FRAMEWORKS OF REFERENCE IN THE IDENTIFICATION OF LATIN DIALECTS[1]

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Abstract: Various studies proved that the methodology of J. Herman produces plausible and veri-fiable results in the field of Latin dialectology, but certain methodological questions remained still unanswered regarding our points of reference in the decision which proportions of the data of the inscriptional faults are classified significant; how to decide on the basis of the proportion of a certain error type if a certain linguistic change was in progress, if it was completed, or if it was not active in the examined territory; which types of errors can serve as base or bases of comparison for a specific examined error type; which periods and territories should be the point of reference in comparisons. In the present study, we attempt to give answers to these questions by running statis-tical surveys using different points of reference in statistical significance and different bases of comparisons in the error types, and we set up a list of expected results based on the known tenden-cies of sound changes in Vulgar Latin against which we will measure the actual results of the survey in order to determine which methods were the most effective in meeting the expected pic-ture that we already know about the development of Romance languages.
Keywords: vulgar Latin, dialectology, methodology, regional diversification, phonology, inscriptions

Introduction and methodology

After the incomplete and erroneous approaches of scholars like P. A. Gaeng, W. Omeltchenko, J. L. Barbarino and J. N. Adams,[2] a functioning methodology for sta-tistical analyses in inscriptional Latin dialectology was devised by J. Herman and improved by B. Adamik,[3] which resulted in the establishment of the Computerized

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[2] These methods are applied in their works, see Gaeng 1968, Omeltchenko 1977, Barbarino 1978 and Adams 2008. The refutation of their methodology is found in Adamik 2012.

[3] See the detailed explanation of the methodology in Herman 2000b and Adamik 2012.

Historical Linguistic Database of Latin Inscriptions of the Imperial Age or (also known as "Late Latin Database", and henceforward abbreviated as LLDB).[4] In the previous years, various studies proved that the Herman-methodology is capable of producing plausible and verifiable results in the field of Latin dialectology, but certain inherent problems in this methodology presented themselves, as well. In linguistic analyses conducted according to the Herman–method, a certain misspelling within a given territory is measured and compared to other types of misspellings in the same territory or in several other territories. However, since the proportions of a certain misspelling may be greatly varied in different territories of the empire and can further vary through time, a significant problem emerges regarding our point of reference in comparisons: what degree of the proportion of a certain misspelling in a given territory can be considered low or high, weak or intensive? Which geographical areas and which periods of time should be the point of reference in comparisons? Does the average proportion of that certain phenomenon, if counted from the totality of the data of the entire empire, suffice as an "imperial average" to serve as a neutral point of reference? Which types of errors can a linguistic phenomenon be measured against? These questions are of highest importance, because in the study of Latin dialectology the linguistic variations and changes always manifest themselves over the course of time, and the researcher needs to know not only whether a certain phenomenon was prominent in a given period, but also whether it is prominent in comparison to other periods and to the other territories of the empire. In order to look closer into these methodological questions, we will conduct an experimental analysis in this paper with different statistical methods.

From the testimony of the documented Romance languages, we have a fairly complete knowledge about the different results of certain Latin sound changes in different parts of the Roman empire, even though in many cases the time or the exact place of origin, the progress or other details of the sound change are still unclear. However, these generally well-known regional results of a sound change in the Romance languages can allow us to make very probable predictions about the intensity of phenomena related to the specific Vulgar Latin sound change in areas of the empire where that specific sound change has occurred, which means that, according to the Herman–method, we can logically expect a higher proportion of certain misspellings related to that specific sound change in areas where the surviving Romance language inherited that sound change, and we can expect lower proportions of the same kind of misspelling where the local Romance language did not inherit it. If we select some very characteristic Vulgar Latin sound changes which resulted in different outcomes in different Romance languages, and about which outcomes we have reliable knowledge from all Romance languages, we can

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[4] Web address is given in note 1.

set up the list of those Roman provinces where we would expect higher and lower proportions of inscriptional faults related to the selected sound changes. Thus we will obtain a way to measure the effectivity of different statistical methodologies: methods which are able to demonstrate high proportions in those provinces where we expect to have higher values, and low proportions where we expect low, can be considered successful methods. The more provinces a method identifies with high proportions or low proportions according to our expectations, the better the method is. The best statistical method of dialect identification will be the one which will have the best scores in matching the expected list of provinces. In order that our conclusions be as uncompromised as possible, we exclude those provinces from the list of expected results where the presence and degree of the examined sound change is unknown or highly uncertain, and we analyze them separately, because in many of them certain outcomes are still more plausible than others, and if our results confirm a more plausible outcome, we can add this as corroborating evidence to the efficacy of the given statistical method.

1.1. Testing criteria of provinces

According to the principles that we have laid down, our first step is to select those ubiquitous and linguistically very well-known and very well evidenced phenomena from the history of Romance languages which will serve as subjects of our experiment on methodology. In this study, we choose to examine four characteristic Vulgar Latin sound changes, two of which were universal, and two of which were specific only to certain dialects which later became different Romance languages. The monophthongization of the /ae/ diphthong into simple /e/, and the loss of word ending /-m/ were Pan-Romance phenomena. We can measure the general degree of Vulgar Latin development with these. The loss of word final /-s/ and the change of the stressed short /u/ velar vowel to /o/ are dialect specific: Romance languages north of the Massa–Senigallia line plus Sardinia originally retained the word ending /-s/, Southern and Eastern Romance lost it, and during later developments almost all Northern Italian dialects lost it, as well.[5] We differentiate these as Western and Eastern Vulgar Latin, or later, Western and Eastern Romance dialects. The stressed short /u/ in most contexts changed[6] to /o/ in the aforementioned Western Vulgar Latin, and it changed to /o/ also in the Vulgar Latin of the entire Italian peninsula, therefore part of the Eastern Vulgar Latin block belongs here, too. We call this extended Western block the Italo–Western group. On the other hand, the

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[5] More about the elimination of the word-final /-s/, see Adamik 2017b.
[6] Tamás 1983, 45–48 on the various developments of the velar vowels.

stressed short /u/ was persevered in the rest of the Eastern group, and we call this diminished Eastern group as Balkan Romance or Balkan Vulgar Latin block. Within this block, Dalmatia was a mixed territory between the Italo–Western and the Balkan dialects, because the Dalmatian languages did not preserve the stressed short /u/ in open syllables, but it merged with the /o/ the same way as it did in the Italo–Western group. Sardinian Vulgar Latin, where none of these vowels merged, will be grouped together with the Balkan Vulgar Latin block, because the stressed short /u/ has the same outcome here. African Vulgar Latin is usually supposed to have had the same vowel system as Sardinia, therefore we put it in this second group, as well.

After the selection of the dialect-differentiating sound changes, the second step is to categorize the provinces according to the expected outcomes of the statistical survey: where do we expect higher and where lower proportions according to the Romance dialectal classifications detailed in the previous paragraph. We exclude the Greek speaking provinces from the analysis, although we include Thracia because large parts of it were on the Latin speaking side from the Jireček Line which divides the Latin and Greek speaking provinces of the empire. The expected statistical results of the provinces are shown in Tables 1–2 below:

High proportions (14)	Low proportions (14)	Unknown (10)
Moesia Superior	Sardinia	
Moesia Inferior		**Probably low (3)**
	Aemilia / Regio VIII	
Thracia	Liguria / Regio IX	Germania Superior
Dacia	Venetia et Histria / Regio X	Germania Inferior
	Transpadana / Regio XI	
Dalmatia		Britannia
	Raetia	
Sicilia		**Probably high (7)**
	Alpes	
Roma		Noricum
	Gallia Narbonensis	
Latium et Campania / Regio I	Lugudunensis	Pannonia Superior
Apulia et Calabria / Regio II	Aquitania	Pannonia Inferior
Bruttium et Lucania / Regio III	Belgica	
Samnium / Regio IV		Africa Proconsularis
Picenum / Regio V	Hispania Citerior	Numidia
Umbria / Regio VI	Baetica	Mauretania Caesariensis
Etruria / Regio VII	Lusitania	Mauretania Tingitana

Table 1. Expected results for the **/-s/ > ø faults**

76

High proportion (22)	Medium proportion (1)	Low proportion (9)	Unknown (6)
Sicilia	Dalmatia	Moesia Superior	
		Moesia Inferior	**Probably low (3)**
Roma			
		Thracia	Noricum
Latium et Campania / Regio I		Dacia	
Apulia et Calabria / Regio II			Pannonia Superior
Bruttium et Lucania / Regio III		Sardinia	Pannonia Inferior
Samnium / Regio IV			
Picenum / Regio V		Africa Proconsularis	**Probably high (3)**
Umbria / Regio VI		Numidia	
Etruria / Regio VII		Mauretania Caesariensis	Germania Superior
		Mauretania Tingitana	Germania Inferior
Aemilia / Regio VIII			
Liguria / Regio IX			Britannia
Venetia et Histria / Regio X			
Transpadana / Regio XI			
Raetia			
Alpes			
Gallia Narbonensis			
Lugudunensis			
Aquitania			
Belgica			
Hispania Citerior			
Baetica			
Lusitania			

Table 2. Expected results for the **/ú/ > O faults**

The allocation of most of the provinces in Tables 1–2 above does not require further explanation, but we must say a few words about some of them. Moesia Inferior, Superior and Thracia did not bequeath Romance languages to us, but according to some theories,[7] Romanian language might have been (in part) originated in the territories of Thracia and Moesia. This — and their geographical vicinity which makes their linguistic similarity more likely — is the reason why we group them together with Dacia. As for Raetia, although Rhaeto-Romance dialects exist, they are not exactly covering the ancient territory of Raetia, therefore we relied only on the assumption that Rhaeto-Romance is (in part) a descendant of Raetian Latinity, but the theory that links ancient Raetian language to the Etruscan language also connects Raetian Latinity to Northern Italian Vulgar Latin which had a significant Etruscan substrate. Africa Proconsularis, Numidia, Mauretania Caesariensis and Tingitana are always grouped together, because when our sources speak about "African Latinity", we do not know if this could refer to other African provinces or just to Africa Proconsularis (as "African" usually refers to that province alone). Again, their vicinity and similarity in culture bring us to categorize them together,

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[7] About the possible origin of Romanian language from the south of the Danube, Thracia, Moesia Inferior and Superor and even Pannonia Inferior, see Rosetti 1978 77, 215, Izzo 1986, 144–145 and Schramm 1997, 326, 340–342.

but we expect differences at least in the case of the two Mauretaniae which are very close and socio-politically very connected to the Iberian Peninsula and could have been influenced by Ibero-Romance tendencies (and vice versa). In the classification of /-s/ dropping and /-s/ keeping territories, the African provinces are marked as "unknown", but there have been indications that African Latinity might have been characterized by /-s/ dropping,[8] so these provinces are labelled as "probably high" regarding the proportion of word-final /-s/ elimination. The two Germaniae, Britannia, and the two Pannoniae and Noricum are always put into the "unknown" category, because there is no surviving Romance language in these territories, and we generally know very little about their Vulgar Latin. We can suppose that Pannonia Inferior, Superior and Noricum were linguistically somewhere between the Northern Italian and the Balkan Vulgar Latin,[9] their degree of /-s/ elimination was probably high as they are Eastern provinces, and because both Northern Italian and Balkan dialects eliminated the /-s/. With respect to the /ú/ > O phenomenon, they probably should produce low proportions, because all Balkan Romance languages were conservative regarding this change, however, we can expect the Pannoniae and Noricum to be more intensive in this phenomenon, because this is more intensive in the neighbouring Dalmatia, and even more intensive in Raetia and Northern Italy. The case of the Germanic provinces and Britannia is very similar, they are classified as "unknown", but as the Germaniae are neighbours to the Gallic provinces and Britannia is both close to Gallia and is of Celtic substrate like Gallia, it seems plausible for me to expect them to give similar results like the Gallic provinces, therefore they are expected to give higher or lower proportions in concert with the Gallic provinces.

The situation with the elimination of the word-final /-m/ and the E~AE confusions is both simpler and more complicated. Simpler, because as pan-Romance phenomena we expect them to be mostly invariable across the provinces, but more complicated, because they evidently are not entirely uniform, and there were a number of historical and cultural factors which caused these errors to increase or decrease in certain provinces. Nevertheless, we will expect them to be largely within the category of high and medium degree of proportion, but we set apart the Gallic provinces in the case of the /-m/ dropping, which we expect to be somewhat less intensive, more conservative, due to the fact that Gallo-Romance retained the distinction between nominative and accusative cases, even if not by preserving the singular accusative ending "-m", but by keeping the singular nominative "-s" endings. For speakers of the Gallic Vulgar Latin, observing the different orthography — even if not the

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[8] Adamik 2017b doesn't prove this but the discussion of frequent /-s/ omissions points to this direction.

[9] Gonda 2017a and 2017b.

pronunciation (but to a certain degree, maybe that, too) — for singular accusatives with the word ending "-m" was probably easier, and consequently we can expect a better retention ratio for the singular accusative word ending "-m" in the Gallic provinces. Because it is possible to give an easy justification about them, we also expect the isolated provinces, the islands, and those troubled frontier provinces to have a lower degree in these two pan-Romance phenomena, where Latin was not continued after the collapse. This includes Dacia, because it was not only relatively isolated from the rest of the empire, but also the shortest living province, Britannia (both an island and a less Romanized,[10] stormy province) and Sardinia (the latter one being not only an island, but also the most conservative territory regarding sound changes), the two Germaniae (in case of the /-m/ dropping, the influence from Gallia and their partially shared population is also an argument), the two Pannoniae and Noricum, all of which are war zones, and their inhabitants — we might suppose — probably weren't latinized enough to keep Latin as their language. The result can be seen in Tables 3 and 4:

High or medium proportions (30)	Probably lowest proportions (8)
Moesia Superior	Germania Superior
Moesia Inferior	Germania Inferior
Thracia	Britannia
Dalmatia	Noricum
Sicilia	Pannonia Superior
	Pannonia Inferior
Roma	
	Dacia
Latium et Campania / Regio I	
Apulia et Calabria / Regio II	Sardinia
Bruttium et Lucania / Regio III	
Samnium / Regio IV	
Picenum / Regio V	
Umbria / Regio VI	
Etruria / Regio VII	
Aemilia / Regio VIII	
Liguria / Regio IX	
Venetia et Histria / Regio X	
Transpadana / Regio XI	
Raetia	
Alpes	
Gallia Narbonensis	
Lugudunensis	
Aquitania	
Belgica	
Hispania Citerior	
Baetica	
Lusitania	
Africa Proconsularis	
Numidia	
Mauretania Caesariensis	
Mauretania Tingitana	

High or medium proportions (26)	Probably lowest proportions (12)
Moesia Superior	Gallia Narbonensis
Moesia Inferior	Lugudunensis
	Aquitania
Thracia	Belgica
Dalmatia	Germania Superior
	Germania Inferior
Sicilia	
	Britannia
Roma	
	Noricum
Latium et Campania / Regio I	
Apulia et Calabria / Regio II	Pannonia Superior
Bruttium et Lucania / Regio III	Pannonia Inferior
Samnium / Regio IV	
Picenum / Regio V	Dacia
Umbria / Regio VI	
Etruria / Regio VII	Sardinia
Aemilia / Regio VIII	
Liguria / Regio IX	
Venetia et Histria / Regio X	
Transpadana / Regio XI	
Raetia	
Alpes	
Hispania Citerior	
Baetica	
Lusitania	
Africa Proconsularis	
Numidia	
Mauretania Caesariensis	
Mauretania Tingitana	

Table 3. Expected results for the **/ae/ > E faults**   Table 4. Expected results for the **/-m/ > ø faults**
Note: Here the lowest proportions are not expected but allowed, as there can be a justification for their low degree.

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[10] Gutkind 1971, 146–148 demonstrates a low degree of Romanization in Britain.

In the case of the AE > E and -M dropping faults, as these were pan-Romance phenomena, and our analysis is focused on showing if they were present in all provinces with a relatively uniform proportion, we don't explicitly look for where they are higher and where lower than the imperial total or average by provinces or the proportion of Classical Rome, but we expect them to be more uniform, and we are only registering the extremely low proportions, those provinces where the activity of this process didn't seem to reach the normal level in the empire. In order to find the extremely low proportions, we calculate the value of *population standard deviation*[11] from the average of the provinces, and we register those provinces which have a lower value than the lower limit of the standard deviation. Scores are given for those provinces which fall in the extremely low (under standard deviation) category but are indeed expected to be in the low category according to Tables 3–4.

1.2. Points of reference in measuring the significance of error proportions

The third necessary step before we could run our survey is to determine some universal, empire-wide points of reference in respect to which a certain proportion of inscriptional faults can be considered higher or lower. The "imperial average", i.e. the average proportion of a certain phenomenon in the empire, counted from the totality of the data of the entire empire, was already applied in a number of studies[12] as a basic point of reference to determine the degree of intensity of the phenomenon. It is obvious that, when we investigate faults in the inscriptions which are of different degrees of frequency in the various provinces of the empire, we need to determine what degree of frequency is significantly high. We need to know what the average proportion of that phenomenon was in the Latin speaking world. In previous attempts, researchers used the total number of mistakes in the inscriptions of the whole Roman empire for the purpose of counting the average proportions of various linguistic phenomena: we took all kinds of data from all provinces and counted the proportion of the misspellings indicating final /-s/ or /-m/ drop or the degree of /ae/ monophthongization or the stressed short /u/~/o/ merger, and we compared the same types of spelling faults to these imperial average numbers.

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[11] Standard deviation is a statistic measure of dispersion in a frequency distribution, equal to the square root of the mean of the squares of the deviations from the arithmetic mean of the distribution. The population standard deviation is a parameter, which is a fixed value calculated from every individual value in the "population" (data values).

[12] For example, in Adamik 2017b or recently in Gonda 2019.

What might be the problem with this method? It completely neglects the fact that certain provinces or Italian regions, or the city of Rome, which is treated as a region, too, produce so high numbers of data that they overshadow the data of the majority of the provinces of the empire. It wouldn't be a problem if we didn't want to count a mean value of a certain misspelling for the purpose of using it as a point of reference, the geographical average of the regional diversification of Vulgar Latin variants. This method *does* give an average: the mean value of a certain misspelling per the total number of Latin speakers; however, not the mean value of the regional variants of Latin, but the mean value of all Latin speakers. To give a clear and very simplified example: let's imagine an empire consisting of two provinces, *Province A* and *Province B*. If the proportion of 250 misspellings caused by a *sound change X* to the 500 total data of all kinds of spelling faults is 50% in *Province A*, and the same value is 14% in *Province B*, where 10 of the same faults are measured to 70 total number of errors, then by counting the imperial average we have to add up 250 plus 10, the number of all faults indicating *sound change X* and divide it by 500 plus 70, the number of the total number of all types of errors in both territories. The result is 46%. It's so high because *Province A* (which had 50%) overshadowed *Province B* with its great number of data. The value we got here is the value of the average degree of *sound change X* per speakers, represented by the inscriptions they erected. The average form of vernacular as the theoretical middle ground between the two dialects of this experimental empire isn't realistically represented by this percentage. 46% represents only *Province A* and its strong 50% value. *Province B* which had 14% has almost disappeared in the result. 46% is not a mean value of the two dialects, but a mean value of all inscriptional faults, and thus, of all speakers who made them, and because *Province A* has probably more speakers, the dialect of *Province B* is relegated to insignificance and doesn't affect the value of the average.

	Province A	*Province B*
Errors indicating **sound change X**	250 data = 50%	10 data = 14%
Total number of errors	500 data = 100%	70 data = 100%
Imperial total average by totality of data	260/570 = 46%	
Average by provinces of the empire	50% ~ 14% = 32%	

Table 5. Counting the "imperial average" with two different methods

What could be the solution to this problem? We have to count the average not from the sum of all *errors X* of the empire, but from the proportion of *error X* to all data within each province, which was 50% in *Province A* and 14% in *Province B*. Thus we receive 32%, which is a faithful representation of the mean value of the dialects of the two provinces. Note that the difference between the two types

of average is very significant, 14%. This clearly demonstrates how much the method of calculation matters, and how flawed the calculation of the total number of data could be at certain extreme cases, where by "flawed", we mean the 46% didn't show the average value of *sound change X* of the territorial dialects, but it showed the average value per all speakers (all erectors of inscription). In the following survey, we will obtain information about which type of "imperial average" proves to be in practice more efficient point of reference to determine if a certain province has a higher or lower value of an error in comparison to the other provinces.

However, according to our hypothesis, the imperial average as a point of reference will not be enough, because it can only inform us about the mean value of an error type within the empire at a given period, and if most of the provinces have a high proportion of that error type, the imperial average will be high, and it will not accurately reveal all the provinces which had a high degree of that phenomenon, only the provinces with the most prominent degree. The high but not most prominent values will appear as average or even below average values. This means that the imperial average is only good for telling us about which provinces produced a higher or lower value from a certain phenomenon than the average of the empire in the examined time frame, but it doesn't inform us whether that certain phenomenon was high enough or significant enough to be considered a real phonetical process of permanent impact in respect to that basic degree of its occurrences which could have been expected as technical engraving mistakes (which didn't originate from a sound change in the language but from negligence, clerical *lapsus calami*, or from an individual habit in writing or pronunciation) in non-Vulgar but standard Classical Latin environment. Only if we know about an error type that it was of significant proportion in comparison to what we could have expected if the examined territory had not had that sound change which that error type indicates, only then we can more confidently conclude that the sound change in question was likely occurring or had occurred in the examined territory. In order to know that, we need another point of reference, we need to know what the proportions of spelling faults were in the non-dialectal, i. e., standard Classical Latin inscriptions. According to our suggestion, we can find this Classical Latin reference point of the basic value of spelling faults in the spelling mistakes of the inscriptions of the city of Rome in the early principate. We will specifically use the data of Rome from between 50 BC and 100 AD, because the LLDB is focused on the inscriptions of the imperial period, and the collection is very scant in respect to the republican era. However, we will not miss those earlier inscriptions: it's better to leave out the inscriptions of earlier decades, because if we went into the past beyond 50 BCE, the distribution of

errors would be starting to be dominated by all kinds of archaisms and phenomena peculiar to Old Latin rather than Classical. According to our hypothesis, the statistical data of the city of Rome from the Classical Latin period will be able to provide that basic, non-dialectal values and proportions of inscriptional errors that can serve as the point of reference in determining which values of a certain province are high enough to indicate a real sound change, and we expect it to work better than the imperial total or the average of the provinces. Classical Latin was quite stable and well preserved until 100 AD in Rome, while the imperial average from the same period would contain the various territorial discrepancies, as well, which would not give such a clear picture about the non-dialectal profile of inscriptional faults. Even Italy was too colourful in local variations, and rustic areas had interesting features which we wouldn't want to be represented in the basic non-dialectal point of reference, which explains why we choose only Rome, and not the whole Italy or the empire in the Classical Latin period.

1.3. Error types and groups serving as bases of comparison

The fourth essential step before we can run our survey addresses the question which types of errors a linguistic phenomenon can be measured against. In the practice of the Herman-school, researchers of Latin dialectology compare an error type to the total number of all types of errors (referred to as *omnes errores* in our tables), or to the number of those errors which had a true phonetical background (*errores phonologici*), in contrast to technical errors of the engraving process such as poorly designed letters (*errores technici*). The advantage of comparing our examined error type to all types of errors is that the errors of morphosyntax and technical errors fine-tune the result by important aspects of the linguistic reality; the disadvantage is the same — the technical mistakes and the errors of morphology distort the proportion of an error type indicating sound change. The *errores phonologici* are used as the basis of comparison in order to eliminate the aforementioned distortion: we expect to receive clearer results with this method, but its weakness is that the results are not calibrated by the other aspects of the corpus of inscriptional errors. We will run our surveys with a third, intermediate variant, too: comparing the examined error type to all linguistically relevant mistakes (phonology, morphology, syntax and semantic combined, which excludes the errors of writing technics only) which we will call the *errores grammatici*. This method might unite the virtues of comparison to the *omnes errores* and to the *errores phonologici*, as comparison in this happens to all phenomena that are linguistically relevant.

The problem with all of these methods, however, is that the variety and degree of intensity of linguistic developments change over time, and when we examine a certain phenomenon in the early and the late period, comparing it to the rest of the misspellings, if the other types of data are increased or decreased in number excessively between the compared periods, this change in the proportions can cause a distortion which makes our examined phenomenon appear less significant or more significant than it was. Let's see a simplified example. *Error type X* is present with 20 occurrences in the early period, which is 5% of all linguistic data from the period, and it is found that it increased to 50 occurrences in the later period, but it's just 1% of the data of the later period. According to our usual method, we were obliged to suppose a decrease in frequency in this case. But is it truly a decrease in frequency? We examine the rest of the data types, and we find that the overwhelming majority of the rest of the data consists of some typical and very characteristic late period sound changes (81%, indicated by *errors Y, Z, V, W*), which had such a big increase in data occurrence that it overshadows the proportion of our examined *error X* (1%). However, if we consider that 81% of the errors come from only a few, very "aggressively" increased error types, and this 1% of *error X* is actually 12,5% in comparison to the 8% of the other phonetical errors, while its earlier value 5% was just 11,36% compared to the 44% of other phonetical errors, we could argue that the seemingly five-fold decrease of *error X* in percentage (5% > 1%) might really have been a small increase of the intensity of this phenomenon, but it was unfortunately shadowed by some even bigger increase of a few other, more virulent phenomena.

	Early Period	Later Period
Errors indicating *sound change X*	20 data = 5%	50 data = 1%
Vehemently increased *errors Y, Z, V, W*	4 data = 1%	4050 data = 81%
Rest of the error types	44% Other phonetical errors 50% Technical errors	8% Other phonetical errors 10% Technical errors

Table 6. Example for distortion in the overall proportion of one error type due to extremely increased value of a small group of other errors

How can we circumvent this problem? Comparing the proportion of *error X* to its imperial total proportion, to its imperial average by provinces and to Classical Rome can certainly refine the picture, but we are trying to explore additional solutions at this chapter by finding the best bases of comparison. It's quite apparent that it's better to compare our examined error type to more than one reference points, and to find those reference points among the error types which are more or less static from period to period. One of the most static error types is the

errores technici[13] (although in the interest of emphasizing the extremities, its proportion was set increased and then lowered unrealistically in the previous example in Table 6). These types of errors don't depend on the status or developments of the changing Latin language. These types of technical errors can occur in Archaic Latin just as well as in the Classical Period or in the Late Vulgar Latin. Its proportion among the rest of the error types may depend in some degree on the intensity of the other error types, so if there are too many intensive sound changes at the same time they will overshadow the proportion of the *errores technici*. Another factor influencing the proportion of the *errores technici* can be the standard of civilization in the given province: if it is in poor condition and the populace is overwhelmingly barbaric in comparison to better Romanized provinces, the proportion of technical errors might be higher. However, we should not attribute too much significance to this factor, because higher civilization or economical standard can also mean an increase in the number of inscriptions which in turn increases the number of technically spoiled inscriptions.

The other most reliably static component of data in every period during the empire is the faults caused by the monophthongization process of the /ae/ diphthong. This process had started in the time of the mid-republic and was part of Vulgar Latin ever since. The educated classes tried to preserve its correct pronunciation for quite some time over the imperial era, but very high degrees of its proportion among the inscriptional errors make it sure that it was nothing more than an orthographic convention for the common people from at least the 1st century AD. Its consistently high proportion in every province makes it an excellent point of reference, similar to the *errores technici*.

Once we have got the results from comparing our examined error type to the *omnes errores*, to the *errores grammatici*, to the *errores phonologici*, to the *errores technici* and to the faults regarding the AE diphthong, and we have classified the provinces using the imperial total percentage, the average of the empire by provinces and the basic reference point of Classical Rome, a fifth step will still be needed: there will most likely be a number of provinces that do not match the expected category, but there might still be a way to "remedy" them. Another point of reference offers itself in the difference between the early period and later period values of the examined error type. If a province, which we expected to be

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[13] These are the various technical errors of the *lapicida*: mistaken repetition, confusion, unintentional omission of letters or syllables, obvious *lapsus calami* type of mistakes. The purely technical mistakes, labeled as "*errores technici*", are the carving mistakes of the *lapicida*: for example, the carving of F instead of E. The purely orthographical mistakes, "*errores orthographici*" are also included in this category in the present study, which are those faults that do not imply a change in the pronunciation but only a confusion about the use of certain letters that are pronounced the same, for example, the confusion between the letters C~K~Q and X~CS.

in the "high" category, ends up in the "low" category, shows a significant increment from the early period to the later period, we can argue that the process of that sound change has started, and may result in a fully completed sound change soon after the examined period. This is especially relevant when we examine a province which doesn't have many inscriptions from the late period, or where the custom of erecting inscriptions ceases very early, and it lacks testimony about the extent of the sound change.

2. Evaluation of the data

Our method of data processing was the following:[14] we divided the linguistic data for an early period and a late period, determined as from 1st to 3rd and from 4th to 8th centuries, but since the number of data can't be dated precisely to only one of the two periods, we included the data in the early period if their possible dating was spread out to the 4th (but no later than 325 AD) if their earliest possible date is earlier than at least 275 AD, and we included data in the later period also from the 3rd century if their possible dating was spread out later than at least 325 AD. We excluded the category labelled as *fortasse recte* in the LLDB, which are those inscriptional errors that potentially might be explained as correct. The ratios seen in the tables which I use for the analysis are obtained by the Herman-method.[15] For the current examination, I calculated[16] the relative frequencies of the errors of E~AE confusions (both when Classical Latin /ae/ is written as E and its hypercorrect version, when /e/ is written as AE), the disappearance of word-final /-m/ and its hypercorrect version, when an –M is spelled at the end of a word where it shouldn't be, the writing of Classical Latin short stressed /ú/ with the letter O and the elimination of word-final /-s/ (among these last two categories no hypercorrections were admitted). The data for the category labelled as "Classical Rome" are the data from the city of Rome which can be securely dated between 51 BC and 100 AD. When calculating the "average by provinces", the category "*Graecae et ceterae*" (which includes all of the non-Latin speaking provinces) wasn't counted toward the average of the provinces.

Tables 9–13 show results of our survey, where the results regarding letters AE and -M are given in two columns, in the first we find the number of provinces which had a very low degree of that error type (lower than the lower limit

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[14] All other statistical methodologies if otherwise not stated, are done as described in Gonda 2017a.

[15] The description of the methodology is found in Herman (2000b) and Adamik (2012).

[16] All statistics, if not stated otherwise, are counted from data according to the state of the LLDB in March, 2019.

of standard deviation) but their low degree could be justified (as explained in chapter 1.1), and the second column shows the percentage of this previous number in comparison to the number of all those provinces which were classified as having very low proportion (below the standard deviation). In these same tables, the results for -S and /ú/ > O are also given in four columns, where the first two columns contain the number of provinces that scored correctly according to our expectations as listed in Tables 1–2 and the percentage when compared to the number of all those provinces which we had a clear expectation about (28 in the case of –S and 32 in the case of /ú/ > O), and the two second columns contain the same things but with the addition of the provinces with "unknown" result expectations, as described in chapter 1.1 and in Tables 1–2. In case of the –S dropping and stressed short /ú/ > O mistakes, the provinces are classified high only if they have a proportion higher than the late imperial total, late average by provinces or Classical Rome. Abbreviations in the statistical tables are to be read in the following way: "Omn": *errores omnes*, "Gram": *errores grammatici*, "Phon": *errores phonologici*, "Tech": *errores technici*.

Territory	Omn	Gram	Phon	Tech	AE>E	-M	-S	Ú>O	Tech /Omn	AE>E /Omn	-M /Omn	-S /Omn	Ú>O /Omn	AE>E /Gram	-M /Gram	-S /Gram	Ú>O /Gram	AE>E /Phon.	-M /Phon	-S /Phon	Ú>O /Phon	AE>E /Tech	-M /Tech	-S /Tech	Ú>O /Tech	-M /AE	-S /AE	Ú>O /AE
Classical Rome	1043	892	653	151	88	25	16	0	14.48%	8.44%	2.40%	1.53%	0.00%	9.87%	2.80%	1.79%	0.00%	13.48%	3.83%	2.45%	0.00%	36.82%	14.20%	15.38%	0.00%	22.12%	18.18%	0.00%
Early imperial total	37475	31498	23763	5977	5639	1181	854	31	15.95%	15.05%	3.15%	2.28%	0.08%	17.90%	3.75%	2.71%	0.10%	23.73%	4.97%	3.59%	0.13%	48.55%	16.50%	13.15%	0.52%	17.32%	13.15%	0.55%
Early average by prov.									17.31%	14.35%	3.03%	2.97%	0.18%	17.24%	3.69%	3.65%	0.22%	22.85%	4.74%	4.32%	0.13%	45.41%	14.63%	17.41%	0.95%	18.21%	17.41%	1.43%
Graecae et ceterae	545	448	306	97	55	13	13	3	17.80%	10.09%	2.39%	2.39%	0.55%	12.28%	2.90%	2.90%	0.67%	17.97%	4.25%	4.25%	0.98%	36.18%	11.82%	19.12%	3.00%	19.12%	19.12%	5.17%
Aemilia / Regio VIII	232	188	117	44	33	5	4		18.97%	14.22%	2.16%	1.72%		17.55%	2.66%	2.13%		28.21%	4.27%	3.42%	0.00%	42.86%	10.20%	10.81%		13.16%	10.81%	
Africa proconsularis	2797	2277	1858	520	274	190	71	1	18.59%	9.80%	6.79%	2.54%	0.04%	12.03%	8.34%	3.12%	0.04%	14.75%	10.23%	3.82%	0.05%	34.51%	26.76%	20.58%	0.19%	40.95%	20.58%	0.36%
Alpes	188	150	105	38	22	4	6	1	20.21%	11.70%	2.13%	3.19%	0.53%	14.67%	2.67%	4.00%	0.67%	20.95%	3.81%	5.71%	0.95%	36.67%	9.52%	21.43%	2.56%	15.38%	21.43%	4.35%
Apulia et C. / Regio II	327	278	200	49	48	4	9		14.98%	14.68%	1.22%	2.75%		17.27%	1.44%	3.24%		24.00%	2.00%	4.50%	0.00%	49.48%	7.55%	15.79%		7.69%	15.79%	
Aquitania	525	401	343	124	57	7	50	2	23.62%	10.86%	1.33%	9.52%	0.38%	14.21%	1.75%	12.47%	0.50%	16.62%	2.04%	14.58%	0.58%	31.49%	5.34%	46.73%	1.59%	10.94%	46.73%	3.39%
Baetica	1005	800	647	205	65	66	16	1	20.40%	6.47%	6.57%	1.59%	0.10%	8.13%	8.25%	2.00%	0.13%	10.05%	10.20%	2.47%	0.15%	24.07%	24.35%	19.75%	0.49%	50.38%	19.75%	1.52%
Belgica	137	115	95	22	39	2	3		16.06%	28.47%	1.46%	2.19%		33.91%	1.74%	2.61%		41.05%	2.11%	3.16%	0.00%	63.93%	8.33%	7.14%		4.88%	7.14%	
Britannia	424	325	290	99	48	13	13	1	23.35%	11.32%	3.07%	3.07%	0.24%	14.77%	4.00%	4.00%	0.31%	16.55%	4.48%	4.48%	0.34%	32.65%	11.61%	21.31%	1.00%	21.31%	21.31%	2.04%
Brutt. et L. / Regio III	275	243	173	32	50	3	4		11.64%	18.18%	1.09%	1.45%		20.58%	1.23%	1.65%		28.90%	1.73%	2.31%	0.00%	60.98%	8.57%	7.41%		5.66%	7.41%	
Etruria / Regio VII	131	100	70	31	12	0	6		23.66%	9.16%	0.00%	4.58%		12.00%	0.00%	6.00%		17.14%	0.00%	8.57%	0.00%	27.91%	0.00%	33.33%		0.00%	33.33%	
Dacia	1114	949	699	165	137	39	25	1	14.81%	12.30%	3.50%	2.24%	0.09%	14.44%	4.11%	2.63%	0.11%	19.60%	5.58%	3.58%	0.14%	45.36%	19.12%	15.43%	0.60%	22.16%	15.43%	0.72%
Dalmatia	2923	2465	1854	458	658	38	39	1	15.67%	22.51%	1.30%	1.33%	0.03%	26.69%	1.54%	1.58%	0.04%	35.49%	2.05%	2.10%	0.05%	58.96%	7.66%	5.60%	0.22%	5.46%	5.60%	0.15%
Gallia Narbonensis	1220	1062	703	158	181	11	17	1	12.95%	14.84%	0.90%	1.39%	0.08%	17.04%	1.04%	1.60%	0.09%	25.75%	1.56%	2.42%	0.14%	53.39%	6.51%	8.59%	0.63%	5.73%	8.59%	0.55%
Germania Superior	1048	874	730	174	163	33	43	2	16.60%	15.55%	3.15%	4.10%	0.19%	18.65%	3.78%	4.92%	0.23%	22.33%	4.52%	5.89%	0.27%	48.37%	15.94%	20.87%	1.14%	16.84%	20.87%	1.21%
Germania inferior	461	374	322	87	79	8	25		18.87%	17.14%	1.74%	5.42%		21.12%	2.14%	6.68%		24.53%	2.48%	7.76%	0.00%	47.59%	8.42%	24.04%		9.20%	24.04%	
Hispania Citerior	1588	1319	959	269	213	85	30	4	16.94%	13.41%	5.35%	1.89%	0.25%	16.15%	6.44%	2.27%	0.30%	22.21%	8.86%	3.13%	0.42%	44.19%	24.01%	12.35%	1.47%	28.52%	12.35%	1.84%
Latium et C. / Regio I	838	717	537	121	126	23	11		14.44%	15.04%	2.74%	1.31%		17.57%	3.21%	1.53%		23.46%	4.28%	2.05%	0.00%	51.01%	15.97%	8.03%		15.44%	8.03%	
Liguria / Regio IX	153	105	79	48	18	3			31.37%	11.76%	1.96%			17.14%	2.86%			22.78%	3.80%		0.00%	37.40%	5.88%			14.29%		
Lugudunensis	461	379	307	82	49	10	47		17.79%	10.63%	2.17%	10.20%		12.93%	2.64%	12.40%		15.96%	3.26%	15.31%	0.00%	37.40%	10.87%	48.96%		16.95%	48.96%	
Lusitania	1361	1117	851	244	131	48	23	5	17.93%	9.63%	3.53%	1.69%	0.37%	11.73%	4.30%	2.06%	0.45%	15.39%	5.64%	2.70%	0.59%	34.93%	16.44%	14.94%	2.01%	26.82%	14.94%	3.68%
Mauretania Caes.	1006	775	605	231	131	36	32	1	22.96%	13.02%	3.58%	3.18%	0.10%	16.90%	4.65%	4.13%	0.13%	21.65%	5.95%	5.29%	0.17%	36.19%	13.48%	19.63%	0.43%	21.56%	19.63%	0.76%
Mauretania Tingitana	220	175	141	45	30	10	4		20.45%	13.64%	4.55%	1.82%		17.14%	5.71%	2.29%		21.28%	7.09%	2.84%	0.00%	40.00%	22.22%	11.76%		25.00%	11.76%	
Moesia inferior	1209	1049	676	160	143	81	33		13.23%	11.83%	6.70%	2.73%		13.63%	7.72%	3.15%		21.15%	11.98%	4.88%	0.00%	47.19%	33.61%	18.75%		36.16%	18.75%	
Moesia superior	696	605	420	91	93	19	15		13.07%	13.36%	2.73%	2.16%		15.37%	3.14%	2.48%		22.14%	4.52%	3.57%	0.00%	50.54%	17.27%	13.89%		16.96%	13.89%	
Noricum	946	843	710	103	242	7	18		10.89%	25.58%	0.74%	1.90%	0.00%	28.71%	0.83%	2.14%	0.00%	34.08%	0.99%	2.54%	0.00%	70.14%	6.36%	6.92%	0.00%	2.81%	6.92%	0.00%
Numidia	1853	1382	1244	471	214	52	45	5	25.42%	11.55%	2.81%	2.43%	0.27%	15.48%	3.76%	3.26%	0.36%	17.20%	4.18%	3.62%	0.40%	31.24%	9.94%	17.37%	1.05%	19.55%	17.37%	2.28%
Pannonia inferior	1411	1173	908	238	282	55	15	1	16.87%	19.99%	3.90%	1.06%	0.07%	24.04%	4.69%	1.28%	0.09%	31.06%	6.06%	1.65%	0.11%	56.77%	16.20%	5.05%	0.42%	16.32%	5.05%	0.35%
Pannonia superior	1205	1044	807	161	216	38	45		13.36%	17.93%	3.15%	3.73%		20.69%	3.64%	4.31%		26.77%	4.71%	5.58%	0.00%	54.10%	19.10%	17.24%		14.96%	17.24%	
Picenum / Regio V	200	179	132	21	31	2			10.50%	15.50%	1.00%			17.32%	1.12%			23.48%	1.52%		0.00%	59.62%	8.70%			6.06%		
Raetia	215	175	140	40	24	12	3		18.60%	11.16%	5.58%	1.40%		13.71%	6.86%	1.71%		17.14%	8.57%	2.14%	0.00%	37.50%	23.08%	11.11%		33.33%	11.11%	
Roma	8840	7738	5533	1102	1447	213	134	3	12.47%	16.37%	2.41%	1.52%	0.03%	18.70%	2.75%	1.73%	0.04%	26.15%	3.85%	2.42%	0.05%	56.77%	16.20%	12.83%	0.18%	8.48%	12.83%	0.14%
Samnium / Regio IV	547	463	321	84	99	7	5		15.36%	18.10%	1.28%	0.91%		21.38%	1.51%	1.08%		30.84%	2.18%	1.56%	0.00%	54.10%	8.48%	7.48%		16.20%	7.48%	
Sardinia	223	197	155	26	33	5	5		11.66%	14.80%	2.24%	2.24%		16.75%	2.54%	2.54%		21.29%	3.23%	3.23%	0.00%	55.93%	16.13%	13.16%		13.16%	13.16%	
Sicilia	32	25	20	7	3	2			21.88%	9.38%	6.25%			12.00%	8.00%			15.00%	10.00%		0.00%	30.00%	30.00%			40.00%		
Thracia	201	151	130	50	14	6	18		24.88%	6.97%	2.99%	8.96%		9.27%	3.97%	11.92%		10.77%	4.62%	13.85%	0.00%	22.00%	9.09%	56.25%		7.35%	56.25%	
Transpad. / Regio XI	399	329	215	50	63	5	8		12.53%	15.79%	1.25%	2.01%		19.15%	1.52%	2.43%		29.30%	2.33%	3.72%	0.00%	55.56%	9.09%	11.27%		7.35%	11.27%	
Umbria / Regio VI	395	343	220	52	65	29	9	1	13.16%	16.46%	7.34%	2.28%	0.25%	18.95%	8.45%	2.62%	0.29%	29.55%	13.18%	4.09%	0.45%	55.56%	35.80%	12.16%	0.45%	30.85%	12.16%	1.52%
Ven. et Hist. / Regio X	689	614	447	75	106	10	20	1	10.89%	15.38%	1.45%	2.90%	0.15%	17.26%	1.63%	3.26%	0.16%	23.71%	2.24%	4.47%	0.22%	58.56%	11.76%	15.87%	0.22%	8.62%	15.87%	0.93%

Table 7. Statistics of the early empire (1st–3rd c.). Numbers of individual data followed by the percentages counted from those data as indicated in the header.

Table 8. Statistics of the late empire (4th–8th c.). Numbers of individual data followed by the percentages counted from those data as indicated in the header.

Territory	Omn	Gram	Phon	Tech	AE >E	-M	-S	Ú >O	Tech /Omn	AE>E /Omn	-M /Omn	-S /Omn	Ú>O /Omn	AE>E /Gram	-M /Gram	-S /Gram	Ú>O /Gram	AE>E /Phon	-M /Phon	-S /Phon	Ú>O /Phon	AE>E /Tech	-M /Tech	-S /Tech	Ú>O /Tech	-M /AE	-S /AE	Ú>O /AE
Classical Rome	1043	892	653	151	88	25	16	0	14.48%	8.44%	2.40%	1.53%	0.00%	9.87%	2.80%	1.79%	0.00%	13.48%	3.83%	2.45%	0.00%	36.82%	14.20%	15.38%	0.00%	22.12%	18.18%	0.00%
Early imperial total	27404	23937	19027	3467	3650	1087	496	131	12.65%	13.32%	3.97%	1.81%	0.48%	15.25%	4.54%	2.07%	0.55%	19.18%	5.71%	2.61%	0.69%	51.29%	23.87%	11.96%	3.64%	22.95%	13.59%	3.46%
Early average by prov.	0								12.34%	14.50%	4.13%	2.08%	1.23%	16.61%	4.73%	2.36%	1.39%	21.04%	5.82%	2.68%	1.02%	53.76%	26.20%	14.29%	10.64%	22.94%	19.29%	8.04%
Graecae et cetetae	264	183	158	81	17	3	10		30.68%	6.44%	1.14%	3.79%		9.29%	1.64%	5.46%		10.76%	1.90%	6.33%		17.35%	3.57%	37.04%		15.00%	58.82%	
Aemilia / Regio VIII	316	285	233	31	67	9	2		9.81%	21.20%	2.85%	0.63%		23.51%	3.16%	0.70%		28.76%	3.86%	0.86%		68.37%	22.50%	2.90%		11.84%	2.99%	
Africa proconsularis	3038	2575	2232	463	299	112	68		15.24%	9.84%	3.69%	2.24%		11.61%	4.35%	2.64%		13.40%	5.02%	3.05%		39.24%	19.48%	18.53%		27.25%	22.74%	
Alpes	32	26	22	6	11		1		18.75%	34.38%		3.13%		42.31%		3.85%		50.00%		4.55%		64.71%		8.33%			9.09%	
Apulia et C. / Regio II	346	300	267	46	39	8	15	2	13.29%	11.27%	2.31%	4.34%	0.58%	13.00%	2.67%	5.00%	0.67%	14.61%	3.00%	5.62%	0.75%	45.88%	14.81%	27.78%	4.17%	17.02%	38.46%	4.88%
Aquitania	304	283	268	21	46	5	3	19	6.91%	15.13%	1.64%	0.99%	6.25%	16.25%	1.77%	1.06%	6.71%	17.16%	1.87%	1.12%	7.09%	68.66%	19.23%	6.12%	47.50%	9.80%	6.53%	29.23%
Baetica	425	385	324	40	131	18	11		9.41%	30.82%	4.24%	2.59%		34.03%	4.68%	2.86%		40.43%	5.56%	3.40%		76.61%	31.03%	7.75%		12.08%	8.40%	
Belgica	579	514	412	65	40	16	2	5	11.23%	6.91%	2.76%	0.35%	0.86%	7.78%	3.11%	0.39%	0.97%	9.71%	3.88%	0.49%	1.21%	38.10%	19.75%	4.76%	7.14%	28.57%	5.00%	11.11%
Britannia	196	158	122	38	13	2	3		19.39%	6.63%	1.02%	1.53%		8.23%	1.27%	1.90%		10.66%	1.64%	2.46%		25.49%	5.00%	18.75%		13.33%	23.08%	
Brutt. et L. / Regio III	223	194	176	29	37	6	1	1	13.00%	16.59%	2.69%	0.45%	0.45%	19.07%	3.09%	0.52%	0.52%	21.02%	3.41%	0.57%	0.57%	56.06%	17.14%	2.63%	3.33%	13.95%	2.70%	2.63%
Etruria · Regio VII	483	413	330	70	78	13	9	2	14.49%	16.15%	2.69%	1.86%	0.41%	18.89%	3.15%	2.18%	0.48%	23.64%	3.94%	2.73%	0.61%	52.70%	15.66%	10.34%	2.78%	14.29%	11.54%	2.50%
Dacia	30	28	24	2	2		2		6.67%	6.67%		6.67%		7.14%		7.14%		8.33%		8.33%		50.00%		50.00%			100.00%	
Dalmatia	1173	1038	814	135	166	35	28	8	11.51%	14.15%	2.98%	2.39%	0.68%	15.99%	3.37%	2.70%	0.77%	20.39%	4.30%	3.44%	0.98%	55.15%	20.59%	14.43%	5.59%	17.41%	16.87%	4.60%
Gallia Narbonensis	1632	1495	1216	137	225	31	6	32	8.39%	13.79%	1.90%	0.37%	1.96%	15.05%	2.07%	0.40%	2.14%	18.50%	2.55%	0.49%	2.63%	62.15%	18.45%	2.60%	18.93%	12.11%	2.67%	12.45%
Germania Superior	463	399	289	64	41	8	6	5	13.82%	8.86%	1.73%	1.30%	1.08%	10.28%	2.01%	1.50%	1.25%	14.19%	2.77%	2.08%	1.73%	39.05%	11.11%	12.77%	7.25%	16.33%	14.63%	10.87%
Germania inferior	165	133	97	32	18	2	4	2	19.39%	10.91%	1.21%	2.42%	1.21%	13.53%	1.50%	3.01%	1.50%	18.56%	2.06%	4.12%	2.06%	36.00%	5.88%	18.18%	5.88%	10.00%	22.22%	10.00%
Hispania Citerior	663	581	473	82	108	48	11	4	12.37%	16.29%	7.24%	1.66%	0.60%	18.59%	8.26%	1.89%	0.69%	22.83%	10.15%	2.33%	0.85%	56.84%	36.92%	9.24%	4.65%	30.77%	10.19%	3.57%
Latium et C. / Regio I	222	192	152	30	37	5	4		13.51%	16.67%	2.25%	1.80%		19.27%	2.60%	2.08%		24.34%	3.29%	2.63%		55.22%	14.29%	9.76%		11.90%	10.81%	
Liguria / Regio IX	334	310	254	24	36	11	5	1	7.19%	10.78%	3.29%	1.50%	0.30%	11.61%	3.55%	1.61%	0.32%	14.17%	4.33%	1.97%	0.39%	60.00%	31.43%	12.20%	4.00%	23.40%	13.89%	2.70%
Lugudunensis	797	721	583	76	94	21	5	16	9.54%	11.79%	2.63%	0.63%	2.01%	13.04%	2.91%	0.69%	2.22%	16.12%	3.60%	0.86%	2.74%	55.29%	21.65%	5.05%	17.39%	18.26%	5.32%	14.55%
Lusitania	1618	1508	1140	110	199	125	24	5	6.80%	12.30%	7.73%	1.48%	0.31%	13.20%	8.29%	1.59%	0.33%	17.46%	10.96%	2.11%	0.44%	64.40%	53.19%	10.76%	4.35%	38.58%	12.06%	2.45%
Mauretania Caes.	1053	777	609	276	130	78	27		26.21%	12.35%	7.41%	2.56%		16.73%	10.04%	3.47%		21.35%	12.81%	4.43%		32.02%	22.03%	17.20%		37.50%	20.77%	
Mauretania Tingitana	29	21	15	8	3		1	1	27.59%	10.34%		3.45%	3.45%	14.29%		4.76%	4.76%	20.00%		6.67%	6.67%	27.27%		25.00%	11.11%		33.33%	25.00%
Moesia inferior	305	282	167	23	36	20	5	3	7.54%	11.80%	6.56%	1.64%	0.98%	12.77%	7.09%	1.77%	1.06%	21.56%	11.98%	2.99%	1.80%	61.02%	46.51%	12.20%	11.54%	35.71%	13.89%	7.69%
Moesia superior	73	66	37	7	7	4	2	2	9.59%	9.59%	5.48%	2.74%	2.74%	10.61%	6.06%	3.03%	3.03%	18.92%	10.81%	5.41%	5.41%	50.00%	36.36%	22.22%	22.22%	36.36%	28.57%	22.22%
Noricum	44	41	29	3	9	2	1		6.82%	20.45%	4.55%	2.27%		21.95%	4.88%	2.44%		31.03%	6.90%	3.45%		75.00%	40.00%	10.00%		18.18%	11.11%	
Numidia	409	355	319	54	64	38	9	9	13.20%	15.65%	9.29%	2.20%	2.20%	18.03%	10.70%	2.54%	2.54%	20.06%	11.91%	2.82%	2.82%	54.24%	41.30%	12.33%	14.29%	37.25%	14.06%	12.33%
Pannonia inferior	101	89	71	12	21	8			11.88%	20.79%	7.92%			23.60%	8.99%			29.58%	11.27%			63.64%	40.00%			27.59%		
Pannonia superior	129	100	66	29	30	2			22.48%	23.26%	1.55%			30.00%	2.00%			45.45%	3.03%			50.85%	6.45%			6.25%		
Picenum / Regio V	117	110	102	7	17	4	2		5.98%	14.53%	3.42%	1.71%		15.45%	3.64%	1.82%		16.67%	3.92%	1.96%		70.83%	36.36%	10.53%		19.05%	11.76%	
Raetia	34	33	25	7	7	1	1	1	20.59%	20.59%	2.94%	2.94%	2.94%	21.21%	3.03%	3.03%	3.03%	28.00%	4.00%	4.00%	4.00%	50.00%	12.50%	12.50%	12.50%	12.50%	14.29%	12.50%
Roma	8440	7308	5661	1132	1149	287	153	15	13.41%	13.61%	3.40%	1.81%	0.18%	15.72%	3.93%	2.09%	0.21%	20.30%	5.07%	2.70%	0.26%	50.37%	20.23%	11.75%	1.31%	19.99%	13.32%	1.29%
Samnium / Regio IV	187	152	116	35	25	5	5	1	18.72%	13.37%	2.67%	2.67%	0.53%	16.45%	3.29%	3.29%	0.66%	21.55%	4.31%	4.31%	0.86%	41.67%	12.50%	16.67%	2.78%	16.67%	20.00%	3.85%
Sardinia	496	432	337	39	39	8	7		7.86%	7.86%	1.61%	1.41%		9.03%	1.85%	1.62%		11.57%	2.37%	2.08%		50.00%	17.02%	15.22%		17.02%	17.95%	
Sicilia	124	110	100	14	19	6	2	1	11.29%	15.32%	4.84%	1.61%	0.81%	17.27%	5.45%	1.82%	0.91%	19.00%	6.00%	2.00%	1.00%	57.58%	30.00%	9.52%	6.67%	24.00%	10.53%	5.00%
Thracia	96	88	64	8	11	1	3	1	8.33%	11.46%	1.04%	3.13%	1.04%	12.50%	1.14%	3.41%	1.14%	17.19%	1.56%	4.69%	1.56%	57.89%	11.11%	21.43%	11.11%	8.33%	27.27%	8.33%
Transpad. / Regio XI	986	893	635	93	160	27	10	3	9.43%	16.23%	2.74%	1.01%	0.30%	17.92%	3.02%	1.12%	0.34%	25.20%	4.25%	1.57%	0.47%	63.24%	22.50%	5.88%	3.13%	14.44%	6.25%	1.84%
Umbria / Regio VI	268	247	191	21	43	11	9	1	7.84%	16.04%	4.10%	3.36%	0.37%	17.41%	4.45%	3.64%	0.40%	22.51%	5.76%	4.71%	0.52%	67.19%	34.38%	17.31%	4.55%	20.37%	20.93%	2.27%
Ven. et Hist. / Regio X	1474	1295	1065	179	198	97	51	3	12.14%	13.43%	6.58%	3.46%	0.20%	15.29%	7.49%	3.94%	0.23%	18.59%	9.11%	4.79%	0.28%	52.52%	35.14%	20.48%	1.65%	32.88%	25.76%	1.49%

89

	AE > E / Omnes		-M / Omnes		-S / Omnes				Ù > O / Omnes			
	Justified / Very low	= %	Justified / Very low	= %	? / 28	= %	? / 38	= %	? / 32	= %	? / 38	= %
Late imperial total	2/4	50%	3/4	75%	19	68%	24	63%	15	47%	20	53%
Late average by prov.	3/5	60%	3/4	75%	18	64%	23	61%	13	41%	18	47%
Classical Rome	3/5	60%	8/11	73%	22	79%	27	71%	22	69%	27	71%
SUCCESS RATE	57%		74%		70%		65%		52%		57%	
TYPE SUCCESS RATE	66%				61% (61%)							
METHOD SUCCESS RATE	64% (64%)											
- Only with late imp. total	59%											
- Only with late average by prov.	58%											
- Only with Classical Rome	71%											

	AE > E / Gramatici		-M / Grammatici		-S / Grammatici				Ù > O / Grammatici			
	Justified / Very low	= %	Justified / Very low	= %	? / 28	= %	? / 38	= %	? / 32	= %	? / 38	= %
Late imperial total	1/3	33%	3/4	75%	19	68%	24	63%	14	44%	19	50%
Late average by prov.	3/5	60%	2/3	67%	17	61%	22	58%	12	38%	17	45%
Classical Rome	3/5	60%	8/11	73%	20	71%	24	63%	22	69%	27	71%
SUCCESS RATE	51%		72%		67%		61%		50%		55%	
TYPE SUCCESS RATE	61%				59% (58%)							
METHOD SUCCESS RATE	60% (60%)											
- Only with late imp. total	56%											
- Only with late average by prov.	55%											
- Only with Classical Rome	68%											

	AE > E / Phonetici		-M / Phonetici		-S / Phonetici				Ù > O / Phonetici			
	Justified / Very low	= %	Justified / Very low	= %	? / 28	= %	? / 38	= %	? / 32	= %	? / 38	= %
Late imperial total	1/3	33%	2/3	67%	21	75%	26	68%	15	47%	20	53%
Late average by prov.	3/5	60%	2/3	67%	20	71%	25	66%	12	38%	17	45%
Classical Rome	3/6	50%	19/3	69%	21	75%	25	66%	22	69%	27	71%
SUCCESS RATE	48%		68%		74%		67%		51%		56%	
TYPE SUCCESS RATE	58%				63% (62%)							
METHOD SUCCESS RATE	60% (60%)											
- Only with late imp. total	57%											
- Only with late average by prov.	58%											
- Only with Classical Rome	67%											

	AE > E / Technici		-M / Technici		-S / Technici				Ù > O / Technici			
	Justified / Very low	= %	Justified / Very low	= %	? / 28	= %	? / 38	= %	? / 32	= %	? / 38	= %
Late imperial total	2/5	40%	4/5	80%	16	57%	21	55%	17	53%	22	58%
Late average by prov.	4/8	50%	4/5	80%	17	61%	20	53%	13	41%	17	45%
Classical Rome	2/5	40%	6/7	86%	17	61%	20	53%	22	69%	27	71%
SUCCESS RATE	43%		82%		60%		54%		54%		58%	
TYPE SUCCESS RATE	62%				57% (56%)							
METHOD SUCCESS RATE	60% (59%)											
- Only with late imp. total	57%											
- Only with late average by prov.	55%											
- Only with Classical Rome	63%											

		-M / AE > E		-S / AE > E				Ù > O / AE > E			
		Justified / Very low	= %	? / 28	= %	? / 38	= %	? / 32	= %	? / 38	= %
Late imperial total		2/3	67%	18	64%	21	55%	15	47%	20	53%
Late average by prov.		2/3	67%	19	68%	21	55%	14	44%	19	50%
Classical Rome		10/24	42%	17	61%	18	47%	22	69%	27	71%
SUCCESS RATE		59%		64%		52%		53%		58%	
TYPE SUCCESS RATE		59%				59% (55%)					
METHOD SUCCESS RATE		59% (57%)									
- Only with late imp. total		57%									
- Only with late average by prov.		57%									
- Only with Classical Rome		58%									

Tables 9–13. Results of the statistical survey with different methodologies. To interpret these tables read chapter 2.

3. Results of the survey

After the evaluation of the data and the examination of Tables 9–13, we can immediately realize that different methods brought different results, and in fact there are better and less successful approaches. Contrarily to our supposition, the comparison to *errores technici* or the errors of AE didn't make the identification of the dialectal tendencies clearer, neither did the narrowing of the basis of comparison to linguistically more relevant errors, the *grammatici* and the *phonologici* help much, however, both of these proved to be much more successful than the comparison to *technici* and AE faults. The most successful method was the comparison to *omnes errores*, all errors, regardless of their nature (64% success rate), and use of Classical Rome (65%) as a reference point in deciding statistical relevance. The most successful test was when the dropping of -M was compared to the technical mistakes contrasted to Classical Rome (86% success rate), followed by the same contrasted to the average of the provinces and to the imperial total (both with 80-80% success rate). The third most successful test was the word-final –S elimination compared to *errores omnes*, with 78% success rate. If we look at all those tests which brought a success rate of 60% of more, it is apparent that comparisons to all mistakes, grammatical mistakes and phonetical mistakes (13-12-12 tests being above 60%) are much more effective than the tests with the technical and AE errors, as only 7-7 tests could give a success rate of 60%. However, if we also look into those which met our expectations at least 65% or 70% successfully, the dominance of the *omnes* method is unquestionable and much more visible than its 64% overall success rate in comparison to the other methods' 60-60-60% and 59%. You can see the details in Table 14, where it also becomes evident, that despite the methods with *grammatici*, *phonologici* and *technici* all scored with 60%, the *phonologici*-method was more successful than the rest of them, as it contained 11 tests which brought a success rate of 65% or more. The phonological method is clearly the second best, and the one with the *errores grammatici* is third.

Method	Total success rate	70% or more	65% or more	60% or more
/ Omnes	64%	6	8	13
/ Grammatici	60%	4	7	12
/ Phonologici	60%	4	11	12
/ Technici	60%	4	5	7
/ AE > E	59%	1	5	7
Contrasted				
to Classical Rome	65%	12	19	23
to Imperial Total	57%	3	8	15
to Average by prov.	57%	4	9	12

Table 14. The distribution of the best resulting tests
and the total success rate of the different methods

Regarding the standard reference points to which the significance of the proportions of the error types can be measured, our findings show that the inscriptional error profile of Classical Rome is the best point of reference, and if we look at those tests only which brought a success rate of 70% or more, Classical Rome has an outstanding dominance (12 tests over 70% success, compared to 3 and 4). The second most effective point of reference is the imperial total, which is slightly better than average by provinces, because it has 15 tests with over 60% success rate, while the referencing to the average by provinces has only 12. The statistical analysis demonstrated that the best method is to compare dialectal data to the values of Classical Rome. However, contrarily to our expectation, it also turned out that, the comparison to the imperial "average by provinces" isn't a better method than the comparison to the imperial total: these two methods achieve largely the same rate of success, the imperial total being slightly more successful.

With this, however, the testing is not completed. As we mentioned in chapter 1.3, there can be an additional method to remedy the results, i.e. to re-evaluate those provinces which didn't end up in their expected category of intensity, and to assign them as yet weak but promising candidates to the category where we suspected them to belong. This method is the analysis of the differences in the proportions between the early period percentages and those of the later period. Since the proportions between the two periods may slightly vary due to randomness, we also have to set up a criterion when we can classify a province as having a significant increase or decrease in a phenomenon in comparison to the early period. It seems logical to suppose that the average value of increase counted from all the increasing proportions of the provinces within a test (i.e. a testing calculation, like -S / Omn, -M / Omn, -AE / tech etc.) should serve as the measuring point, and all increases that are higher than the average value of increase

of all provinces which have an increasing proportion in a test should count as significant increase, and the affected province can be re-assigned, with caveat, to the category of provinces with high intensity of the examined phenomenon. The same should apply to the decrease, the average decrease has to be counted from the provinces with a decreasing value as compared to the early period, and a province can be reclassified and admitted among those with low proportion if it has a decrease greater than the average decrease within a test method.

In this paper we have place only to run this experiment for the most successful and most interesting survey items, which is really dialect-defining: these are the errors of /-s/ elimination and /ú/ > O misspelling, when compared to *omnes errores*, and measured to Classical Rome. The results of the analysis of the differences between the early period and late period run through all testing methods can be seen in Tables 15–16, where the values which can change the classification (high or low) of a given province according to the criteria of average increase or average decrease (as described above) are marked with an X.

Provinces with failure in classification	Survey method type for the short stressed /ú/ > O error									
	Ú > O / Omn		Ú > O / Gram		Ú > O / Tech		Ú > O / AE>E		Ú > O / Phon	
	The repeating percentages in each second row are the **average increase** and **average decrease** of proportions in each method type. The mark **"X" signs** where the increase or decrease in the province is greater than the average.									
Aemilia / Regio VIII	0,00%	N/A	0,00%	N/A	0,00%	N/A	0,00%	N/A	0,00%	N/A
Alpes	X -0,53%	-0,17%	X -0,67%	-0,22%	X -2,56%	-0,84%	X -4,35%	-1,51%	X -0,95%	-0,27%
Baetica	-0,10%	-0,17%	-0,13%	-0,22%	-0,49%	10,16%	X -1,52%	-1,51%	-0,15%	-0,27%
Latium & C. / Regio I	0,00%	N/A	0,00%	N/A	0,00%	N/A	0,00%	N/A	0,00%	N/A
Picenum / Regio V	0,00%	N/A	0,00%	N/A	0,00%	N/A	0,00%	N/A	0,00%	N/A
Samnium / Regio IV	0,00%	N/A	0,00%	N/A	0,00%	N/A	0,00%	N/A	0,00%	N/A
Mauretania Tingitana	X 3,45%	1,21%	X 4,76%	1,37%	X 11,11%	10,16%	X 25,00%	7,85%	X 6,67%	1,71%
Moesia inferior	0,98%	1,21%	1,06%	1,37%	X 11,54%	10,16%	7,69%	7,85%	X 1,80%	1,71%
Thracia	1,04%	1,21%	1,14%	1,37%	X 11,11%	10,16%	X 8,33%	7,85%	1,56%	1,71%
Provinces in the UNKNOWN category with failure in classification	Ú > O / Omn		Ú > O / Gram		Ú > O / Tech		Ú > O / AE>E		Ú > O / Phon	
	The repeating percentages in each second row are the **average increase** and **average decrease** of proportions in each method type. The mark **"X" signs** where the increase or decrease in the province is greater than the average.									
Britannia	X -0,24%	-0,17%	X -0,31%	-0,22%	X -1,00%	-0,84%	X -2,04%	1,51%	X -0,34%	-0,27%

Provinces with failure in classification	Survey method type for elimination of final /-s/									
	-S / Omn		-S / Gram		-S / Tech		-S / AE>E		-S / Phon	
	The repeating percentages in each second row are the **average increase** and **average decrease** of proportions in each method type. The mark **"X" signs** where the increase or decrease in the province is greater than the average.									
Brutt. et L. / Regio III	-1,01%	-2,17%	-1,13%	-2,80%	-4,78%	-11,45%	-4,70%	-11,72%	-1,74%	-3,50%
Hispania Citerior	-0,23%	-2,17%	-0,38%	-2,80%	-3,10%	-11,45%	-2,16%	-11,72%	-0,80%	-3,50%
Baetica	1,00%	1,33%	0,86%	1,40%	X -12,01%	-11,45%	-11,36%	-11,72%	0,92%	1,53%
Raetia	X 1,55%	1,33%	1,32%	1,40%	1,39%	10,80%	3,17%	17,21%	X 1,86%	1,53%
Alpes	-0,07%	-2,17%	-0,15%	-2,80%	X -13,10%	-11,45%	X -12,34%	-11,72%	-1,17%	-3,50%
Ven. & Hist. / Regio X	0,56%	1,33%	0,68%	1,40%	4,61%	10,80%	9,88%	17,21%	0,31%	1,53%
Provinces in the UNKNOWN category with failure in classification	-S / Omn		-S / Gram		-S / Tech		-S / AE>E		-S / Phon	
	The repeating percentages in each second row are the **average increase** and **average decrease** of proportions in each method type. The mark **"X" signs** where the increase or decrease in the province is greater than the average.									
Mauretania Tingitana	-1,82%	-2,17%	-2,29%	-2,80%	X -11,76%	-11,45%	X -11,76%	-11,72%	-2,84%	-3,50%
Noricum	-1,90%	-2,17%	-2,14%	-2,80%	-6,92%	-11,45%	-6,92%	-11,72%	-2,54%	-3,50%
Pannonia inferior	-1,06%	-2,17%	-1,28%	-2,80%	-5,05%	-11,45%	-5,05%	-11,72%	-1,65%	-3,50%
Pannonia superior	X -3,73%	-2,17%	X -4,31%	-2,80%	X -17,24%	-11,45%	X -17,24%	-11,72%	X -5,58%	-3,50%
Numidia	-0,23%	-2,17%	-0,72%	-2,80%	-5,05%	-11,45%	-3,31%	-11,72%	-0,80%	-3,50%
Africa proconsularis	-0,30%	-2,17%	-0,48%	-2,80%	-2,05%	-11,45%	2,16%	17,21%	-0,77%	-3,50%
Germania inferior	X -3,00%	-2,17%	X -3,68%	-2,80%	-5,86%	-11,45%	-1,82%	-11,72%	X -3,64%	-3,50%

Table 15–16. Increases and decreases of /-s/ elimination and /ú/ > O spelling faults
between the early and late periods run through all testing methods
to adjust the results of the tests labeled as *-S / Omn* and *Ú > O / Omn*

The result is promising: the greatest degree of correction is achieved by the calculation of the difference between the early and late period proportions of the /-s/ dropping and /ú/ > O misspelling errors compared to the *errores technici*, where /-s/ elimination gets two provinces (which were originally classified as high) into the low group, and two additional provinces in the "unknown" category which were suspected to be low, but ended up in the "high" category, can also be re-classified as "low", thus 4 provinces in total get scores for this combined method. The testing of /ú/ > O has come out of this even better, it scores 5 provinces in addition by this process of refinement of results, from which only one (Britannia) is from the "unknown status" group.

Our other tested basis of comparison has also showed its value, and perhaps has given evidence that can be of use: the comparison to the AE > E faults, which are almost like technical errors after the early completion of the monophthongization process throughout the empire. The difference between the percentages from the comparison to the AE mistakes gives 3 new scores to the /-s/ survey and 4 new scores to the /ú/ > O survey. Our initial suspicion seems to gain some ground, and comparison to errors of technical or purely orthographical nature may indeed have an ability to help detect hidden processes, or at least adjust the final picture. After such a refinement of the process, the following final results can be presented:

	-S / Omnes (measured to Classical Rome)				Ú > O / Omnes (measured to Classical Rome)			
	? / 28	= %	? / 38	= %	? / 32	= %	? / 38	= %
Original results	22	79%	27	71%	22	69%	27	71%
Adjusted by in-/decrease	24	86%	31	82%	26	81%	32	84%

Table 17. Refined best results of the survey

This means that significant improvement can be reached if we also look at the tendencies of increase and decrease between the periods as these can signal the future and fate of certain sound developments which didn't yet appear in their final form or strength.

4. Conclusions

Our experiments with various points of reference and bases of comparison have given some answers to our initial questions. Using the misspelling data of Rome in the Classical Latin period provided very convincing results and has proven to be significantly superior to the method of measuring the proportions of errors to the total proportions of the empire or to the, slightly less successful, method of measuring to the imperial average of the provinces. Our suspicion that technical errors can become a neutral point of reference in all kinds of comparisons wasn't verified, however, they turned out to be a promising tool to detect changes in the tendencies from earlier to later period. The reason behind this is probably the fact that the *errores technici* are generally constant, and if a type of error is suddenly increased or decreased due to the increase or decrease of the intensity of a process of sound change, the ratio between such error type and these technical errors might be more fragile, more susceptible to expressing change. Another viable and successful method can be the comparison of data indicating a sound change

to the purely phonological errors, or even to the purely grammatical (phonetical and morphosyntactical) errors, though their effectiveness was less spectacular in this survey. We can recommend researchers of Latin dialectology the use of the statistical data of spelling errors of the city of Rome as the best measurement of the significance and intensity of a supposed sound change, and the comparison of an examined sound change to all types of errors and, if needed, to the purely phonological errors, and the refinement of the results by observing the degree of changes in proportions between an earlier and later period contrasted to the proportions of technical and purely orthographical mistakes in the same two periods.

Bibliography

Adamik 2012 = Adamik, B.: In Search of the Regional Diversification of Latin: Some Methodological Considerations in Employing the Inscriptional Evidence. In: Biville, F. et al. (edd.): *Latin vulgaire - latin tardif IX. Actes du IXe colloque international sur le latin vulgaire et tardif, Lyon, 6 – 9 septembre 2009.* Publications de la Maison de l'Orient e la Méditerranée. Lyon, 123–139.
— 2016 = Adamik, B.: The frequency of syncope in the Latin of the Empire: A statistical and dialectological study based on the analysis of inscriptions. In.: Paolo Poccetti (ed.): *LATINITATIS RATIONES: Descriptive and Historical Accounts for the Latin Language.* Berlin–Boston.
— 2017a = Adamik, B.: On the Vulgar Latin merger of /b/ and /w/ and its correlation with the loss of intervocalic /w/: Dialectological evidence from inscriptions. *Pallas*, 103, 25–36.
— 2017b = Adamik, B.: The problem of the omission of word-final -s as evidenced in Latin inscriptions. *GRAECO-LATINA BRUNENSIA,* 22 (2), 5–21.
Adams 2008 = Adams, J. N.: *The Regional Diversification of Latin 200 BC–AD 600*. Cambridge.
Barbarino 1978 = Barbarino, J. L.: The Evolution of the Latin /b/-/v/ Merger: a Quantitative and Comparative Analysis of the B-V Alternation in Latin Inscriptions. *North Carolina Studies in the Romance Languages and Literatures*, 203. Chapel Hill.
Benincà, Parry, Pescarini 2016 = Benincà, P., Parry, M., Pescarini, D.: The dialects of northern Italy. In: Ledgeway, A., Maiden, M. (edd.): *The Oxford Guide to the Romance Languages.* Oxford, 185–205.
Gaeng 1968 = Gaeng, P. A.: *An Inquiry into Local Variations in Vulgar Latin, as Reflected in the Vocalism of Christian Inscriptions.* Chapel Hill.
Gonda 2015 = Gonda, A.: Aquincum latin nyelve [The Latin language of Aquincum]. In: Bárány, I., Bolonyai, G., Ferenczi, A., Vér, Á. (edd.): *Studia Classica*. Budapest, 317–338.
— 2017a = Gonda, A.: Changes in the consonant system of Pannonia Inferior, Dalmatia and Venetia et Histria. *GRAECO-LATINA BRUNENSIA,* 22 (2), 165–181.
— 2017b = Gonda, A.: The Aquincum–Salona–Aquileia Triangle: Latin language in the Alps–Danube–Adria region. *Acta Antiqua,* 57 (1), 99–123.
— 2019 = Gonda, A.: Phonetic Changes in the Latin of Noricum. *Acta Classica Universitatis Scientiarum Debreceniensis,* 55. 75–96.
Gutkind 1971 = Gutkind, E. A.: *International History of City Development VI. Urban Development in Western Europe: The Netherlands and Great Britain.* New York.
Herman 1983 = Herman, J.: Le latin dans les provinces danubiennes de l'Empire romain. Problemes et perspectives de la recherche. *ANRW II*, 29, 2, 1089–1106.

— 2000a = Herman, J.: *Vulgar Latin*. University Park.

— 2000b = Herman, J.: Differenze territoriali nel latino parlato dell'Italia tardo-imperiale: un contributo preliminare. In: Herman, J. – Marinetti, A. (edd.): *La preistoria dell Italiano. Atti della Tavola Rotonda di Linguistica Storica. Università Ca' Foscari di Venezia 11–13 giugno 1998.* Tübingen, 124–135.

Izzo 1986 = Izzo, H. J.: On the history of Romanian. In: Marino, M. – Pérez, L. A. (edd.): *The Twelfth LACUS Forum, 1985.* Linguistic Association of Canada and the United States, 139–146.

Lloret 2004 = Lloret, M.-R.: The Phonological Role of Paradigms: The case of insular Catalan. In: Auger, J. – Clements, J. C. – Vance, B. (edd.): *Contemporary Approaches to Romance Linguistics: Selected Papers from the 33rd Linguistic Symposium on Romance Languages*. Philadelphia, 258, 275–298.

Loporcaro 2011a = Loporcaro, M.: Syllable, Segment and Prosody. In: Maiden, M. et al. (edd.): *The Cambridge History of the Romance Languages I.* Cambridge, 50–108.

— 2011b = Loporcaro, M.: Phonological Processes. In: Maiden, M. et al. (edd.): *The Cambridge History of the Romance Languages I.* Cambridge, 109–154.

Omeltchenko 1977 = Omeltchenko, W.: A Quantitative and Comparative Study of the Vocalism of the Latin Inscriptions of North Africa, Britain, Dalmatia, and the Balkans. *North Carolina Studies in the Romance Languages and Literatures,* 180. Chapel Hill.

Rosetti 1978 = Rosetti, A.: *Istoria limbii române*. Editura Ştiinţifică şi Enciclopedică

Schramm 1997 = Schramm, G*.: Ein Damm bricht. Die römische Donaugrenze und die Invasionen des 5–7. Jahrhunderts in Lichte der Namen und Wörter.* R. Oldenbourg Verlag.

Tamás 1983 = Tamás, L.: *Einführung in die historisch-vergleichende romanische Sprachwissenschaft.* Wissenschaftlicher Verlag A. Lehmann Gerbrunn, Würzburg.

Väänänen 1981 = Väänänen, V.: *Introduction au latin vulgaire.* Paris.