *ĭn-doctus* : *īn-fēlīx*, *iŭngō* : *iūnxī*.

It is interesting to note that – unlike some other sound changes – these shortenings and lengthenings were never cancelled by paradigmatic analogy: they must have remained as productive phonotactic rules in Latin until distinctive vowel quantities were altogether lost in Late Latin spoken varieties.[177]

Vowel weakening, a process that started in the fifth century BC and was completed in the second (for more discussion, see 3.2.3. and Appendix II), engendered several morphophonological vowel alternations in inflectional and derivational paradigms, e.g. *nōmen* : *nōmin-is*; *Sicilia* : *Siculī* (from Gr. Σικελία, Σικελοί), *faciō*, *factus* : *cōn-ficiō*, *cōn-fectus*. The change itself is quite regular, but its effects were often reversed – or they seem to have been reversed, even though they never took place. This is illustrated by two compounds of *habēre*: *adhibēre* (Plaut.+, weakened: composed permanently before the fifth century BC) : *posthabēre* (Ter.+, not weakened: composed or recomposed at a later date).

Other regular sound changes also sometimes caused morphophonological alternations in vowel quality, but these seldom had any consequences for verb paradigms. In noun paradigms, however, qualitative alternation is present, especially in the second and third declension. For

[177] A further lengthening phenomenon, which in my view does not qualify as a regular sound change, is Lachmann's rule (see discussion in Appendix I).

example, *o* > *u* /_C# and *i* > *e* /_# caused such alternations as *serv-u̲s*, *serv-u̲m* : *serv-ō̲*, *serv-ō̲rum*; *mare̲* : *mari̲-s*, *mari̲-a*, etc.

Sometimes the origin of the vowel alternation is not clear. A case in point, as discussed by Nishimura (2014), is a number of nominal compounds, where the second component is formed of a verb root showing an unetymological long vowel (termed "*vr̥ddhi*-looking vowel" by Nishimura). For example, some compounds built to the root **hₓeg-* have a long *-ā-*, such as *amb-āgēs* 'circumlocution', *ind-āgō* 'ring of huntsmen', *co-āgulum* 'bond', while the corresponding base verb has the expected *-ă-* in the present stem (*ăgō*) and *-ē-* in the perfect stem (*ēgī*, from **hₓēg-* by Eichner's Law), as well as an *-ā-* in the PPP (*āctum*, due to Lachmann's rule). The long *-ā-* in the compounds cannot derive from a PIE lengthened grade, and Nishimura (2014: 244) suggests that they are secondary creations within Latin, caused by certain phonological factors. However, two problems persist: first, there is no regular phonological lengthening rule in Latin, which could be the cause (Lachmann's rule does certainly not apply here). Second, analogical change is most definitely involved here (as admitted by Nishimura), meaning that the decisive factors are in fact of morphological rather than phonological nature. In the next section, we will examine the morphological factors that underlie such changes.

4.2. Sound change vs. analogy

A recurring methodological problem in historical morphology (and more broadly in the study of language change) is, to what extent grammar change is caused by regular sound change and to what extent by analogy (here reanalysis is to be understood as type of analogy; see below).[178] There have been a number of classical cases, where grammar change is attributed to regular sound change either directly or indirectly (i.e. grammar change is a reaction to sound change). However, recent research indicates that it is not a priori clear, whether the sound change directly caused the grammar change. There are also documented cases of grammar-conditioned sound change, pointing towards some degree of interdependence between the two domains (see, e.g., Hill 2007: 83–84). Furthermore, from a theoretical perspective it is plausible to expect that every instantiation of grammar change requires the involvement of analogy (most typically in the form of reanalysis), meaning that sound change alone is never a sufficient explanation.

In this section, I will offer a brief overview of three morphological changes, in which regular sound change does not exert a direct effect on the outcome of the changes.

Loss of dat.sg. *-e* in Modern German: the OHG *a*-stem ending *-e* (e.g. *tage* 'day') was directly continued in MHG (*tage*)[179] and in ENHG (*tage*), but in NHG it is no longer present in the productive declensions (*Tag*): forms with the ending appear normally only in collocations (e.g. *im Stande sein* 'be capable' – but *dem Stand* in other contexts) and petrified expressions (e.g. *zuhause* 'at home' – but *dem Haus* in other contexts), while in normal morphosyntactic contexts (e.g. *an diesem Tage* 'at this day') the use of the ending is pragmatically marked (formal, poetic). There is no sound change *e* > Ø /_# in German: the MHG *-e* is preserved, i.a.,

[178] Phonological change itself, of course, involves a degree of analogy: this is the basis of the regularity of sound change (Anttila 1989: 88). In fact, phonological systems themselves are based on analogical organistation (cf. Itkonen 2005: 76–77).
[179] Pronunciation changed from [e] into [ə].

in the plural (MHG *tage* > NHG *Tage*), in the singular of feminine nouns (MHG *zunge* > NHG *Zunge* 'tongue'), in the adjective declension (*das schöne Haus* 'the beautiful house'), in the verb morphology (*ich nehme* 'I take') etc. The reason for the loss of dative-*e* is paradigmatic analogy: in Modern German, case functions are coded almost exclusively by the article; hence, there is no need to encode dat.sg. with a suffix at the noun, since it is in any case expressed elsewhere in the noun phrase.

Loss of case in the Romance languages: according to the traditional view, sound change (in particular, loss of contrastive vowel length and loss of word-final *-m* and *-s*) was largely responsible for (i.e. it had caused) the merger of several case forms. For example, after loss of vowel length and word-final *-m*, the nom.sg., acc.sg. and abl.sg. of the first declension (e.g. *amica*, *amicam*, *amicā* > *amica*, *amica*, *amica*) and the acc.sg. and abl.sg. of the third (e.g. *mentem*, *mente* > *mente*, *mente*) were no longer formally distinct. These changes were seen as pivotal in the loss of case distinctions and the grammaticalisation of word order and new prepositional phrases, which were developed to express those functions that the Latin case originally expressed. Recent research, however, has contested the traditional view (Ledgeway 2012): the morphosyntactic change is a complicated process, where sound change plays a minor, non-decisive role. For example, the case confusion of acc.pl. and abl.pl. with the prepositions *ex* and *de* in the first-to-third-century Roman brick stamps (e.g. *ex figlinas* instead of the CLat. *ex figlinis*) is demonstrably not due to the effect of sound change (Alho and Leppänen 2016).

Neo-Hittite nom.pl. and acc.pl. (Melchert 1995; Hoffner and Melchert 2008: 69–71): Old Hittite had a stable distribution across declension classes, i.e. *-eš* in the nom.pl. and *-uš* in the acc.pl., but after a transitory period of mixed usage, another stable distribution is achieved by late Neo-Hittite, i.e. *-uš* is generalised for both cases, except for *i*-stems (which have *-aš* – probably from the gen.pl. and dat.-loc.pl.), *u*-stem adjectives (which have *-aweš*), *t*-stems (which have *-eš*) and the relative-interrogative *kui-* (which has *kuiēš*). As already shown by the Neo-Hittite distribution, no sound change is operative here; hence, the mechanism of this change must be morphological (i.e. analogical).

These examples hint at the direction that the role of sound change in the development of ablaut in the Latin verb system may have previously been overestimated. Most importantly, there is no a priori reason to assume that sound change is the only cause for the loss of ablaut alternations in Latin. This question was examined in detail in Ch. 3.

4.3. Morphological change

The framework of morphological change adopted and endorsed in this study consists of a constellation of principles and theories drawn from the functionalist-typological school of linguistics. The most central concept here is *analogy*; but analogy (in the widest sense "structural similarity") alone is too powerful an explanation for morphological change, since it can be referred to in almost every such case, in which two linguistic entities share at least one similar feature or exhibit some kind of similarity relation. In order to evaluate the plausibility or implausibility of a proposed analogical process, a framework of morphological change is needed: such a framework must have system-external reference points, e.g., in typological generalisations, psycholinguistic findings, or in actual language use (which, in turn, is amenable

to rational explanation, as explained above). A cornerstone of my methodology is the *generality continuum*, that is, the principles and theories of morphological change are arranged on a continuum from most general to most specific: a more general solution (which most likely applies in most cases) should primarily be referred to; when this is not possible, a more specific explanation is sought.

4.3.1. Heredity principle

The most central component of language change and the working hypothesis of historical linguistics is the regularity of sound change. Since phonemes alone do not convey semantic or grammatical functions, phonological change operates with different parameters than other levels of grammar: first, sound change is – all other things being equal – perfectly regular and exceptionless; second, sound change is mostly unconscious and often takes place without ever being noticed by the speakers of the linguistic community or even by the linguist investigating ongoing language change within that community; third, the absence of meaning-form-pairing makes phonological change fundamentally different than morphological, syntactic and semantic change, where both meanings and forms and their relations are constantly involved and hence they stand in the foreground. In the context of this study it suffices to say that – all other things being equal – sound change takes place independently and regardless of other levels of language.

Development in terms of regular sound change is thus the default case of language change. This can also be taken as the zero-hypothesis of morphological change. Indeed, since language consists of socially shared rules, there is no need to assume that such rules change, unless there is positive evidence that they have changed; the task of the historical linguist is then to describe and explain the change. This is formulated as the **heredity principle** ("Hereditätsprinzip") by Gerhard Meiser, with additional components adopted for the analysis of specifically Indo-European historical morphology:

> Bei ungebrochener historischer Kontinuität ist die regelmäßige Fortführung der aus einem früheren Stadium ererbten sprachlichen (z.B. morphologischen) Einheiten zu erwarten, unbeschadet genereller, den spezifischen Fall übergreifender, trivialer Veränderungen (z.B. Thematisierung, Endungsersatz, regelmäßige lautliche Veränderungen). Festzustellende Abweichungen von diesem Prinzip bedürfen – wie die "Ausnahmen" von lautgesetzlicher Entwicklung – grundsätzlich der Erklärung. (Meiser 2003: 5).

The heredity principle can be interpreted in the following way: the default case of morphological change is no change at all. Regular sound change does not constitute morphological change. In a specific case of morphological change (say, in the development of a certain verb form), minor adjustments that apply in the historical morphology generally (and not just in this particular case) are also understood as regular, expected developments. For Meiser, this is first and foremost a methodological principle, but I extend it to the ontology of language change, since it captures several key generalisations that have received both theoretical and empirical validation elsewhere in the domain of historical linguistics. The heredity principle is in my framework the most general principle: it is expected to be the default case. Should the attested or reconstructed data indicate otherwise, the principle does not apply, and a specific explanation must then be sought.

To rephrase Meiser's definition into a more general one, I will define heredity principle as follows:

> **Heredity principle**: In case of an undisturbed historical continuity, direct inheritance of morphological entities (i.e. forms and paradigms) from a chronologically preceding language stage is expected. The entities may have undergone non-morphological or morphologically trivial and general changes, which transcend the individual case, such as regular sound change, loss of grammatical categories, renovations that concern the morphological system as a whole, and so on. The principle applies as long as the attested or reconstructed data do not indicate that a morphological change has taken place. Should such indication occur, the change that has been observed requires an explanation.

The immediate repercussion of this principle for the study of the development of ablaut is evident: it is expected that the inherited PIE ablaut alternations are continued *lautgesetzlich* in those Latin forms and formations that are of PIE pedigree. When this is not the case, i.e., if the Latin form is **not** a phonologically regular reflex of the PIE ancestor form, an explanation for the discontinuity, i.e., for the non-hereditary development, is required.

4.3.2. Types of analogical change

The main operative mechanism in morphological change is *analogy*. In fact, analogy is much more than that: it is the driving force behind human thinking (see Anttila 2003; Itkonen 2005; Hofstadter and Sander 2013). The organisation of language is largely analogical, and certain elements such as morphological paradigms and syntactic structures are, in essence, analogical networks (and they can effectively be described as such). Since one of the main topics of this study is morphological change, an overview of different types of analogical changes is in order.

Like any other linguistic concept, analogy can be defined in various ways, and its role in morphological change can be emphasised or de-emphasised. Following Itkonen (2005: 1), I will adopt the following general definition for analogy: *analogy is structural similarity*;[180] analogy is a metarelation, which holds between relations in systems, which share the same number of parts. Since the notion of similarity in this definition is relational, it is also abstract in the sense that it is not *material*: analogy holds primarily between relations (systems, properties, functions) of objects, not between the materiality of the objects themselves.[181] For example, wings (in birds) and fins (in fish) are relationally similar – they need not be materially similar. And since structure and function go hand in hand, analogy is also *functional* similarity: both wings and fins are used for locomotion, and hence they are functionally similar (despite, again, lacking material similarity). The same applies for linguistic material as well: for example, the relation of *sing* to *sang* is analogical to that of *walk* to *walked* – they are functionally similar despite lacking material similarity. Oftentimes, material similarity is also involved: for example, *sing* : *sang* is analogical to *ring* : *rang*, *sink* : *sank*, and so on.

Although the general nature of analogy is, at least in typological-functional linguistics, mainly uncontroversial, the role of analogy in language structure and change requires further

[180] Cf. also Anttila (2003: 428): "analogy is a relation of similarity, that is, a diagram."
[181] The diagrammatic aspect of analogy in linguistic analysis has been stressed by Anttila (1977: 10): language structure itself relies heavily on diagrammatic relations, less so on material similarity of the linguistic units themselves.

qualifications.[182] Fertig (2013) distinguishes the general human capacity to analogise from a specifically linguistic type of analogy, and calls the former "analogy$_1$" and the latter "analogy$_2$". It is clear, of course, that analogy$_2$ is just a contextually-determined subtype of analogy$_1$. While such a division may be useful for practical purposes, it may lead to the misconception that linguistic analogy (including analogical change) is somehow distinct from the general human capability to analogise, and that there are some forms of morphological change, where analogy is *not* involved.[183] For these reasons, I do not find Fertig's distinction necessary: "language is just one facet of the human capacity for analogizing" (Anttila 1977: 19). This, however, is not to say that every possible change could be termed "analogical" without any further qualifications; I will rather endorse the view that linguists should be critical and theoretically informed when discussing analogy and applying it in the actual research.

In the following sections, I will examine the basic types of analogical change (proportional analogy, nonproportional analogy, and reanalysis). These are the most important mechanisms that underlie morphological change. Additionally, the directionality of analogical change is discussed, since this is very much relevant for the upcoming analysis.

4.3.2.1. Proportional analogy

A basic type of analogy is based on *proportions*:[184] A is to B what C is to D, or A : B :: C : D (cf. Anttila 1977: 16f). Mathematical proportions are a case in point, e.g. 2 : 4 :: 3 : 6, that is, 2 × 2 = 4 and 3 × 2 = 6. Linguistically, proportional analogy is evident in the organisation of morphological paradigms, e.g. *cat* : *cat-s* :: *chair* : *chair-s*, or *am-ō* : *am-ās* :: *habit-ō* : *habit-ās*, etc.[185] Proportions need not involve only 2 × 2 pairs, but can consist of chains of groups, which amount to a complex network, e.g. *am-ō* : *am-ās* : *am-at* :: *habit-ō* : *habit-ās* : *habit-at* :: *clām-ō* : *clām-ās* : *clām-at*, etc. For reasons of clarity, such complex proportions are best presented as tables (as in Table 36; cf. Anttila 1977: 21f). This is indeed the traditional way of presenting morphological paradigms and is unobjectionable as such – tabular and graphic visualisations of analogy are perfectly valid descriptions (cf. Anttila 2003: 425–426).

inf.	*am-āre* 'love'	*habit-āre* 'live'	*clām-āre* 'shout'
1sg.	*am-ō*	*habit-ō*	*clām-ō*
2sg.	*am-ās*	*habit-ās*	*clām-ās*
3sg.	*am-at*	*habit-at*	*clām-at*

Table 36: Proportional analogy in tabular form.

An example of an immaterial relation is the relation of forms belonging to different inflectional classes, e.g. *am-at* : *am-ant* :: *hab-et* : *hab-ent* :: *dīc-it* :: *dīc-unt*, and so on. According to the

[182] For a short historical survey, see Hock (2003: 444f).
[183] In similar spirit, Hock (2003: 449) mentions *natural morphology* and *grammaticalisation* as processes resulting in changes that do not involve analogy. This claim is not sustainable: both natural morphology and grammaticalisation do involve analogy and analogical change in multiple ways (see below).
[184] Coincidentally, the Latin term *proportio* is a translation of the Greek term ἀναλογία (Anttila 1977: 17). An alternative term, *four-part analogy* is used by Hock (2003), but, as we will soon note, exactly four components need not be involved.
[185] This kind of analogy was already discovered by the ancient Greek and Roman grammarians.

classification of Hermann Paul (1920), analogical relations, where the form remains maximally same, are *material groups*, while relations, where the function remains maximally same, are *formal groups* (Anttila 1977: 26–27). Taken together, the interplay of material and formal groups constitutes the paradigmatic structure of grammar, which is to large extent based on the contrasts of same vs. different (Anttila 1977: 28). Since ablaut is a subtype of vowel alternation and internal modification, the relational-functional aspect of analogy is extremely important. The descriptive adequacy of the proportional analogy is strengthened by its relatively high psychological reality (Anttila 1989: 105).

Proportional analogy is closely connected with *productivity*. The proportions can, namely, be phrased as problem-solving, e.g. *am-ō* : *am-ās* :: *habit-ō* : X, where X = *habit-ās* (cf. 2 : 4 :: 3 : X, where X = 6). This is the working principle of productive morphological paradigms. Many instances of morphological change can also be described as problem-solving (Anttila 1989: 89f), for example, when an irregular recessive paradigm is renovated by the forms of a productive paradigm. A case in point is the English verb *help*, which was originally a strong verb (OE pret. *healp*, cf. NHG *helfen* : *half*). At some point in history, the preterit of this verb was renovated by modelling it after the productive and much more prominent weak conjugation, along the lines of such proportions as *walk* : *walked* :: *help* : X, where X = *helped*. A more detailed explication of this kind of analogical change is in Leed (1970). According to him, each proportional change requires a minimum of four components: 1) formal operations, 2) identity of focus, 3) lexical lists (i.e. the model constructions), and 4) indeterminacy (i.e. the problem to be solved) (cf. Anttila 1977: 70). Leed's model is shown in Figure 3.

$$\frac{\text{Category a}}{\text{Category b}} : \frac{\text{Focus a}}{\text{Product b}} : \frac{\text{Example a}}{\text{Example b}} : \frac{\text{Item c}}{\text{X}}$$

(lists)

Figure 3: Proportional change.

The regularisation of *help* can thus be described as in Figure 4.

$$\frac{\text{non-past}}{\text{past}} : \frac{\text{…Ø}}{\text{…/ed/}} : \frac{\textit{walk}}{\textit{walked}} : \frac{\textit{help}}{\text{X (= } \textit{helped}\text{)}}$$

(etc.)

Figure 4: Regularisation of *help*.

Leed's model offers a great amount of precision in describing and analysing this kind of analogical change, but in clear cases a simpler description (understood as a sort of shorthand) will suffice.

When phonologically conditioned regular sound change causes some forms of the paradigm to become irregular, thus breaking the paradigmatic uniformity, proportional analogy can restore the uniformity by cancelling or modifying the outcome of the sound change (or, depending on the model of morphological change, this can also be viewed as analogy *preventing* the onset of the sound change). For example, in Attic Greek the general development of the PIE labiovelar **k^w* was into **p* before back vowels and into **t* before front high vowels

(Rix 1992: 87–88); thus the development of the thematic present of the root **sekʷ-* 'follow' was regular in 1sg. **sekʷ-o-maḭ* > ἕπομαι, 1pl. **sekʷ-o-medʰa* > ἑπόμεθα and 3pl. **sekʷ-o-ntaḭ* > ἕπονται, while in other forms the results would have been 2sg. **sekʷ-e-saḭ* > ˣἔτῃ, 3sg. **sekʷ-e-taḭ* > ˣἔτεται and 2pl. **sekʷ-e-stʰe* > ˣἔτεσθε. This would have produced an irregular paradigm with stem alternation ἑπ- : ἑτ-. Instead, the stem of the latter set of forms was renovated to match the former set, resulting in the attested forms 2sg. ἕπῃ, 3sg. ἕπεται and 2pl. ἕπεσθε. The model was probably the large majority of verb stems, where sound change did not produce such alternations, e.g. τρέπομαι : τρέπεται :: ἕπομαι : X, where X = ἕπεται, etc.[186] To the Neogrammarians, analogy was an important counter-factor to regular sound change.

When it comes to explaining a particular analogical change that is based on proportions, the application of rational explanation is often very straightforward: the strive towards regular, proportional and symmetrical paradigms can be phrased as a rationality principle. (For more discussion on this topic, see Ch. 4.3.2. and Appendix III.)

A further aspect of analogical change need to be mentioned in the present context, since it is very much dependent on proportions: analogical *levelling* and *extension.* These terms are sometimes used differently, so a clarification is in order (cf. Anttila 1989: 104):

Levelling (cf. Hock and Joseph 2009: 152f) refers to the simplification of a paradigm by eliminating morphophonological variation, i.e. one allomorph is standardised, resulting in a reduction of allomorphy. Typically, the standard allomorph is the most frequently occurring or the most salient and functionally superior one. For example, before Modern German the preterit sg. vs. pl. distinction was levelled in those verbs that originally had the alternation, e.g. *ich ward* : *wir wurden* → *ich wurde* : *wir wurden*, *ich stand* : *wir stunden* → *ich stand* : *wir standen*. Such levellings can be described as proportional analogies, where either a non-alternating verb serves as the model (e.g. *ich fuhr* : *wir fuhren* :: *ich stand* : X, where X = *wir standen*) or a category without sg. vs. pl. alternation (such as the present tense, e.g. *ich stehe* : *wir stehen* :: *ich stand* : X, where X = *wir standen*).

Extension (cf. Hock and Joseph 2009: 158f) refers to the spread of a feature into a form (or set of forms) that originally did not have the said feature. This may not result in an increase of alternating paradigms, but rather leads to the marginalisation or elimination of morphological variation, since the extended feature is typically a productive one. For example, the inherited Latin nom.pl. forms (**-āsˌ/-ōs* from PIE **-eh₂s/-oes*) of the first and second declensions were renovated by the extension of the corresponding pronominal endings (**-aḭ/-oḭ*) into the noun paradigms: ***-āsˌ/-ōs* → **-aḭ/-oḭ* > *-ae/-ī*.

4.3.2.2. Nonproportional analogy

Another important type of analogy is not based on symmetrical proportions; hence, it can be called *nonproportional analogy*. The aspect of relational similarity is crucial, even though the process cannot be described as proportional equations. But the human mind is capable of (and even tends towards) formulating associations that do not fulfil mathematical proportions.[187]

[186] The verb τρέπω 'turn' is from the root PIE **trep-* (*EDG*, s.v. τρέπω).

[187] Hill (2007) criticises the notion of nonproportional analogy and suggests that all analogical changes ought to be either described as four-part proportions or abandoned altogether as insufficient explanations. Hill's proposal is, in turn, criticised by Pooth (2016), who questions the adequacy of four-part proportions entirely and suggests a prototype-based templatic model of analogical change as a replacement.

Nonproportional analogy by necessity operates with a wider scope than proportional analogy (which focuses on paradigms), and thus a syntagm (e.g. a sentence) or some other kind of juxtaposition is involved (Anttila 1989: 91–92). Nonproportional analogy is evident in cases, where the old form is not entirely replaced, but rather reinforced with another marker originating from another paradigm, e.g. ME *cild* sg. : *cild-re* pl. → *cild-re-n* pl. > PDE *children*. Reinforcement (perhaps due to strive after a maximally natural morphological marking) is also evident in the NHG past participle of *essen* 'eat', i.e. *gegessen*: the regular phonological outcome of *ge-ess-en* would have been ˣ*gessen*, which was reinforced by prefixing another *ge-* into this already prefixed form, producing the attested *gegessen* (Anttila 1989: 92).

A typical case of nonproportional analogy is **contamination**, where similarity (e.g. semantic) no doubt plays a part. For example, the Classical Latin adjective *gravis* 'heavy' was in Proto-Romance contaminated by its antonym *levis* 'light' into **grevis*; hence OFr. *grief*, OSpan. *grieve*, Ital. *greve* (the form *grave* in the modern languages is surely a later educated loan directly from Latin) (Hock and Joseph 2009: 163). Contaminations can be quite complex: for example, the first declension gen.sg. ending in *-aes*, which occurs in some Latin inscriptions, is a contamination of the native *-ae* by the corresponding Greek ending -ης (Alho and Leppänen 2017). This contamination is based on the functional similarity of the endings, the monophthongisation of CLat. *ae* [aɪ̯] into VLat. [ɛː] (which was also the sound value of Gr. η), and the occurrence of likewise phonologically similar dat.sg. endings in similar contexts (according to the proportion dat.sg. : gen.sg. :: (Gr.) /ē/ : /ēs/ :: (Lat.) /ē/ : X, where X = /ēs/).

Blending (cf. Hock and Joseph 2009: 161–162) is a clear case of analogy, where no exact proportions are present. For example, the neologism *smog* 'a type of air pollutant' is a blend of *smoke* and *fog*. Strong iconic-relational factors are in operation: due to the material resemblance of the phenomenon to both smoke and fog, the resulting neologism is patterned after the corresponding words.

Folk etymology attempts to render unanalysable word forms into analysable ones, constituting (or actually requiring) a kind of reanalysis (for which see below). A classical example, cited by both Anttila (1989: 92) and Hock and Joseph (2009: 169), is the reformulation of *asparagus* (from Greek via Latin) into *sparrow grass* in some varieties of English. Phonological similarity and semantic motivation are at play here. Sometimes folk etymology does not result in concrete modification of the affected word form itself, but the underlaying reanalysis may fuel deliberate neologistic creativity. For example, the English words *history* and *boycott* (both of non-English origin, of course) were folk-etymologised as being composed of *his-story* and *boy-cott*; such overtly masculine terms were in some contexts found undesirable, and the neologisms *herstory* and *girlcott* were coined (Anttila 1989: 93).[188]

Recomposition is quite similar to folk etymology in operation, i.e. it concerns the modification of opaque and synchronically unanalysable word forms (which usually become so as an effect of sound change) into more transparent ones. For example, the Old English word *hūswīf* (literally 'housewife') became EModE *hussy* by regular sound change and was thus no longer analysable to its components. This form acquired derogatory connotations, while for the

[188] Needless to say, *history* and *boycott* have nothing to do with masculinity other than phonological chance resemblance. The former is from Gr. ἱστορία 'research', the latter from the last name of *Charles Boycott*, an English land agent in 19th-century Ireland, who was "boycotted" by the Irish Land League for not lowering the rents.

neutral meaning the word was renovated into PDE *housewife* by way of recomposition (Hock and Joseph 2009: 168). Several cases, where Latin vowel weakening does not seem to apply, are explained by recomposition, e.g. **ad-u̯ena* (from *venīre* 'to come') > ˣ*advina* → *advena* 'stranger' (for more discussion on this topic, see Ch. 3.2.3. and Appendix II).

There are also many other identified cases of nonproportional analogy, which are not relevant for this study (the interested reader is advised to consult the standard handbooks of historical linguistics for examples and references).

4.3.2.3. Reanalysis

While the two other types of analogy (proportional and nonproportional analogy) had concrete manifestations in linguistic units (especially as results of analogical change), the third type, *reanalysis* (sometimes called *reinterpretation*), does not have any materialisation; rather, it results in a change in the internal structure of the involved entities. The concept itself, however, is somewhat debated, and its relationship with (other types of) analogical change has been perceived as somewhat problematic by some scholars.[189] But there is no denying that reanalysis is based on a quite similar notion of structural similarity as analogy in general, meaning that classifying reanalysis as a subtype of analogy is unproblematic.

The basic idea of reanalysis is simple: the internal structure of an entity (e.g. the number of constituents or the borders of the constituents) is analysed[190] differently (e.g. the number of constituents is reduced or the borders are changed) without any actual material change in the entity itself.

There are different types of changes that result from reanalysis. A comprehensive classification is in Fertig (2013: 27f). He distinguishes four types of reanalysis, the naming of which is based on the proportional schema A : B :: C : D:

D-reanalysis is the classical proportional problem-solving analogy, i.e. A : B :: C : X, where X = D (for examples, see above).

C-reanalysis is traditionally called *backformation*: the renovation of the original basic form on the model of a complex, derived form, i.e. B : A :: D : X, where X = C. For example, the agent noun *babysitter* seems to have been derived from the verb *babysit*, but historically, the noun is the original form (attested since 1914) and the verb is a backformation from the noun (*babysit* is attested since 1947).

B-reanalysis concerns the relationship of the A- and B-forms, and leads to the extension of this relationship to the other side of the proportion. According to Fertig (2013: 32), this may result in a new rule – the actual process must then be *abduction*. For example, the adjective *alcoholic* (which etymologically consists of *alchol-ic*) was reanalysed (or resegmented) as *alco-holic*, resulting in a new suffix *-(a)holic* 'addicted to something', which was then used to produce such neologisms as *sugarholic*, *foodoholic*, *workaholic*, *chocoholic*, and so on.

A-reanalysis affects the domain or conditions of application of a rule, which then comes to apply to different input forms; in other words, this is analogical extension. For example, the

[189] Anttila (1989: 92–93), for example, classifies reanalysis as a subtype of nonproportional analogy – which it *ex definitione* is.

[190] The terms "analyse" and "(re)analysis" should in this context be understood not as scholarly activity, but rather as a process that occurs in the linguistic intuition of the speakers.

German suffix *-bar* is derived from a verb meaning 'to bear',[191] and it originally attached only to nouns, forming compounds with transparent meaning, e.g. *fruchtbar* 'fertile, i.e. fruit-bearing'. By reanalysis (coupled with semantic bleaching), the *-bar* suffix became extended to other contexts with the meaning 'possible, able to do something', e.g. *machbar* 'doable'.

Despite its apparently attractive comprehensiveness, Fertig's classification introduces only few such insights, which were not already covered by the other types of analogy discussed in this chapter. D-reanalysis is identical with the proportional analogy and the resulting change, and is in fact no reanalysis at all, according to most definitions. C-reanalysis introduced the concept of backformation – which as such is useful – but the mechanism itself proceeds according to the usual proportional analogy. B-reanalysis could, in my opinion, be better termed *resegmentation*, which is a useful concept. Finally, A-reanalysis is, in fact, analogical extension and thus closely connected with grammaticalisation (for which see below). In this study, I will apply reanalysis only to such cases, where resegmentation occurs or where the domain of a rule changes. Note that characteristic to these types of reanalysis is their immateriality: once a particular change actually occurs, it will do so by way of proportional or nonproportional analogical change.

4.3.2.4. Direction of analogical change

A much-debated issue in the theory of language change is the *directionality* of change.[192] As an empirical observation, some changes seem to occur predominantly (or exclusively) in one direction. For example, in historical phonology there are many documented cases of sibilants weakening into spirants and then disappearing (i.e. *s* > *h* > Ø), but the opposite, that is, the appearance of spirants out of nowhere and the strengthening of spirants into sibilants is much rarer (or practically non-existent).[193] Thus, there appears to be a universal principle of directionality involved. The directionality of *grammaticalisation* is also often debated: in the majority of cases, grammaticalisation manifests itself in phonological reduction, semantic weakening and the reduction of involved entities (via reanalysis), but some scholars have identified cases, where this directionality is (or seems to be) reversed. Often these kinds of debates boil down to terminological issues (e.g. how to define grammaticalisation; see Ch. 2.3.8. below).

The directionality issue is also relevant in the discussion of analogical change (Anttila 2003: 435). Since Neogrammarian times, analogy has been identified as the driving force of morphological change, but it lacked a proper theoretical backing. To address this issue, Jerzy Kuryłowicz famously introduced the "six laws of analogy". While these "laws" (a better term

[191] In NHG, this meaning is expressed by the verb *tragen*, while the original PIE root **b^{h}er-* only survives in *gebären* 'to give birth'. The English verb *bear* is a cognate.

[192] This issue is directly connected with the nature of *explanation* in linguistics. After the Neogrammarians had identified (mostly) exceptionless, law-like sound changes, there was motivation to establish same kind of exceptionless principles for analogy as well. Finding such "laws of analogy" was motivated by the strive towards a natural scientific mode of explanation. However, such strive is nowadays hopelessly outdated, and the only viable mode of explanation for language change (including analogical change) is *rational explanation* (see Appendix III).

[193] Ondřej Šefčik (p.c.) informs me that in some Czech dialects close to Sorbian, an epenthetic *h* appears before the vowel *a* in the beginning of a word (cf. the more common epenthesis of *j*(*e*)- and *w*(*o*)-). As such, this seems to be a case of a phoneme appearing *ex nihilo*, but there surely is an articulatory-phonetic motivation for such epenthesis phenomena.

would be "principles") capture some important generalisations about morphological change, they are not without exceptions, and have thus been rightly criticised, most famously by Witold Mańczak (for discussion and references, see Anttila 1977: 76–80; 2003: 434–435; Hock 2003: 445–446). Vincent (1974) has identified three core factors that are common to both Kurłowicz's and Mańczak's models: 1) morphological markedness, 2) length or strength of exponents, 3) reduction of allomorphy. While Kurułowicz's model is based on more formal and structural criteria, Mańczak introduced frequency as a further factor – and, in the end, both were right. As a synthesis, the five relevant factors for determining the direction of analogical change are the following:

- **Morphological markedness**. In this study, markedness is observed both in its own right and as a component of natural morphology.
- **Formal properties of exponents**, including synchronic structure and productivity. Again, this is relevant within natural morphology as well as in the structural-functional analysis of morphology.
- **Functional weight**, i.e. the distribution of the expression of grammatical functions among the constituents.
- **One meaning – one form (1M1F)**, for which see below.
- **Frequency of occurrence**, also see below.

Considering these factors together with previous studies on morphological change, we can tentatively formulate the following, to my knowledge rather uncontroversial, principles for the directionality of analogical change (cf. Schindler 1974: 3–4):

- Marked exponents tend to become less marked, while less marked exponents tend to be replaced by more marked ones in important functions. Thus, we do not expect that a less marked marking suddenly gains functional prominence and becomes extended over more prominent markers in the same context.
- Exponents that provide clear contrasts vis-à-vis neighbouring exponents tend to get generalised and extended more easily than exponents with less contrasting value.
- Functional weight within a syntagm typically crystallises around more marked and prominent exponents, subjecting less marked and less prominent exponents to elimination.
- Generally, analogical change proceeds into a direction with less allomorphy, striving towards one-to-one mapping of forms and functions.
- More frequently occurring exponents tend to replace less frequently occurring ones. However, in categories of very high-frequency, certain types of analogical change (especially simplification and reduction of allomorphy) typically do not take place.

The importance of the total linguistic context in evaluating analogical change has been rightly emphasised by Anttila (1977: 79; 2003: 435). The interplay of these factors and their contextual interpretation, as well as their methodological implications, are discussed in Ch. 2.3.10. below.

4.3.3. Isomorphism (1M1F)

An important tendency in analogical change, directly related to the workings of human mind, is the reduction of unnecessary variation. This tendency, which has been known, among other names, as *one meaning – one form* (or 1M1F; Anttila), *Humboldt's Universal* (Vennemann), or

the principle of *isomorphism*, determines the ideal form-meaning mapping that is central to the very essence of language (Anttila 1977: 55; Hock 2003: 445):

> Jede Sprache ist unaufhörlich damit beschäftigt, alle unnützen Ungleichmässigkeiten zu beseitigen, für das funktionell Gleiche auch den gleichen lautlichen Ausdruck zu schaffen. (Paul 1920: 227; quoted in Coseriu 1974: 85 and Anttila 1977: 68).

The most basic mapping of form and meaning is based on a one-to-one relation: (exactly) one meaning is paired with (exactly) one form. For example, the meaning 'in their houses?' is mapped in Finnish as *talo-i-ssa-nsa-ko*, morpheme for morpheme ('house', plural, inessive, third person possessive, interrogative). This kind of *one meaning – one form* situation, however, is not the only possibility. It is not uncommon that languages also occasionally have other mapping relations; indeed, natural language requires asymmetric mappings as well (Anttila 1977: 56). In the following list, "2" should be understood as "two or more" (cf. Itkonen 2016: 35):

- Paradigmatic 1M2F = *allomorphy*, e.g. Lat. gen.sg. *-ae* : *-ī* : *-is* : *-ūs* : *-eī*, etc.
- Paradigmatic 2M1F = *portmanteau morphology*, e.g. *serv-ō* expresses both dat./abl. and sg.
- Syntagmatic 1M2F = *synonymy*, e.g. PDE future periphrasis *will do* : *is going to do*.
- Syntagmatic 2M1F = *homophony*, e.g. Fin. *kuusi* 'spruce' : *kuusi* '6' : *kuusi* 'your moon'.[194]

These four relations can be described as *non-isomorphic*. As Raimo Anttila has shown, languages tend to shun such asymmetrical mappings and prefer the ideal 1M1F mappings (Anttila 1977: 57–58; 1989: 100f; 2003: 427). This often results in the elimination of the asymmetrical mapping by the introduction or reduction of the involved forms and meanings so that the isomorphic relation is achieved. This, of course, has significant communicative benefits, meaning that 1M1F is not just a tendency of language change but also a rationality principle in its own right. For example, when the inherited plural of PDE *brother*, i.e. *brethren*, was regularised into *brothers*, the old form was not immediately given up: the result was that there existed two forms for one meaning (1M2F). Later on, the forms were differentiated in meaning so that today *brothers* is the basic form while *brethren* only refers to the members of a religious order (there is also a stylistic difference). Thus, the situation today is in fact 2M2F, which is essentially the same as 1M1F, i.e. the isomorphic mapping has been (almost) completely restored. The actual operational mechanism here is, as in non-phonological change in general, an interplay of similarity and association (Anttila 1977: 57).

Another relevant example of the operation of the 1M1F principle is paradigmatic levelling, which was discussed above. As for proportional and nonproportional analogical change, 1M1F does not correlate with or depend on the type of analogical mechanism involved, since both mechanisms may introduce non-isomorphic relations as well as eliminate them.

The principle of isomorphism has crucial implications for the direction of analogical change. We can expect that whenever analogical change takes place, at default it eliminates

[194] As a kind of language joke, the Finnish phrase *kuusi palaa* can be correctly translated into English in at least seven different ways, e.g. 'six pieces', 'the spruce is on fire', 'the spruce returns', 'six [things] are on fire', 'six [things] return', 'your moon is on fire', and so on. This is an extreme example of a fortuitous yet completely innocuous homophony, which is unlikely to be lost.

non-functional structural variation rather than creating it. This, however, does not mean that language becomes *simpler* by 1M1F. As was demonstrated above, the elimination of non-isomorphic relations may result in either the reduction of existing relations or the introduction of new ones (cf. Anttila 1989: 100).

4.3.4. Markedness

Crucial to morphological change is not only the mapping relations of meanings and forms, but also the position of the entity that undergoes change in the grammar of the language, i.e. the relations of meanings and forms to other meanings and forms. The salience of an entity vis-à-vis the other entities can be conceptualised as a *markedness relation*: an entity in a more marked position is more salient and explicit than an entity in a less marked position.[195] As in most cases in linguistic analysis, the position of an entity has two intertwined aspects: formal and functional. *Formal markedness* refers to the salience of the morphological operation, which the entity undergoes (see below on natural morphology). This aspect is highly language-specific, since markedness relations depend on and are defined according to the grammatical structure of the language. *Functional markedness* refers to the universal salience of the grammatical functions that the entity expresses. This aspect is to a large extent universal, since the functional categories are not language-specific; of course, which functions are expressed in the grammar of a language *is* language-specific, since the selection of expressible functions varies from language to language. Thus, functional markedness finds good use in linguistic typology. In this section, I will discuss markedness as a synchronic phenomenon.

Functional (or semantic) markedness concerns the markedness value of grammatical functions, such as person, tense, number, and so on.[196] For example, the function 'singular' is generally less marked than 'plural', all other things being equal (cf. Matthews 1991: 236; Langacker 1991: 74). Note that markedness is always based on contrasts (Lehmann 1989/1993: 2); moreover, it is relative. For example, it is not possible to determine whether 'singular' is more marked than 'third person', because these functions do not contrast; absolute values cannot be assigned to markedness relations either.

Mayerthaler (1981: 13; 1987: 41) provides the following list of functional markedness contrasts (quoted from Wurzel 1984: 21–22; "<" means "less marked than"):

- Subject < object.
- Animate < inanimate.
- First person < other persons.
- Present < non-present.
- Indicative < non-indicative.
- Affirmative < non-affirmative.
- Singular < plural.

Mayerthaler's analysis is based on a rational explanation: those properties that are closest and most self-evident to the human being (the language user) are perceived as less marked than more distant and less obvious ones (cf. Moravcsik and Wirth 1986). However, some important

[195] *Markedness* as a term and concept originates from the Prague school of structuralist linguistics, who applied it in phonology. For the various uses of the term in the literature, see Haspelmath (2006: 26f).
[196] Lexical items can also have markedness relations. For example, *horse* as a general term for the animal is less marked than *colt* 'young horse' (Lehmann 1989/1993: 2).

qualifications are in order. First, the markedness of a syntactic function may depend on the entity in question. For persons and most animate nouns, for example, subject function is certainly the less marked one, but for concrete objects, which normally occur as targets for human actions, the object function may be the less marked one (remember that the question is about functional markedness, not about the formal marking of the functions). Second, according to the *communis opinio*, third person is usually taken to be the least marked person (see Hock 2003: 446 for references); this is known as "Watkins' law" (Janse 2009: 93–94). Third, objects or persons that normally occur as pairs or in indefinite numbers may be regarded unmarked in the plural (or dual) instead of singular. Thus, caution is advised in the analysis of functional markedness, since not all generalisations apply in each individual case (Givón 1991: 33–37).

Formal markedness concerns the relationship of the function and its expression in the linguistic entity. According to Mayerthaler (1981: 22f; quoted from Wurzel 1984: 22–23), three factors determine formal markedness ("Symbolisierungsmarkiertheit"):

- Iconicity: concatenative morphological operations are considered highly iconic, internal modification less iconic, lack of morphological marking non-iconic, and the inversion of iconicity counter-iconic. The more iconic, the less marked.
- Uniformity: one-to-one mapping of functions and forms, i.e. the 1M1F principle, as discussed above. The more uniform, the less marked.
- Transparency: the occurrence of monofunctional markers.[197] The more transparent, the less marked.

Mayerthaler's examples for functional markedness contrasts include the following (from Wurzel 1984: 24; "<" means "less marked than"):

- Little allomorphy < much allomorphy.
- No suppletion < suppletion.
- Monofunctionality < polyfunctionality.
- One-to-one symbolisation < one-to-many symbolisation.
- Non-deponent < deponent.

As a function of both formal and functional markedness, Mayerthaler (1981: 40–59) defines the total markedness of a form in the following way (as paraphrased by Wurzel 1984: 24): when formal and functional markedness coincide, the resulting form is unmarked; when there is discrepancy between formal and functional markedness, the resulting form is marked. For example, the German diminutive formation of the type *Buch* 'book' → *Büchlein* 'small book' is formally counter-iconic (the expression of "smallness" is carried out by augmentation), that is, marked. Functionally, the form is also marked, since it includes more semantic propositions than the basic (= unmarked) form. Thus, in its totality, the formation is unmarked, since the high degree of formal markedness coincides with the high degree of functional markedness.

The discussion thus far has been exclusively synchronic, and with regard to morphological change, quite uncontroversial.[198] The importance of markedness relations is, however, relevant

[197] It remains to me unclear, how Mayerthaler's conception of transparency actually differs from uniformity.

[198] Like almost any concept in linguistics, the usefulness and adequacy of markedness has been questioned, most famously by Haspelmath (2006), who suggests that markedness should be replaced in linguistic analysis by considerations of frequency and "difficulty", i.e. reduced into more basic, concrete notions. However, such considerations have been observed in markedness theory from the beginning, meaning that Haspelmath's criticism is partly unwarranted.

for morphological change, and in the next section we will turn to a specific framework in order to understand the role of markedness in the context of language change.

4.3.5. Natural morphology

The framework of natural morphology was developed in the 1980's as a continuation of *natural phonology*, which, in turn, was an upshot of the dissatisfaction with generative phonology of the 1960s and -70s (see Wurzel 1984: 13f). The main contributions for the theory of natural morphology are Mayerthaler (1981), Wurzel (1984), and Dressler et al. (1987).

The basic concept of natural morphology is *naturalness*; it is the opposite of markedness. Thus, less marked entities are more natural, and more marked entities are less natural. There are several universal (cross-linguistic) properties, which amount to *system-**independent** naturalness.* According to Wurzel (1984: 202), the universal properties of natural structures are the following:[199]

- They are widespread among natural languages.
- They often occur through language change but are themselves comparatively resistant to language change.
- They are acquired relatively early by children.
- They are relatively unaffected by disorders, etc.

Regarding the direction of change of markedness relations, Mayerthaler (1981: 41; 1987: 50; cited from Wurzel 1984: 24) introduces the following generalisations:

- Undisturbed morphological change proceeds from more marked / less natural into less marked / more natural.
- When a more marked form competes with a less marked form, the less marked form is continued.

This is the working hypothesis of natural morphological change. For example, should the German irregular adjective gradation *gut* : *besser* : *am besten* undergo paradigmatic levelling, the less marked positive form would most likely be taken as the starting point; this would produce *gut* : ˣ*guter* : ˣ*am gutesten*. It is less likely that the more marked non-positive stem *bes(s)-* would be extended, i.e. ˣ*bess* : *besser* : *am besten*. Naturalness can be also considered as a methodological principle, which guides the scholar in determining the direction of change in unclear cases.

However, Mayerthaler's scheme requires qualifications in order to cope with the evident language-specific exceptions to the aforementioned tendencies. Wurzel (1984; 1987) has introduced a number of relevant additions to the theory of natural morphology.[200] One of his most important contributions is the observation of the language-specific properties of inflectional systems, which amount to *system-**dependent** naturalness*. This is one of the key factors for explaining the differences in the inflectional systems of the languages of the world. For example, if the reduction of ablaut alternations (qua reduction of allomorphy, etc.) is defined as a natural morphological change (which it, according to the 1M1F principle, arguably is), we can conclude that Latin is simply following this universal tendency. However, in some

[199] A more thorough list of extralinguistic factors can be found in Dressler et al. (1987: 13–14).

[200] Concerning the topics of this study, Wurzel's analyses unfortunately revolve almost exclusively around nominal morphology. How system-dependent naturalness ought to be analysed in the development of the verb system, lacks thus a prominent example.

languages, e.g. in the Germanic languages and Old Indic, alternations are not only levelled but also, under certain conditions, expanded. This would contradict the universal principle. By observing the system-dependent naturalness, it is justified to hypothesise that the Latin grammar includes such properties that propitiate the loss of ablaut alternations, whereas in Germanic and Old Indic the grammatical system prefers the extension of the alternations. The historical linguist must then find out, which factors lead to the loss of the alternations in some languages and to the extension in others.

Wurzel (1987: 63) defines the components of an *inflectional system* in the following way:

- Inventory of categories, i.e. the grammatical functions that are morphologically expressed.
- Occurrence of base form inflection vs. stem inflection (Latin, for example, is strongly of the stem-inflecting type).
- Occurrence of separate vs. combined symbolisation of categories, i.e. the non-existence or existence of portmanteau morphology, respectively (Latin has a largely separate symbolisation of functions in the verb morphology).
- The number and manner of formal distinctions in the paradigm, i.e. whether homophonous but functionally contrasting forms occur.
- The marker types occurring in relation to the category sets involved, i.e. the use of various morphological operations (Latin employs mainly suffixation).
- The presence vs. absence of inflectional classes (Latin has inflectional classes, i.e. conjugations, in the verb morphology).

Those components that are clearly dominant in the inflectional system of a language constitute its *system-defining structural properties* (SDSPs) (Wurzel 1987: 62f). They establish what is morphologically normal for a language. If the inflectional system is not entirely uniform (as in Latin), the decisive factor for determining SDSPs is the number, relative size and the extent of the inflectional classes in which a structural property is realised. This, however, is not entirely quantifiable, but is in most cases straightforward to discover (Wurzel 1987: 65). The degree of match between a morphological entity (e.g. a paradigm, an inflected form, a morphological marker, etc.) and the SDSPs of a language is conceptualised as *system-congruity*. Non-system-congruent morphological entities are marked. SDSPs are resistant to morphological change: Wurzel maintains that the change of SDSPs can only take place by way of non-morphological (usually phonological) change. In my opinion, this is just one possibility: other factors surely include grammaticalisation, syntactic change, and frequency effects. In short, I think that the totality of language structure (not just phonology and morphology) should be observed in the analysis of the change of SDSPs. In case there is a conflict between system-independent naturalness (as postulated by Mayerthaler) and the language-specific system-congruity, the latter prevails (Wurzel 1987: 70).

Wurzel conceptualises inflectional paradigms as networks of implications. For example, in Latin the acc.sg. *-im* implies *-ī* in the abl.sg., *-īs* in the acc.pl., *-ium* in the gen.pl., and so on (but note that this is essentially just analogy); from acc.sg. we can imply the other forms but not vice versa. These implicative networks Wurzel calls *paradigm structure conditions* (PSCs) (Wurzel 1987: 76f). This is relevant for the *stability* of inflectional classes: an inflectional class is stable if it functions according to the dominant PSC; and stable inflectional classes are natural (in the sense of system-dependent naturalness). The stability of an inflectional class also means

that its markers are stable. Such markers that are stable across different inflectional classes are *over-stable* markers: they are capable of independently spreading into different inflectional classes. According to Wurzel, a change within an inflectional class takes place by proportional analogy, and the spread of a marker by nonproportional analogy.

The theory of natural morphology also includes significant generalisations for morphological change across languages (see Wurzel 1987: 92f), but this aspect lies outside the scope of the present study. In the next section, we will examine a more specific kind of morphological change, which is relevant for the genesis of new forms and functions.

4.3.6. Grammaticalisation and lexicalisation

The mechanisms of morphological change introduced thus far rarely introduce genuinely new material into the grammar. For example, the various types of analogical change do result in modifications in the existing paradigms, or even in the genesis of new paradigms, but such processes actually "recycle" existing linguistic material by extending or levelling it in some way. Thus, crucial to morphological change is to identify such processes that result in *entirely* novel forms and functions. In this section, two such processes are discussed: grammaticalisation and lexicalisation.

Grammaticalisation is a type of reductive change, by which a linguistic entity advances from a less grammatical to a more grammatical status (Kuryłowicz 1965: 69).[201] A typical grammaticalisation process is the reduction of a lexical word (e.g. an adverb) into a clitic and then into a suffix; during the process the word loses it semantic (i.e. lexical) propositions as well as its material integrity (i.e. it loses phonetic substance). Grammaticalisation as a process had been known in some disguise for more than 200 years, until Antoine Meillet (1912) introduced the modern term.[202] It became a popular topic in linguistics in the late 1970s and has remained popular ever since, judging from the vast amount of conferences and publications dedicated to the topic; pioneers of modern grammaticalisation theory include Talmy Givón, Bernd Heine, and Christian Lehmann. In this study, I will adopt the model of Lehmann (2015; first version 1982), since I think that it offers the most comprehensive framework for studying grammaticalisation presented to date.[203] My goal is not to provide a critical review of grammaticalisation theory, but to rather introduce the most important points that are relevant for morphological change.

Lehmann's model is based on six operationalizable *parameters* and the associated language change *processes*. The three basic parameters are *weight*, *cohesion* and *variability*, which each occur on the paradigmatic and syntagmatic axes (for a total of six parameters). We

[201] This is a specific definition of grammaticalisation. According to a broader definition, grammaticalisation can be understood as the genesis of grammatical structures of whatever origin and by whichever mechanism. For example, the morphologisation of umlaut-plurals in English (as discussed in Ch. 2.2.2. above) can be termed "grammaticalisation" as the process results in novel grammatical content, but is not grammaticalisation in the narrower sense, as it does not involve development from a less grammatical expression into a more grammatical one.

[202] For the history of grammaticalisation and grammaticalisation studies, see Hopper and Traugott (2003: Ch. 2), Lindström (2004), Lehmann (2015: 1–9).

[203] A competing, perhaps more widely used but less precise model is the four-parameter model of Bernd Heine and colleagues (see, e.g., Heine and Narrog 2010). For non-Lehmannian approaches to grammaticalisation, see, e.g. Heine, Claudi, and Hünnemeyer (1991), Hopper and Traugott (2003), and Narrog and Heine (2011).

need to have a short look at each parameter and the associated processes in order to grasp the essence of grammaticalisation and its relevance for morphological change.

Paradigmatic weight, or *integrity* (Lehmann 2015: 134–141), refers to the distinctness of an entity from other entities, its prominence in contrast to the other entities in the syntagm. Here, both formal and functional aspects can be readily distinguished. By grammaticalisation, integrity decreases. The decrease of formal integrity, or *phonological attrition*, refers to the gradual loss of phonological substance. This may involve suprasegmental features (e.g. loss of accentuation or tone), certain phonological features of segments (e.g. loss of a feature due to assimilation), or loss of entire segments. The decrease of functional integrity, or *desemanticisation*, refers to the loss of semantic propositions that the entity originally exhibited. Typically, lexical propositions are lost to the extent that only relational (or grammatical) ones are left in the end.

Paradigmatic cohesion, or *paradigmaticity* (Lehmann 2015: 141–146), is the formal and functional integration of the paradigm as a whole and of its subcategories. By grammaticalisation, paradigmaticity increases; this is the process of *paradigmaticisation*. Aspects of paradigmaticity include the size of the paradigm (the smaller its, size, the more grammaticalized the paradigm), major vs. minor word classes (members of minor classes, such as pronouns, tend to be more grammaticalized than members of major classes, such as nouns and verbs), and the homogeneity of the paradigm.

Paradigmatic variability (Lehmann 2015: 146–152) refers to the freedom with which an entity is allowed to occur in a context. The parameter has an intraparadigmatic and a transparadigmatic aspect. Intrapardigmatically, the paradigm forms of a non-grammaticalized entity may vary according to the requirements of the discourse, i.e. their appearance is not grammatically regulated. By grammaticalisation, this variability is reduced, i.e. the appearance of a certain paradigm form becomes obligatory. Transparadigmatically, an entity may in its entirety be left unexpressed. After grammaticalisation, this option exists no longer, and the expression becomes obligatory. Correspondingly, the grammaticalisation-induced process of decreasing paradigmatic variability is *obligatorification*.

We turn now to the syntactic parameters: syntagmatic weight, or *structural scope* (Lehmann 2015: 152–157), refers to the structural size of the construction, in which it partakes. By grammaticalisation, the size of the construction becomes smaller (e.g. from clause to word to morpheme); this is the process of *condensation*.

Syntagmatic cohesion, or *bondedness* (Lehmann 2015: 157–167), is a measure of the intimacy, with which an entity is connected with another syntagmatically associated entity. Bondedness varies on a continuum from juxtaposition (least grammaticalized) to merger (most grammaticalized). One way to operationalise bondedness is to analyse the occurrence of prosodic boundaries (e.g. a word boundary is less bonded than a morpheme boundary). The process of increasing bondedness is *coalescence*.[204]

Finally, *syntagmatic variability* (Lehmann 2015: 167–170) refers to the possibility of shifting an entity around in its context, i.e. its positional mutability vis-à-vis other entities in

[204] Lehmann's terminological choice is, in my opinion, at this point slightly unsuccessful due to the fact that the term *coalescence* occurs in other context in different meaning, i.e. largely synonymous with (phonological) *merger*. My proposal for a better term would be *bonding* (see *OED*, s.v. *bonding*, n.).

the syntagm. By grammaticalisation, syntagmatic variability decreases, i.e. the constituent order becomes more fixed. This is the process of *fixation*.

Ideally, when all parameters change according to the processes mentioned above (decreasing weight and variability, increasing cohesion), the net result is increasing grammaticalisation. This scheme is summarised in Table 37 (adopted from Lehmann 2015: 174).

PARAMETER	WEAK GRAMMATICALISATION	PROCESS	STRONG GRAMMATICALISATION
INTEGRITY	bundle of semantic features; distinct phonological features	attrition + desemanticisation →	few semantic features; few distinct phonological features
PARADIGMATICITY	item participates loosely in semantic field	paradigmaticisation →	small, tightly integrated paradigm
PARADIGMATIC VARIABILITY	free choice of items according to communicative intentions	obligatorification →	choice systematically constrained, use largely obligatory
STRUCTURAL SCOPE	item relates to constituent of arbitrary complexity	condensation →	item modifies word or stem
BONDEDNESS	item is independently juxtaposed	coalescence →	item is affix or even phonological feature of carrier
SYNTAGMATIC VARIABILITY	item can be shifted around freely	fixation →	item occupies fixed slot

Table 37: Grammaticalisation: parameters and processes.

The actual mechanisms that are involved in grammaticalisation are *reanalysis* and *extension* (Itkonen 2002); and, as argued in Ch. 2.3.4., both involve *analogy*. It follows that grammaticalisation itself is very much a matter of analogical change. However, the widely accepted definition of grammaticalisation and the processes described above are, as such, insufficient at explaining the development of grammar in its entirety, for grammaticalisation is both unpredictable and unsystematic. By unpredictability I refer to the fact (common to most processes of language change) that neither the onset of grammaticalisation nor its endpoint can be predicted on the basis of the linguistic data; thus, grammaticalisation is only observed post facto. And when it *does* take place, it becomes amenable to the rational explanation. By unsystematicity I refer to the fact that grammaticalisation proper concerns individual linguistic entities only: for example, the development of a complex conjugation system (e.g. those of the Romance languages), even though it unarguably involves grammaticalisation (e.g. of the innovative French future *chanterai* from Latin *cantāre habeō*), requires a much broader theoretical apparatus for an adequate explanation (involving, at least, various paradigmatic levellings, extensions, reanalyses, sound change, etc.).

At this juncture, I must point out what grammaticalisation, as understood within the context of this study, is *not*. Some scholars use the term in the sense "is grammatically coded" or "is obligatory to express". One could say that, for example, "the future tense is grammaticalized in English and Latin (*will do [tomorrow]*, *[crās] faciam*) but not in Finnish

(*teen [huomenna]*)".[205] Some scholars perceive grammaticalisation as the process by which *all* grammar ultimately emerges; I disagree with this use of the term for reasons that I have already mentioned. Lastly, grammaticalisation can be used as a cover term for the genesis of grammar, regardless of which processes actually are involved at the micro-level. Since in this study my goal is to expose the very micro-level mechanisms that operate in language change, I do not use the term grammaticalisation in this wide and general sense: unless indicated otherwise, it should be understood in the narrow and more precise sense.

Grammaticalisation has been argued to be a unidirectional phenomenon, i.e. the direction of change is thought to be always in a predefined direction (from less grammatical to more grammatical). This is, among other factors, due to the positive identification of specific *grammaticalisation channels* (or *paths* or *clines*), i.e. strong unidirectional tendencies according to which grammaticalisation proceeds.[206] However, several scholars (e.g. Norde 2009) have contested the unidirectionality hypothesis and have provided evidence for a counter-phenomenon, **degrammaticalisation**. In my view, the importance of this debate is often overemphasised, since the issue in question is to a large extent a definitional one: a case of counter-directional change does not falsify the unidirectionality hypothesis, since it does not qualify as a genuine case of grammaticalisation (in the narrow sense). And, the question whether counter-unidirectional changes should be included in the definition of grammaticalisation, is ultimately a matter of taste. In any case, a prototypical case of degrammaticalisation would proceed from more grammatical to less grammatical, i.e. the processes (as described above) would be diametrically reversed. To my knowledge, such cases have thus far not been successfully identified. A prototypical case of degrammaticalisation involves the reversal of one or two processes (e.g. the development of the Swedish genitive clitic *-s* from the gen.sg. ending of the *a*-stem paradigm; see Norde 1997).

Lexicalisation is also – at least in some respects – a counter-phenomenon to grammaticalisation (in general, see Brinton and Traugott 2005). Since grammaticalisation pushes entities towards and into grammar, lexicalisation can be defined as the pushing of entities into lexicon. Typically, lexicalisation involves the reduction of a phrase (consisting of at least two elements) into a single construction or a single, structurally opaque element (cf. Lehmann 2002: 13). Despite their obvious differences, lexicalisation and grammaticalisation are not diametrically opposed processes, as pointed out by Lehmann (2002). In fact, certain grammaticalisation phenomena presuppose lexicalisation, e.g. the grammaticalisation of the German phrase *auf Grund (von)* into a preposition *aufgrund (von)* (Lehmann 2002: 1): since the prepositions of German are stored in the lexicon of the language, the creation of a new preposition by necessity involves the creation of a new lexicon entry, hence lexicalisation. But this is unarguably also a case of grammaticalisation, since the transparently constructed phrase has been reduced into a single entity (cf. the parameters above). However, grammaticalisation *need not* involve lexicalisation (Lehmann 2002: 13). Both processes are characterised by their *reductive* nature: an element is drawn away from its original environment, stripped off of some of its properties, and reassigned into another duty elsewhere within the language system.

[205] Colloquial Finnish does have a future periphrasis of the type *tulla tekemään* 'to come to do' → 'will do', but its status is still so controversial that it is not mentioned in prescriptive grammars (e.g. Karlsson 1999).

[206] For examples of grammaticalisation channels, see, e.g. Lehmann (2015: 39, 59, 119). A representative collection of empirical data is in Heine and Kuteva (2002)

4.3.7. Frequency

The effect of the frequency of occurrence of linguistic entities for the organisation and development of language has long since been recognized, and the topic has received attention in recent decades not only in the theoretical discussion but also in the form of *corpus linguistics*.[207] As was pointed out in Ch. 2.1. above, the grammatical description of a language is not amenable to statistical analysis in clear cases (which constitute the majority) – only in less-than-clear cases, it was argued, is statistical analysis called for. Thus, we need to distinguish frequency and statistics as *descriptive and/or explanatory factor* from its causal *effect* on language and language change. The topic of this section is exclusively the latter.

First, we must distinguish two methods of counting frequency: *token frequency* and *type frequency* (see, e.g., Bybee 2003: 604–605). Within a limited corpus, token frequency refers to the number of occurrence of each linguistic entity, and type frequency refers to the number of occurrence of a class of linguistic entities. For example, a text might contain the following set of verb forms: *was, are, is, has, had, are, had, is*. Of these eight verbs, the token frequency of the forms of 'be' is 5/8 (or 62%), and of those of 'have' 3/8 (38%), and so on, and the type frequency in the class 'verbs' is 1 for 'be' (50%) and 1 for 'have' (50%), out of two verbs. The relevant question for the theory of language change is: does a particularly high/low token/type frequency cause certain changes in language structure?

The answer is affirmative. Historical linguists have identified several effects that frequency of occurrence exerts on language change. We can classify these into low-frequency and high-frequency effects. Extremely low frequency over long periods of time basically means that the entity is forgotten and that it is no longer part of the language (ontologically speaking, this is a case of a loss of a norm). Grammatical entities (such as suffixes and endings) are rarely forgotten, but it is possible that an inherited, non-productive form eventually becomes so rare that it is replaced – by analogy – on the model of a more productive formation. This is directly related to the capabilities of human memory: "analogy is successful where memory fails" (Anttila 1989: 101). We can thus generalise that a form that has low frequency of occurrence is more liable to undergo analogical change (as opposed to direct, phonologically regular continuation according to the heredity principle) than a more frequently occurring form.

The effects of high frequency are more numerous and to some degree controversial regarding the direction of causality. There is empirical evidence to support at least the following generalisations:

- Frequently occurring forms tend to be less susceptible to analogical change (cf. above) and thus they preserve the outcome of regular sound change more faithfully.
- Frequently occurring forms tend to be more susceptible to phonological erosion and desemanticisation.[208]
- Grammatical items tend to occur with higher frequency, by virtue of their nature, than lexical items.
- It has also been claimed that high frequency results in grammaticalisation (see below).

[207] For theoretical contributions, see, e.g. Winter (1971), Bybee (2001), and Bybee (2007).
[208] George Kingsley Zipf (1935) noticed an important inverse correlation between signal length and frequency: the more frequently the signal occurs, the shorter it generally is.

Some of these generalisations can surely be reduced to more general principles. For example, the fact that high-frequency items preserve regular sound change better is directly related to the fact that sound change generally simplifies or reduces phonological substance (according to the principle of least effort). The relationship of frequency and grammaticalisation is more complicated. In my view, there is probably a two-way causality involved: frequently occurring items are more susceptible to becoming grammaticalized, and once they do, this increases their frequency even more. Desemanticisation – considered on its own and as a sub-process of grammaticalisation – is also related to high frequency, since repeated occurrence tends to diminish both the pragmatic and semantic values of an expression (swear words are a parade example of this kind of desemanticisation). Additionally, high frequency is related to naturalness: for example, the reduction of markedness that was one of the working principles of natural morphological change can be seen as a frequency-induced desemanticisation process, which can occur on its own (depending on the pragmatic context) or as a part of grammaticalisation.

As for methodology, the measurement of both type and token frequencies is generally straightforward to carry out, especially on a specific corpus with the help of digital technology. In modern languages, the lack of a suitable corpus can be compensated by field work, but this option is not available for the study of dead languages. In particular, the occurrence of forms and functions in literary texts and everyday spoken language is certainly different – this is problematic, because language change is first and foremost a matter of spoken language, and the changes that have already taken place are often slowly reflected in the written medium. This means that when reliable and representative corpus data are not available, the linguist needs to resort to more general principles, such as the generalisation that grammatical items occur with higher frequency than purely lexical ones, and so on.

4.4. Hierarchy of mechanisms

All of the above principles, theories and tendencies are widely recognized as important factors in language change. Two questions, however, remain: first, which factor is conclusive in a given instance of morphological change; and second, is there a reliable method to answer the first question. As is generally known, any number of descriptions and theories can be formulated on the basis of the same data; thus, a case of morphological change can potentially be explained as an analogical change toward an isomorphic form-meaning-mapping, a change toward naturalness, or a case of (possibly frequency-induced) grammaticalisation. Without an extensive framework of morphological change, the choice between the various explanations may remain arbitrary. In order to overcome this issue, *a framework which results in the most realistic representation of actual linguistic development* must be conceived.

To this end, I will introduce the concept of *generality continuum*, on which the mechanisms of morphological change presented in this chapter are arranged in a hierarchical order. The basis for this is the generality or specificity of a certain instance of language change. The left end of the continuum concerns the most general cases. In language change, regular sound change affects (all other things being equal) all morphological forms and categories with equal results, and it is, therefore, the most general mechanism affecting morphological change. Thus, the heredity principle occupies the leftmost position on the continuum. However, if the

form under analysis does not conform to known sound changes, or it has undergone a modification that is clearly not caused by regular sound change, heredity principle no longer applies. Moving one step to the right on the continuum, we can thus expect that some kind of analogical modification has taken place. At default, such analogies aim at achieving isomorphic mapping of meanings and forms; this is the 1M1F principle. Advancing further to the right, a change that has demonstrably *not* resulted in the establishment of 1M1F has, instead, *ex hypothesi* taken place in order to enhance the naturalness of the morphological system. All the changes mentioned thus far are fairly general in the sense that they most likely involve more than one form, category or structure, and their effect is typically observable at the level of the morphological system (as opposed to just affecting a single lexeme or a small, closed class of forms). A more specific type of change (again, towards the right end of the continuum) is grammaticalisation, which – at least in its initial stages – concerns only a certain kind of syntagm that has been extracted from discourse and reanalysed and reduced to a more grammatical function. For example, the reduction of a local case form into an adposition does not *per se* affect the workings of the morphological system, but is in essence a singular occurrence. At the utmost right end of the continuum we can expect to have changes for which no particular mechanism or a clear tendency has been detected. These can be due to various contextual and pragmatic factors, which ultimately are amenable to the rational explanation.

As was pointed out in the previous section, frequency of occurrence may sometimes interfere with the expected development. Despite some obvious and generally acknowledged tendencies, the frequency profile of an entity is highly entity-specific; thus, frequency effects fall rather on the right (more specific) end of the continuum. A consequence of these factors is that a noticeably high or a noticeable low frequency of occurrence may *overrule* the effect of other principles. According to the generalisations mentioned in the previous section, we can conclude that a particularly high frequency is likely to restore the effect of regular sound change (or, in other words, prevent the occurrence of analogical changes that occur elsewhere in the system), and that a particularly low frequency is likely to subject the entity to the most straightforward analogical modifications (i.e. 1M1F). This scheme and the generality continuum are presented in Figure 5 below.

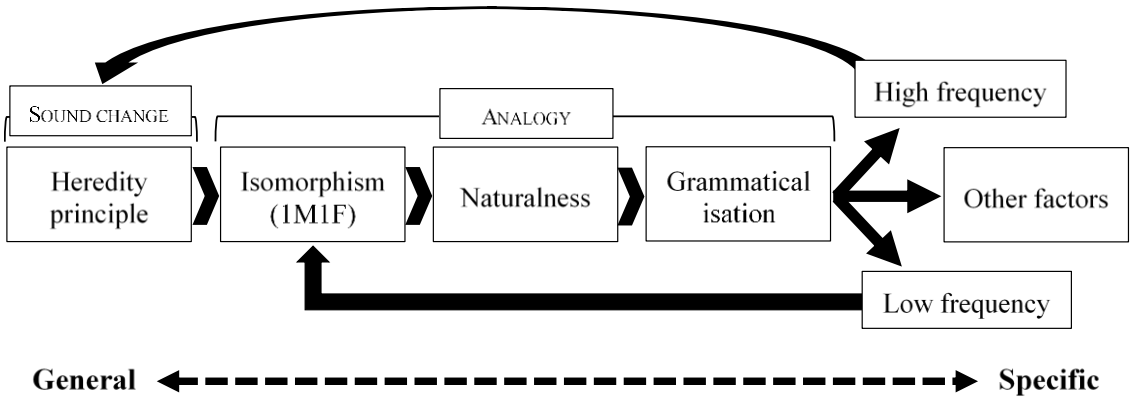

Figure 5: Generality continuum and hierarchy of mechanisms.

The scheme is used as follows. Given a word-form *E*, of which we do not *a priori* know, whether it is directly inherited from the parent language, a result of analogical modification or grammaticalisation, or a loanword. At first, the phonological form of *E* is analysed. If it conforms to the known regular sound changes and thus corresponds one-to-one with its reconstructed proto-form, the conclusion is that, as per heredity principle, *E* is directly inherited and no analogical modification has taken place. Should the form not conform to the known sound changes, the nature and cause of the non-*lautgesetzlich* modification that *E* has undergone needs to be investigated. The expected case is that the modification has taken place according to the 1M1F principle. If this indeed is the case, the investigation can be concluded, since an adequate explanation has been identified. Should the modification of *E* not conform to the 1M1F principle, it can be expected to have taken place as an enhancement of the naturalness of the morphological (sub)system to which *E* belongs. If this is the case, an adequate explanation has been reached. However, if morphological naturalness can be ruled out as a factor, the possibility of *E* having undergone grammaticalisation should be investigated (for example, it is possible that *E* contains a suffix or an ending, which originally was an independent word). In case a plausible grammaticalisation channel can be identified, this constitutes an adequate explanation. If this is not so, further factors should be investigated. One of them is the frequency profile: should *E* have an extremely high frequency of occurrence, it is expected that *E* has – against other analogical modifications that the category to which *E* belongs has undergone – preserved the regular sound changes, which then leads to *E* standing outside the regular morphological paradigms. Should *E* have an extremely low frequency of occurrence, it is possible that it has undergone analogical levelling (according to 1M1F principle) unlike other forms of in its paradigmatic environment. If none of these can be identified as an adequate explanatory factor for *E*, further more specific possibilities must be considered, e.g. borrowing from another language, morphological contamination, taboo deformation, retention of an archaism for an artistic effect, and so on. This highlights, again, the importance of the cooperation of linguistics and philology, and of theory and empirical data.

4.5. Summary and assessment

The examination of these regular verb formations illustrates the different mechanisms that have influenced the development of the Latin verb system and the continuation of the inherited ablaut alternations. The most important factors are summarised as follows:

Direct historical continuity as per heredity principle is expectedly not only a methodological basis for the analysis but also a historical linguistic fact. As a general tendency, present formations of basic verbs of relatively high frequency are oftenmost directly transmitted. Neo-perfect stems involve a degree of discontinuity due to the radical changes in the verb system, such as the complete abandonment of intraparadigmatic ablaut relations and the post-Proto-Italic merger of aorist and perfect formations. PPPs are subject to analogical modifications, as a rule, only if regular sound change diminishes paradigmatic uniformity.

Paradigmatic levelling (1M1F): all regular Latin present and neo-perfect formations that are based on PIE formations with intraparadigmatic ablaut (athematic ablaut, Narten ablaut, or perfect ablaut) have analogically levelled said alternations, unless the alternations were otherwise neutralised by regular sound change, but this seems to be a relatively rare occurrence

(see below). Levelling also takes place occasionally between the three stems of a verb: typically, the present stem influences the vocalism of other stems, but sometimes the aorist/perfect stem serves as the model. The vocalism of *trahere* (Ch. 2.2.1.14.) and *frangere* (Ch. 2.3.2.2.) may have been influenced by their respective PPPs *tractus*, *fractus*. We should, however, note that levelling is almost never pushed to extreme: complete levelling of the vocalism across all three stems is a rare occurrence, which depends on multiple factors such as relative and absolute frequency, functional adequacy, and morphological naturalness.

Functional factors: the development (continuation or loss) of ablaut alternations is not entirely guided by "blind" sound change and the simplistic rationality of paradigmatic levelling. In many cases, the direction of levelling is determined by functional factors such as the capability of the morphological system to express important contrasts. Two clear tendencies are observed: first, given a formally unmarked formation, the form with more phonological substance (typically an e-grade or o-grade root) is continued, and second, given a formally marked formation, the form with less phonological substance (typically a zero-grade root) is continued. The first tendency is evident in the transmission of root presents, root aorists, and simple thematic presents, which always continue the inherited strong stem e-grade root, and in causative-iteratives, which always continue the inherited o-grade root (as the stem marker *-ē-* had by Proto-Italic been reduced into an effaced present class marker void of actual grammatical function). The second tendency is observed elsewhere: *i̯e/o*-presents, *sk̂e/o*-presents, reduplicated presents, nasal presents and (almost all) reduplicated perfects prefer zero-grade roots. There are, however, two exceptions: first, the marker *-s-* of whatever origin (i.e. *s*-aorists and desideratives) takes regularly the phonologically fuller form, and second, the three reduplicated perfects (*totondī*, *spopondī*, *momordī*) of second-conjugation causative-iteratives seem to reflect o-grade strong stem forms. However, considering that these present stems *qua* inherited causative-iteratives exhibit regular and prominent o-grade vocalism and that Latin neo-perfect stems generally reflect zero-grade reduplicated perfect forms, it is perhaps more probable that the vocalism of these neo-perfects has in fact been levelled on the model of the present stems, rather than being genuine reflexes of the original o-grade perfect vocalism.

Morphological naturalness: some changes undergone by the verb system can be explained by considering the naturalness of inflectional paradigms. For example, there is tendency to prefer monosyllabic roots and/or stems, ideally of structure (C)CV(R)C-; apparently, such structures are considered more natural than polysyllabic ones. There is also preference towards suffixal marking of non-present stems: thus, for neo-perfect stems the preference is for a suffix (*-s-*, *-u-* or *-v-*), reduplication, or a long vowel, and the PPPs are in any case regularly marked by *-t-* or *-s-*. The result of these considerations is that direct, phonologically regular continuity has occasionally been disturbed *without* being an explicit manifestation of the 1M1F-principle.

Thematisation of inherited athematic formations is an important factor that precipitated the loss of intraparadigmatic ablaut alternations. PIE thematic formations do not have intraparadigmatic ablaut, and it seems that, as a side effect of thematisation, the alternations originally part of the athematic paradigms were levelled. Thus, thematisation is not mere replacement of suffixes and endings, but it also affects the total morphological composition of the affected paradigms. Some scholars (e.g. Dunkel 1998 and Garnier 2010) consider at least some thematised formations to be continuations of inherited *subjunctive* forms of the original

athematic formations. While it is indeed true that a fully thematised paradigm of an old athematic verb is formally identical with its original subjunctive present inflection, it still does not make any functional sense to assume that some verbs suddenly lost their proper indicative forms, which were replaced by the inherited subjunctive forms, without providing a rational explanation for such a scenario. To my knowledge, such an explanation has thus far not been provided. The ultimate impetus for thematisation must, thus, be sought elsewhere.

Regular sound change: one of the most evident effects of regular sound change is the submersion of original root vowel quality, especially in reduplicated formations (due to vowel weakening in medial syllables). But we should also note that the relatively conservative vocalism in Latin initial syllables acted towards the preservation of the original qualitative contrasts. Another effect is the neutralisation of some quantitative contrasts. A third effect is the shuffling of vowel qualities due to various context-dependent changes, such as monophthongisation and recolouring induced by *l pinguis*. These sound changes, as was pointed out in Ch. 3., occurred at various times during the prehistory and attested history of Latin. To the oldest stratum belong, most importantly, Osthoff's Law and **eu̯* > **ou̯*. The reconstructions presented in this study indicate that the Proto-Italic verb system featured noticeably less ablaut alternations than the PIE one, and that only some of the neutralisations can be explained by the strictly local effect of sound change. Many changes, such as long vowel tensening and *vo-* > *ve-* are within the history of Latin relatively late, only occurring during the second century BC. Changes such as these have indeed shaped the ultimate appearance of many Latin verbs, but considerations of relative and absolute chronology reveal that they are largely irrelevant for the development of the verb system and its vowel alternations.

5. Conclusions

In this study, the continuation of inherited PIE ablaut alternations in the Latin verb system has been analysed on the basis of 77 verb formations and the associated sound changes and mechanisms of morphological change. The objective was to estimate the effect of regular sound change on the transmission of the inherited alternations, and to identify the mechanisms of morphological change that have been operational in the development of the verb system from PIE to Latin. This chapter offers a summary of the analysis and provides answers to the research questions of this study.

5.1. Development of the Latin verb system

An overview of the PIE, Proto-Italic, and Latin verb systems was provided in Ch. 2.1. We can now relate the results of the analysis, i.e. the phonological and morphological transmission of inherited ablaut alternations, to the big picture.

The most crucial changes involving the transformation of the PIE verb system into the Proto-Italic one include, first, the change from a root-inflecting type towards a stem-inflecting type (see the theoretical discussion in Ch. 4.3.5.), second, the proliferation of the thematic conjugation to the near-exclusion of the athematic type, and third, the creation of the system of four regular present conjugation classes. These three changes exerted a *systemwide* effect on the inherited ablaut alternations:

- The PIE verb system, of a root-inflecting type, involved a network of morphophonological vowel alternations (i.e. ablaut) that concerned both lexical (roots) and grammatical (suffixes, endings) morphemes. As was pointed out in the introduction (Ch. 1.1.), this kind of system of vowel alternations was pervasive, comparable to a degree to the Semitic inflection (as briefly mentioned in Ch. 4.1.2.), and included a relatively frequent occurrence of multiple exponence (as laid out in Ch. 4.1.2.). By contrast, the Proto-Italic and especially the Latin verb systems were of a stem-inflecting type, in which the expression of grammatical functions was almost non-existent at the stem-internal level (no internal modification), while the morphological composition of a word form crystallised at the interplay of verb stems and (segmental) suffixes and endings. In PIE, the expression of a given grammatical function sometimes necessitated the modification of the vocalism of not only the root but also of one (or more) suffixes, while already in Proto-Italic, almost all verb roots had lost their autonomous inflectional properties and were grammaticalised as tense-stems: to express a function, an appropriate stem was selected and furnished with the required suffixes and personal endings.
- In PIE, thematic and athematic inflection types differed in two complementary properties: the former had the thematic vowel **-e/o-* and no intraparadigmatic ablaut, while the latter lacked the thematic vowel but had intraparadigmatic ablaut, that is, the strong stem was differentiated from the weak stem by having a different ablaut grade. Comparative Italic evidence indicates that by Proto-Italic, at the latest, the thematic conjugation type had by far ousted the athematic type (salient traces of it remained only in such synchronically irregular, high-frequency basic verbs as *esse* ‘to be’, Ch. 2.3.4.1., *īre* ‘to go’, Ch. 2.3.4.2., *velle* ‘to want’, Ch. 2.3.4.3., and *ēsse* (*edere*) ‘to eat’, Ch. 2.3.4.4.). As an epiphenomenon

of this, intraparadigmatic ablaut became very rare in terms of type frequency, and hence systemically marginalised.

– As a result of regular sound change, thematic stems ending in PIt. *-*ā*- formed the first conjugation, those in *-*ē*- the second, those in *-*ī*- (or *-*i̯ī*-) the fourth, and those ending in a consonant or *-*i̯*- the third. This is the basis of the system of four conjugations of the Italic languages. To each present stem was assigned, ideally, one aorist stem, one perfect stem, and a PPP; some oblique stems and PPPs were shared by more than one present stem, so the stem-system was not entirely symmetrical, but still much more symmetrical and uniform than the original PIE tense/aspect system. Most importantly, rather than inflecting each verb form as a composite unit consisting of a root, a suffix and an ending, all with associated, morphologically determined vowel alternations, there was a drift towards grammaticalising the stems (whichever their original morphological composition happened to be) and basing the expression of grammatical functions on these stems. This drift, however, did not result in systemic elimination of transparadigmatic alternations (see below). Nonetheless, the tighter integration of various verb formations into symmetrical paradigms promoted the occurrence of analogical levelling within the recently grammaticalised paradigms.

Despite the relatively radical destructive effect of these three developmental tendencies, vowel alternations were not completely lost. In fact, as an effect of the grammaticalisation and/or lexicalisation of the stems-and-conjugations-system, there were many phonological and morphological contexts, in which an inherited alternation, especially at the transparadigmatic level, was not only preserved, but also served a functionally relevant purpose: such minimal pairs survive occasionally into Classical Latin, e.g. *facit* prs. ≠ *fēcit* pf., and *docet* ‘teaches’ ≠ *decet* ‘it is befitting’.

A second set of notable changes occurred during the transformation of the Proto-Italic verb system into the Latin one. The most salient change that occurred during this period was the merger of the Proto-Italic aorist and perfect into the Latin neo-perfect. This functional merger left formal residue in its wake, resulting in a temporary 1M2F-situation (too many forms for a single function), which was eventually resolved by continuing either of the two Proto-Italic stems as the Latin neo-perfect stem, or by renovating the inherited formations by an innovative *v/u*-perfect. This merger resulted in an overall reduction of alternation patterns, as many inherited formations (which might have preserved inherited ablaut alternations) were lost. Additionally, the innovative formations were always based on the existing vocalism, which was already present in the paradigm (typically, the vowel of the present stem was continued in the innovative neo-perfect formations); such renovations also diminished the prominence of inherited vowel alternations.

The same drift towards symmetrical tense stems and symmetrical conjugation patterns, which was initiated before Proto-Italic, continued until Classical Latin. Old Latin still preserved some relics of the abandoned formations (such the preventives and *s*-futures), but these were eventually lost. Paradigmatic uniformity was tightened. Even some irregular verbs could not escape the standardisation drift, as such inherited (an in Old Latin very common) forms as ipf.sbj. *forem* (a suppletive form of *esse* ‘to be’) and prs.sbj. *edim* (from *ēsse/edere* ‘to eat’) were renovated by more regular formations in Classical Latin, i.e. ipf.sbj. *essem*, prs.sbj. *edam*, respectively.

The drifts and tendencies presented above are results of several micro-level language change processes that operated in the individual cases. A closer look at the actual mechanisms, and the generalisations of the operation of these mechanisms, is also required in order to understand and explain the transmission of PIE ablaut alternations into Latin.

5.2. Sound change

As was pointed out in the introduction (Ch. 1.2.), most scholars have thus far agreed that regular sound change has played a significant role in the overall reduction of the inherited vowel alternations from PIE to Latin. It was hypothesised that such phonologically regular neutralisations have exerted a destructive effect on the system of alternations. One of the objectives of this study is to check the validity of this hypothesis by examining the sound changes and assessing their effect on the transmission of ablaut alternations within the Latin verb system. In this section, I will present my final assessment.

Most relevant for the transmission of the inherited vowel alternations are such changes that result in the merger, confusion or submersion of ablauting vowels. The PIE ablaut vowels are **e*, **o*, **ē*, **ō*, and Ø (i.e. absence of vowel). Additionally, sound changes concerning other PIE syllabic phonemes (i.e. **i*, **u*, **m̥*, **n̥*, **r̥*, **l̥*, **h₁*, **h₂*, **h₃*) needs to be observed as well, as their respective consonantal (or semi-vocalic) allophones form sequences (diphthongs) with the ablauting vowels.

One of the first post-PIE changes that concern the ablaut vowels is the loss of laryngeals (see Ch. 3.1.2.). This has an immediate effect on the phonology of verb roots:

- Qualitative changes: laryngeals colour (first subphonemically, then phonemically) an adjacent **e* into **a* (by **h₂*) or **o* (by **h₃*) – **h₁* is neutral in this regard. This multiplies possible e-grade vocalisms in *seṭ*-roots, as **e* is no longer the only phonological manifestation of a morphological e-grade. Verbs affected by this change include *agere* (< **h₂eĝ-*, Ch. 2.2.1.1.), *unguere* (< **h₃engʷ-*, Ch. 2.2.1.17.), and °*uere* (< **h₃eu̯-*, Ch. 2.2.1.16.).
- Quantitative changes: loss of postvocalic laryngeals causes compensatory lengthening of the preceding vowel. This is, in the case of **e* before **h₂* and **h₃*, coupled with laryngeal colouring, i.e. **eh₁ > *ē*, **eh₂ > *ā*, **eh₃ > *ō*; other vowels are not qualitatively affected, e.g. **iH > *ī*, **uH > *ū*, **oh₂ > *ō*, etc. Verbs affected by this change include *dare* (< **deh₃-*, Ch. 2.3.4.5.), °*plēre* (< **pleh₁-*, Ch. 2.2.2.7.), *nōscere* (< **ĝneh₃-*, Ch. 2.2.3.2.), *nēre* (< **(s)neh₁-*, Ch. 2.3.1.3.), and *stāre* (< **steh₂-*, Ch. 2.2.5.6.). A few PIE reduplicated perfects end up as PIt. longvocalic perfects as a result of this change, e.g. *ēdī* (< **h₁e-h₁d-*, Ch. 2.3.4.4.), and *ēmī* (< **h₁e-h₁m-*, Ch. 2.2.1.6.). Additionally, a few PIE root aorists end up as PIt. longvocalic aorists, e.g. *fēcī* (< **dʰeh₁k-*, Ch. 2.2.7.3.), and *iēcī* (< **Hi̯eh₁k-*, Ch. 2.2.2.5.).
- Vocalisation of **H*: between two consonants, all PIE syllabic laryngeals are vocalised as PIt. **a*. This is relevant for the development of many verb formations with zero-grade root, e.g. *faciō* (< **dʰh₁k-i̯é/ó-*, Ch. 2.2.2.7.), *capiō* (< **kh₂p-i̯é/ó-*, Ch. 2.2.2.1.), and *taceō* (< **th₂k-(e)h₁i̯é/ó-*, Ch. 2.2.5.7.), *status* (< **stH₂-tó-*, Ch. 2.2.5.6.).
- When a laryngeal is preceded by a syllabic nasal or a liquid, the result is PIt. **-Rā-* before consonants, **-aR-* before vowels (Palma rule, i.e. vocalisation of *accented *R̥H* into

*-*aRa*-, does not occur in the data of this study). Verb formations affected by this change include *lātus* (< **t̥lh₂-tó-*, Ch. 2.3.2.9.) and *parere* (< **p̥rh₃-e/o-*, Ch. 2.2.2.6.).

Laryngeal-related sound changes are the first crucial step towards the loss of the system of *morphophonological* alternations.[209] Laryngeals were present in many verbal roots, which were continued in the Italic branch, and consequently, in these roots the familiar ablaut pattern **e* : **o* : **ē* : **ō* : Ø is no longer distinctly manifested at the surface level, while roots without laryngeals continue the inherited system mostly intact.

Also of Proto-Italic date is the vocalisation of syllabic liquids: in most cases, **r̥* > **or*, **l̥* > **ol* before consonants, and **r̥* > **ar*, **l̥* > **al* before vowels (see Ch. 3.1.3.). This change affected such verb formations as *tollere* (< **tl̥-n-h₂-*, Ch. 2.3.2.9.). Syllabic nasals (**m̥*, **n̥*) not adjacent to laryngeals were vocalised not until the *einzelsprachlich* period of the Italic languages (see below).

We should at this point address the continuation of zero-grade vocalism from PIE into Proto-Italic. In diphthongal roots containing the sequences **Ei̯*,**Eu̯*, and **EN*, the zero-grade is transmitted without any discernible change at the surface representation, e.g. *dictus* (< **dik̂-tó-* ← **dei̯k̂-*, Ch. 2.2.1.4.), *cupiō* (< **kup-i̯é/ó-* ← **keu̯p-*, Ch. 2.2.2.2.), *tentus* < PIt. **tn̥-to-* (< **tn̥-tó-* ← **ten-*, Ch. 2.2.5.8.). In roots involving laryngeals and/or liquids next to the ablauting vowel, changes described above take place regularly. However, in several cases the actually attested vocalism is not a regular reflex of a PIE zero-grade. The surface vowel is either **e* or **a* (of non-laryngeal origin):

- **PIt. **e***: *decet* (< **dk̂-(e)h₁i̯é/ó-* ← **dek̂-*, Ch. 2.2.5.8.), *sedēre* (< **sd-(e)h₁i̯é/ó-* ← **sed-*, Ch. 2.2.5.5.; cf. *sīdere* < **si-sd-é/ó-*, Ch. 2.2.6.3.), *specere* (< **spk̂-i̯é/ó-* ← **spek̂-*, Ch. 2.2.2.9.), *tepēre* (< **tp-(e)h₁i̯é/ó-* ← **tep-*, Ch. 2.2.5.9.).
- **PIt. **a***: *carēre* (< **k̂s-(e)h₁i̯é/ó-* ← **k̂es-* (?), Ch. 2.2.5.1.), *carpere* (< **(s)kr̥p-* ← **(s)kerp-*, Ch. 2.3.1.1.), *frangere* (< **bʰr-n-g-* (?) ← **bʰreg-*, Ch. 2.3.2.2.), *habēre* (< **gʰbʰ-(e)h₁i̯é/ó-* ← **gʰebʰ-* (?), Ch. 2.2.5.3.), *manēre* (< **mn̥(n)-(e)h₁i̯é/ó-* ← **men-*, Ch. 2.2.5.4.), *pandere* (< **pt-n-h₂-* ← **peth₂-*, Ch. 2.3.2.6.).

There are also several PPPs which do not reflect the regular zero-grade root. In these cases, the vocalism always reflects the full grade root of the present stem (see Table 32, Ch. 2.4.), e.g. *tēctus* (< **(s)tg-tó-*, Ch. 2.2.1.13.). Judging from *vectus* (< **u̯eĝʰ-tó-*, not **uĝʰ-tó-* > ˣ*uctus*, Ch. 2.2.1.18.), this discrepancy cannot be phonologically motivated (avoidance of unpronounceable sequences, see below).

In a further morphological environment, i.e. transmission of zero-grade reduplicated perfects, yet another phonologically irregular continuation of the PIE zero-grade root is observed. Most reduplicated perfects are regularly continued, e.g. *sēdī* (< **se-sd-* ← **sed-*, Ch. 2.2.6.3.), *tetigī* (< **te-toh₂g-/te-th₂g-* ← **teh₂g-*, Ch. 2.3.2.8.), but a small group of Latin neo-perfects (of reduplicated perfect origin) has a long vowel – as though reflecting an original ē-

[209] It would be interesting to compare the results of this study with a similar study conducted on nominal morphology. PIE ablaut was, of course, not just limited to the verb system. Any conclusions regarding the language-wide (non-)existence of morphophonological vowel alternations must be based on the analysis of all word classes.

grade: *lēgī* (← **le-lg-*, Ch. 2.2.1.9.), and *frēgī* (← **bʰ(r)e-bʰrg-*, Ch. 2.3.2.2.) (cf. Meiser 2003: 153f).[210]

Here we must distinguish phonological developments from morphological modifications. Renovated PPPs and longvocalic perfects are clearly secondary analogical modifications: the former occurred as a strategy to maintain paradigmatic uniformity, the latter to maintain the naturalness of tense-stem inflection. The root vocalism is in other cases more problematic. Such cases as **spek̂-* for **spk̂-* and **(s)teg-tó-* for **(s)tg-tó-* are most likely very old: it is difficult to imagine a phonological system, where such stop (or stop + sibilant) sequences would be phonotactically permissible. It would be tempting to postulate that some PIE roots did not have vowelless zero-grade variants at all, but this does not seem to have been the case (cf. *sedēre* vs. *sīdere*, *sēdī*). Another possibility would be to consider e-grade-looking forms older (perhaps of PIE age), while *a*-vocalism is younger; but since, e.g., both *tepēre* (< **tp-* ← **tep-*) and *pandere* (< **pt-n-h₂-* ← **peth₂-*) are inherited from PIE, this seems not to be a sustainable explanation. Apart from *sedēre* and *decet*, most of these verbs are paradigmatically isolated, i.e. analogical modification based on e-grade variants elsewhere in the Proto-Italic/Latin paradigm constellation is not a very likely option. The conclusion is that more evidence (preferably from the nominal domain) needs to be collected in order to determine the exact conditions that led to *e*-vocalism in some roots and to *a*-vocalism in others.

Quantitative ablaut is also occasionally neutralised by Osthoff's Law (Ch. 3.1.4.). This concerns only such diphthongal roots that had Narten ablaut in some formations. Examples include prs.ind *vult* < **u̯ĕl-t(i)* < **u̯él-ti* (Ch. 2.3.4.3.), and a few *s*-aorists (e.g. *dīxī* < **dĕi̯k̂-s-* < **déi̯k̂-s-*, Ch. 2.2.1.4.; *dūxī* < **dŏu̯k-s-* < **dĕu̯k-s-* < **déu̯k-s-*, Ch. 2.2.1.5.). In other phonological contexts, ē-grade strong stem is regularly continued (e.g. *ēst* < **h₁éd^{s}-ti*, Ch. 2.3.4.4.; *tēxī* < **(s)tēg-s-*, Ch. 2.2.1.13.), meaning that Osthoff's Law has indeed exerted a neutralising effect on the ablaut relation **ē* : **e* in isolated cases, without affecting the system.

Few e-grade roots are transformed into o-grade-looking roots by the Proto-Italic change **eu̯* > **ou̯* (e.g. *dūcere* < **dou̯k-e/o-* < **déu̯k-e/o-*, Ch. 2.2.1.5.). This is a strictly local change, which in my estimation affects only ca. 10 verb roots that are continued in Latin.

As summarised in Ch. 5.1. above, the most radical changes in the history of the Latin verb system occurred by Proto-Italic. It follows that sound changes discussed thus far are the only ones that can have affected the transmission of inherited ablaut relations until the dissolution of Proto-Italic. To my best estimation, these few isolated sound changes cannot alone have resulted in a noticeable loss of morphophonological vowel alternations. If the inherited ablaut relations would have been transmitted according to these regular phonological developments, Proto-Italic would have (by heredity principle) had much more intraparadigmatic and transparadigmatic vowel alternations, which, in turn, would have been observable in the Italic languages (notwithstanding *einzelsprachlich* levellings that occurred or could have occurred at a later date; cf. Ch. 5.4. below).

Many characteristically Latin sound changes occurred only after the dissolution of Proto-Italic and within the attested history of Latin. The vocalism of the earliest preserved Latin documents is very close to that of Proto-Italic. In the fifth century BC, vowel weakening begins,

[210] A Narten imperfect origin for these verbs was also taken into consideration, but in almost all cases it was refuted due to the fact that, apart from *edere/ēdī* and *regere/rēgī*, there is no concrete evidence for PIE Narten presents, from which these longvocalic forms would originate.

as non-high vowels in medial and final syllables are reduced into **ə*, and by the third century BC, **ə* is strengthened into *i*, *u* or *e*, depending on the phonological environment (see Ch. 3.2.3. and Appendix II). This change indeed affects many verb formations by totally neutralising the inherited vocalism in medial syllables (be it the directly inherited ablaut vowels **e* and **o*, or **a* of whatever origin). However, most Latin verb stems either are monosyllabic (i.e. vowel weakening does not affect the root) or the second syllable contains a long vowel such as *-ā-* or *-ē-* (and vowel weakening does not affect long vowels). The only formation that is saliently affected is the reduplicated perfect (see Table 31, Ch. 2.4.): the quality of the root vowel, which in these formations is in a medial syllable, is submerged, all qualitative contrasts are neutralised, and the original vocalism is no longer deductively recoverable. For the functioning of the system, this change is less relevant, as the reduplicated stem is already explicitly marked by the reduplication syllable. In few cases (namely *totondī*, *spopondī*, *momordī*, see Ch. 2.2.4.5.), the weakened vocalism is renovated by the vocalism of the present stem.

All other Latin sound changes, such as monophthongisations (Ch. 3.2.4.), and various qualitative (Ch. 3.2.6.) and quantitative (Ch. 3.2.5.) changes do affect the vocalism of the verb system by further neutralising several phonological contrasts, on which the system of ablaut alternations depended. However, these changes occur relatively late in the history of the language (during the last three centuries BC), and are thus too recent to have exerted a systematically destructive effect on the inherited vowel alternations.

In sum, there is no doubt that regular sound change was responsible for neutralising several inherited vowel distinctions, which originally were part of the morphophonological PIE ablaut system. However, it is also beyond doubt that not every instance of ablaut-loss can be explained by regular sound change. Considering this state of affairs and the fact that PIE ablaut had a relevant morphological function, the next step is to assess the mechanisms of morphological change that influenced the development of ablaut alternations.

5.3. Morphological change

In Ch. 4. an ensemble of mechanisms related to morphological change (analogical change in particular) was presented. These mechanisms were in Ch. 4.4. arranged on a continuum of generality, which was a key component of the theoretical framework of this study. In this section, I will summarise each mechanism and assess its influence on the continuation of ablaut in the Latin verb system.

According to the **heredity principle** (Ch. 4.3.1.), regular phonological development of morphological formations is expected. This is indeed the case on many occasions in the history of the Latin verb system. Many synchronic vowel alternations, e.g. *dīcere* : *dictus*, *docet* : *decet*, *faciō* : *fēcī*, etc. (see Ch. 5.4. below), are phonologically regular outcomes of the respective PIE alternations. Neutralisations that resulted from regular sound change were summarised in Ch. 5.2. above.

Isomorphism, or the 1M1F-principle (Ch. 4.3.3.), is the single most decisive non-phonological mechanisms that neutralised many inherited ablaut contrasts. The operative sub-mechanism here was **paradigmatic levelling**. Three domains are particularly strongly affected:

– Old athematic present stems: the Latin language does not include any instance of intraparadigmatic vowel alternation in the regular conjugations. The intraparadigmatic

ablaut in those present stems that are based on PIE athematic formations (i.e. nasal presents, root presents, athematic reduplicated presents, and desideratives) was completely levelled. In the wake of thematisation of such present formations, one of the two inherited stem variants was continued as the invariant Latin present stem (see Table 27 and Ch. 2.4. for summary and conclusions). Apart from desideratives (which continue the e-grade root), root presents generally continue the e-grade strong stem variant, while overtly marked formations (all the rest) continue the zero-grade weak stem variant.[211] In none of the cases examined in this study could it be conclusively shown that the neutralisation was due to the effect of regular sound change. Interestingly, even the present forms of the high-frequency basic verb *īre* do not escape this kind of paradigmatic levelling: there is evidence that the e-grade strong stem **e̯i-* (< **h₁e̯i-*) was generalised early – without involving thematisation (e.g. 1pl. **e̯i-mos* > *īmus*; see Ch. 2.3.4.2.).

– Neo-perfects of aoristic origin: all PIE athematic aorist formations had intraparadigmatic ablaut, which all Latin neo-perfects lack. In few *s*-aorists (namely *dīxī*, Ch. 2.2.1.4., *dūxī*, Ch. 2.2.1.5., *fīnxī*, Ch. 2.3.2.1., and *sēnsī*, Ch. 2.2.2.8.) this was due to regular sound change; in all others, the neutralisation of the inherited ablaut relation took place by paradigmatic levelling. In fact, due to the partial submersion of vowel quantity caused by regular sound change, it is not entirely clear, whether the associated sound change was actually the primary neutralising factor: it is also possible that the alternation was neutralised by paradigmatic levelling already *before* the sound change took place. In order not to overemphasise morphological modifications under insufficient evidence, I prefer to explain the neutralisations by sound change, when possible.
– Neo-perfects of reduplicated perfect origin: all PIE perfect formations had intraparadigmatic ablaut, which all Latin neo-perfects lack. In all but few cases, the Latin neo-perfect continues the inherited zero-grade weak stem variant. There is no phonological reason as to why such o-grade variants as **le-lóg-* (> Lat. *×leligī*) and **te-tóh₂g-* (> Lat. *×tetōgī*) could not have been continued. In some cases (such as *tetinī*: both **te-tón-* and **te-tn̥(n)-* would produce the attested form) the alternation may have been neutralised by regular sound change, but due to submersion of the vowel quality (caused, e.g., by medial vowel weakening), this is difficult to verify. Again, I prefer to explain these neutralisations by sound change rather than by analogical modification (see Table 31).

As was pointed out above (Ch. 5.1.), the paradigm-internal relations became more intimate in the history of the Latin verbs, as the system of four present conjugations and the associated tense stems developed. As a result of this, some paradigm-internal levellings take place. For example, the vocalism of the present and participle stems of *(g)nōscere* (Ch. 2.2.3.2.) originates from the neo-perfect (← root aorist). The vowel quality of the perfect stem *scābī* is possibly a renovation of the inherited **skēb-*, based on the present stem *scab-* (Ch. 2.2.1.11.). This kind of levelling is another manifestation of the 1M1F-principle.

Morphological naturalness (Ch. 4.3.5.), in those instances where it is not directly related to the 1M1F-principle, provides an adequate explanation for the discontinuity of the phonologically regular transmission. For example, the vocalism of the OLat. prs.sbj. paradigm

[211] See also the discussion in Ch. 2.3.2.4. as to why the disyllabic nasal present strong stem was shunned.

of *esse* (i.e. *siem, siēs, siet, sīmus, sītis, sient*) was levelled – quite unexpectedly – into *-ī-* (*sim, sīs, sit, sint*), not into *-iē-* (×*siēmus*, ×*siētis*), which would make more sense under considerations of markedness and frequency (see Ch. 2.3.4.1.). The *-ī-* marker, which occurred as prs.sbj. marker in a small class of verbs (e.g. *velim* of *velle*, *edim* of *ēsse/edere*) was less marked than the obtrusive *-iē-* (which occurred as a future marker in fourth conjugation and the third conjugation *-iō* verbs, e.g. fut.2sg. *faciēs*). Thus, in terms of morphological naturalness, *sīs* was more natural than *siēs* (the latter of which continued its existence as a stylistically marked form). Borderline cases between morphological naturalness and simple paradigmatic levelling are the e-grade-looking PPPs, such as *vectus* (not ×*uctus*) and *rēctus* (not ×*orctus*) (see Table 32 and the discussion in Ch. 2.4.).

Expectedly, **grammaticalisation** and **lexicalisation** (Ch. 4.3.6.) had a highly specific, and thus a more marginal effect on the overall continuation of ablaut alternations in the Latin verb system. These reductive changes manifested themselves, e.g., in the reduction of the PIE phrase **k̂e≂déh₃/k̂e≂dh₃té* into the Lat. particle *cedo/cette* 'give here' (Ch. 2.3.4.5.), and in the incorporation of the present stem marker *-sc-* (< **-sk̂-e/o-*) into the neo-perfect stem *poposcī* (of *poscere*, Ch. 2.2.3.3.). The development of the symmetrical and uniform tense-stem system also show the occurrence of many grammaticalisation parameters such as increasing paradigmaticisation and bondedness. Concerning ablaut proper, grammaticalisation and lexicalisation are less relevant.

The effects of **frequency** of occurrence were noticeable especially in the development of the irregular verbs *esse, īre, velle, ēsse/edere* and *dare* (Ch. 2.3.4.), which are the only Latin verbs that have preserved relics of the PIE athematic conjugation. As these verbs are all high-frequency basic verbs, they are expected to retain regular phonological development (as per heredity principle) rather than to be subjected to analogical modifications. Nonetheless, even the athematic ablaut of the present forms of *īre* was levelled (as per 1M1F) rather early, meaning that the regularising effect must have been particularly strong in the (pre)history of the Latin verb system.

Finally, a few theoretical observations on **thematisation** are in order. As was pointed out in Ch. 2.4., the hypothesis that the thematised inflection of an old athematic verb originates from the prs.sbj. paradigm of that verb is, in most cases, not a plausible presumption. How, then, can thematisation be explained in light of the theory of morphological change? To begin with, this depends on the *antiquity* of the thematisation process. If the thematisation took place in PIE or in the immediate post-PIE period, when the root-based accent/ablaut-type of inflection was still operational, the process was most likely carried out according to the productive morphological rules, i.e. by standard proportional analogy (see the discussion in Ch. 4.3.2.1.). This kind of thematisation probably concerned the inherited PIE root presents (see Table 27). If the thematisation took place later (perhaps in Proto-Italic, or as late as in the *einzelsprachlich* history of Latin), recourse to PIE productive morphological rules was no longer available. Furthermore, starting from an early period, the productive verbal formations were formed with the suffix **-ā-* or **-ē-* (marginally also **-i̯e/o-*), which ended up as first, second and fourth conjugation verbs, respectively. However, the thematisation of most inherited athematic verbs does not result in these kind of formations (i.e. not, e.g., ×*iungāre* or ×*iungēre*), but rather in the simple thematic-looking type (i.e. regular third conjugation *iungere*). This means that a reanalysis (see Ch. 4.3.2.3.) followed by nonproportional analogy (see Ch. 4.3.2.2.) must have

been involved. This kind of process was probably responsible for the thematisation of most affixed athematic formations such as nasal presents and reduplicated presents. Due to reasons of space, this topic cannot be further elaborated in this study.

5.4. Ablaut

As discussed in Chs. 1.4. and 4.1.2., PIE ablaut was a subtype of morphophonologically conditioned vowel alternation, sometimes involved in multiple-exponent marking of grammatical functions. In this section, I will summarise the development of ablaut from PIE to Latin by tracing the history of the alternations according to the results of this study.

Concerning intraparadigmatic ablaut, almost all instances of paradigm-internal alternations are neutralised (either by sound change or by analogy, see above) by Proto-Italic, at the latest. The original PIE strong stem vs. weak stem alternation, with associated ablaut, is no longer relevant in Proto-Italic and Latin, as only one of the two stems is continued as an invariable stem. Traces of intraparadigmatic ablaut, which can be reconstructed for Proto-Italic with reasonable reliability, remain in the following cases:

- PIt. prs.3sg. **es-t* : 3pl. **s-ent* < PIE **h₁és-ti* : **h₁s-énti* (Ch. 2.3.4.1.).
- PIt. prs.sbj.2sg. **s-i̯ē-s* : 2pl. **s-ī-te(s)* < PIE **h₁s-i̯éh₁-s* : **h₁s-ih₁-té(s)* (Ch. 2.3.4.1.).
- PIt. prs.3sg. **ēdˢ-t* : 3pl. **ĕd-n̥t/ont* < PIE **h₁ḗdˢ-ti* : **h₁ĕd-n̥t* (Ch. 2.3.4.4.).
- PIt. 2sg. **ke≀dō* : 2pl. **ke≀date* < PIE **k̂e≀déh₃* : **k̂e≀dh₃-té* (Ch. 2.3.4.5.).
- PIt. aor.3sg. **fēk-ed* : 3pl. **fak-ond* ← PIE **dʰéh₁(k)-t* : **dʰh₁(k)-ént* (Ch. 2.2.7.).

Between tense-stems belonging to the same verb, the inherited alternations (notwithstanding the elimination of intraparadigmatic ablaut) generally remain. Some examples include the following:

- PIt. prs. **fak̯i-e/o-* : aor.sg. **fēk-e/o-* : aor.pl. **fak-e/o-* : pf. **fe-fak-* : PPP **fak-to-* (Ch. 2.2.7.).
- PIt. prs. **ag-e/o-* : aor. **ēg-e/o-* : PPP **ag-to-* (Ch. 2.2.1.1.).
- PIt. prs. **de̯ik-e/o-* : aor. **de̯ik-s-* : pf. **de-dik-* : PPP **dik-to-* (Ch. 2.2.1.4.).
- PIt. prs. **teg-e/o-* : aor. **tēg-s-* : PPP **teg-to-* (Ch. 2.2.1.13.).
- PIt. prs. **sn̥ti̯-e/o-* : aor. **sĕ̄nt-s-* : PPP **sn̥tˢ-to-* (Ch. 2.2.2.8.).
- PIt. prs. **u̯ink-e/o-* : aor. **u̯e̯ik-e/o-* : PPP **u̯ik-to-* (Ch. 2.3.2.10.).

In few cases, ablaut-looking alternations are created by regular sound change. In Proto-Italic, these surface manifestations were probably synchronically indistinguishable from the genuine, inherited ablaut:

- PIt. prs. **gign-e/o-* : aor. **gen-e/o-*. The present stem vowel is from the reduplication syllable, while the aorist reflects the original e-grade root (Ch. 2.2.6.2.).
- PIt. prs. **sizd-e/o-* : pf. **sezd-*. The present stem vowel is from the *i*-reduplication of the PIE reduplicated present, while the perfect stem reflects the *e*-reduplication of the PIE reduplicated perfect (Ch. 2.2.6.3.). To this can be added the PIt. essive **sed-ē-*, the root vocalism of which is a secondary e-grade of the PIE root **sed-* (Ch. 2.2.5.5.).
- PIt. prs. **skăb-e/o-* : aor./pf. **skāb-*. This alternation was probably not part of the original PIE ablaut pattern (but Proto-Italic may still have had **skēb-*; Ch. 2.2.1.11.).

Inherited transparadigmatic ablaut is seldom levelled. This is most likely due to the fact that the PIE root-inflected type evolved into a stem-inflected type, and the inherited alternations were reanalysed to be part of the root/stem in the respective formations. Examples:

- PIt. essive **dek-ē-* : causative **dok-ē-* (Chs. 2.2.4.1., 2.2.5.2.).
- PIt. desiderative **u̯eiḯds-e/o-* : essive **u̯id-ē-* (Chs. 2.3.3.2., 2.2.5.10.).
- PIt. main verb **doṷk-e/o-* : derivative **dŭk-ā-* (cf. Ch. 2.2.1.5.).

The Proto-Italic alternations are generally directly continued in Latin. More recent sound changes alter the surface vocalism and neutralise few inherited alternations. Remains of athematic ablaut include the following:

- 3sg. *est* : 3pl. *sunt*. But the original strong stem vs. weak stem pattern is no longer apparent, cf. 1sg. *sum* vs. 2pl. *estis*.
- OLat. 2sg. *siēs* : 2pl. *sīmus*. This alternation is neutralised already in Old Latin (→ 2sg. *sīs*).
- 3sg. *ēst* : 3pl. *ĕdunt*. In Imperial Latin, regular third conjugation forms appear, thus neutralising this alternation (→ 3sg. *ĕdit*).
- 2sg. *cĕdŏ* : 2pl. *cette*. This relic is no longer a part of the verb system.

Increasing paradigmatic uniformity also causes intraparadigmatic levellings, most notably across the tense-stems. Apart from that, alternations between tense-stems as well as most transparadigmatic alternations (or, what is left of them after the drastic changes in the verb system) are generally retained, for example:

- Prs. *faciō* : pf. *fēcī* : PPP *factus*.
- Prs. *agō* : pf. *ēgī* (: PPP *āctus*; see below).
- Prs. *dīcō* : pf. *dīxī* : PPP *dĭctus* : derivative *dĭcāre*.
- Prs. *tegō* : pf. *tēxī* (: PPP *tēctus*; see below) : noun *toga*.
- Prs. *sentiō* : pf. *sēnsī* (: PPP *sēnsus*; see below).
- Prs. *vĭncō* : pf. *vīcī* : PPP *vĭctus*.
- Essive *decet* : causative *docet*.
- Desiderative *vīsere* : essive *vĭdēre*.
- Basic verb *dūcere* : derivative *dŭcāre*.

Regular sound change produces occasional ablaut-looking alternations, which are not related to the inherited ablaut, for example:

- PPPs affected by Lachmann's rule, e.g. *āctus*, *tēctus*.
- Forms affected by NS-lengthening, e.g. *sēnsus*.
- Forms affected by vowel weakening, e.g. prs. *tangō* : pf. *tetigī* (< **tetəgəi̯* < **te-tag-ai̯*), basic verb *faciō*, *factus* : compound *perficiō*, *perfectus*.

In sum, the development of ablaut in the Latin verb system is characterised by successive neutralisations of both phonological and morphological nature. Often the latter takes precedence in that the effects of regular sound change are levelled by analogy. This and various mechanisms of morphological change play a crucial role in the reduction of the inherited alternations. The associated change took place within a significantly broad time span, from the dissolution of the late-PIE linguistic unity until the beginning of Classical Latin.

5.5. Metatheoretical observations

At the beginning of this study, it was stated that the metascientific level concerning the aspects of linguistic normativity is part of the framework of this study (see Ch. 1.1., Appendix III). In the course of the analysis, only a few explicit references to the actual components of normativity, i.e. correctness and rationality, were made. The logical question follows: for what reason, then, was normativity mentioned in the first place? In this section I will summarise the general points that connect this study to the metascientific discussion. It turns out that the paucity of explicit references does not correlate with the importance and under-the-hood workings of the chosen metaframework.

The benefits of normativity and the related discussion are twofold: theoretical and material. On the theoretical side, the application of linguistic methodology, terminology, and the various theoretical presumptions can be closely and critically observed. This concerns not only the analysis of the present study but also the evaluation of previous scholarly literature. On the material side, the actual low-level analysis of the data can be conducted with more precision and, most importantly, the observation of the key components of normativity provide a more immediate access to the linguistic reality that the documents represent. This, in turn, allows for a more realistic and accurate analysis. Such was the case in the analysis of several Latin inscriptions (see, e.g., Ch. 3.2.).

It should also be noted that many components of linguistic normativity have existed as integrated parts of the historical linguistic scholarship during the previous centuries. Exposing these underlying principles and linking them to the current metascientific discussion proves their modernity and longevity: there is nothing "old-fashioned" in doing typological-functional linguistics (or historical linguistics for that matter).

Concerning PIE ablaut, there can be no doubt that the phenomenon itself was part of the linguistic reality of the parent language, and that large parts of our modern analysis correspond to the linguistic intuition of the members of PIE community. To what extent ablaut was accessible to the intuition of the speakers, needs further inquiry. However, judging from the pervasiveness and operationality of PIE ablaut, it is reasonable to presume that we are not just dealing with a collection of separate rules (e.g. "**h₁és-ti* is a correct expression"), but significant generalisations (e.g. that the accented syllable generally has e-grade) were rather part of the linguistic intuition. Comparing this with the Latin state of affairs, little of such intuition remains. It is quite evident that the Latin vowel alternations, which demonstrably originate from PIE ablaut (as discussed in Ch. 5.4. above), are manifested in the intuition as individual rules, which are no longer interconnected in the same way that the original PIE rules were. If the scholar is unable to formulate reliable and uncontroversial generalisations of Latin vowel alternations, it is most likely the case that a system of alternations was not intuitively known by Latin speakers, and that there is no basis in the linguistic reality for the scholar to postulate such a system.

This leads directly to the question, why and how was the intuition lost, or, normatively speaking, what was the *rationality* of this change. As pointed out in the previous section, the change took place during a significant time period and there was no single, decisive cause for it. Regular sound change and a collection of mechanisms of morphological change was discovered to be the cause for the reduction of the alternations. How does this relate to the

rationality of language change at the metascientific level? First, regular sound change has a rationality of its own (the topic has been extensively discussed and need not concern us here), and such change often takes place unconsciously and unnoticed by the linguistic community. Such generalisations as "making pronunciation easier" or "following the socially accepted and widespread pronunciation", which belong to the standard toolbox of the historical phonologist, can be understood as *rationality principles*, which guide phonological change. Thus, referring to such principles in the historical analysis – when appropriate – constitutes a *rational explanation* for the observed changes. Second, certain mechanisms of morphological change, such as "striving after isomorphic coding of forms and meanings" and most principles associated with markedness and morphological naturalness can also be understood as rationality principles and, hence, they constitute elements of the rational explanation for the observed phenomenon.

The inclusion of normativity has, thus, brought a number of important theoretical and practical benefits for this study, even though such benefits may escape the eye at first sight and some of them are, to the proficient linguist, largely self-evident. But most crucially, the metascientific discussion has shown that at least those explanatory principles that were employed in this study rest on a solid scientific foundation (as understood within the context of human sciencies such as linguistics), thus evading the danger of slipping into mere conventional wisdom, against which Hale (2007: 4) warns us.

Bibliography

Abbreviated works:

CIL = *Corpus Inscriptionum Latinarum*. Berlin, 1893-. cil.bbaw.de [15.01.2018].

DTB = Adams, Douglas Q. 2013. *A Dictionary of Tocharian B. Revised and Greatly Enlarged* (2 Volumes). Amsterdam/New York: Rodopi.

EDG = Beekes, R. S. P. 2010. *Etymological Dictionary of Greek.* Leiden/Boston: Brill.

EDHIL = Kloekhorst, Alwin. 2008. *Etymological Dictionary of the Hittite Inherited Lexicon*. Leiden/Boston: Brill.

EDLIL = de Vaan, Michiel. 2008. *Etymological Dictionary of Latin and the Other Italic Languages*. Leiden/Boston: Brill.

EDPG = Kroonen, Guus. 2013. *Etymological Dictionary of Proto-Germanic*. Leiden/Boston: Brill.

EM = Ernout, Alfred and Antoine Meillet. 1959. *Dictionnaire étymologique de la langue latine: Histoire des mots*. 4th ed. Paris: Klincksieck.

EWAia = Mayrhofer, Manfred. 1992–2001. *Etymologisches Wörterbuch des Altindoarischen*. Heidelberg: Winter.

GG = Giacomelli, Gabriella. 1963. *La lingua falisca*. Firenze.

GL = Keil, Henricus (ed.). 1855–1880. *Grammatici Latini* (7 Volumes). Leipzig.

IG = Inscriptiones Graecae. ig.bbaw.de [15.01.2018].

IEW = Pokorny, Julius. 1959–1969. *Indogermanisches etymologisches Wörterbuch*. Bern: Francke.

ILLRP = Degrassi, Attilio. 1957–1963. *Inscriptiones Latinae liberae rei publicae*. Florence: La Nuova Italia.

ImIt = Crawford, M. H. (ed.). 2011. *Imagines Italicae. A Corpus of Italic Inscriptions* (3 Volumes). London: Institute of Classical Studies.

LIPP = Dunkel, George E. 2014. *Lexikon der indogermanischen Partikeln und Pronominalstämme* (2 Volumes). Heidelberg: Winter.

*LIV*² = Rix, Helmut et al. 2001. *Lexikon der indogermanischen Verben*. 2nd ed. Wiesbaden: Reichert.

*LIV*²⁺ = Kümmel, Martin J. 2017. *Addenda und Korrigenda zu LIV*². oriindufa.uni-jena.de/iskvomedia/indogermanistik/Kümmel_liv2_add.pdf [15.01.2018].

LS = Lewis, Charlton T. and Charles Short. 1879. *A Latin Dictionary*. Oxford: Clarendon Press.

LSJ = Liddell, Henry G., Robert Scott and Henry S. Jones. 1940. *A Greek-English Lexicon*, revised and augmented by Sir Henry Stuart Jones with the assistance of Roderick McKenzie. Oxford: Oxford University Press.

NIL = Wodtko, Dagmar S., Britta Irslinger and Carolin Schneider. 2008. *Nomina im indogermanischen Lexikon*. Heidelberg: Winter.

OED = Oxford English Dictionary. oed.com [15.01.2018].

OLD = Glare, Peter G. W. (ed.). 1982. *Oxford Latin Dictionary*. Oxford: Oxford University Press.

ST = Rix, Helmut. 2002. *Sabellische Texte: Die Texte des Oskischen, Umbrischen und Südpikenischen*. Heidelberg: Winter.

ThLL = Thesaurus Linguae Latinae. thesaurus.badw.de [15.01.2018].

WH = Walde, Alois and J. B. Hofmann. 1938-1956. *Lateinisches etymologisches Wörterbuch*. Heidelberg: Winter.

WOU = Untermann, Jürgen. 2000. *Wörterbuch des Oskisch-Umbrischen*. Heidelberg: Winter.

Other literature:

Adams, James Noel. 2007. *The Regional Diversification of Latin, 200 BC - AD 600*. Cambridge: Cambridge University Press.

Adams, James Noel. 2013. *Social Variation and the Latin Language*. Cambridge: Cambridge University Press.

Alho, Tommi, and Ville Leppänen. 2016. Roman brick stamps: evidence for the development of Latin case syntax. *Glotta* 92, 3–15.

Alho, Tommi, and Ville Leppänen. 2017. On Roman brick stamps and the Latin *-(a)es* genitive. *Pallas* 103, 87–93.

Allen, W. Sidney. 1978. *Vox Latina: A Guide to the Pronunciation of Classical Latin*. 2nd ed. Cambridge: Cambridge University Press.

Anderson, Stephen R. 1988. Morphological change. In: *Linguistics: The Cambridge Survey. Volume I. Linguistic Theory: Foundations*, ed. by Frederick Newmeyer, 324–362. Cambridge: Cambridge University Press.

Antkowski, Ferdynand. 1956. *La chronologie de la monophtongaison des diphtongues dans les langues indo-européennes*. Poznan: Panstwowe Wydawnictwo Naukowe.

Anttila, Raimo. 1970. Review on Kuryłowicz 1968. *Kratylos* 15, 37–40.

Anttila, Raimo. 1975. Linguistics and philology. In: *Linguistics and neighboring disciplines*, ed. by Renate Bartsch and Theo Vennemann, 145–155. Amsterdam: North Holland.

Anttila, Raimo. 1977. *Analogy*. The Hague/Paris: Mouton.

Anttila, Raimo. 1989. *Historical and Comparative Linguistics*. 2nd ed. Amsterdam: Benjamins.

Anttila, Raimo. 2000. *Greek and Indo-European Etymology in Action: Proto-Indo-European *ag-*. Amsterdam: Benjamins.

Anttila, Raimo. 2003. Analogy: The Warp and Woof of Cognition. In: *The Handbook of Historical Linguistics*, ed. by Brian D. Joseph and Richard D. Janda, 425–440. Malden, MA: Blackwell.

Arens, Hans. 1969. *Sprachwissenschaft: der Gang ihrer Entwicklung von der Antike bis zur Gegenwart*. Freiburg: Alber.

Badawi, Elsaid, Michael G. Carter, Adrian Gully, and Maher Awad. 2016. *Modern Written Arabic. A Comprehensive Grammar*. Revised ed. London/New York: Routledge.

Baerman, Matthew, and Greville G. Corbett. 2012. Stem alternations and multiple exponence. *Word Structure* 5/1, 52–68.

Bakkum, Gabriël C. L. M. 2009. *The Latin Dialect of Ager Faliscus: 150 Years of Scholarship*. Amsterdam: Amsterdam University Press.

Baldi, Philip. 1976. The Latin Imperfect in **bā-*. *Language* 52/4, 839–850.

Baldi, Philip. 1991. Lachmann's Law in the light of the glottalic theory of PIE consonantism. In: *New studies in Latin linguistics*, ed. by Robert Coleman, 3–21. Amsterdam: Benjamins.

Baldi, Philip. 2002. *The Foundations of Latin*. Berlin/New York: Mouton de Gruyter.

Bammesberger, Alfred. 1984a. *Lateinische Sprachwissenschaft*. Regensburg: Pustet.

Bammesberger, Alfred. 1984b. *Studien zur Laryngaltheorie*. Göttingen: Vandenhoeck and Ruprecht.

Bartholomae, Christian. 1885. Die altindischen *ē*-formen im schwachen perfekt. *Zeitschrift für vergleichende Sprachforschung* 27, 337–365.

Bartsch, Renate. 1987. *Norms of Language*. Harlow: Longman.

Beekes, R. S. P. 1969. *The Development of the Proto-Indo-European Laryngeals in Greek*. The Hague: Mouton.

Beekes, R. S. P. 1988. PIE. RHC- in Greek and other languages. *Indogermanische Forschungen* 93, 22–45.

Beekes, R. S. P. 2011. *Comparative Indo-European linguistics: an introduction*. 2nd ed. Amsterdam/Philadelphia: Benjamins.
Berenguer Sánchez, José A., and Eugenio R. Luján Martínez. 2005. Falisco *faced* y el perfecto de **dheH1-k-* 'hacer' en las lenguas itálicas. *Emerita* 72/2, 197–216.
Bickel, Balthasar, and Johanna Nichols. 2007. Inflectional morphology. In: *Language Typology and Syntactic Description. Volume III: Grammatical Categories and the Lexicon*, ed. by Timothy Shopen, 169–240. Cambridge: Cambridge University Press.
Bloomfield, Leonard. 1926. A Set of Postulates for the Science of Language. *Language* 2/3, 153–164.
Bloomfield, Leonard. 1933. *Language*. New York: Henry Holt.
Bock, Bettina. 2008. *Die einfach thematischen Präsentien in der dritten Konjugation des Lateinischen, Grazer Vergleichende Arbeiten*. Graz: Leykam.
Bonfante, Giuliano. 1932. Lat. *sum, es, est,* etc. *Bulletin de la Société de Linguistique de Paris* 99, 111–129.
Bopp, Franz. 1816. *Über das Conjugationssystem der Sanskritsprache in Vergleichung mit jenem der griechischen, lateinischen, persischen und germanischen Sprache*. Frankfurt am Main: Andreäische Buchhandlung.
Brennan, Geoffrey, Lina Eriksson, Robert E. Goodin, and Nicholas Southwood, eds. 2013. *Explaining Norms*. Oxford: Oxford University Press.
Brinton, Laurel J., and Elizabeth Closs Traugott. 2005. *Lexicalization and language change*. Cambridge: Cambridge University Press.
Brugmann, Karl. 1886. *Grundriss der vergleichenden Grammatik der indogermanischen Sprachen. Erster Band: Einleitung und Lautlehre*. 1st ed. Strassburg: Karl J. Trübner.
Brugmann, Karl. 1892. *Grundriss der vergleichenden Grammatik der indogermanischen Sprachen. Zweiter Band: Wortbildungslehre (Stammbildungs- und Flexionslehre)*. Straßburg: Karl. J Trübner.
Brugmann, Karl. 1897. *Vergleichende Laut-, Stammbildungs- und Flexionslehre der indogermanischen Sprachen. Erster Band: Einleitung und Lautlehre*. 2nd ed. Berlin/Leipzig: Walter de Gruyter.
Brugmann, Karl. 1906–1916. *Vergleichende Laut-, Stammbildungs- und Flexionslehre der indogermanischen Sprachen. Zweiter Band: Lehre von den Wortformen und ihrem Gebrauch (3 Teile).* 2nd ed. Berlin/Leipzig: Walter de Gruyter.
Brugmann, Karl. 1912. Zu den reduplizierten Verbalbildungen des Indoiranischen. *Indogermanische Forschungen* 31, 89–104.
Buck, Carl Darling. 1896. Some General Problems of Ablaut. *American Journal of Philology* 17/3, 267–288.
Buck, Carl Darling. 1933. *Comparative Grammar of Greek and Latin*. Chicago/London: University of Chicago Press.
Bybee, Joan. 2001. *Frequency and the emergence of linguistic structure*. Amsterdam: Benjamins.
Bybee, Joan. 2003. Mechanisms of Change in Grammaticization: The Role of Frequency. In *The Handbook of Historical Linguistics*, edited by Brian D. Joseph and Richard D. Janda, 602-623. Malden, MA: Blackwell.
Bybee, Joan, ed. 2007. *Frequency of use and the organization of language*. Oxford: Oxford University Press.
Bybee, Joan. 2010. *Language, Usage and Cognition*. Cambridge: Cambridge University Press.
Byrd, Andrew Miles. 2013. A Crazy Rule in PIE? A Closer Look at the Saussure Effect. Paper presented at the University of Kentucky, January 19th, 2013.
Byrd, Andrew Miles. 2015. *The Indo-European syllable*. Leiden: Brill.

Caballero, Gabriela, and Alice C. Harris. 2012. A working typology of multiple exponence. In: *Current Issues in Morphological Theory. (Ir)regularity, analogy and frequency*, ed. by Ferenc Kiefer, Mária Ladányi and Péter Siptár, 163–188. Amsterdam: Benjamins.
Campbell, Lyle. 2013. *Historical Linguistics: An Introduction*. 3rd ed. Cambridge, MA: The MIT Press.
Christol, Alain. 1996. Le rhotacisme. *Latomus* 55, 806–814.
Christol, Alain. 2005. Subjonctif Latin (*-sē-*) et future Indien (*-syā-*)." In *Proceedings of the Twelfth International Colloquium on Latin Linguistics (Bologna, 9-14 June 2003)*, ed. by Gualtiero Calboli, 25–36. Roma: Herder Editrice.
Clackson, James. 2007. *Indo-European Linguistics: An Introduction*. Cambridge: Cambridge University Press.
Clackson, James, and Geoffrey Horrocks. 2007. *The Blackwell History of the Latin Language*. Malden, MA: Blackwell.
Collinge, N. E. 1985. *The Laws of Indo-European*. Amsterdam: Benjamins.
Coseriu, Eugenio. 1974. *Synchronie, Diachronie und Geschichte: das Problem des Sprachwandels*. München: Fink.
Coseriu, Eugenio. 1975. *Sprachtheorie und allgemeine Sprachwissenschaft: 5 Studien*. München: Wilhelm Fink.
Cowgill, Warren. 1978. The source of Latin *vīs* 'thou wilt'. *Die Sprache* 24, 29–44.
Cristofani, Mauro. 1996. *Due testi dell'Italia preromana, Quaderni di Archeologia etrusco-italica*. Roma.
De Angelis, Alessandro, and Annamaria Chilà. 2015. A new interpretation of Lachmann's Law. *Folia Linguistica Historica* 36, 89–111.
De Decker, Filip. 2012. Are Latin *pons, pontifex* and the Indo-European cognates evidence of an *i* stem? *Journal of Indo-European Studies* 40, 11–45.
de Vaan, Michiel. 2012. Latin *danunt*. In: *Multi Nominis Grammaticus. Studies in Classical and Indo-European Linguistics in honor of Alan J. Nussbaum on the occasion of his sixty-fifth birthday*, ed. by Adam I. Cooper, Jeremy Rau and Michael Weiss, 21–25. Ann Arbor: Beech Stave Press.
Demiraj, Bardhyl. 1997. *Albanische Etymologien (Untersuchungen zum albanischen Erbwortschatz)*. Amsterdam/Atlanta: Rodopi.
Dressler, Wolfgang U., Willi Mayerthaler, Oswald Panagl, and W. Ulrich Wurzel, eds. 1987. *Leitmotifs in Natural Morphology*. Amsterdam: Benjamins.
Drinka, Bridget. 1991. Lachmann's law: A phonological solution. *Indogermanische Forschungen* 96, 52–74.
Dunkel, George E. 1998. On the "Thematisation" of Latin *sum*, *volō*, *eō*, and *edō* and the System of Endings in the IE Subjunctive Active. In: *Mír Curad: Studies in Honor of Calvert Watkins*, ed. by Jay Jasanoff, H. Craig Melchert and Lisi Oliver, 83–100. Innsbruck: Institut für Sprachwissenschaft.
Dunkel, George E. 2000. Latin verbs in *-igāre* and *-īgāre*. In *125 Jahre Indogermanistik in Graz. Festband anläßlich des 125jährigen Bestehens der Forschungsrichtung "Indogermanistik" an der Karl-Franzens-Universität Graz*, ed. by Michaela Ofitsch and Christian Zinko, 87–99. Graz: Leykam.
Eichner, Heiner. 1973. Die Etymologie von heth. *meḫur*. *Münchener Studien zur Sprachwissenschaft* 31, 53–107.
Erhart, Adolf. 1970. *Studien zur indoeuropäischen Morphologie*. Brno: Opera Universitatis Purkynianae Brunensis Facultas Philosophica.
Ernout, Alfred. 1953. *Morphologie historique du latin*. 3rd ed. Paris: Klincksieck.
Fertig, David. 2013. *Analogy and Morphological Change*. Edinburgh: Edinburgh University Press.

Fortson, Benjamin W., IV. 2010. *Indo-European Language and Culture: An Introduction*. 2nd ed. Chichester: Wiley-Blackwell.
Fox, Anthony. 1995. *Linguistic Reconstruction: an Introduction to Theory and Method*. Oxford: Oxford University Press.
Fritz, Matthias A. 1996. Das urindogermanische Wort für 'Nase' und das grundsprachliche Lautgesetz RHV > RV. *Historische Sprachforschung* 109/1, 1–20.
Garnier, Romain. 2010. *Sur le vocalisme du verb latin: étude synchronique et diachronique*, *Innsbrucker Beiträge zur Sprachwissenschaft*. Innsbruck: Institut für Sprachwissenschaft.
Garrett, Andrew. 2005. Latin weak verb root vowel paradigm leveling. Paper presented at the 24th East Coast Indo-European Conference, June 4, 2005. University of California, Berkeley.
Givón, Talmy. 1991. Markedness in grammar: distributional, communicative and cognitive correlates of syntactic structure. *Studies in Language* 15/2, 335–370.
Götze, Albrecht. 1923. Relative Chronologie von Lauterscheinungen im Italischen. *Indogermanische Forschungen* 41, 78–149.
Grice, H. Paul. 1975. Logic and Conversation. In *Syntax and Semantics, Vol. 3: Speech Acts*, ed. by Peter Cole and Jerry L. Morgan, 41–58. New York: Academic Press.
Hackstein, Olav. 1991-1993. On the Prehistory of Dual Inflection in the Tocharian Verb. *Die Sprache* 35/1, 47–70.
Hackstein, Olav. 1992. Eine weitere grieschisch-tocharische Gleichung: Griechisch πτῆξαι und tocharisch B *pyāktsi*. *Glotta* 70, 136–165.
Hackstein, Olav. 1995. *Untersuchungen zu den sigmatischen Präsensstammbildungen des Tocharischen*. Göttingen: Vandenhoeck & Ruprecht.
Hackstein, Olav. 2001. Studien zur Grammatikalisierung in älteren indogermanischen Sprachen. *Historische Sprachforschung* 114, 15–42.
Hackstein, Olav. 2002a. Uridg. *CH.CC > *C.CC. *Historische Sprachforschung* 115, 1–22.
Hackstein, Olav. 2002b. *Die Sprachform der homerischen Epen. Faktoren morphologischer Variabilität in literarischen Frühformen: Tradition, Sprachwandel, Sprachliche Anachronismen*. Wiesbaden: Reichert.
Hackstein, Olav. 2011. Proklise und Subordination im Indogermanischen. In: *Indogermanistik und Linguistik im Dialog. Akten der III. Fachtagung der indogermanischen Gesellschaft in Salzburg*, ed. by Thomas Krisch and Thomas Lindner, 192–202. Wiesbaden: Reichert.
Hackstein, Olav. 2012a. Review of Weiss 2011. *Kratylos* 57, 109–115.
Hackstein, Olav. 2012b. Der negative Existentialsatz im Indogermanischen. *Historische Sprachforschung* 125, 123–142.
Hale, Mark. 2007. *Historical linguistics: theory and method*. Malden, MA: Blackwell.
Harðarson, Jón Axel. 1993. *Studien zum Urindogermanischen Wurzelaorist, Innsbrucker Beiträge zur Sprachwissenschaft*. Innsbruck: Institut für Sprachwissenschaft.
Harðarson, Jón Axel. 1998. Mit dem Suffix *-*eh*$_1$- bzw. *-*(e)h*$_1$-*ie/o*- gebildete Verbalstämme im Indogermanischen. In: *Sprache und Kultur der Indogermanen. Akten der X. Fachtagung der Indogermanischen Gesellschaft, Innsbruck, 22.–28. September 1996*, ed. by Wolfgang Meid, 323–339. Innsbruck: Institut für Sprachwissenschaft.
Harðarson, Jón Axel. 2011. The 2nd Line of the Duenos Inscription. *Alessandria* 5, 153–163.
Harris, Alice C. 2017. *Multiple Exponence*. Oxford: Oxford University Press.
Hartmann, Markus. 2005. *Die frühlateinischen Inschriften und ihre Datierung*. Bremen: Hempen Verlag.
Haspelmath, Martin. 2006. Against markedness (and what to replace it with). *Journal of Linguistics* 42/1, 25–70.

Havet, Louis. 1891. L 'S latin caduc. In: *Etudes romanes, dédiées à Gaston Paris, le 29 décembre 1880 (25e anniversaire de son doctorat dès lettres)*, 303–329. Paris: E. Bouillon.
Heine, Bernd, Ulrike Claudi, and Friederike Hünnemeyer. 1991. *Grammaticalization: A Conceptual Framework*. Chicago: University of Chicago Press.
Heine, Bernd, and Tania Kuteva. 2002. *World Lexicon of Grammaticalization*. Cambridge: Cambridge University Press.
Heine, Bernd, and Heiko Narrog. 2010. Grammaticalization and linguistic analysis. In: *The Oxford Handbook of Linguistic Analysis*, ed. by Bernd Heine and Heiko Narrog, 401–423. Oxford: Oxford University Press.
Hill, Eugen. 2007. Proportionale Analogie, paradigmatischer Ausgleich und Formenerweiterung: Ein Beitrag zur Typologie des morphologischen Wandels. *Diachronica* 24/1, 81–118.
Hirt, Hermann. 1900. *Der indogermanische Ablaut, vornehmlich in seinem Verhältnis zur Betonung*. Strassburg: Karl J. Trübner.
Hirt, Hermann. 1921. *Indogermanische Grammatik, Teil II: Der indogermanische Vokalismus*. Heidelberg: Carl Winter.
Hock, Hans Henrich. 2003. Analogical Change. In: *The Handbook of Historical Linguistics*, ed. by Brian D. Joseph and Richard D. Janda, 441–460. Malden, MA: Blackwell.
Hock, Hans Henrich, and Brian D. Joseph. 2009. *Language History, Language Change, and Language Relationship: An Introduction to Historical and Comparative Linguistics*. Berlin/New York: Mouton de Gruyter.
Hodgman, Arthur Winfred. 1907. Verb Forms in Plautus (Continued). *Classical Quarterly* 1/3, 97–134.
Hoffner, Harry A., and H. Craig Melchert. 2008. *A Grammar of the Hittite Language. Part 1: Reference Grammar*. Winona Lake, IN: Eisenbrauns.
Höfler, Stefan. 2017. Observations on the *palma* rule. *Pallas* 103, 15–23.
Hofstadter, Douglas, and Emmanuel Sander. 2013. *Surfaces and Essences: Analogy as the Fuel and Fire of Thinking*. New York: Basic Books.
Hogg, Richard M. 2011. *A Grammar of Old English. Volume 1: Phonology*. Chichester: Wiley-Blackwell.
Hopper, Paul, and Elizabeth Closs Traugott. 2003. *Grammaticalization*. 2nd ed. Cambridge: Cambridge University Press.
Itkonen, Esa. 1978. *Grammatical Theory and Metascience: A Critical Investigation into the Methodological and Philosophical Foundations of 'Autonomous' Linguistics*. Amsterdam: Benjamins.
Itkonen, Esa. 1983. *Causality in Linguistic Theory: A Critical Investigation into the Philosophical and Methodological Foundations of 'Non-autonomous' Linguistics*. London/Canberra: Croom Helm.
Itkonen, Esa. 1984. On the 'rationalist' conception of language change. *Diachronica* 1/2, 203–216.
Itkonen, Esa. 2002. Grammaticalization as an analogue of hypothetico-deductive thinking. In: *New Reflections on Grammaticalization*, ed. by Ilse Wischer and Gabriele Diewald, 413–422. Amsterdam: Benjamins.
Itkonen, Esa. 2003. *What is Language? A Study in the Philosophy of Linguistics*. Turku.
Itkonen, Esa. 2005. *Analogy as Structure and Process*. Amsterdam: Benjamins.
Itkonen, Esa. 2008a. The Central Role of Normativity in Language and in Linguistics. In: *The Shared Mind. Perspectives on Intersubjectivity*, ed. by Jordan Zlatev, Timothy Racine, Chris Sinha and Esa Itkonen, 279–305. Amsterdam: Benjamins.

Itkonen, Esa. 2008b. *Maailman kielten erilaisuus ja samuus. Osa I* [= The Difference and Sameness of the World's Languages]. Turku: Yleinen kielitiede.
Itkonen, Esa. 2013–14. On explanation in linguistics. *Energeia* 5, 10–40.
Itkonen, Esa. 2016. "The whole is greater than the sum of its parts" – True, false or meaningless? *Public Journal of Semiotics* 7/2, 21–50.
Janda, Michael. 2000. *Eleusis. Das indogermanische Erbe der Mysterien*. Innsbruck: Institut für Sprachwissenschaft.
Janse, Mark. 2009. Watkins' Law and the development of agglutinative inflections in Asia Minor Greek. *Journal of Greek Linguistics* 9, 93–109.
Jasanoff, Jay. 1988. The sigmatic aorist in Tocharian and Indo-European. *Tocharian and Indo-European Studies* 2, 52–76.
Jasanoff, Jay. 1991. The origin of the Italic imperfect subjunctive. *Historische Sprachforschung* 104, 84–105.
Jasanoff, Jay. 2003. *Hittite and the Indo-European Verb*. Oxford: Oxford University Press.
Jasanoff, Jay. 2004. *Plus ça change...*: Lachmann's Law in Latin. In: *Indo-European Perspectives: Studies in Honour of Anna Morpurgo Davies*, ed. by John Penney, 405–416. Oxford: Oxford University Press.
Jasanoff, Jay. 2012. Long-vowel Preterites in Indo-European. In: *The Indo-European Verb. Proceedings of the Conference of the Society for Indo-European Studies, Los Angeles 13–15 September 2010*, edited by H. Craig Melchert, 127–135. Wiesbaden: Reichert.
Joseph, Brian, and Rex Wallace. 1987. Latin *sum*/Oscan **súm**, **sim**, **esum**. *American Journal of Philology* 108/4, 675–693.
Karlsson, Fred. 1999. *Finnish: An Essential Grammar*. Translated by Andrew Chesterman. 2nd ed. London and New York: Routledge.
Kent, Roland G. 1928. Lachmann's law of vowel lengthening. *Language* 4, 181–190.
Keydana, Götz, Paul Widmer, and Thomas Oleander, eds. 2013. *Indo-European Accent and Ablaut*. Copenhagen: Museum Tusculanum Press.
Kieckers, Ernst. 1930. *Historische lateinische Grammatik. Erster Teil: Lautlehre*. München: Max Hueber Verlag.
Kimball, Sara E. 1991. The Origin of the Greek κ-perfect. *Glotta* 69, 141–153.
King, Robert D. 1973. Rule insertion. *Language* 49, 551–578.
Kiparsky, Paul. 1965. *Phonological Change*. PhD dissertation, MIT.
Kloekhorst, Alwin. 2004. The Preservation of **h1* in Hieroglyphic Luwian: Two Separate a-Signs. *Historische Sprachforschung* 117/1, 26–49.
Komárek, Miroslav. 1964. Sur l'appréciation fonctionalle des alternances morphonologiques. *Travaux linguistiques de Prague* 1, 145–161.
Korhonen, Mikko. 1969. Die Entwicklung der morphologischen Methode im Lappischen. *Finnisch-Ugrische Forschungen* 37, 203–362.
Kortland, Frederik. 1989. Lachmann's Law. In: *The new sound of Indo-European: Essays in phonological reconstruction*, ed. by Theo Vennemann, 103–105. Berlin: Mouton de Gruyter.
Kortland, Frederik. 2007. *Italo-Celtic origins and prehistoric development of the Irish language*. Amsterdam/New York: Rodopi.
Kümmel, Martin J. 1998. Wurzelpräsens neben Wurzelaorist im Indogermanischen. *Historische Sprachforschung* 111/2, 191–208.
Kümmel, Martin J. 2000. *Das Perfekt im Indoiranischen*. Wiesbaden: Reichert.
Kümmel, Martin J. 2007. The Third Person Endings of the Old Latin Perfect and the Fate of Final *-d* in Latin. In: *Proceedings of the 18th Annual UCLA Indo-European Conference, Los Angeles, November 3–4, 2006*, ed. by Karlene Jones-Bley, Martin E. Huld, Angela

Della Volpe and Miriam Robbins Dexter, 89–100. Washington, DC: Institute for the Study of Man.
Kuryłowicz, Jerzy. 1952. *L'accentuation des langues indo-européennes*. Kraków: Polska Akademia Umiejetnosci.
Kuryłowicz, Jerzy. 1956. *L'apophonie en indo-européen*. Wrocław: Polska Akademia Nauk.
Kuryłowicz, Jerzy. 1965. The Evolution of Grammatical Categories. *Diogenes* 13, 55–71.
Kuryłowicz, Jerzy. 1968a. *Indogermanische Grammatik, Band II: Akzent, Ablaut*. Heidelberg: Carl Winter.
Kuryłowicz, Jerzy. 1968b. A remark on Lachmann's Law. *Harvard Studies in Classical Philology* 72, 295–299.
Kurzová, Helena. 1993. *From Indo-European to Latin: The Evolution of a Morphosyntactic Type*. Amsterdam: Benjamins.
Labov, William. 1994. *Principles of Linguistic Change. Volume 1: Internal Factors*. Malden, MA: Blackwell.
Langacker, Ronald W. 1991. *Foundations of Cognitive Grammar, vol. II: Descriptive application*. Stanford, CA: Stanford University Press.
Ledgeway, Adam. 2012. *From Latin to Romance: morphosyntactic typology and change*. Oxford: Oxford University Press.
Leed, Richard L. 1970. Distinctive features and analogy. *Lingua* 26, 1–24.
Lehmann, Christian. 1989/1993. Markedness and grammaticalization. In: *Markedness in synchrony and diachrony*, ed. by Olga M. Tomić, 175–190. Berlin & New York: Mouton de Gruyter.
Lehmann, Christian. 2002. New reflections on grammaticalization and lexicalization. In: *New Reflections on Grammaticalization*, ed. by Ilse Wischer and Gabriele Diewald, 1–18. Amsterdam: Benjamins.
Lehmann, Christian. 2015. *Thoughts on grammaticalization*. 3rd ed. Berlin: Language Science Press.
Lehmann, Winfred P. 1993. *Theoretical Bases of Indo-European Linguistics*. London/New York: Routledge.
Leppänen, Ville. 2012. *Litteris commutatis – Kielihistoriallisia elementtejä Varron etymologioissa* [= Language historical elements in Varronian etymology]. M.A. thesis, Department of Classics, University of Turku.
Leppänen, Ville, and Tommi Alho. 2018. On The Mergers Of Latin Close-Mid Vowels. *Transactions of the Philological Society* 116/3, 460–483.
Leumann, Manu. 1926–1928. *Lateinische Grammatik. Vol. 1. Lateinische Laut- und Formenlehre*. München: C. H. Beck.
Leumann, Manu. 1977. *Lateinische Laut- und Formenlehre*. München: C. H. Beck.
Lindsay, W. M. 1894. *The Latin Language: An historical account of Latin sounds, stems, and flexions*. Oxford: Clarendon Press.
Lindström, Therese. 2004. *The History of the Concept of Grammaticalisation*. PhD dissertation, University of Sheffield.
Livingston, Ivy. 2004. *A Linguistic Commentary on Livius Andronicus*. New York: Routledge.
Loporcaro, Michele. 2011. Syllable, segment and prosody. In: *The Cambridge History of the Romance Languages. Volume I: Structures*, ed. by Martin Maiden, John Charles Smith and Adam Ledgeway, 50–108. Cambridge: Cambridge University Press.
Loporcaro, Michele. 2015. *Vowel Length from Latin to Romance*. Oxford: Oxford University Press.
Mancini, Marco. 1997. *Osservazioni sulla nuova epigrafe del Garigliano, Opuscula IV(1), Biblioteca di Ricerche Linguistiche e Filologiche 42.1*. Roma.

Maniet, Albert. 1956. La ‘loi de Lachmann’ et les antinomies de l'allongement compensatoire. In: *Hommages à Max Niedermann, vol. 23*, edited by Marcel Renard and Georges Redard, 230–237. Brussels: Berchem, Collection Latomus.
Maras, Daniele F. 2012. Scientists declare the Fibula Praenestina and its inscription to be genuine “beyond any reasonable doubt”. *Etruscan News* 14.
Matthews, Peter H. 1972. *Inflectional Morphology: A Theoretical Study Based on Aspects of Latin Verb Conjugation*. Cambridge: Cambridge University Press.
Matthews, Peter H. 1991. *Morphology*. 2nd ed. Cambridge: Cambridge University Press.
Mayerthaler, Willi. 1981. *Morphologische Natürlichkeit*. Wiesbaden: Athenaion Verlag.
Mayerthaler, Willi. 1987. System-independent morphological naturalness. In: *Leitmorifs in Natural Morphology*, ed. by Wolfgang U. Dressler, Willi Mayerthaler, Oswald Panagl and W. Ulrich Wurzel, 25–58. Amsterdam: Benjamins.
Mayrhofer, Manfred. 1986. *Indogermanische Grammatik, Band I: Lautlehre*. Heidelberg: Carl Winter.
Meier-Brügger, Michael. 2010. *Indogermanische Sprachwissenschaft*. 9th ed. Berlin/New York: De Gruyter.
Meillet, Antoine. 1912. L'évolution des forms grammaticales. *Scientia (Rivista di Scienza)* 12/26: 130–148.
Meillet, Antoine, and Joseph Vendryes. 1979. *Traité de grammaire comparée des langues classiques*. 5th ed. Paris: Champion.
Meiser, Gerhard. 1986. *Lautgeschichte der umbrischen Sprache, Innsbrucker Beiträge zur Sprachwissenschaft*. Innsbruck: Institut für Sprachwissenschaft.
Meiser, Gerhard. 1998. *Historische Laut- und Formenlehre der lateinischen Sprache*. Darmstadt: Wissenschaftliche Buchgesellschaft.
Meiser, Gerhard. 2003. *Veni Vidi Vici: Die Vorgeschichte des lateinischen Perfektsystems, Zetemata*. München: C. H. Beck.
Melchert, H. Craig. 1984. *Studies in Hittite Historical Phonology*. Göttingen: Vandenhoeck & Ruprecht.
Melchert, H. Craig. 1995. Neo-Hittite Nominal Inflection. In: *Atti del II Congresso Internazionale di Hittitologia*, ed. by O. Carruba, M. Giorgeri and C. Mora, 269–274. Pavia: Iuculano.
Melchert, H. Craig. 2010. Spelling of Initial /*a*-/ in Hieroglyphic Luwian. In: *ipamati kistamati pari tumatimis. Luwian and Hittite studies presented to J. David Hawkins on the occasion of his 70th birthday*, ed. by Itamar Singer, 147–158. Tel Aviv: Institute of Arhaeology, Tel Aviv University.
Melchert, H. Craig. 2016. Lengthened Grades of PIE *(C)aC Roots. Paper presented at the 15. Fachtagung der Indogermanischen Gesellschaft, Wien.
Monteil, Pierre. 1970. *Elements de Phonetique et de Morphologie du Latin*. Paris: Fernand Nathan.
Moravcsik, Edith A., and Jessica Wirth. 1986. Markedness - an overview. In: *Markedness*, ed. by Fred R. Eckman, Edith A. Moravcsik and Jessica Wirth, 1–11. New York: Plenum Press.
Müller, Stefan. 2007. *Zum Germanischen aus laryngaltheoretischer Sicht. Mit einer Einführung in die Grundlagen der Laryngaltheorie*. Berlin: Walter de Gruyter.
Mäkilähde, Aleksi, Ville Leppänen, and Esa Itkonen, eds. 2019. *Normativity in Language and Linguistics*. Amsterdam: Benjamins.
Narrog, Heiko, and Bernd Heine, eds. 2011. *The Oxford Handbook of Grammaticalization*. Oxford: Oxford University Press.
Neri, Sergio. 2011. *Wetter. Etymologie und Lautgesetz*. PhD dissertation, Friedrich-Schiller-Universität Jena.

Neue, Friedrich. 1897. *Formenlehre der lateinischen Sprache. Dritter Band: Das Verbum*. 3rd ed. Leipzig: O. R. Reisland.
Nishimura, Kanehiro. 2008. *Vowel reduction and deletion in Italic: Effects of stress*. PhD dissertation, University of California, Los Angeles.
Nishimura, Kanehiro. 2010a. Chronology between word-internal and word-final vowel reduction in Latin. *Incontri Linguistici* 33, 167–177.
Nishimura, Kanehiro. 2010b. Patterns of Vowel Reduction in Latin: Phonetics and Phonology. *Historische Sprachforschung* 123, 217–257.
Nishimura, Kanehiro. 2011. Syncope in Latin: A Historical Restatement of its Conditions. *International Journal of Diachronic Linguistics and Linguistic Reconstruction* 8, 1–41.
Nishimura, Kanehiro. 2014. Vowel Lengthening in the Latin Nominal Lexicon: Innovation and Inheritance. *Historische Sprachforschung* 127, 228–248.
Norde, Muriel. 1997. *The history of the genitive in Swedish. A case study in degrammaticalization*. PhD dissertation, University of Amsterdam.
Norde, Muriel. 2009. *Degrammaticalization*. Oxford: Oxford University Press.
Noreen, Adolf. 1903. *Altisländische und altnorwegische Grammatik, unter Berücksichtigung des Urnordischen*. 3rd ed. Halle: Max Niemeyer.
Nussbaum, Alan. 1997. The "Saussure Effect" in Latin and Italic. In: *Sound law and analogy: papers in honor of Robert S. P. Beekes on the occasion of his 60th birthday*, ed. by Alexander Lubotsky, 181–203. Amsterdam/Atlanta: Rodopi.
Nussbaum, Alan. 2004. A *-t-* party: Various IE nominal stems in **-(o/e)t-*. Paper presnted at the 16th UCLA Indo-European conference.
Nussbaum, Alan. 2017. The Latin "bonus rule" and *benignus* 'generous, kind'. In: *Usque ad radices: Indo-European Studies in honour of Birgit Anette Olsen*, ed. by Bjarne Simmelkjær Sandgaard Hansen et al., 575–592. Copenhagen: Museum Tusculanum Press.
Nyman, Martti A. 1977. Where does Latin sum come from? *Language* 53/1, 39–60.
Oniga, Renato. 1990. L'apofonia nei composti e l'ipotesi dell' 'intensità iniziale' in latino (con alcune conseguenze per la teoria dell'ictus metrico)." In: *Metrica classica e linguistica*, ed. by R. et al. Danese, 195–236. Urbino: QuattroVenti.
Opfermann, Andreas. 2016. *Univerbierung. Der passive Wortbildungsmechanismus*. Hamburg: Baar.
Osthoff, Hermann. 1884. *Zur Geschichte des Perfects im Indogermanischen*. Strasbourg: K. J. Trubner.
Osthoff, Hermann, and Karl Brugmann. 1878. *Morphologische Untersuchungen auf dem Gebiete der indogermanischen Sprachen*. Leipzig: S. Hirzel.
Owens, David. 2012. *Shaping the Normative Landscape*. Oxford: Oxford University Press.
Palmer, L. R. 1961. *The Latin Language*. 3rd ed. London: Faber and Faber.
Parker, Holt Neumon. 1986. *The Relative Chronology of some major Latin Sound Changes*. PhD dissertation, Yale University.
Paul, Hermann. 1920. *Prinzipien der Sprachgeschichte*. 5th ed. Tübingen: Max Niemeyer.
Peters, Martin. 1980. *Untersuchungen zur Vertretung der indogermanischen Laryngale im Griechischen*. Wien: Verlag der österreichischen Akademie der Wissenschaften.
Peters, Martin. 1999. Ein tiefes Problem. In: *Compositiones Indogermanicae in memoriam Jochem Schindler*, ed. by Heiner Eichner and Hans Christian Luschützky, 447–456. Prague: Enigma.
Poetto, Massimo. 1998. Review of Hawkins, J. David. 1995. *The Hieroglyphic Inscription of the Sacred Pool Complex at Hattusa*. Wiesbaden: Harrassowitz. *Kratylos* 43, 108–117.

Polomé, Edgar. 1982. Germanic as an Archaic Indo-European Language. In: *Festschrift für Karl Schneider*, ed. by Kurt R. Jankowsky and Ernst Dick, 51–59. Amsterdam: Benjamins.
Pooth, Roland A. 2016. Against proportional four-part analogy (and what to replace it with). Manuscript, available online at leidenuniv.academia.edu/RolandPooth [15.01.2018].
Pronk, Tijmen. 2011. The "Saussure effect" in Indo-European Languages other than Greek. *Journal of Indo-European Studies* 39, 176–193.
Pultrová, Lucie. 2006. *The Vocalism of Latin Medial Syllables*. Prague: Univerzita Karlova v Praze, Nakl. Karolinum.
Questa, Cesare. 2007. *La metrica di Plauto e di Terenzio*. Urbino: QuattroVenti.
Rasmussen, Jens E. 1989. *Studien zur Morphophonemik der indogermanischen Grundsprache*, *Innsbrucker Beiträge zur Sprachwissenschaft*. Innsbruck: Institut für Sprachwissenschaft.
Rasmussen, Jens E. 2007. A Reflex of *$*h_1$* in Hieroglyphic Luvian? In: *Proceedings of the 18th Annual UCLA Indo-European Conference. Los Angeles, November 3-4, 2006.*, ed. by Karlene Jones-Bley et al., 161–167. Washington: Institute for the Study of Man.
Ringe, Don, and Ann Taylor. 2014. *The Development of Old English*. Oxford: Oxford University Press.
Risch, Ernst. 1992. Die Indogermanischen Grundlagen des Lateins. In: *Latein und Indogermanisch. Akten des Kolloquiums der Indogermanischen Gesellschaft, Salzburg, 23.–26. September 1986*, ed. by Oswald Panagl and Thomas Krisch, 11–27. Innsbruck: Institut für Sprachwissenschaft.
Rix, Helmut. 1966. Die lateinische Syncope als historisches und phonologisches Problem. *Kratylos* 11, 156–165.
Rix, Helmut. 1969. Review of Beekes 1969. *Kratylos* 11, 156–165.
Rix, Helmut. 1992. *Historische Grammatik des Griechischen: Laut- und Formenlehre*. 2nd ed. Darmstadt: Wissenschaftliche Buchgesellschaft.
Rix, Helmut. 1996. Review of Schrijver 1991. *Kratylos* 41, 153–163.
Rix, Helmut. 1998. Eine neue frühsabellische Inschrift und der altitalische Präventiv. *Zeitschrift für vergleichende Sprachforschung* 111, 247–269.
Roberts, Philip. 2009. *An Optimality-Theoretic Analysis of Lachmann's Law*. M.A. thesis, University of Oxford.
Safarewicz, Jan. 1969. *Historische lateinische Grammatik*. Transl. by Katherina Rollka and Ludwig Rollka. Halle (Saale): Max Niemeyer.
Sarullo, Giulia. 2014. *Il Carmen Saliare. Indagini filologiche e riflessioni linguistiche*. Berlin: Walter de Gruyter.
Saussure, Ferdinand de. 1878. *Mémoire sur le système primitif des voyelles dans les langues indo-européennes*. Leipzig: Teubner.
Saussure, Ferdinand de. 1885. Sur un point de la phonétique des consonnes en indo-européen. *Mémoires de la Société de Linguistique de Paris* 6, 246–257.
Saussure, Ferdinand de. 1916. *Cours de linguistique générale*. Paris: Payot.
Schindler, Jochem. 1974. Fragen zum paradigmatischen Ausgleich. *Die Sprache* 20, 1–9.
Schleicher, August. 1861/1862. *Compendium der vergleichenden Grammatik der indogermanischen Sprachen*. Weimar: H. Boehlau.
Schmalstieg, W. R. 1972. Denominative verbs with the suffix *-j-*. *La Linguistique* 8, 123–136.
Schrijver, Peter. 1991. *The Reflexes of the Proto-Indo-European Laryngeals in Latin*. Amsterdam/Atlanta, GA: Rodopi.
Schrijver, Peter. 2003. Athematic *i*-presents: the Italic and Celtic evidence. *Incontri Linguistici* 26, 59–86.

Schrijver, Peter. 2014. *Language Contact and the Origins of the Germanic Languages*. New York: Routledge.
Schrijver, Peter. 2016. The present of the verb ‘to be’ and its connection to the history of a and e modals in Celtic. Paper presented at Indo-European from within: Explaining IE subphyla, Göttingen, 1–3 March 2016.
Searle, John R. 1969. *Speech Acts: An Essay in the Philosophy of Language*. Cambridge: Cambridge University Press.
Sen, Ranjan. 2012. Reconstructing phonological change: duration and syllable structure in Latin vowel reduction. *Phonology* 29/3, 465–506.
Sen, Ranjan. 2015. *Syllable and segment in Latin*. Oxford: Oxford University Press.
Shields, Kenneth C. 1992. *A History of Indo-European Verb Morphology*. Amsterdam: Benjamins.
Sihler, Andrew. 1995. *New Comparative Grammar of Greek and Latin*. Cambridge: Cambridge University Press.
Silvestri, Domenico. 1993. I più antichi documenti epigrafici del latino. In *Caratteri e diffusione del latino in età arcaica*, ed. by E. Campanile, 97–118. Pisa: Giardini.
Simon, Zsolt. 2013. Once again on the Hieroglyphic Luwian sign *19 <á>. *Indogermanische Forschungen* 118, 1–21.
Sjöstrand, Nils. 2014 [1953]. *Ny Latinsk Grammatik*. 3rd ed. Uppsala: Institutionen för lingvistik och filologi.
Sommer, Ferdinand. 1914. *Handbuch der lateinischen Laut- und Formenlehre*. 2nd ed. Heidelberg: Carl Winter.
Sommer, Ferdinand, and Raimund Pfister. 1977. *Handbuch der lateinischen Laut- und Formenlehre. Band I: Einleitung und Lautlehre*. 4th ed. Heidelberg: Carl Winter.
Stolz, Friedrich. 1894–1895. *Historische Grammatik der lateinischen Sprache. Erster Band. Einleitung, Lautlehre, Stammbildungslehre*. Leipzig: B. G. Teubner.
Stuart-Smith, Jane. 2004. *Phonetics and Philology: Sound Change in Italic*. Oxford: Oxford University Press.
Stump, Gregory T. 2001. *Inflectional Morphology: A Theory of Paradigm Structure*. Cambridge: Cambridge University Press.
Sukač, Roman. 2012. Lachmann's Law (Part 1). *Linguistica Brunensia* 60, 13–36.
Szemerényi, Oswald. 1946. Latin *sum*. *Egyetemes Philologiai Közlöny* 69, 82–91.
Szemerényi, Oswald. 1960. Etyma Latina I. (1-6). *Glotta* 38, 216–251.
Szemerényi, Oswald. 1964. *Syncope in Greek and Indo-European and the nature of Indo-European accent*. Naples.
Szemerényi, Oswald. 1996. *Introduction to Indo-European Linguistics*. Oxford: Clarendon Press.
Tichy, Eva. 2006. *A Survey of Proto-Indo-European*. Translated by James E. Cathey. Bremen: Hempen.
Trubetzkoy, Nikolai. 1939. *Grundzüge der Phonologie*. Prague.
Untermann, Jürgen. 1993. Gr. ἔθηκα = lat. *feci*, gr. ἧκα = lat. *ieci* ? In: *Indogermanica et Italica. Festschrift für Helmut Rix*, ed. by Gerhard Meiser, 461–468. Innsbruck: Institut für Sprachwissenschaft.
Vainio, Seppo, Jukka Hyönä, and Anneli Pajunen. 2003. Facilitatory and inhibitory effects of grammatical agreement: evidence from readers' eye fixation patterns. *Brain and Language* 85/2, 197–202.
van Beek, Lucien. 2011. The “Saussure effect” in Greek: a reinterpretation of the evidence. *Journal of Indo-European Studies* 39, 129–175.
van Wijk, Nicolaas. 1905. Zur Konjugation des Verbum substantivum. *Indogermanische Forschungen* 18, 49–59.

Vincent, Nigel. 1974. Analogy reconsidered. In: *Historical linguistics. Proceedings of the first international conference on historical linguistics, Edinburgh, Sept. 2–7, 1973, 2 vols.*, ed. by John M. Anderson and Charles Jones, 427–445. Amsterdam: North-Holland.
Vine, Brent. 1993. *Studies in Archaic Latin Inscriptions, Innsbrucker Beiträge zur Sprachwissenschaft*. Innsbruck: Institut für Sprachwissenschaft.
Vine, Brent. 1998. Remarks on the Archaic Latin "Garigliano Bowl" Inscription. *Zeitschrift für Papyrologie und Epigraphik* 121, 257–262.
Vine, Brent. 1999. Greek ῥίζα 'root' and "Schwa Secundum". In: *UCLA Indo-European Studies* 1, ed. by Vjačeslav Ivanov and Brent Vine, 5–30.
Vine, Brent. 2011. Initial **mo-* in Latin and Italic. *Münchener Studien zur Sprachwissenschaft* 65, 261–286.
Vine, Brent. 2012. PIE mobile accent in Italic: Further evidence. In: *The Sound of Indo-European. Phonetics, Phonemics, and Morphophonemics*, ed. by Benedicte Nielsen Whitehead, Thomas Olander, Birgit Anette Olsen and Jens Elmegård Rasmussen, 545–575. Copenhagen: Museum Tusculanum Press.
von Wright, Georg Henrik. 1963. *Norm and Action: A Logical Enquiry*. London: Routledge & Kegan Paul.
Wachter, Rudolf. 1987. *Altlateinische Inschriften: Sprachliche und epigraphische Untersuchungen zu den Dokumenten bis etwa 150 v. Chr.* Bern: Peter Lang.
Wallace, Rex. 2005. A Faliscan Inscription in the Michael and Judy Steinhardt Collection. *Zeitschrift für Papyrologie und Epigraphik* 153, 175–182.
Watkins, Calvert. 1962. *Indo-European Origins of the Celtic Verb*. Dublin: Institute for Advanced Studies.
Watkins, Calvert. 1970. A further remark on Lachmann's Law. *Harvard Studies in Classical Philology* 74, 55–65.
Wedgewood, Ralph. 2007. *The Nature of Normativity*. Oxford: Clarendon Press.
Weiss, Michael. 1993. *Studies in Italic nominal morphology*. PhD dissertation, Cornell University.
Weiss, Michael. 2010. *Language and Ritual in Sabellic Italy. The Ritual Complex of the Third and Fourth* Tabluae Iguvinae. Leiden/Boston: Brill.
Weiss, Michael. 2011. *Outline of the Historical and Comparative Grammar of Latin*. 2nd ed. Ann Arbor, NY: Beech Stave Press.
Weiss, Michael. 2016. "Sleep" in Latin and Indo-European: On the Non-verbal Origin of Latin *sopio*." In: *Sahasram Ati Srajas. Indo-Iranian and Indo-European Studies in Honor of Stephanie W. Jamison*, ed. by Dieter Gunkel, Joshua T. Katz, Brent Vine and Michael Weiss, 470–485. Ann Arbor, NY: Beech Stave Press.
Wescott, Roger W. 1970. Types of Vowel Alternation in English. *Word* 26/3, 309–343.
Whitney, William D. 1875. *The Life and Growth of Language: An Outline of Linguistic Science*. New York: D. Appleton and Company.
Willi, Andreas. 2018. *Origins of the Greek Verb*. Cambridge: Cambridge University Press.
Winter, Werner. 1971. Formal frequency and linguistic change: some preliminary comments. *Folia Linguistica* 5, 55–61.
Wittgenstein, Ludwig. 1958. *Philosophical Investigations*. 2nd ed. Oxford: Blackwell.
Yamazaki, Yoko. 2009. The Saussure Effect in Lithuanian. *Journal of Indo-European Studies* 37/3, 430–461.
Zahn, Ingo. 2014. *Vergleichende indogermanische Formenlehre*. Hamburg: Verlag Dr. Kovac.
Zair, Nicholas. 2012. *The Reflexes of the Proto-Indo-European Laryngeals in Celtic*. Leiden/Boston: Brill.
Zimmermann, J. L. 1986. La fin de Falerii Veteres: Un témoignage archéologique. *J. P. Getty Museum Journal* 14, 37–41.

Zipf, George K. 1935. *The psycho-biology of language*. Boston: Houghton Mifflin.

Appendices

Appendix I: Lachmann's rule

Lachmann's rule, more commonly known as **Lachmann's Law**, that is, verbal roots ending in an etymological voiced stop lengthen the root vowel in the PPP, e.g. *ăgō* (< **h₂eg-*) → **ăg-to-* > *āctus* (Sommer and Pfister 1977: 101; Jasanoff 2004: 405). This particular sound change is often debated and its details variously explained.[212] It is not entirely clear, whether we are dealing here with an actual sound law or a straightforward analogical modification of the vocalism of certain PPPs. The core area of Lachmann's rule is a number of participle stems, which show an unetymological long vowel, e.g. *legere* : *lēctus*, *edere* : *ēsus*, *frangere* : *frāctus*, *regere* : *rēctus*, *tegere* : *tēctus*. Other items, sometimes explained by Lachmann's rule, include the putatively long vowel of the superlative *māximus* < **magisn̥mo-*, and the long vowel of 2sg. *ēs* and 3sg. *ēst* (of *ēsse* 'to eat', from PIE root **h₁ed-*). All these items have in common that their root ends in a voiced (unaspirated) stop, which is subsequently unvoiced or lost altogether; forms with an etymological voiceless stop or voiced aspirated stop are not affected, e.g. *facere* : *factus* (< PIE **dʰeh₁(k)-*), *fodere* : *fossus* (< PIE **bʰedʰh₂-*). Crucial for the nature of the phenomenon is the fact that some items escape lengthening, even when their root does end in a voiced stop, e.g. *grĕx* (< **grĕg-s*; Baldi 1991: 7), *lăssus* (< **lad-tó-*; Jasanoff 2004: 407 n. 3), *tŭssis* (< **tud-ti-*; *ibid.*): as a parallel for *tŭssis*, we have the regular PPP of the verb *tundere*, namely *tūsus* (< **tūssus* < **tud-tó-*), which expectedly shows the effect of Lachmann's rule. It is thus quite clear that the phenomenon is restricted to the vocalism of PPPs and is not a regular phonological change (for this reason I refer to it not as a "law" but as a "rule"). Three explanations have been proposed:

1. **Interplay of sound change and analogy**. Although details vary, this is both the oldest (Osthoff 1884) and the most recent approach (De Angelis and Chilà 2015). We will return to this shortly.
2. **Generative approaches**. This was the topic of Paul Kiparsky's 1965 dissertation, where he argued for Lachmann's rule as a case of "rule insertion" in order to show the relevance of generative grammar for historical linguistics. Since then, rule insertion and the early generativist approaches have been abandoned (see King 1973). To my knowledge, the most recent attempt to approach Lachmann's rule in generativist terms is Roberts (2009).[213]
3. **Glottalic theory**. A new avenue of approach was opened in the wake of the glottalic theory, according to which the traditionally reconstructed voiced unaspirated stops were actually preglottalized voiceless stops. Thus, the lengthening of the root vowel in **-to-*participles is a result of the glottalisation turning the preceding vowel into a long one, e.g. **le'k-to-* > **lēkto-* > *lēctus*. This explanation was first proposed by Philip Baldi (1991) and is still supported by the Leiden school (see, e.g., Beekes 2011: 128). Thus,

[212] On research history (with references), see Collinge (1985: 105f), Jasanoff (2004: 405–411), Sukač (2012), and De Angelis and Chilà (2015: 89–91).
[213] Sukač (2012) was originally planned as the first part of an optimality-theoretic explanation of Lachmann's rule, but to my knowledge the second part has thus far not been published.

the dating of Lachmann's rule would be pushed back to late-PIE or immediately thereafter, before the loss of preglottalisation.

The original proposal of Osthoff (1884: 112–113) explained long-vocalic PPPs as analogical modifications based on long-vocalic perfects, e.g. *legō* : *lēgī* : **lĕctum* → *lēctum*, but this does not explain non-lengthened forms such as *dĭctum* (despite pf. *dīxī*). According to Saussure (1885), the consonantism of some inherited PPPs was in Latin restored according to the present stem, and the re-voiced stop then caused the lengthening of the root vowel before becoming – once again – voiceless by assimilation, e.g. *agere* : **ak-to-* → **ag-to-* > **āgto-* > **ākto-* > *āctus*. Kent (1928) denied the phonological character of the change and (over)emphasized analogical influence from within the verbal paradigms and from one verb to others, again on a mostly ad hoc basis. Maniet (1956) suggested that some PPPs were renovated post-PIE with e-grade vocalism – another ad hoc solution plagued by counter-examples. Kuryłowicz (1968b) took morphological levelling as the starting point: while Latin lacks synthetic pf.pass. forms, the periphrasis *esse* + PPP occasioned a paradigmatic levelling of the PPP – in the spirit of Osthoff (1884) – e.g. *lĕgit* : *lĕgitur* :: *lēgit* : *l*X*ctus est*, where X = *-ē-*. There would be, however, two conditions: first, only verbal roots ending in *d*, *g* and *m* were affected, and second, the dissimilarity of present and perfect stems (e.g. *iaciō* : *iēcī* : *iăctus*) blocked the effect. Watkins' (1970) model is similar, but he excludes any phonological criteria and extends the effect to reduplicated perfects (e.g. *pangō* : *pepigī* : **păctus* → *pāctus*). Finally, Drinka (1991) has suggested that the long vowels originally belonged to PPPs of *n*-infixed presents, where the infix was systematically extended from the present stem to the PPP; in some cases, this led to a regular lengthening (by NS-lengthening, see 3.1.4.), while in others it was a kind of compensatory lengthening to avoid superheavy syllables – the remaining cases are analogical extensions. De Angelis and Chilà (2015) basically approve Drinka's scheme, but suggest that the extension was carried out by way of a "lexical connectionist process" (which, however, boils immediately down to standard analogical extension).

In sum, unless one wishes to adopt a generativist or a glottalic-theoretical approach (which are in no way *sine quibus non* in Indo-European studies), there seems to be very little lawlike in Lachmann's "Law". In my view, the most plausible explanation includes phonologically regular lengthening in those forms, where it did occur by regular sound change, and the rest are analogical modifications influenced by – among other things – the vocalism of the present and perfect stems. The dating of the change is difficult to determine in exact terms, but since some long-vocalic PPPs depend on NS-lengthening (which occurred for the first time in Proto-Italic), the process has probably started only after Proto-Italic.

Appendix II: Latin vowel weakening

The vowel changes that took place during the attested history of Latin (starting approximately in the eighth century BC) are numerous and complex, characterized by several prosody-induced changes (syncopes and apocopes) as well as a complex ensemble of vowel weakenings and consonant-induced colourings. Most of the relevant changes occurred between about 600 and 200 BC, considering that the vocalism of the Plautine comedies is, apart from few clearly archaic features such as *servos* for *servus* and *voster* for *vester* (which, of course, changed only after 200 BC), very close to the classical language. However, the epigraphic evidence from the Very Old Latin period is rather scarce, and consequently does not provide sufficient data for a direct, observation-based analysis. Rather, the relative (and, when possible, absolute) chronology must be worked out by way of a combination of three methods:

- Comparison of the attested Old Latin and Classical Latin forms with their PIE and Proto-Italic ancestors (also involving Sabellic and other Indo-European comparanda).
- Examination of the relative order of changes (only the correct chronological ordering produces the correct outcomes).
- Reflecting the results produced by the above methods upon the actually attested data in order to confirm or falsify the chronology.

This kind of analysis is in fact very rarely attempted in a grand scale, although the method is implicit in practically every study on Latin historical phonology. An exception is Parker (1986), who uses a generative framework in order to work out the relative chronology of some sound changes, but his study is not exhaustive;[214] in fact, a comprehensive analysis of the chronology of Latin sound changes is still a desideratum.

Perhaps the most characteristic feature of Latin historical vocalism is *vowel weakening* (VW), also referred to as *vowel reduction*. This process plays a key role in the development of Latin vocalism, for which reason its mechanisms must be examined here in great detail in order to assess its effect on the development of ablaut alternations.

There is a widely-documented tendency that, in languages with a strong dynamic accent, unaccented vowels are weakened, reduced, or even deleted (syncopated or apocopated); the total loss of a vowel is called *vowel deletion* (VD). Languages where this tendency is observed include English, Russian, Czech and Etruscan, while exceptions are not unheard of (such as Finnish). In the case of Very Old Latin, where ISS was operational, VW concerns medial and final syllables – vowels in initial syllables remain unchanged. For this reason, the phenomenon is sometimes referred to as *medial vowel weakening*, while changes in final syllables are treated as a separate (but perhaps related) phenomenon. It is certainly true that most vowel changes in final syllables need neither be ISS-induced nor originate from that period, since final syllables remain unaccented even under the Penultimate rule.[215]

The dependency of VW/VD on accentuation has long since been recognized (e.g. Lindsay 1894: 170, 185), but the exact mechanics of VW/VD are, to a certain degree, a matter of debate. The correspondences before and after VW/VD can be described as simple and straightforward sound changes (e.g. **a > i*), but a more exact examination takes into account the fact that the

[214] A very short list and a chart based on Parker (1986) is provided by Weiss (2011: 191–193).
[215] Nishimura (2008: 34; 2010a), however, argues with good reasons that VW/VD in medial and final syllables ought to be analysed synthetically and that they are chronologically contemporaneous.

change must have been more complex and have taken place during an extended period of time. Most importantly, there is evidence that at the onset of VW/VD there existed a stage, when some or all vowels were reduced into *ə* before turning into other vowels or being deleted. This scenario was first mentioned by Götze (1923: 114), later elaborated by Rix (1966) and, more recently, by Nishimura (2008, 2010a, 2010b, 2011), and following Nishimura, Leppänen and Alho (2018).[216] However, several factors indicate that VW/VD is also closely connected to the development of the peripherality-based phonological system of Classical Latin (see below), the development of which has thus far lacked a proper examination.

In short, the complex VW/VD changes can be divided into the following stages (in chronological order):[217]

- **Non-high medial weakening:** reduction of medial *a*, *e* and *o* into *ə* (which had a rounded allophone *ɵ* in labial environments).
- **Final *a*-weakening:** reduction of final *a* into *ə*, then into *e*.
- **Open-syllable syncope, round 1:** deletion of short vowels in open medial syllables.
- **Final-syllable syncope:** deletion of *i* and *o* after *t* and *r* and before word-final *s*.
- **Final raising, round 1:** rising of final *e* into *i* and *o* into *u* before a consonant.
- **Schwa-strengthening:** raising of medial *ə* into *i* (and of *ɵ* into *u*) in open syllables, and fronting into *e* in closed syllables.
- ***u*-fronting:** fronting of medial *u* into *i* in certain environments.
- **Open-syllable syncope, round 2:** deletion of short vowels in open medial syllables.
- **Final raising, round 2:** rising of final -*o*C into -*u*C (the remains of round 1).
- **Sporadic syncope:** occasional deletion of word-final vowels.

These changes cover the timespan between roughly the fifth and the first centuries BC, which coincides with the period of the Roman Republic, characterized by almost continuous wars and territorial expansion. It was also a significant period for the development of Roman culture, including its first preserved literary works. The workings of VW/VD are interspersed with other changes that occur during the same time span. These changes, to be examined separately in Chs. 3.2.4., 3.2.5. and 3.2.6., include

- several qualitative vowel changes that are not ISS-induced, i.e. unrelated to VW/VD changes,
- monophthongisation of diphthongs,
- shortening and lengthening of vowels in certain environments,
- vocalisation of the secondary syllabic resonants *$\underset{\circ}{n}_2$, *$\underset{\circ}{l}_2$ and *$\underset{\circ}{r}_2$, and
- a number of important consonant changes (such as rhotacism) that also affect vowels (and hence need to be mentioned here).

Syncope of short vowels in medial syllables is a characteristic feature of Latin historical phonology, and it occurred several times (here referred to as *rounds*) under different accentual conditions. Latin, however, is by no means unique in this regard: Sabellic languages and

[216] Analyses that do not presume (or at least do not explicitly mention the possibility of) schwa-reduction include Leumann 1977: 79f; Sommer and Pfister 1977: 81f; Weiss 2011: 116f; Sen 2012; Sen 2015: 80f. Oniga (1990) and Pultrová (2006) are sceptical about the role of ISS in VW/VD, but the alternatives that these scholars propose are not superior to the traditional views (as noted by Weiss 2011: 121 n. 22).

[217] The ordering is based on Nishimura 2008, 2010a, 2010b, 2011 and Weiss 2011. My terminology is for the most part based on these studies.

Etruscan – all also characterized by ISS – exhibit salient syncope as well. Thus, ISS and ISS-induced syncope were certainly widespread areal linguistic phenomena in early Iron Age Italy. Concerning Latin syncope, *communis opinio* is that its first round was more or less directly caused by ISS, but the details of the deletion process can be interpreted in a number of ways. Three basic interpretations are possible:

1. **Separate rules:** Under certain conditions, all short vowels in medial syllables were deleted. Those unaffected by the deletion rules remained and underwent regular reduction according to the rules of the (chronologically subsequent) weakening process.
2. **"Schwa anaptycticum":** All short vowels in medial syllables were deleted. If the resulting consonant sequence was phonotactically disallowed, an anaptyctic *ə* developed, which was then treated in the same way as the *ə* that arouse as a result of the subsequent weakening (Meiser 1998: 66).
3. **Rix's (1966) syncope rule:** Syncope was preceded by the weakening of all short vowels into *ə* in medial syllables. Under certain rules, *ə* was then lost altogether or underwent subsequent development.

The Separate rules hypothesis requires separate sets of rules for syncope and weakening, which, from a theoretical perspective, is perfectly adequate. The only objection in favour of Rix's rule, however, is the fact that phonetically reduced vowels are more likely deleted altogether than full sonorous vowels. The "Schwa anaptycticum" has the same outcome as Rix's rule with the additional complication that all short vowels were at one point deleted. This complication is, in my view, not necessary. Following Rix's rule, we can establish the relative chronology of the first round of syncope and that of weakening: non-high medial weakening precedes open-syllable syncope, round 1.

Non-high medial weakening refers to "Process I" of Nishimura (2010b: 225). By this process, non-high vowels *a, e, o* in medial syllables (both open and closed) are weakened into *ə*,[218] e.g. **re-fakiō* > **refəkiō* > CLat. *reficiō* 'remake', **ob-sedeō* > **obsədeo* > CLat. *obsideō* 'remain', **kupido-tāts* > **kupidətāts* > CLat. *cupiditās* 'desire', **re-faktos* > **refəktos* > CLat. *refectus* 'remade', **en-kaḭdō* > **enkəḭdō* > CLat. *incīdō* 'cut into' (Weiss 2011: 116-117). Additionally, the reduced vowel had a rounded allophone *ɵ* in certain phonetic environments, namely before a labial consonant (typically *b, m* and *f*), before or after a rounded vowel (*o* and *u*), and before *l pinguis* [ɬ], e.g. **op-tm̥mo-* > **optemo-* > **optɵmo-* > *optimus/optumus* 'best', **mone-mentom* > **monəməntom* > *monumentum* 'monument', **ob-keɬō* > **okkɵɬō* > CLat. *occulō* 'conceal', **en-klau̯dō* > **enkləu̯dō* (or **enkləu̯dō*?) > CLat. *inclūdō* 'enclose' (Nishimura 2010b: 220). Vowels in hiatus are not affected, e.g. **au̯re.os* > CLat. *aureus* 'golden' (not ×***au̯rə.os* > ×*aurius*). This weakening can be dated to about the fifth century BC, since early Greek loanwords (which could not have been adopted before language contact with Magna Graecia) are affected by it (Weiss 2011: 120), e.g. Gr.(Dor.) μᾱχανᾱ → **mākʰanā* > **mākʰənā* > CLat. *māchina* '(war) machine'. This change has the effect of neutralizing ablaut distinctions between primary e- and o-grades of C*e*C- roots on the one hand, and secondary zero-grades (with *a*-vocalism) of some roots. Typical morphological environments include compound verbs and reduplicated perfects, where the quality of the medial vowel becomes

[218] Unlike previously thought, there are plausible reasons for assuming that *i* and *u* did not participate in this first round of weakening, see Nishimura (2010b: 223f) for details.

submerged. After this change, it is in most cases no longer possible to deduce the original ablaut grade of a Classical Latin reduplicated perfect stem (e.g. *cecidī, (te)tulī*) solely by tracing its regular phonological development.

Final *a*-weakening, that is, *a* > *ə* /_C(C)#, occurs within the same time spectrum as non-high medial weakening, as argued by Nishimura (2010a). This change affects short *a* in final syllables, e.g. **arti-fak-s* > **artifəks* > CLat. *artifex* 'artificer', first declension dat./abl.pl. **-ai̯s* > **-əi̯s* > CLat. *-īs*, **tuba-kan-nt-s* > **tubəkənn* > CLat. *tubicen* 'trumpeter'.

At approximately the same time, the **laxing of high vowels in unaccented syllables** occurs, that is, in medial and final syllables (which were always unaccented under ISS) *i* and *u* developed laxed allophones [ɪ] and [ʊ], respectively, e.g. **kupidotāts* > **kupɪdətāts* > *cupiditās*. At this point, the laxing does not lead to the merger of medial and final *i* and *u* into *ə*, as compellingly argued by Nishimura (see above), but laxing of these vowels is a necessary intermediate stage for understanding Old Latin orthographic variation and for explaining subsequent changes in the vowel system. This is also a preparatory step towards the peripherality-based allophone system, which later becomes a central feature of Latin vocalism. The three changes discussed above constitute the earliest stage of VW/VD changes, datable from about the sixth to the fifth century BC. They are partially of purely phonetic nature, since – apart from the neutralisation of medial syllable contrasts (*a*, *e*, *o*) > *ə* – they do not modify the phonological system. All contrasts are still retained in initial (i.e. stressed) syllables. The development of Very Old Latin short vowels in medial and final syllables is presented below in graphic form (Figures 6 and 7).

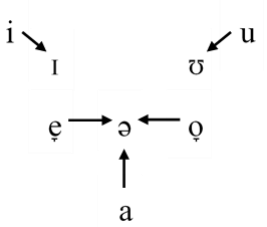

Figure 6: Stage 1 VW in medial syllables.

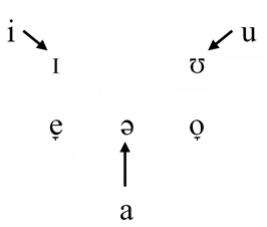

Figure 7: Stage 1 VW in final syllables.

Open-syllable syncope, round 1 affects sequences of two light syllables, especially when a liquid or nasal is present (cf. Götze 1923: 108f) or one or both of the syllables contain a schwa, e.g. **re-tet*V*lai̯* > **retətələi̯* > **rettələi̯* > CLat. *rettulī* 'brought back', **deksiteros* > **dekstəros* > **dekstros* > CLat. *dexter* 'right (hand side)' (see immediately below), **opi-fak-iom* > **opɪfəkiom* > **opfəkiom* > CLat. *officium* 'service', **palama* > **paləma* > CLat. *palma* 'palm' (cf. Götze 1923: 83; Nishimura 2011: 2f).[219] If, however, a sequence -C*r*- follows a light syllable, syncope does not happen, e.g. **fero-trom* > **ferətrom* > CLat. *feretrum* 'bier' (Götze 1923: 115–116). If, as a result of the syncope, a liquid or nasal becomes "trapped" between two consonants, it becomes syllabic; these are traditionally notated **n̥₂*, **l̥₂*, **r̥₂* in order to distinguish them from the PIE **n̥*, **l̥*, **r̥*, which were vocalized differently and much earlier

[219] According to Götze (1923: 86, 110–111, 120), the sequences -*t*V*m*- (e.g. *lēgitimus* 'legal', *fīnitimus* 'bordering', *maritimus* 'maritime') and -*m*V*n*- (e.g. *sequiminī* 'you (pl.) follow' – but *alumnus* 'foster-son', if from **alomanos*, is a counterexample) do not syncopate even when preceded by a light syllable.

(see above). These secondary syllabics are then vocalized into *in*, *il*, *er*, respectively, e.g. **pōklelom* > **pōkləlom* > **pōkl̥₂lom* > CLat. *pōcillum* ‘little cup’, **skabnelom* > **skabnəlom* > **skabn̥₂lom* > **skabinlom* > CLat. *scabillum* ‘footstool’, **agrelos* > **agrəlos* > **agr̥₂los* > **agerlos* > CLat. *agellus* ‘little field’ (Meiser 1998: 74; Weiss 2011: 123).

Final-syllable syncope (possibly contemporaneous with open-syllable syncope, round 1)[220] affects the vowels *o* and *i* before word-final *s*. The result develops thereafter *lautgesetzlich*, e.g. **mn̥tis* > **mentis* > **ments* > CLat. *mēns* ‘mind’, sakros ‘sacred’ (from *Lapis Niger*, a VOLat. text) > **sakr̥₂s* > **sakerr* > CLat. *sacer*, as well as **deksiteros* > **dekstəros* > **dekstros* > **dekstr̥₂s* > CLat. *dexter* (cf. Weiss 2011: 123).

Final raising, round 1 involves two related processes and concerns word-final syllables ending in a consonant (vowels in absolute word final position are not affected): first, raising on the front axis, affecting word-final *e* and *ə* (< *a*), and second, raising on the back axis, affecting word-final *o*; that is, (*e*, *ə*) > *i* [ɪ], *o* > *u* [ʊ], respectively, e.g. 1st decl. dat./abl.pl. **-a̯is* > **-ə̯is* > *-īs*, *fēced* ‘made’ > *fēcit*, 3rd decl. gen.sg. **-es* > *-is*, **is-tod* > *istud* ‘that (of yours)’, 3pl. ending **-ont* > *-unt*. Since high vowel laxing had already produced centralized allophones for *i* and *u* in final syllables, this change is unspectacular in phonetic terms and is visualized in Figure 8.

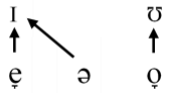

Figure 8: Final raising, round 1.

This change has two apparent and two real exceptions. First, few CLat. word forms end in *-ĕs*, e.g. *mīlĕs* ‘soldier’ (gen. *mīlĭtis*), but such forms contained a long final consonant at the time of final raising, i.e. OLat. *mīlĕss* (< **mīlĕt-s*) in Plautine scansion, and are thus not affected. Second, the sequences **-em* and **-om* (most notably of the acc.sg. endings in the 2nd and 3rd declensions)[221] are unaffected. This is due to the fact that *m* exerted a nasalizing effect on the preceding vowel (i.e. [ẽm], [õm]). Nasalisation typically makes the vowel also more open (i.e. [ɛ̃m], [ɔ̃m]) and prosodically longer, with the possible (but not obligatory) loss of the nasal consonant itself (i.e. [ɛ̃ː], [ɔ̃ː]). Whether such nasalisation occurred as a regular process in every environment, is not known with certainty,[222] but it certainly prevented these sequences from taking part in final raising.[223] Third, **-o-* is retained after a labial glide (**u̯*) or labiovelar (**kʷ*), e.g. **ekʷos* ‘horse’ > *equos* (e.g. Cato *Mor. frg.* 2) > *ecus* (e.g. Lucr. 4, 420) → (analogically after forms such as gen.sg. *equī*) *equus*, OLat. comflvont ‘flow together’ (*CIL* I² 584, 117 BC) > CLat. *confluunt* (Meiser 1998: 71, 84). Lastly, the sequence *-en* is not affected, apparently without any particular phonetic motivation, e.g. PIE **h₃neh₃mn̥* > PIt. **nōmn̥* > CLat. *nōmen* ‘name’ (Meiser 1998: 71).

[220] In Umbrian, final-syllable syncope is, however, younger than medial-syllable syncope (Götze 1923: 99).
[221] Fourth declension has an etymological *-um*, while the fifth declension *-em* had still a long vowel (**-ēm*) at the time of final raising.
[222] Cf. the regular elision of -V*m* sequences in poetry as well as the frequent *m*-less forms in epigraphy, e.g. OINO, DVONORO, OPTVMO, VIRO, CORSICA, VRBE (*CIL* I² 9) ≡ CLat. *ūnum*, *bonōrum*, *optimum*, *virum*, *Corsicam*, *urbem*. Cf. Meiser 1998: 94. Was this the current orthographic norm at that time?
[223] Judging from the fact that the orthography with <M> became standard and was used until Late Latin, the nasal consonant was most likely preserved at least in some environments (e.g. in sandhi before a consonant).

The changes discussed above constitute the second stage of VW/VD changes. They were completed before the third century BC, since, as predicted by Rix (1966: 160–162) and confirmed by Nishimura (2010b: 231), the centralized allophones survived until the beginning of the literary period. But before this period, ISS was replaced by the Penultimate rule. This fact – Leppänen and Alho (2018) suggest – is crucial for explaining the rest of the VW/VD changes, since, after the adoption of the Penultimate rule, reduced vowels [ə, ɵ] became (or would have become) accented in certain environments.

The **Penultimate rule**, that is, the Classical Latin accentuation system, replaced ISS during the fourth century BC. Bisyllabic words were (as under ISS) accentuated on the first syllable, and tri- or polysyllabic words on the second-to-last syllable (the penultimate) if it was prosodically long (i.e. *naturā* or *positione*), otherwise the accent fell on the third-to-last syllable (the antepenultimate), e.g. *amı́cus*, *perféctus*, *fácĭlis*. In Old Latin, there was the additional **Facilius rule**, that is, quadrisyllabic words with four successive short syllables were accented on the first syllable (the ante-antepenultimate) rather than on the antepenultimate, e.g. *fácĭlĭus*. Before the adoption of the Penultimate rule, the allophonic distribution caused by VW was already phonologised, i.e. it was no longer synchronically dependent on the location of the accent: when the new accentuation was adopted, the allophones remained. This shift from ISS to Penultimate rule, I argue, initiated the third stage of VW/VD changes.

Schwa-strengthening refers to the replacement of schwas (i.e. [ə] and its rounded allophone [ɵ], the products of VW) with more sonorous vowels, resulting in a reshuffling of phonemes and allophones within the vowel system. This corresponds, roughly, to "Process II" of Nishimura (2010b: 231–232). Let us consider two stock examples of VW, VOLat. **re-fakiō* and **re-faktos*: in the first two stages of VW they were regularly reduced to **réfəkɪō* and **réfəktʊs*, and subsequently the weakened allophones in the medial and final syllables were phonologised (i.e. they became normative) in the sound structure of these word forms. When the Penultimate rule was adopted, the expected outcomes would have been **refə́kɪō* and **refə́ktʊs* – with accented schwas.[224] This would have been a highly untypical scenario in phonetic terms, and it would have created a new phoneme /ə/. Instead, schwas in accented syllables were replaced by (or reinterpreted as) the neighbouring more sonorous vowels; schwas in other syllables followed suit. This change was conditioned by the phonetic environment: in medial open syllables *ə* > *ɪ* and *ɵ* > *ʊ* (Nishimura's "Process A"), in medial closed syllables, before *r*, and in final syllables *ə, ɵ* > *e* (Nishimura's "Process B"), e.g. **réfəkɪō* > *refíciō*, **réfəktʊs* > *reféctus*, **túbəkən(n)* > *tubicen*.[225] If the phonologisation of the allophones would not have taken place, the original vocalism of the simplex, i.e. ˣ*refaciō,* ˣ*refactus*, ˣ*tubacan*,

[224] *Pace* Nishimura (2010b: 245), who states that vowels reduced to *i* remain unaccented under the Penultimate rule. In fact, it is not uncommon that the reduced vowel becomes accented, e.g. *refíciō* (< **réfəkɪō*), *adhíbeō* (< **ádhəbeō*), *diffícilis* (< **dísfəkɪlɪs* < **dis-fakil-*), and in certain paradigms the accent may occasionally fall on the syllable containing the reduced vowel, e.g. *cécidī* (< **kékədəi̯* < **ké-kad-ai̯*) vs. *cecídimus* (< **kékədəmʊs*) vs. *cecidḗre* (< **kékədērɪ*).

[225] This conditioned distribution must be due to certain phonetic (articulatory, perceptual or acoustic) factors. For example, it is a general tendency that vowels next to a *r*-sound tend to become or remain more open, cf. Gr.(Att.) χώρᾱ (not ˣχώρη) vs. τῑμή. According to Sen (2012), vowels in closed syllables were phonetically longer than in open syllables: since open vowels require more articulation time than close ones, *ə* in closed syllables was strengthened into *e* instead of *i* in open ones. Nishimura (2010b: 231, n. 241) points out that writing <E> for *ə* was the default spelling in Old Latin texts, due to the articulatory similarity of *e* and *ə* (both are unrounded mid vowels). The issue has both phonological and orthographic perspectives.

would most likely have been reinstated by way of a phonological process (that is, not by morphological analogy). Schwa-strengthening is visualized in Figures 9 and 10.

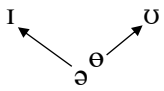

Figure 9: Schwa-strengthening, process A.

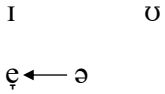

Figure 10: Schwa-strengthening, process B.

As a result of schwa-strengthening, medial *i*'s, *u*'s and *e*'s were no longer considered allophones of their original full vowels (i.e. *a, e, o*): these strengthened schwas merged phonemically with the pre-existing short vowels *i, u* and *e*. The initial corner high vowels *i* and *u*, fully stressed under ISS and, hence, phonetically non-reduced [i] and [u], were most likely very soon centralized into [ɪ] and [ʊ] as well, since accentuation and position (initial vs. non-initial) were no longer conditioning factors for allophones, and under the Penultimate rule initial syllables could in any case be either accented or unaccented. The transcription of *i* with <ε> in Latin loanwords into Greek supports this conclusion, e.g. *comitium* 'assembly' → κομέτιον (*IG* 14, 951) (Allen 1978: 49). This was a further step towards the peripherality distinctions, a characteristic feature of Classical and Late Latin vocalism, which developed during the first two centuries BC.

During and after schwa-strengthening, that is, in the third and second centuries BC (sporadically even later), there occurs a considerable amount of orthographic variation in the writing of the reduced and strengthened vowels. Some, such as PONTVFEX (*CIL* I² 1488, early third century BC) < **ponti-fak-s*, seem to imply that also the corner high vowels *i* and *u* were reduced into schwas at the first stage of VW. As pointed out by Nishimura (2010b: 232), such cases most likely represent fluctuating orthography during the transitory period, and should not be counted as evidence for schwa-reduction of *i* and *u*. According to him, "phonetic ambiguity between [i] and [ə] and between [i] and [u] in unstressed syllables seems to have perplexed native speakers" (*loc. cit.*). But this explanation needs clarification and is as such not quite accurate, considering that in Nishimura's model VOLat. **i* and **u* are **not** reduced nor even centralized, meaning that, as close corner vowels, *i* and *u* would have been at all periods clearly differentiated (by the features *maximally front* vs. *maximally back*, and *unrounded* vs. *rounded*) and thus clearly distinguishable for any native speaker.[226] Instead, Leppänen and Alho (2018) offer the following explanatory factors for the attested orthographic fluctuation:

- First, in my model the centralized *ɪ*, *ʊ* and the reduced *ə* (*ɵ*) occupy a rather narrow articulatory space. Thus, the confusion has a better articulatory (and/or perceptual) motivation in comparison with a model that does not presume laxing.
- Second, phonological environment is known to affect both pronunciation (vowel harmonic effect) and orthography, and the attested Latin epigraphy offers a multitude of examples of this. Thus, the phonological context motivates both orthography and the result of schwa-strengthening, at least to some extent.

[226] Also cf. Bloomfield (1926: 157): "such a thing as 'a small difference in sound' does not exist in language", and Labov (1994: 15–16): "no matter how small a phonetic distinction may seem to outsiders, native speakers will have no difficulty in identifying it if it consistently distinguishes two groups of words".

– Third, although writing is to a varying extent based on, and influenced by, the current pronunciation of a language, it is unwise to assume that sporadic spelling variants directly reflect the actual pronunciation.[227] Rather, we ought to acknowledge that the written form of a language is also a *variety* in itself, consisting partially of its own set of norms. Moreover, a choice for a particular variant (on the part of the writer of the text) can be explained by the rational explanation; hence, there is need to understand the pragmatic motivation for a particular spelling (e.g. striving after maximally official-looking language, etc.). Thus, the normative aspect need to be considered in the light of the available contextual factors.

The orthographic confusion occurs exclusively in open medial syllables, e.g. PONTVFEX (*CIL* I² 1488) < **ponti-fak-s*, CLat. *pontifex*; TEMPESTATEBVS (*CIL* I² 12, ca. 260 BC) < **-ibʰos*, CLat. *-ibus*; SVRVPVERIT (*CIL* I² 756.14), CLat. *surripuerit*; HEC (*CIL* I² 9, late third century BC), CLat. *hĭc*; OLat. *mancupis* gen.sg. (< **mankəpɪs* < **man-kap-es*), CLat. *mancipis*; OLat. *optumus*, CLat. *optimus* (and other superlatives), etc. Apart from sporadic cases, this concerns *i* and *u* in a prelabial environment (as noted by Nishimura 2010b: 232). The cases where an etymological *i* is written <V> or <E> are most likely due to the cramped articulatory space of the short medial vowels, coupled with the rounding effect of the following labial (thus *ɪ* > *ɵ* > *ʊ*) and the attempt to write in a good, official register (for example, <V> and <E> are as graphemes more prominent than <I>).[228] As for the *optumus* : *optimus* confusion, we must first note that, although the *i*-form was canonized in the classical literature, the epigraphic record abounds in superlatives with *u*, even in the late Republican and Imperial Periods (see *CIL* VI index, p. 289), indicating that it actually did not fall out of use in Classical Latin (with the exception of the highest literary register).[229]

The phonetic context also plays an important role. As noted by Nishimura (2010b: 233f), adjacent *i*-vocalism tends to propitiate the *ə* > *i* process, while it has already been established that labial and *l pinguis* contexts allow the schwa to be rounded, i.e. *ə* > *ɵ*, whence regularly *ɵ* > *u*. Thus, Leppänen and Alho (2018) suggest that the phonetic context is relevant for the

---

[227] Such argument rests on the assumption that ancient scribes and inscribers *consistently* attempted to render the spoken form of an utterance *phonetically* into writing. It is clear that in some cases fluctuating orthography is indeed caused by a mismatch between the spoken and written form, provided that the writer of the text has not properly internalized the norms and prescriptions of the written register. But in the case of most Old Latin texts, we rarely have access to this kind of information, meaning that such assumption is not warranted as the working hypothesis in historical linguistics.

[228] Also note that in the graphic sequences PONTVFEX, TEMPESTATEBVS and HEC, the vowel is preceded or followed by a letter with a prominent vertical element (such as <F>, <T>, <H>), adding to the need to graphically make the vowel more distinct-looking. The once attested PONTFEX (*CIL* I² 2835, early third century BC), can simply be a spelling mistake, although it is interpreted as a legitimate piece of evidence for vowel weakening by Wachter (1987: 344) and Vine (1993: 339).

According to De Decker (2012), the PIE ancestor of *pōns* was not an *i*-stem. He argues that the original noun was an *ehɪ*-stem and that the zero-grade form of the suffix was used in the compound (implying a PIE transponat **ponthɪ-dʰh̥ɪk-s*). This would then have resulted regularly in pre-Lat. **-a-*, which was subsequently weakened into *-i-*. It is difficult to show that this compound is that old, despite, e.g., the Old Indic parallel *pathi-kṛt-* 'path-maker'. Moreover, as is argued in this study, the phonologically regular result of VW of **-a-* before a labial consonant would be *-u-*; it is thus possible that the *hapax* PONTVFEX actually is the product of the regular VW, while the normal form *pontifex* is a renovation (i.e. a recomposition) based on the *i*-stem *pōns, pontis*.

[229] Why the *i*-forms were selected for the classical literature, is a complex and somewhat unrelated issue, which can be answered ultimately by rational expalantion: C. Iulius Caesar's role in the standardisation of *i*-forms seems to have been crucial (Allen 1978: 58). Also see Clackson and Horrocks (2007: Ch. V) on the standardisation of the Classical Latin literary register.

orthographic confusions (see above and below) and for the distribution of rounded vs. unrounded allophones of the reduced vowel, while the changes *ə* > *i* and *ɵ* > *u* themselves are regular. We may also generalise that adjacent *i*-vocalism seems to have a more prominent effect, often overruling the rounding effect of labial and *l pinguis* contexts, e.g. **kom-teneō* > **kontəneō* > CLat. *contineō* (no rounding context), **moi̯no-kapiom* > **mōnəkəpɪom* (> **mōnəkɵpɪom*?) > CLat. *mūnicipium* (*i*-context; the first *ə* > *i* is regular), **mone-mentom* > **monəməntom* > **monɵməntom* > CLat. *monumentum* (rounding context, no *i*-context). Another good example is **ad-kapiō* > **akkəpɪō* (> **akkɵpɪō*?) > CLat. *accipiō* vs. **ob-kapō* > **okkəpō* > **okkɵpō* > CLat. *occupō*.

We must also note that there are two special conditions, under which either VW does not materialize in the expected way or schwa-strengthening has irregular results:

- First, the effect of *vowel harmony* (also called the **Alacer rule**) has often been discussed in the literature: in a sequence of vowels, the sound value of the first vowel is extended into following vowels, e.g. *alacer* 'lively' (not ˣ*alicer*), *vegetus* 'vigorous' (not ˣ*vegitus*) (Weiss 2011: 118–119). The effect may be purely graphic or actually reflect pronunciation, e.g. *anatēs* nom.pl. (of *anas* 'duck') is often taken to be a graphic modification of the expected (and phonetically real) **anətēs* – and the expected orthography is attested as *anitēs* (Plaut. *Capt.* 1003) and *anitum* (Cic. *Nat. Deor.* 2, 124), while the above cases of schwa-strengthening, e.g. *mūnicipium* and *accipiō* also qualify for a vowel harmonic effect. In several compounds, VW does not take place, e.g. *posthabeō* 'postpone' (vs. *adhibeō*), *calefaciō* 'make warm' (vs. *perficiō*). This can be plausibly attributed to recomposition, i.e. *posthabeō* is relatively young (Ter.+), or other factors, i.e. *calĕfaciō* was not yet univerbated at the time of the initial stages of VW, since it shows the effect of iambic shortening, that is, **kalē fakiō* > **kalĕ fakiō* > CLat. *calefaciō* (also cf. *calfaciō* with late syncope, and *calficiō* as an analogical remodelling after the *perficiō*-type compounds).
- Second, analogical extension and levelling may, in some cases, be shown to undo the effects of VW. Two such examples are discussed by Nishimura (2010a: 235f; following Garrett 2005): *concrepō* 'rattle' (not ˣ*concripō*) and *ēdoceō* 'instruct' (not ˣ*ēdiceō*). As an effect of (occasionally) accented root vowels and analogical pressure of simplex verbs (*crepō*, *doceō*), the original root vocalism is restored.[230] Although the conditions under which such restoration occurs has, to some extent, been successfully identified, the occurrence of analogical levelling cannot in general be predicted with 100% accuracy. As has been noted, some verbal compounds are very sensitive to VW (e.g. °*ficiō*) while some are never affected (e.g. *adamō*, *redamō*, from *amō* 'love'). This may be a frequency-induced phenomenon (low-frequency verbs lack VW), or a desire to avoid homophony (e.g. *ad-amō* (not reduced) vs. **ad-emō* > *adimō* (reduced)) but the issue cannot be investigated in more detail in this study.

[230] To be sure, I do not fully agree with Garrett and Nishimura on the exact factors of the restoration process. As noted above, the phonologisation of word forms with reduced allophones of *e*, *a* and *o* must have occurred before schwa-strengthening, thus making the restoration of any "ideal phonetic representations" (Nishimura 2010b: 237) no longer possible. The only way for this to occur, then, is through standard analogical extension on the model of the simplex verbs (as partially admitted by Nishimura, *loc. cit.*).

Open-syllable syncope, round 2 occurs demonstrably after the transition to the Penultimate rule (see Nishimura 2011: 4f). The affected vowel in these cases either immediately follows or precedes the accented syllable, e.g. *bálineum* 'bath' (Plaut.+, ← Gr. βαλανεῖον)[231] > *balneum* (Caecil.+), *válidē* 'strongly'> *valdē* 'very' (both Plaut.+), *discipulī́na* 'instruction' > *disciplīna* (both Plaut.+), *aévitās* 'age' (*Lex XII*) > *aetās* (Plaut.+). The co-occurrence of syncopated and non-syncopated forms in Plautus indicates that this change was on its way in about 200 BC and completed sometime later, perhaps by about 100 BC.

As Leppänen and Alho (2018) argue, these changes (in combination with other Old Latin sound changes) eventually lead into the "peripheralisation" of the Latin vowel system, which, in turn, was in part responsible for several mergers and other developments in Late Latin and Early Romance.

[231] Note the regular vowel weakening and hiatus shortening, confirming a relatively ancient date for this loan: **balanēom* > **balənēom* > **balənĕom* > OLat. *balineum*.

Appendix III: On normativity, correctness and rationality

This study is based on the metascientific concept of *linguistic normativity*. It includes important background assumptions that are relevant for linguistic analysis. According to this view, language is first and foremost a socially shared, or intersubjective, phenomenon. The structure of a language consists of and its contextual use is regulated by social norms. Two types of norms are most significant in linguistics: norms of correctness and norms of rationality. For most linguists working in the typological-functionalist tradition (as most linguists have done in the recent centuries),[232] most of what follows is implicitly known and to a degree self-evident. It is nonetheless important to be aware of one's metascientific underpinnings.

Norms of correctness, or *rules of language*, are the minimal building blocks of language structure, including the grammar and the lexicon: rules of language connect meanings to forms, and define the correct order of forms (Itkonen 1978, 2008).[233] An example of a rule of the Latin language could be described as follows: "the correct nom.pl. form of *servus* is *servī* (not, e.g., ˣ*servum*, ˣ*servae* or ˣ*servēs*)". Such rules are intuitively known (or in the case of Latin, were known) by the members of the linguistic community. In clear cases, rules of language are known with certainty, and the existence of a rule can be tested by making a *mistake* (Itkonen 1978: 124). It is important to note that, epistemologically, norms can only be intuitively known; norms, namely, are not statistical entities, which means that the existence of a norm cannot be verified (nor can it be falsified) by statistical analysis (cf. Bloomfield 1933: 37). As primarily social entities, norms cannot be reduced to individual-psychological phenomena either (Itkonen 1978: 117, 149; 1984: 205).

Despite their metascientific importance, such pretheoretical rules are of little linguistic interest (for example, claiming that nom.pl. of *servus* is *servī* is hardly a linguistically significant feat); it is rather the case that the linguist formulates concepts, theories and generalisations (termed *rules of grammar*) concerning these mostly trivial rules of language (Itkonen 1978: 126; 2008: 293–294). This is the basis of synchronic grammatical descriptions. However, it is important to note that pretheoretical rules of language and theoretical rules of grammar do not stand on an equal footing: while rules of language are intuitively known with certainty by the members of the linguistic community, in the minds of which they have certain neuro-psychological representations (called the *internalisation* of norms), rules of grammar are theoretical constructs, whose details are subject to the interpretation of the linguist that has formulated them (cf. Itkonen 1978: 193).

[232] The basic idea of normativity is practically as old as Western linguistics, ultimately reaching back to the Greek and Roman grammarians. In modern linguistics, normativity and its aspects have in some form been discussed by Whitney (1875), de Saussure (1916), Trubetzkoy (1939), Coseriu (1975), Bartsch (1987), Anttila (1989), and Mäkilähde et al. (2019). From the philosophical perspective, normativity has been discussed by Wittgenstein (1958), von Wright (1963), Searle (1969), Wedgewood (2007), Owens (2012), and Brennan et al. (2013). Central to the bridging of the gap between the philosophical and linguistic discussion has been Esa Itkonen, who has argued for the importance of linguistic normativity since the 1970s in numerous publications (see this chapter for references).

[233] Note that such concepts as "norms", "rules" and "correctness" ought in this context not to be confused with *prescriptions*. Linguistic prescriptivism is not directly related to the metascientific discussion on normativity. As prescriptions concern contextual language use (for example, how to write good scientific English in a research article), they belong to the domain of rationality.

While rules of grammar are falsifiable like any other theoretical constructs, rules of language are in principle unfalsifiable (Itkonen 1978: 197). There is namely a difference between norms and normative behaviour: the occurrence of an incorrect expression does not falsify the norm or make it disappear (Itkonen 2003: 22). As pointed out above, the existence of norms is inseparable from the possibility of making mistakes (i.e. producing incorrect expressions). However, every language also includes a certain domain, in which the existence of rules is intuitively unclear (i.e. it is not clear whether a certain expression is correct or not). This kind of domain, called the *gray area* of normativity, occurs, for example, during ongoing language change (Itkonen 1978: 151; 2003: 34). We will return to this shortly.

The other type of norms, norms of rationality, concern contextual language use (see Itkonen 1983). The basic idea is that human language activity is *goal-directed*: when a person utters an expression, the person had a certain goal in mind (be it consciously or unconsciously), which the person believed he/she could achieve by uttering the expression (and not any other expression) (Itkonen 2013–14: 10–13). This is at the heart of *rational explanation*: by exposing the underlying goals and beliefs that the language user had, the respective instance of language use has been adequately explained (cf. Itkonen 1978: 26–27; Anttila 1989: 399f). Rational language use is largely trivial, but in the study of ancient languages it highlights the importance of understanding the socio-cultural environment, in which the languages were used (Anttila 1975). High-level theoretical generalisations of rational language use are *rationality principles*, which aim at capturing universal properties of human language activity. Perhaps the best-known rationality principles are *Grice's maxims* (Grice 1975). Note also the two-way independence of correctness and rationality: it is possibly to act rationally by uttering incorrect expressions and to act irrationally by uttering correct expressions (Itkonen 2008: 295).

The starting point for historical linguistic analysis is that language change is primarily a special type of social change (Itkonen 1984: 204), and that it originates from language use, which is subsumable under rational explanation (Itkonen 1983: 211). It is certainly the case that norms are not immutable entities: norms are known to vary according to time, place and context. The presumption is that language change originates from individual cases of incorrect but rational language use. What was originally an incorrect expression, may in time become a correct one, once it has gained a significant frequency of occurrence, and the expression has been reinterpreted as a norm (this is called the *ontological leap*). The intermediate period, during which the status of the norm is unclear, is the gray area of normativity. As pointed out above, the existence of a norm is not subject to statistical analysis, but in the absence of a reliable intuition, statistical analysis may be required in order to provide an adequate description of the ongoing language change (Itkonen 2008: 297).

In terms of actual historical linguistic analysis, such diachronic correspondences as PIE **$h_1$és-ti* > Lat. *est* can be understood as a kind of shorthand for all the language change and norm change processes that have taken place according to the scheme sketched above. Various well-known mechanisms of language change, such as the regularity of phonological change and certain types of analogical change, can be understood as rationality principles. In the analysis of individual instances of language change, it is seldom necessary to explicitly refer to rational explanation or to all other components of normativity; this practice is followed also in this study.

Appendix IV: Deutschsprachige Zusammenfassung

Ablaut und das lateinische Verbum: Aspekte morphophonologischen Wandels

Diese Studie untersucht die Fortsetzung der aus der urindogermanischen Ursprache ererbten Ablautalternationen im lateinischen Verbalsystem. Das Ziel ist es, diejenigen Sprachwandelmechanismen zu analysieren, die zum Verlust bzw. zur Erhaltung dieser Alternationen geführt haben. Der Ausgangspunkt ist das (spät)urindogermanische Verbalsystem, dessen Entwicklung zuerst ins Uritalische und dann bis ins klassische Latein des 1. Jahrhunderts v.Chr. betrachtet wird.

Im Urindogermanischen haben jede Wurzel, mehrere Suffixe sowie wenige Personalendungen abgelautet: Der silbentragende Vokal dieser Morphemen alterniert, je nach morphologischen Verhältnissen, zwischen **e*, **o*, **ē*, **ō* oder Ø (= Null, kein Vokal), bspw. **$h_1$és-ti* ‚er/sie/es ist' : **h_1s-énti* ‚sie sind'. Diese Alternationen sind wahrscheinlich auf gewisse lautliche Umstände im Vorurindogermanischen zurückzuführen, die aber nicht mehr sicher rekonstruierbar sind. Dem Lateinischen fehlt ein solches paradigmatisches Alternationssystem. Allerdings hat die Sprache mehrere (wenn auch sporadische) Spuren der ererbten Alternationen bewahrt, bspw. *est* ‚er/sie/es ist' : *sunt* ‚sie sind', *faciō* ‚ich mache' : *fēcī* ‚ich machte', *dīcō* ‚ich sage' : *dĭctus* ‚gesagt', usw.

Das Ergebnis der Studie ist, dass der Verlust der Ablautalternationen sich teils durch regelmäßigen Lautwandel, teils durch morphologische Faktoren erklären lässt. Der Effekt des Lautwandels betrifft allerdings in den meisten Fällen nur einzelne Verben bzw. Formen und die fürs Lateinische typischen Lautveränderungen fanden meist zu spät statt, um die Entwicklung des Verbalsystems wesentlich beinflusst zu haben. Stattdessen spielt morphologischer Wandel, vor allem paradigmatischer Ausgleich, eine entscheidende Rolle: Bspw. ist der Ablautunterschied zwischen dem starken (Sg.) und schwachen (Pl.) Stamm beim Wurzelaorist (uridg. **d^{h}éh_1(k)-t* : **$d^{h}h_1$(k)-ént* ‚machen'), der im Uritalischen höchstwahrscheinlich noch erhalten war (etwa **fēk-ed* : **fak-ond*), im Lateinischen ausgeglichen worden (*fēcit* : *fēcērunt*). Aus funktionalen Gründen sind gewisse Alternationen jedoch erhalten geblieben, um funktionell verschiedene Formen voneinander auch formell genügend zu unterscheiden, bspw. Prs. *fugit* (< **b^{h}ug-i̯é/ó-* ‚fliehen') : Pf. *fūgit* (< **b^{h}éu̯g-*). Teilweise gehen ererbte Alternationen auch aus dem Grund verloren, dass lautgesetzlich regelmäßige Formen zu stark voneinander abweichen: Bspw. wird das erwartete nullstufige Ptz. von *vehere* ‚transportieren', d.h. **uctus*, durch eine vollstufige Variante (nach dem Präsensstamm) ersetzt, d.h. *vectus*.