

On the interaction between vowel confusions (<e> for /i/ and <o> for /u/) and lexical stress in Latin inscriptions from Rome (ca. 119 BCE – ca. 600 CE)

A preliminary study

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ABSTRACT

The aim of this article is to better define how changes in the Latin vowel system evolved over time in the stressed vs. the unstressed syllables in the Latin of Rome. To this end, the cases of <e> for /i/ and <o> for /u/ in an epigraphic corpus of 6,599 inscriptions from this city have been analysed by comparing the number of epigraphic errors occurring under and out of stress in five different periods. Our results indicate that, until about the 4th cent. CE, cases of <e> for /i/ and <o> for /u/ occur mostly in the unstressed syllables in our inscriptions, which is consistent with the view that the reorganisation of the vocalic qualities in the Latin vowel system affected the unstressed vowels before it affected the stressed ones. However, the same results also indicate that the number of epigraphic deviations concerning the stressed vowels /i/ and /u/ in our corpus increases from about the 4th–5th cent. CE onwards, and that this fact should be linked to the dephonologisation of contrastive vowel quantity (in the stressed syllables).

KEYWORDS

Latin inscriptions, “Vulgar Latin”, vowel system, lexical stress

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1. FRAMING THE PROBLEM

The reshaping of the “Classical Latin” (CL) vowel system (based on quantitative oppositions involving long vs. short vowels) into the Romance vowel system (based on qualitative oppositions involving different degrees of opening) was one of the most important changes that occurred in the transition from Latin to Romance. This change was the result of two main phonological processes: the dephonologisation of contrastive vowel quantity (CVQ), and the (progressive) emergence of qualitative distinctions (initially only allophonic) for the CL long vs. short vowels (with the short vowels progressively acquiring a more open quality than the corresponding long ones).¹ The latter process caused the short (open) /i/ and /u/ to gradually approach the quality of the long (close) /e:/ and /o:/, a circumstance that, after the loss of CVQ, led these two sets of phonemes to merge (as a close /e/ and /o/, respectively) in most of Romània (apart from the well-known exceptions of Sardinian, “Eastern Romance”, and some dialects of Southern Italy).²

It is usually assumed that the reorganisation of the vocalic qualities in the Latin vowel system went further in the unstressed syllables than in the stressed syllables. This hypothesis is supported by metalinguistic testimonies in Latin grammarians and by the evidence of the Romance languages. With regard to the latter, the vowel mergers that were just mentioned (/i, e:/ > /e/ and /u, o:/ > /o/) were also extended to the outcomes of the Latin short /e/ and /o/ outside stress, whereas these latter vowels were usually continued by (open) /e/ and /ɔ/ (rather than by close /e/ and /o/) in the stressed syllables.³

When it comes to the Latin grammarians, in his *De Orthographia* (2nd cent. CE), Terentius Scaurus prescribes to write the vowel of the (masculine and feminine) nominative plural ending -ēs of adjectives such as *facilis* and *docilis* by using the digraph <ei> instead of <e>, to further distinguish the final short /i/ of the nominative singular from the long /e:/ of the nominative plural endings of these adjectives.⁴ However, the same grammarian does not prescribe a similar distinction for the stressed vowels (long vs. short), since, in the latter case, he is satisfied with traditional orthographies such as *apex* and *I longa*.⁵ This circumstance may be particularly significant. According to Loporcaro,⁶ the testimony of Scaurus suggests that a graphic innovation was considered necessary (already in the 2nd cent. CE) in order to distinguish between two phonemes (namely, /i/ and /e:/) that were already in the process of merging in the unstressed (final) syllables, while the absence of similar prescriptions on the part of the grammarian

¹See (among others) LOPORCARO (2015) 32–33.

²LOPORCARO (2015) 54–56. In this case, it should be emphasised that “Eastern Romance” is probably better defined as “Daco-Romance”. This is because, according to ADAMIK (forthcoming), Dalmatian essentially underwent the same vowel mergers that occurred in most of the Romance languages (i.e. /i, e:/ > /e/ and /u, o:/ > /o/). On Sardinian (merging each of the CL long vs. short pairs), see now TAMPONI (2022). On the basis of the available evidence, the same type of vowel system as that of Sardinian was also attested in African Latin. On this point, cf. ADAMIK (2020), and see also PAPINI (2022b) 360–372 and references therein.

³HERMAN (2000) 34.

⁴Scaur. *GL* VII 33, 2.

⁵LOPORCARO (2015) 53. Cf. Scaur. *GL* VII 33, 4–10.

⁶LOPORCARO (2015) 53.



regarding the writing of the stressed vowels indicates that the merger of the stressed /i/ and /e:/ “was not yet a real threat in his time”.⁷

That the vowel mergers characterising most of the Romance languages occurred earlier (and went further) in the unstressed (mainly final) syllables than in the stressed syllables is also suggested by the epigraphic evidence. As Adams⁸ points out, inscriptional spellings with <e> for the short /i/ are attested in non-literary corpora from the first centuries CE especially in word-final position (notably, in verb endings; see, for example, <pugnabet> for *pugnabit*, which occurs twice in *CIL* IV 1989; one of the Pompeian graffiti; 1st cent. CE).⁹ According to Adams, the (relatively) high frequency of *e*-spellings (instead of /i/) in the final vowels (rather than in the stressed syllables) in these types of corpora indicates “the manner in which readjustments to the front-vowel system must have been getting under way in the early centuries of the Empire”.¹⁰ In particular, Adams suggests that the short /i/ in the unstressed (final) syllables was articulated with particularly reduced tension, so that it could be confused with the long (close) /e:/ more often than in the stressed syllables.

Most importantly, the same scholar points out that there are several indications of a diffuse tendency to abbreviate long vowels in this prosodic environment as early as the first centuries CE (at least in some “substandard” varieties of the language). For example, Sacerdos (3rd cent. CE) informs us that the *imperitissimi* shortened etymologically long vowels in final position with such a regularity that the grammarian considered it necessary to correct them (Sacerd. gramm. *GL* IV 494, 8–12).¹¹ This type of evidence is also particularly important. The abbreviation of long vowels in the unstressed (final) syllables (as described by Sacerdos) contributed drastically to the reduction of the functional load of CVQ outside stress (since it led to the progressive loss of oppositions, still functional in CL, such as those concerning the nominative vs. ablative singular of first declension lexical items, e.g. *puellā* ‘girl(F).NOM.SG’ vs. *puellā* ‘girl(F).ABL.SG’), which explains why, in the transition from Latin to Romance, qualitative confusion between vowels (originally) differing in both quantity and quality (i.e. /i/, /u/ and /e:/, /o:/) progressed more in the unstressed syllables than in the stressed syllables.¹²

According to Herman (1965),¹³ differences in the developments of the CL stressed vs. unstressed vowels were particularly pronounced in the case of Rome. In this epigraphic study, Herman examined (among other things) the effects of lexical stress on the vowel confusions (<e> vs. <i> and <o> vs. <u>) that occurred in “Christian” inscriptions (ca. 5th cent. CE – ca. first

⁷LOPORCARO (2015) 53. However, an alternative interpretation of Scaurus, passage is that the grammarian prescribes writing the nominative plural of adjectives such as *facilis* and *docilis* as <facileis> and <docileis> in order to distinguish (graphically) the CL nominative singular ending *-is* from the Old Latin ending *-īs* (< **-ins*), the original ending of the accusative plural of the *i*-stems of the third declension. For the latter ending (*-īs*) could in some cases be extended by analogy even to the nominative plural (cf. LEUMANN (1977) 440; I thank Professor Béla Adamik for this suggestion).

⁸ADAMS (2013) 60.

⁹On verb *e*-spellings (instead of /i/) in the Pompeian graffiti, see VÄÄNÄNEN (1966) 21–22.

¹⁰ADAMS (2013) 60. According to this scholar, the verb *e*-spellings attested in Pompeii, and in other non-literary corpora, “reflect...an openness of *i*” in the final syllables (p. 59).

¹¹ADAMS (2013) 46–47. See also HERMAN (1968) 202, No. 12 and ADAMIK (2014).

¹²Cf. LOPORCARO (2015) 9–10.

¹³HERMAN (1965) 22–24.



half of the 6th cent. CE) from six areas of the Roman Empire (the Iberian Peninsula, Gaul, Northern Italy, Southern Italy, Rome, and Dalmatia).¹⁴ This examination led Herman to discover “une différence inattendue”¹⁵ between Rome and the other provinces (especially Gaul) in this respect. In particular, Herman observed that, when considering only those “misspellings” which “correspondent à la fusion préromane bien connue entre *e* et *i* dans la série palatale”, and “*o* et *u* dans la série vélaire”,¹⁶ (i.e. in the “short version” of his examination, as defined by Adamik¹⁷), in Gaul, about 29.3% of the cases of <e> vs. <i> and <o> vs. <u> were attested under stress, whereas in Rome the proportion of deviations in the stressed syllables fell to about 13.2%. This led him to conclude that (at least) in Rome the vowel mergers that characterise most of the Romance languages were still occurring in the stressed syllables with a lower intensity than in the unstressed syllables, even as late as the 5th–6th cent. CE, which is consistent with the view that these mergers occurred earlier (and went further) out of stress than under stress (as discussed *supra*).

However, Herman’s (1965) analysis was (mostly) focused on the study of diatopic variation. Herman was primarily interested in investigating whether the vowel system developed differently in the six areas he studied during the transition from Latin to Romance. This caused him to consider a largely homogeneous corpus of inscriptions in terms of their dating. Consequently, he did not address the question of how vowel confusions in the stressed vs. the unstressed syllables evolved over time (with particular reference to the Latin of Rome). This state of affairs requires a further investigation, which will be offered in the following pages.

2. MATERIALS AND METHODS

In order to integrate (and validate) the findings of Herman (1965) on the changes in the Latin stressed and unstressed vowel subsystems in the city of Rome, this article will examine the instances of <e> for /i/ and <o> for /u/ attested in a corpus of 6,599 inscriptions written in that city from about 119 BCE to about 600 CE. In particular, a distinction will be made between “misspellings” occurring under stress and “misspellings” occurring out of stress. Most importantly, since the main purpose of this study is to investigate how changes in the Latin stressed and unstressed vowels evolved over time, all the inscriptions (from Rome) considered in this article will be divided into five different periods, according to their dating. These periods are: 1) the “late Republic” (ca. 119 BCE – ca. 1 BCE); 2) the “early Empire” (ca. 1 CE – ca. 150 CE); 3) the “mid Empire” (ca. 151 CE – ca. 300 CE); 4) the “late Empire” (ca. 301 CE – ca. 450 CE); and 5) the “post imperial period” (ca. 451 – ca. 600 CE; cf. Table 1 below).¹⁸

This periodisation aims to reflect the main “sociolinguistic turning points” that have characterised the history of the Latin language. This corresponds to the methodological principles

¹⁴HERMAN (1965) 13.

¹⁵HERMAN (1965) 22.

¹⁶HERMAN (1965) 23.

¹⁷ADAMIK (2017) 182.

¹⁸As is well known, most of the existing epigraphic documents cannot be dated *ad annum*, but a *terminus post* and *ante quem* can usually be established. In order to place each inscription within the “correct” period, I have therefore calculated the “average” of these two *termini* and used it as an indicator. A similar method has already been used (among others) by ADAMIK (2023) 326, No. 20 and PAPINI (2022a) 240, No. 44.



Table 1. The epigraphic corpus from Rome: number of inscriptions per period

Period	No.	%
Late Republic	871	13.2
Early Empire	2,204	33.4
Mid Empire	1,874	28.4
Late Empire	1,344	20.4
Post imperial period	306	4.6
Total	6,599	100

proposed by Adamik, according to whom periodisations of Latin should be based on “sociolinguistic” and communicative aspects rather than on historical events, since “a change of rulers hardly ever coincides with a new era of language history”.¹⁹ On this basis, our first two periods (the “late Republic” and the “early Empire”) include all the inscriptions written in Rome during the centuries in which the process of “standardisation” led to the codification (and the establishment) of so-called CL. As for the next two periods (the “mid Empire” and the “late Empire”), they correspond to the gradual affirmation of what Mancini²⁰ has defined as “neostandard” Latin, *i.e.* the communicative register “fatto proprio dai ceti dominanti della società posteriore al III sec. d.C.”²¹ Finally, the last chronological division used here (the “post-imperial period”) includes inscriptions from Rome written during the space of time preceding the phase of Latin history that Adamik²² calls “transitional Latin” (ca. 600 CE – ca. 850 CE). Namely, the phase that would mark the “end” of the history of Latin as a unity, and witness the emergence of the Romance languages as independent linguistic systems.²³ As Adamik suggests, the study of the texts written during this “last” phase of Latin history concerns Romance rather than Latin linguistics, which is why, similarly to Herman (1965), this article will not consider epigraphic documents composed in Rome after the end of the 6th cent. CE.

¹⁹ADAMIK (2015) 643.

²⁰MANCINI (2005) 144.

²¹MANCINI (2005) 143. According to ADAMIK (2015) 647–684, CL lasted from ca. 120 BCE (the beginning of the “Late Republic” in our corpus) to ca. 250 CE (roughly corresponding to the chronological division between the “mid” and the “late Empire” in our periodisation). However, as pointed out by MANCINI (2005) 142–143, the harbingers of the process that would lead to the creation of the “neostandard” appear as early as the (mid-)2nd cent. CE (which explains why 150 CE marks the division between the “early” and the “mid Empire” in our corpus). Indeed, the language of non-literary documents such as the letters of *Claudius Terentianus* testifies to the gradual diffusion of a new communicative register among Latin speakers in the 2nd cent. CE, a register “caratterizzato dalla presenza di alcuni tratti ‘preromanzi’ ma al tempo stesso sufficientemente prestigioso da rappresentare...un modello uniforme di diffusione per gli alloglotti del latino L2”.

²²ADAMIK (2015) 650.

²³In this case, the chronological division of 450 CE between the “late Empire” and the “post imperial period” in our corpus corresponds roughly to the completion of HERMAN’S (1985) 89 “second wave of dialectalisation of Latin”, which took place during the Empire and “a duré jusqu’aux décennies qui ont suivi la chute de l’Empire d’Occident”. On this point, see also LOPORCARO (2015) 19.



With regard to the types of errors studied, I will only take into account inscriptional spellings such as <e> for the short /i/ and <o> for the short /u/ (as anticipated in the first part of this section). This means that, following Herman's (1965) "short version" (as defined above), not only "misspellings" concerning vowels that would not participate in the Romance mergers (e.g. <e> for the long /i:/), but also epigraphic deviations with <i> and <u> for the short /e/ and /o/ in the unstressed syllables will be excluded from the quantitative analysis in the following pages. Furthermore, unlike Herman (1965), I will also exclude hypercorrections involving the use of <i> for the long /e:/ and <u> for the long /o:/.

As Versteegh²⁴ points out, these types of hypercorrections primarily reflect the aspiration of the writers to spell according to the CL "norm", suggesting that they may be less influenced by lexical stress. This is because one cannot exclude the hypothesis that the authors of our inscriptions, in their (unsuccessful) attempt to reproduce the CL orthography, could sometimes have written <i> for /e:/ or <u> for /o:/, regardless of whether the vowels in question were stressed or unstressed. It can also be added that, according to the calculations of Herman,²⁵ Latin long vowels such as /o:/ and (especially) /e:/ tend to appear more often under than outside stress (the ratio of long to short vowels being of about 2:3 in the stressed syllables and of only 1:4 in the unstressed syllables), a circumstance that may also cause hypercorrections involving the use of <i> for /e:/ and <u> for /o:/ to occur more frequently (at least statistically) in the stressed than in the unstressed syllables. Consequently, the exclusion of hypercorrect spellings from our analysis aims to provide as reliable a picture as possible of how changes concerning the Latin vowels (stressed vs. unstressed) evolved over time in the city of Rome.

For the same reason, the quantitative analysis in the next section will also exclude those cases of <e> for /i/ and <o> for /u/ that may have an alternative explanation (either linguistic or non-linguistic) and should therefore not be used to argue for changes in the Latin vowel system.

These include forms that are probably merely archaising, and "special cases" of the type of <cives> instead of *civīs*.²⁶ To give some examples, recourse to archaism is likely in the case of the ending <-o(s)>/<-o(m)> (instead of *-ūs/-ūm*) of the nominative and accusative singular of 2nd declension lexical items, and in the case of the morpheme of the 3rd person singular of the perfect indicative (<-et> instead of *-it*). As is well known, these kinds of *o*- and *e*-forms (instead of /u/ and /i/) reproduce the ancient spelling preceding the change from /o, e/ to /i, u/ in the closed final syllables (ca. 3rd cent. BCE), and are common in inscriptions from the "Old Latin" period (see, for instance, <Luciom> for *Luciūm*, and <dedet> instead of *dedīt* in *CIL* I² 9; ca. 3rd cent. BCE).²⁷ However, the same forms are very persistent in Latin epigraphy, since they also occur in inscriptions written well after the time of the Republic (e.g. <servos> for *servūs* = *CIL* VI 2344; 2nd cent. CE, or <fece(t)> for *fecīt* = *CIL* VI 13753; 1st cent. CE). This suggests that such forms are most likely traditional orthographies, meaning that they do not testify to the qualitative similarity of the short /i/ and /u/ with the long /e:/ and /o:/.²⁸

²⁴VERSTEEGH (2002) 64.

²⁵HERMAN (1968) 197–198. See also LOPORCARO (2015) 11.

²⁶The term "special cases" to define the instances of the spelling variation with <e> vs. <i> and <o> vs. <u> that may have an alternative explanation is often used by ADAMS (2013).

²⁷Cf. WEISS (2020) 149 and 151–152. On the label "Old Latin", cf. ADAMIK (2015) 646–647.

²⁸Cf. (among others) ADAMS (2013) 42 and 63.



Regarding <cives> (for *civīs*), Galdi²⁹ notes that the *e*-spelling represents about half of the cases of <e> for /i/ occurring in the nominative singular of 3rd declension lexical items in the inscriptions from the Eastern provinces, and that about half of the cases of <-is> for -ēs in the same inscriptions are represented by <milis> (instead of *milēs*). This led him to conclude that epigraphic orthographies such as <cives> and <milis> (for *civīs* and *milēs*) arose from a “contamination” between these two nouns, “d’impiego comunissimo sulle epigrafi (molto spesso in coppia...) e di struttura fonetica molto vicina”.³⁰ In other words, forms such as <cives> (for *civīs*) in our inscriptions (e.g. *CIL* VI 2379; second half of the 2nd cent. CE) may have an alternative explanation, and, for this reason, cannot serve the purpose of our analysis.³¹

In the same vein, an alternative (linguistic) explanation is also possible for those cases of <e> for /i/ and <o> for /u/ that occur in hiatus position (e.g. <suscipeat> for *suscipiāt* = *CIL* XV 7171; ca. 371 CE – ca. 399 CE, or <annoente> instead of *annūente* = *ICUR* V 15410; 5th cent. CE). These types of *e*- and *o*-spellings indicate that, before another vowel, /i, e/ and /u, o/ could be realised as [j] and [w], respectively, meaning that they do not testify to the subsequent Romance developments (but rather to a different linguistic change).³²

A different issue is the “stressed” cases of <e> for /i/ and <o> for /u/, which affect the writing of prepositions such as *cūm* and *in* (e.g. <con filio suo> instead of *cūm filio suo* = *ICUR* I 719; mid-6th cent. CE). As Allen³³ points out, prepositions were liable to be subordinated accentually to the words whose case they governed, with prepositional phrases tending to be treated as unitary entities for stress purposes. The phenomenon is also illustrated by the inscriptional evidence. For example, the interpuncts are sometimes used to group together prepositions and dependent nouns and adjectives in the Vindolanda writing tablets, which, according to Wallace, testifies to the “enclitic character of prepositions”.³⁴ This makes it uncertain whether, for the purposes of our investigation, inscriptional forms of the type of <con> (for *cūm*) just mentioned should be classified as stressed (i.e. as individual words), or rather as unstressed (taking into account the proclitic treatment of prepositions), which justifies their exclusion from the quantitative analysis in the next pages (although the latter solution proposed here is probably preferable).³⁵

Before concluding the discussion in this section, the following point should be made. Of the 9 cases of <e> for the short /i/ attested in the “late Republican” inscriptions included in our corpus, the only 3 that occur in the stressed syllables are the instances of the form <tricepitem>

²⁹ GALDI (2004) 169–173.

³⁰ GALDI (2004) 172.

³¹ However, this is not the case for all the instances of <e> for the short /i/ occurring in the nominative singular of 3rd declension lexical items. On this point, cf. VÄÄNÄNEN (1966) 84, who suggests that Pompeian cases of the type of <fideles> (instead of *fidelis* = *CIL* IV 4812; 1st cent. CE) “relèvent sans doute de la phonétique, e indiquant une prononciation ouverte de i” (see also GALDI (2004) 175–176).

³² Cf. (among others) VÄÄNÄNEN (1981) 46.

³³ ALLEN (1978) 88.

³⁴ WALLACE (2011) 23.

³⁵ Inscriptional spellings involving prepositions are given a separate treatment even by GAENG (1968); see, for example, the discussion on <con> at pp. 91–93. Moreover, epigraphic spellings of the type of <con> may also reflect the influence of compound verbs beginning in *co(n)-* (e.g. *con-ficio*), which further explains why these forms were not considered here (cf. ADAMS (2013) 64).



for *tricipitem* in *CIL* I² 2520a, c, and e, 3 of the 5 curse tablets (1st cent. BCE) that constitute the small corpus of the so-called Johns Hopkins *Defixiones*.³⁶ However, since *CIL* I² 2520a, c, and e were most likely written by the same person (*i.e.* they probably represent the speech and writing habits of a single individual), <tricipitem> in these texts alone cannot be considered representative of Roman Latin in the 1st cent. BCE, especially with regard to the study of the changes that affected the Latin stressed and unstressed vowels (the main purpose of this article). Therefore, the 3 instances of this form have also been excluded from the quantitative analysis in the following pages.³⁷

The same applies to the *e*-spellings (instead of /i/) that modify the orthography of the Greek surname *Callityche* (this name is written twice as <Caletyche> and once as <Caletic(he)> in our corpus).³⁸ In this case, it should be emphasised that Καλλιτύχη in Greek is accented on the penultimate syllable (and not on the antepenultimate one as in Latin), which makes it a “special case” in terms of lexical stress. Indeed, one cannot exclude the hypothesis that (at least some) speakers in Rome could sometimes pronounce the *cognomen* with the same accentuation as in Greek, meaning that the 3 *e*-forms found in our corpus in relation to this name could also concern an unstressed /i/. For this reason, similarly to the instances of <tricipitem> just mentioned, even these *e*-forms have not been included in the quantitative analysis in the next section.³⁹

3. QUANTITATIVE ANALYSIS

The study of the 6,599 inscriptions from Rome included in our corpus allowed us to locate 128 cases of <e> for /i/ and <o> for /u/ that (most likely) anticipate the subsequent Romance developments (excluding the archaisms and the “special cases” discussed in the previous pages). In order to examine how changes in the Latin vowel system evolved over time in the stressed vs. the unstressed syllables in the Latin of Rome, the quantitative analysis in this section will now compare the number of epigraphic errors (<e> for /i/ and <o> for /u/) that occur under stress in our inscriptions with the number of errors that occur out of stress, in each of the five periods defined in section 2. The results of this analysis are summarised in Table 2 below.

³⁶The inscriptions of the “late Republic” do not attest to any case of the spelling variation with <o> vs. <u> which could testify to the subsequent Romance developments. This may confirm that in Rome the merger of the front vowels /i/ and /e:/ occurred earlier than the corresponding merger on the back-vowels axis, as it was the case in most of the Latin-speaking world (cf. discussion in ADAMS (2013) 63 and references therein). In any case, this issue is well beyond the scope of this article, and will be addressed in a future contribution.

³⁷That the Johns Hopkins *Defixiones* were written by the same individual is suggested by the fact that the texts of all the tablets are identical, apart from the names of the “victims”. This may indicate that the curses were prepared in advance by a “professional magician”, and that some spaces were deliberately left blank to be filled in later at the request of the client (cf. URBANOVA (2018) 223–225). On the interpretation of the form <tricipitem> in *CIL* I² 2520a, c, and e, see the discussion in PAPINI (2022a) 250–251.

³⁸Cf. *CIL* VI 7185, *CIL* VI 9537, and KROPP (2008) 1, 4, 4, 15, respectively. All these inscriptions date back to the 1st cent. CE.

³⁹Similar issues may also apply in the case of <Arteme(dori)> (for *Artemidōri*; cf. Gk. Ἀρτεμίδωρος = *CIL* I² 2316; 1st cent. BCE), <Caledrome> (instead of *Callidrome*; cf. Gk. Καλλιδρόμη = *ICUR* IX 24357; second half of the 4th cent. CE), and <Leonedes> (for *Leōnides*; cf. Gk. Λεωνίδης = *ICUR* VIII 20824; 457 CE). Therefore, even these forms have been excluded from the quantitative analysis in section 3.



Table 2. Epigraphic errors (<e> for /i/ and <o> for /u/) in the stressed vs. the unstressed syllables in inscriptions from Rome

		Late Republic	Early Empire	Mid Empire	Late Empire	Post Empire
Errors under stress	No.	0	1	4	13	7
	%	0	9.1	14.3	22.4	26.9
Errors outside stress	No.	5	10	24	45	19
	%	100	90.9	85.7	77.6	73.1
Total	No.	5	11	28	58	26
	%	100	100	100	100	100

As this table shows, the relative proportion of epigraphic “misspellings” involving the use of <e> for /i/ and <o> for /u/ in the stressed syllables tends to increase over time in our inscriptions (as compared to the “misspellings” in the unstressed syllables), especially in the last two periods considered (*i.e.* the “late Empire” and the “post imperial period”). This is evidenced by the fact that, of all the *e*- and *o*-spellings (instead of /i/ and /u/) attested in the epigraphic documents written in Rome between ca. 301 CE and ca. 450 CE, and between ca. 451 CE and ca. 600 CE, about 22.4% (or 13 out of 58), and about 26.9% (*i.e.* 7 out of 26), respectively, occur in the stressed syllables (*e.g.* <Methrae> instead of *Míthrae* = *CIL* VI 511; 377 CE, or <colomna> instead of *colúmna* = *CIL* VI 8460; 452 CE).

These values are higher than the value of ca. 14.3% of stressed deviations found in the inscriptions of the “mid Empire”, which, in turn, is higher than the ca. 9.1% proportion of stressed errors found in the “early imperial” inscriptions.⁴⁰ Moreover, as discussed in section 2, apart from the 3 instances of <tricepitem> instead of *tricípitem* in the Johns Hopkins *Defixiones* (which were all probably written by the same person), the epigraphic documents of the “late Republic” have no stressed instances of <e> for /i/ (nor <o> for /u/). In other words, the data in our corpus seem to confirm the hypothesis that, in Rome, qualitative confusions involving /i/ vs. /e:/ and /u/ vs. /o:/ affected the unstressed syllables before they affected the stressed syllables, which is consistent with the evidence discussed in section 1.

However, it should also be noted that in Latin the short /i/ and /u/ occur about 2.7 times more frequently in the unstressed syllables than in the stressed syllables. This means that, on the hypothesis that confusions involving these two vowels (/i/ and /u/) and the long /e:/ and /o:/ were equally advanced under stress and outside stress in a given period, the expected proportion of *e*- and *o*-spellings (instead of /i/ and /u/) appearing under stress in an epigraphic corpus should be around 27%. This value corresponds approximately to the proportion of stressed deviations found in the inscriptions of the “late Empire” (22.4%) and, especially, the “post imperial period” (26.9%), while the texts from the “late Republic” to the “mid Empire” show

⁴⁰Excluding the three instances of the form <Caletyche>/<Caletic(he)> and the cases of <e> for /i/ and <o> for /u/ occurring in the case of prepositions (on which cf. section 2), the only stressed *e*-spelling in the inscriptions of the “early Empire” is <Meni> for *Míni* (most likely a variant of the Latin surname *Minus*; cf. FORCELLINI (1913–1920), *s.v.*) = *CIL* VI 5093; 1st cent. CE.



values considerably lower than that this expected 27% (see Table 2 above).⁴¹ This fact may be particularly significant. It may suggest that, in Rome, from about the 4th–5th cent. CE, vowel confusions between the short (open) /i/ and /u/ and the long (close) /e:/ and /o:/ were starting to also occur under stress with considerable frequency, rather than being mostly restricted to the unstressed syllables (as it seems to have been the case before).⁴²

In my own view, these results should be related to Herman's (1982) findings on the dephonologisation of CVQ in Roman (and African) Latin. In this study, Herman compared the proportion of versification errors in the stressed and the unstressed syllables in a corpus of 279 metrical inscriptions from Africa (ca. 1st cent CE – ca. mid-4th cent. CE) with the proportion of the same errors in two epigraphic corpora from Rome, the first contemporary and the second later (ca. mid-4th cent. CE – ca. 6th cent. CE).⁴³ He found out that, in Africa and in the “later” inscriptional corpus from Rome, versification errors affected the stressed vowels in about 27% and 29% of the possible cases, respectively, whereas, in the “earlier” Roman corpus, only about 8.6% of all metrical deviations occurred in the stressed syllables.⁴⁴

Leaving aside the significance of Herman's (1982) findings for the question of whether CVQ (in the stressed syllables) was lost in Africa before it was lost in Rome,⁴⁵ what is most important for the present investigation is that these findings suggest that, in Rome, CVQ was (probably) still preserved in the stressed syllables (but “endangered” out of stress, according to the definition of Loporcaro)⁴⁶ before about the mid-4th cent. CE, but that, from this time onwards, the

⁴¹The given value of ca. 27% can be derived from the text counts in HERMAN (1968), who analysed the distribution of ca. 11,000 vowel phonemes in some passages of Cicero's letters (cf. p. 196, No. 2). Herman points out that, in Latin, ca. 37.2% of vowels are stressed and ca. 62.8% are unstressed, and he also offers separate counts for each vowel in the stressed and the unstressed syllables (cf. p. 197). More specifically, Herman points out that stressed /i/ and /u/ together account for ca. 22.4% of the stressed vowels (/i/ = 14.3% and /u/ = 8.1%). Since, as just mentioned, the stressed vowels account for ca. 37.2% of the total number of vowel phonemes in Latin, it can be deduced that stressed /i/ and /u/ represent ca. 8.3% of these phonemes, i.e. $(37.2/100) \times 22.4\%$. Similarly, unstressed /i/ and /u/ represent ca. 36.3% of the unstressed vowels (which, in turn, are 62.8% of all Latin vowels; cf. *supra*). Hence, unstressed /i/ and /u/ make up about 22.8% of all Latin vowels (or, 36.3% of the 62.8% representing the vowels in the unstressed syllables). The ratio of unstressed to stressed /i/ and /u/ is, therefore, ca. 2.7 ($=22.8/8.3$), which means that, in an average Latin corpus, ca. 27% of all /i/'s and /u/'s (taken together) would be stressed ($=1/(1+2.7)\%$).

⁴²In this case, it should be emphasised that, in the inscriptional sample (still) from Rome (5th–7th cent. CE) of GAENG (1968), there are 6 stressed *e*- and *o*-spellings against 240 correctly written instances of (stressed) /i/ and /u/, corresponding to a “degree of error” of ca. 2.4%. On the contrary, in the unstressed syllables, there are 36 cases of <e> for /i/ and <o> for /u/ against 559 “standard” orthographies (“degree of error” = ca. 6.1%). According to a *chi*-squared test for independence, this difference is statistically significant ($X^2(1) = 4.8$, *p*-value < 0.05), suggesting that cases of <e> for /i/ and <o> for /u/ are significantly less frequent under than outside stress in Gaeng's inscriptions. However, it should be emphasised that GAENG (1968) does not take into account stressed errors occurring in the case of monosyllables other than prepositions (cf. pp. 64–65 and 91–93), and, most importantly, that this scholar's discussion of the evidence does not always allow for the elimination of the “special cases” (see, for example, <cibes> for *civis* cited on p. 165). Consequently, Gaeng's data cannot be considered entirely reliable (given the small number of examples). On this point, see also ADAMS (2013) 37. For the calculation of the “degree of error” in epigraphic studies, see PAPINI (2022b) 360–372.

⁴³HERMAN (1982) 224.

⁴⁴HERMAN (1982) 225–228. On this point, cf. the discussion in LOPORCARO (2015) 41–42.

⁴⁵On this, see LOPORCARO (2015) 43–46.

⁴⁶LOPORCARO (2015) 42.



loss of phonological oppositions of vowel quantity was in the process of also affecting the stressed syllables. This is because, as mentioned above, about 37.2% of Latin vowels are stressed, which means that the proportion of versification errors in the stressed syllables in the “later” inscriptional corpus from Rome (and in the epigraphic corpus from Africa) approaches randomness, in contrast to the corpus of Roman metrical inscriptions from the 1st–4th cent. CE, where versification errors cluster in the stressed syllables with a frequency much lower than chance.⁴⁷

In this case, it should be noted that the mid-4th cent. CE (the period from which, according to Herman (1982), CVQ began to be “endangered” in Rome in the stressed syllables) is also about the time when cases of <e> for /i/ and <o> for /u/ start to occur under stress with considerable frequency in our corpus (as compared to the corresponding deviations in the unstressed syllables), since, as discussed *supra*, this occurs mainly during the “late Empire” and (especially) the “post imperial period”.⁴⁸

This may further clarify how the two fundamental changes that caused the reshaping of the CL vowel system into the vowel system of the Romance languages (*i.e.* the gradual opening of the short vowels and the dephonologisation of CVQ; see section 1 above) became intertwined during the history of Latin (and the transition to Romance). In particular, our results suggest that the shift in quality of the short /i/ (and /u/) towards the place of articulation of the long /e:/ (and /o:/) could cause confusions in the writing (and speaking) habits of Latin speakers (at least from Rome) as early as the time of the “late Republic” (when the first instances of <e> for /i/ pointing in the direction of the subsequent Romance developments appear in our inscriptions). However, the same results also suggest that these confusions were (mostly) limited to the unstressed syllables during the whole period from the “late Republic” to the “mid Empire”, probably because CVQ was still preserved in the stressed syllables at that time, which made it more difficult for confusions between vowels that originally differed in both quantity and quality to occur under stress. Nonetheless, this state of affairs seems to have changed in the 4th–6th cent. CE, *i.e.*, from about the time when, according to Herman (1982), CVQ also became “endangered” in the stressed syllables. This is because, from this period onwards, our cases of <e> for /i/ and <o> for /u/ begin to also appear in this prosodic environment with considerable frequency (unlike before).

In other words, our results may provide a more precise picture concerning the “relative chronology” of the changes in the Latin vowel system in the stressed and the unstressed syllables (at least in Rome). Specifically, these results suggest that the vowel system of the city of Rome had made a step forward towards the (Western) Romance vowel system (merging /i/ with /e:/ and /u/ with /o:/ both under and outside stress) during the “late Empire” and, especially, the

⁴⁷On this point, cf. the discussion in LOPORCARO (2015) 42. On the relative proportion of stressed and unstressed vowels in Latin, cf. above, No. 41.

⁴⁸In this case, it should be emphasised that a Fisher exact test could not confirm that the proportion of errors in the stressed vs the unstressed syllables in our corpus changes significantly over time. This, however, may simply be due to the fact that the test did not have enough statistical power (because of the low number of epigraphic examples of <e> for /i/ and <o> for /u/ in our corpus). Indeed, two individual goodness of fit tests suggested that the proportion of cases of <e> for /i/ and <o> for /u/ in the stressed syllables is significantly lower than the expected 27% during the entire period from the “late Republic” to the “mid Empire” ($X^2(1) = 5.4$, p -value < 0.05), but that the same does not hold true for our last two periods ($X^2(1) = 0.43$, p -value = 0.51).



“post imperial period”, and that this step was probably related to the changes affecting CVQ (in the stressed syllables) at that time (for it is possible that these changes might now have favoured qualitative confusions involving also the stressed /i, e:/ and /u, o:/).⁴⁹

Even negative evidence should be taken into account. For example, it should be emphasised that the generalisability of our results is limited by the fact that our inscriptions have very few cases of <e> for /i/ and <o> for /u/ that may point in the direction of the subsequent Romance developments, which is probably due to the high level of orthographic competence of Roman writers.⁵⁰ Second, our results should be validated by further inscriptional inquiries considering other areas of the Roman Empire (using similar methods to those used here).⁵¹ However, despite these limitations, the present article can still shed some new light on how changes in the Latin stressed and unstressed-vowels subsystems evolved over time (with particular reference to the city of Rome).

4. PRELIMINARY CONCLUSIONS

The study of a corpus of 6,599 inscriptions from Rome in this article allowed us to locate 128 cases of <e> for /i/ and <o> for /u/ that (probably) testify to the shift in quality of the short /i/ and /u/ towards of the place of articulation of the long /e:/ and /o:/. In order to investigate how changes in the Latin vowel system evolved over time in the stressed and the unstressed syllables, the quantitative analysis in section 3 compared the number of errors occurring under stress in our inscriptions with the number of errors occurring out of stress in five different periods (cf. *supra* section 2). Our results indicate that the proportion of the stressed instances of <e> for /i/ and <o> for /u/ in our corpus gradually increases over time, which is consistent with the hypothesis that the reorganisation of the vocalic qualities in the Latin vowel system affected the unstressed syllables before it affected the stressed syllables (see section 1 above).

However, our results also indicate that, from about the 4th–5th cent. CE (*i.e.* from the “late Empire” and the “post imperial period”), cases of <e> for /i/ and <o> for /u/ begin to also occur in the stressed syllables (rather than in the unstressed syllables) with a frequency more similar to that of chance, suggesting that, from this time on, qualitative confusions involving /i/ vs. /e:/ and /u/ vs. /o:/ were also taking place under stress (in contrast to the period from the “late Republic” to the “mid Empire”).

This can be related to [Herman’s \(1982\)](#) findings on the dephonologisation of CVQ in Rome, since these findings indicate that the CL oppositions of vowel quantity came to be also “endangered” in the stressed syllables from about the mid-4th cent. CE (roughly corresponding to the time when stressed cases of <e> for /i/ and <o> for /u/ begin to appear with considerable frequency in our inscriptions). Specifically, the hypothesis proposed here is that the dephonologisation of CVQ (under stress) favoured qualitative confusions between vowels that previously differed in both quantity and quality to also occur in this prosodic environment,

⁴⁹As already proposed by [ADAMS \(2013\)](#) 62 (among others).

⁵⁰On this point, see also [PAPINI \(2022a\)](#) 258.

⁵¹In this case, [ADAMIK \(2023\)](#) 338–340 also offers a study of the mergers of the stressed and the unstressed vowels over time. But this latter study uses a different periodisation than the one used here (cf. [ADAMIK \(2023\)](#) 323), and, most importantly, does not consider epigraphic documents written during the Roman Republic (unlike this paper).



which may provide a more precise “relative chronology” (and a linguistically-informed explanation) of the changes in the Latin vowel system (under and outside stress) in the city of Rome.

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