The Slavic Opening of Syllables and the Avar contact hypothesis

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Abstract

The Slavic proto-language was subject to a tendency commonly referred to as the "Opening of Syllables", which is somehow connected to a number of sound changes that all had an opening effect, e.g. nasalization and loss of various coda consonants. The nature of the phenomenon is not quite understood and no language-internal explanations have proven to be successful. This thesis explores the possibility that the Opening of Syllables was due to contact, specifically with the (unknown) language of the Avars, spoken in and around Pannonia during the Migration Period. In order to find out, the relative and absolute chronology of syllable-opening sound changes is examined and mapped onto the spread of the Slavs and the Avars, and the sound changes themselves are compared to possible phonological traits of Avar. Based on this it is argued that contact with Avar was possibly responsible for only two sound changes (monophthongization and the certain developments of consonant clusters), but that this was not the result of a contact-induced tendency toward open syllables. In general, the Opening of Syllables as a whole was not induced by contact with Avar or with any other language.

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Abbreviations

Aeol.	Aeolic	OPr.	Old Prussian
Blg.	Bulgarian	PBS	Proto-Balto-Slavic
CS	Church Slavonic	PIE	Proto-Indo-European
Cz.	Czech	Plb.	Polabian
Dor.	Doric	Pol.	Polish
Est.	Estonian	PSl.	Proto-Slavic
Fi.	Finnish	Ru.	Russian
Go.	Gothic	SCr.	Serbo-Croatian
Gr.	Ancient Greek	Skt.	Sanskrit
Hitt.	Hittite	Sl.	Slavic
Lat.	Latin	Slk.	Slovak
Latv.	Latvian	Sln.	Slovenian
Lith.	Lithuanian	Ukr.	Ukrainian
LS	Lower Sorbian	US	Upper Sorbian
OCS	Old Church Slavonic	VL	Vulgar Latin
OHG	Old High German	WGmc.	West-Germanic
OIr.	Old Irish		

Index

§1 Introduction

§1.1 The problem of the Opening of Syllables

The structure of syllables in Slavic has had a turbulent prehistory. The modern languages (especially Polish and Russian) are well-known among linguists for their complex syllable structures. "Complex" in this context means that, generally speaking, languages allow for combinations of two or more consonants in onset position, i.e. preceding the vowel or nucleus, and/or two or more consonants in coda position, i.e. following the vowel (Maddieson 2013). When we look back in time, however, we observe that the Slavic mother language, Proto-Slavic, featured syllables of a much less complex type:[1] although opinions differ on the exact constraints on the type of segment allowed in the coda, it is clear that the bulk of syllables and certainly all final syllables were open, i.e. lacking a coda consonant. This structure is very similar to what can be observed in the archaic corpus of Old Church Slavonic (OCS) texts. This is all the more striking considering the fact that the Proto-Slavic situation arose from the other extreme, as Proto-Indo-European (PIE) was made up of all kinds of complex syllables, with onsets such as **pn-*, **ti̯-*, **sh₂-*, **dʰǵʰ-* and **h₂st-* and codas like **-ms*, **-u̯d*, **-ǵh₂* and **-kʷts* (Byrd 2015, 123, 279–82). There was probably a high degree of continuity when it comes to the development of the syllable structure from PIE to Proto-Balto-Slavic. This is at least what the Lithuanian and Old Prussian material point to, and there is nothing that suggests otherwise (Kim 2018, 1983).

What is interesting is that Proto-Slavic apparently underwent drastic structural changes in a relatively short time span, which is generally accepted among Slavists. In one way or another these structural changes must be tied to a certain set of sound changes that has been postulated for Proto-Slavic, and this is where many scholars differ in their analysis. Simply put, three different (not necessarily mutually exclusive) perspectives reoccur in the literature. On the one hand, the phenomenon (conveniently named the Opening of Syllables or the Law of Open Syllables) has been referred to as a "tendency" or "trend" in the form of a set of sound changes conspiring in order to meet a common goal, which is to meet the structural prerequisite of open syllables or just simplification of the syllable structure. This idea goes back a long time but it probably gained popularity due to the important role it played in the work of van Wijk (e.g. 1931) and later Nahtigal (1952). Although these sound changes eventually bring about the

[1] In some works on Slavic historical grammar, the Slavic mother language is divided into two major stages, being "Proto-Slavic" and "Common Slavic". The general idea is that the former refers to the stage between the earliest reconstructible form of Slavic and the first innovation that was not shared by all Slavic dialects. The latter denotes the Slavic dialect continuum after the first non-common innovation and therefore after the break-up of Proto-Slavic as a complete unity but before the last partly common innovations. Though at this stage some innovations were not shared by all dialects, other innovations were. In this interpretation both terms stand for a non-synchronic stage of Slavic. However the ways in which they are used in the literature exhibit quite some variation and often lead to confusion. For example, some take as a reference point not the first non-shared innovations but the period of the geographical spread of Slavic, and others interpret "Proto-Slavic" as a synchronic unit. In order to avoid any confusion, "Proto-Slavic" will be used in what follows to denote the stage of Slavic between the break-up of Proto-Balto-Slavic and before the last (partly) common innovations. Where necessary, it will be pointed out whether we are dealing with an early or late stage of Proto-Slavic. For an elaborate discussion of the terminology with references, see Olander (2015, 18–31).

same result, they are not necessarily related in nature. Examples are, according to Hock (1991, 161–62), the loss of word-final and also syllable-final consonants, vowel-liquid metathesis, vowel epenthesis and resyllabification. Schenker (1995, 67) also mentions changes in syllable-initial consonant clusters and the elimination of diphthongs, while Shevelov (1964, 311) includes among other things the rise of nasal vowels – clearly there is no agreement on which sound changes fall under the definition of the Opening of Syllables and which do not, and many scholars remain somewhat implicit or vague on this. Importantly, most scholars who (implicitly) characterize the Opening of Syllables as this type of goal-oriented tendency, such as van Wijk (1931, 46–47) and Kortlandt (2011c, 164, 170), explain it through the more fundamental tendency toward rising sonority within the syllable (vowels being the most sonorous of segments; Clements 1990; Kiparsky 1979). Schenker (1995, 82) even frames it as a consequence of this latter tendency, i.e. the tendency toward rising sonority triggered the elimination of closed syllables, as such leading to the sound changes mentioned above. In this perspective on the Opening of Syllables, sound change is (either implicitly or explicitly) seen as a teleological phenomenon. There is some variation in this line of thinking, though. Hock (1991, 164–65) for example nuances the idea of teleology by stating that the Opening of Syllables is not really a "preconceived grand plan" but rather a "series of tactical decisions" in the form of a chain shift, each sound change resulting in a structure that triggers a response change.

The teleological aspect of the perspective stated above has provoked much criticism, mainly because it does not provide an actual answer to the question *why* the tendency toward open syllables arose. After all, even if it would be due to a tendency toward rising sonority (as per Schenker (1995, 82)) we still do not know where this tendency came from. From this point of view, the explanation in sonority sequencing can be considered ad hoc. On top of that, the idea of teleology in sound change in general is far from commonly accepted. For example Blevins (2004, sec. 10.3, esp. 283–284) has argued against sound change being telic, adducing that structural asymmetries and gaps sometimes persist which would not be expected if sound change would automatically resolve these flaws.[2] This is why from the second perspective on the Opening of Syllables, the reasoning goes the other way round: the tendency toward open syllables or rising sonority is not the cause of the observed sound changes but rather the effect, or as Collins (2018, 1437) calls it, simply a "metalinguistic description[…] of the results". In his discussion of the relevant sound laws (in this case the loss of coda obstruents and final resonants, monophthongization of diphthongs, vowel nasalization and changes in vowel-liquid diphthongs) he argues that each of these rules can be explained independently. The loss of coda obstruents, for example, is said to be cross-linguistically wide-spread and phonetically natural, at least in pre-pausal position (2018, 1440). The author therefore concludes that there is no such thing as an "invisible hand" behind

[2] Although it could be argued that this reasoning does not apply to change in syllable structure, because in this case there is no such thing as structural asymmetry.

the sound changes leading to the Opening of Syllables (Collins 2018, 1438).[3] Likewise, it has been argued by Shevelov (1964, 229) that the loss of word-final consonants was the result of a series of "variously motivated" sound changes rather than sound changes that all had the same aim. The loss paved the way for a new parameter by which all words could only end in a vowel, leading to a higher frequency of open syllables in the language. This was, according to Shevelov (ibid.) just another step toward the rule that the language only allowed CV-syllables. The same is said for the simplification of consonant clusters, which also led to more open syllables rather than that the open syllables somehow triggered cluster simplification.[4] If that were the case, Shevelov (1964, 203) argues, then we would expect simplification of *all* consonant clusters, which was not the case.

There has also been more specific criticism on the former teleological perspective, especially by Shevelov (1964, 203) on the work of van Wijk and Nahtigal – though it applies to much of the literature in which the Opening of Syllables is presented as a unified goal-oriented tendency. According to the critics the problem is that the mentioned sound changes are in reality often labels for sets of sound laws that seem to be disparate in chronology and in some cases even in geography. To take an example, what is referred to as the "loss of word-final consonants" is commonly thought to have taken place in several steps. Shevelov (1964, 229) distinguishes at least three chronological layers, namely loss of resonants, loss of stops and loss of *s* (and *x*).[5] Similarly, Kortlandt assumes that syllable-final nasals before tautosyllabic stops developed into nasal vowels quite a bit later than those that were not followed by such a stop (2011c, 163–65). A third example would be the phenomenon of metathesis of liquids, which is subject to quite some regional variation (2011b, 232). This problem is sometimes used as an argument in favor of the idea that the Opening of Syllables (or the tendency toward rising sonority) is merely the result of sound change rather than the cause. However, this argument is perhaps slightly premature, because there is disagreement on which sound changes are part of the Opening of Syllables and on the relative and absolute chronology of these sound changes. Therefore it is probably too early to say that the Opening of Syllables is nothing more than the natural product of a series of sound changes.

In fact, building on early speculations by Shevelov (1964, 622), Galton (1994; 1997) argued that the supposed drastic changes in Proto-Slavic syllable structure originated in an external source, namely in some Turkic (or perhaps "Altaic") language.[6] His idea is that through language contact a phonotactic rule that disallowed coda consonants was taken over into Slavic, and that this rule was effectuated

[3] The words "invisible hand" are in fact used for Collins' characterization of the Law of Syllabic Synharmony, but the same is concluded for the Law of Open Syllables in the same paragraph (2018, 1437–38).
[4] The simplification was supposedly triggered by a shift of the functional load from consonants to vowels, due to the "richness" of oppositions (quality, length, pitch and place or function) on the vocalic system at the time. In this view, consonants got lost because they were allegedly losing their functions. This idea is also discussed in an article by Shevelov and Chew Jr. (1969).
[5] Note that there is disagreement on the relative and absolute order; cf. Kortlandt (2011). This will be discussed in chapter 2.
[6] In Galton's work the term "Altaic" is reserved for the Turkic, Mongolian and Tungusic languages.

mainly through the contraction of diphthongs and the resolution of clusters of consonant + yod (1994, esp. 83). This is part of the theory that some Altaic or Turkic language(s) had a significant effect on the phonology of Proto-Slavic, by which he also explains the phenomenon of "synharmony" in Slavic (which describes the development of palatal or coronal consonants before front vowels and *i̯ and the fronting of back vowels after palatal consonants; see Collins (2018, 1437–38)).[7] While this latter phenomenon is central to Galton's theory, the Opening of Syllables received much less attention. In fact, the author, in his rather impressionistic account, did not go much further than stating that it could have been a contact feature, without offering a thorough investigation of the material or the processes that would have taken place. This is probably the reason why his contact hypothesis has not been taken seriously in the literature (next to the ease with which the term "Altaic" is used).[8] The lack of follow-up studies is, however, unwarranted, particularly because of the following reason. There is plenty of historical evidence that the speakers of Proto-Slavic stood in some form of contact with a nomadic tribe called the Avars for some time. The language of the Avars is unknown, though there are reasons to think that it was a Turkic language.[9] This means that for historical reasons, Turkic is a priori a likely suspect for our Opening of Syllables, as Galton claimed, and the most natural place to look. The Avars, by the way, have also made an appearance in several more recent studies on the historical grammar of Slavic, most importantly in Vermeer (2020) but also in Pronk (2021). Here it is argued that their presence in parts of Slavic-speaking Europe left a mark on the way some of the emerging dialects evolved. The question whether the Avar language influenced Proto-Slavic therefore becomes all the more interesting.[10]

Clearly, the question of the development of the Opening of Syllables has not been settled. We have seen that the phenomenon can be analyzed from three different perspectives. On the one hand, the law is interpreted by some as a tendency in the form of a group of sound changes that took place in order to meet a common goal, viz. open syllables. On the other hand, there is the idea that the label "Opening of Syllables" is merely a description of the results of a set of sound changes that more or less happened to have the same effect on the language's syllable structure. Though some sound changes may have been connected to others in the sense that the high frequency of the output structure of one sound change

[7] Though the concept of this Law of Syllabic Synharmony is probably as problematic as that of the Law of Open Syllables, as Collins states (2018, 1438).
[8] Exceptions are the studies by Stadnik (2001) and M. Stachowski (2020), but the Opening of Syllables is (mostly) left out of consideration here.
[9] Next to the (probably Turkic-speaking) Avars that are discussed in this thesis, there is another ethnic group that goes by the same name. These Avars nowadays live in the Northeast Caucasus. Their language, also called Avar, is not Turkic but Nakh-Daghestanian. In order to disambiguate, some scholars specify the Turkic-speaking Avars as the Pannonian Avars, referring to the area where they would establish their khanate. It is still an open question whether the Pannonian and Caucasian Avars are ethnically related.
[10] Some scholars have attempted to prove that the Opening of Syllables is due to contact not with Turkic or Avar but with another language, such as Latin or a Romance variety. An example is Enrietti (2009). Caldarelli (2012) however demonstrates that this is an unlikely scenario for several reasons. In chapter 4 of this thesis, it will be argued that this contact scenario is probably incorrect for chronological reasons.

generated a new sound change, as per Shevelov, scholars adhering to this view deny that all sound changes were linked because of their overarching common goal. On the third perspective, which is not necessarily mutually exclusive with the previous two, the Opening of Syllables is analyzed as a contact feature, of which Avar is the most likely donor. This possibility is however understudied. In the following sub-section we will take a look at the questions that will be dealt with in this thesis, which will hopefully bring us closer to an understanding of the development of the Opening of Syllables.

§1.2 Outline of the study

As is clear from the discussion above, a thorough and integral investigation of the contact hypothesis is needed in order to further the discussion on what kind of phenomenon the Opening of Syllables was. Therefore the main question of the present thesis will be: "could the Opening of Syllables have been induced by contact with Avar?". This question can be broken up into several pieces. First of all, the sound changes that affected the syllable structure will have to be situated in time and space. Determining when and where the sound changes took place is not only crucial to the contact hypothesis, it should also help in concretizing the rather vague concept of the Opening of Syllables and in figuring out whether sonority played a role. At the same time it will be attempted to track the exact ways in which each sound change altered the syllable structure. These matters will be addressed in chapter 2. The final section of that chapter, §2.2.8, will deal with the geographical spread of Slavic, which will provide better insight into when and where the sound changes took place. Chapter §3.1 then discusses the historical evidence for the Avars and for contact between the Avars and the Slavs, and in §3.2, we will consider the question whether our syllable-opening sound changes may originate in phonological features of the Avar language. The implications of the findings of chapter 2 and 3 are discussed in the concluding chapter, together with the broader consequences that our conclusions on the contact hypothesis have for the phenomenon of the Opening of Syllables.

§2 Opening of Syllables in time and space

§2.1 Relative chronology

In the introduction it has been discussed that there is no agreement on which sound changes form a part of the Opening of Syllables and which do not. In almost any treatment of the trend, a different set of sound changes is said to be relevant to the phenomenon – in most accounts this set consists of no more than a handful of sound changes, while the dominant underlying idea seems to be that the tendency is made up by a multitude of sound changes. This also means that there is no agreement on the period in which the sound changes occurred. In fact, many accounts lack any time indication of the beginning of the Opening of Syllables, while scholars agree unanimously in that the trend was halted in the late Proto-Slavic stage when weak jers were lost. This in itself is reason enough to study the prehistory of the syllable structure as it is in late Proto-Slavic, where virtually all syllables were open and the phenomenon

is generally thought to be at its peak (Kortlandt 2011c, 166). The central question in this chapter is therefore: which sound changes took place up until the moment that the Opening of Syllables came to an end, and when did they take place? We will attempt to find out about the timing of the sound changes by first examining the relative chronology and then their absolute chronology in combination with their geographical spread, in case there is reason to think that the sound change in question did not affect all of Slavic. As to the question of which sound changes are relevant, we will scrutinize the relative chronology of all sound changes from Proto-Indo-European up to the disintegration of Slavic into the individual languages as postulated by Kortlandt (2011c), and describe for each sound change that affected the syllable structure how it did so, departing from the reasoning that every sound change that had an opening effect on syllable structure is by definition part of the Opening of Syllables. By doing so we hope to avoid the practice of cherry-picking the most spectacular sound changes, as has been done in some of the literature.

§2.1.1 Loss of final **t/d*

The earliest postulated sound change after the PIE stage that had an effect on syllable structure was the loss of word-final **t/d* (these were presumably both realized as unreleased stops). This already happened in the early Balto-Slavic stage (Kortlandt 2011c, 160). A Baltic example of the loss of word-final **d* would be the abl.sg. ending *-o* in Lithuanian, cf. OCS *-a*, both from PIE **-ōd*. The early date of this sound change is quite striking in light of the fact that many scholars claim that the loss of word-final consonants is characteristic of the Opening of Syllables specific to Slavic. Schenker, among others, subsumes the loss of final **t/d* under a more general loss of word-final consonants, namely **t/d* and **s*, e.g. PIE **suHnús* > OCS *synъ* (1995, 82). According to him this took place somewhere in early Proto-Slavic. However, the loss of **t/d* must have happened before Winter's law took place, which is more or less securely dated to late Balto-Slavic (Kortlandt 2011c, 160–61). The dating before Winter's law can be supported by the form of the neuter pronoun in the nom./acc.sg., PIE **tod*, which gave *to* in OCS (rather than ***ta*). Word-final **s* was lost only after Balto-Slavic split up because it was preserved in Baltic (see §2.1.3), so that the two sound changes should be treated as different phenomena (pace Schenker 1995, 82). In general, after the loss of word-final **t/d* (i.e. all stops that were allowed in that position up until then), Balto-Slavic words could only end in a vowel, **s*, a laryngeal or a resonant (the latter two were also lost at a later stage; for resonants see §2.1.3).[11] Shevelov (1964, 227) and Collins (2018, 1440) both explain this sound change as just another way by which consonant clusters were simplified, in this case on word boundaries, with generalization to cases where the following word

[11] An exception is maybe formed by several words that never occurred in absolute, i.e. utterance-final position, such as the OCS prepositions *iz* 'from' < **iz*, *bez(ъ)* 'without' (cf. Lith *bè* < PBS **be(z)* < PIE **b^{h}e-ǵ^{h}*; the optional jer is non-etymological) and *vъz* 'up to' (cf. Lith. *už* 'at, within, instead of, in return for' < PBS **uź*) (Shevelov 1964, 224). Shevelov also mentions *raz-* 'asunder' (a prefix in OCS but a preposition in e.g. Slovenian) and *ob* 'around' (also *o* or *obbi*), but the origins of the former are uncertain and the latter form, reflecting **$h_3eb^{h}i$,* probably still ended in a vowel in this stage of Balto-Slavic (Derksen 2008, s.v. *orz, *ob).

started with a vowel. But word-internal consonant clusters were simplified only much later, as we will see, which makes this analysis not very likely.

§2.1.2 Vocalization of syllabic resonants

At some point in Balto-Slavic the syllabic resonants **r, l, m, n* lost their ability to occur as a nucleus and as a result they developed into a sequence of a prop vowel plus a consonantal resonant, as in e.g. PIE **u̯lkʷos* 'wolf' > PBS **wilkós* > Lith. *vil̃kas*, PSl. **vьl̂kъ*, OCS *vlьkъ*.[12] As such the syllables in question were closed by the resonant (that is, when they were not already closed) and this development thereby acts counter to the supposed trend toward open syllables, which is in itself rather striking. The quality of the prop vowel depended on the neighboring segment: if it followed a labiovelar, it probably merged with **u* but elsewhere with **i* (Vaillant 1950, 167–77 esp. 172; Kortlandt 2007).[13] The distribution of **i* and **u* is almost completely the same in the Baltic and Slavic lexicons, so this is no doubt a development that took place in their common ancestor (Shevelov 1964, 81). Moreover, the dissolution of the syllabic resonants occurred also before Winter's law, because the former gave rise to the clusters **-ndn-* and **-ngn-* which blocked Winter's law. This is at least the course of events that Kortlandt has argued for (2011c, 161; 1979b, 60–61). The advantage of this scenario is that it explains two apparent counterexamples to the law, viz. the words for 'fire' and 'water', resp. OCS *ognь*, Lith. *ugnìs* < PBS **ungnis* < PIE **ngʷni-* (cf. Skt. *agní-*, Lat. *ignis*) and OCS *voda* < PBS **wondōr*, gen.sg. **undnes* < PIE **uod-r/n-* (cf. Lith. *vanduõ* < **vond-*, Latv. *ûdens* < **und-*; Skt. *udán-*, Lat. *unda*, Hitt. *u̯ātar*, gen.sg. *u̯etenas*, OHG *wazzar*). The **-n-* in the root of PBS **undnes* 'water' was supposedly a nasal infix that arose from a suffix, comparable to that in Latin *unda* (though this could also be due to anticipatory assimilation; (de Vaan 2008, 641). The dissolution of syllabic resonants postdated Hirt's law, whereas the loss of final stops likely predated it (Kortlandt 2011c, 160–61). This is a good indication that the dissolution of **R̥* is to be ordered after the loss of final **t/d*.[14]

§2.1.3 Loss of word-final resonants, nasalization of vowels and loss of final **s*

Word-final resonants were lost by two different mechanisms, that is, by loss of word-final resonants after long **ē* and **ō* and by nasalization of vowels before nasals. As there is some interaction in the relative chronology of these changes with the loss of word-final **s*, this will also be discussed here.

[12] The prop vowels are subject to various independent developments in Baltic and in Slavic, and under some circumstances West and South Slavic lose them and develop syllabic resonants again.

[13] Although this is the standard view on the different outcomes of the prop vowel, it must be said that it has been challenged by some, especially Matasović (2004). He argued that **u* arose in initial syllables before a nasal or between a velar and a liquid, while **i* arose in non-initial syllables. However, Kortlandt (2007) has shown that this theory does not hold, because it is based on a fair amount of uncertain etymologies (a problem inherent to the set of *u*-forms).

[14] In contrast to Kortlandt, Matasović (2005, 150–51) flips the order and dates the vocalization of syllabic resonants before the loss of final **d*. Unfortunately no evidence is provided for this specific order.

There seems to be agreement on the idea that resonants in word-final position were lost after the vocalization of *$\underset{\circ}{R}$ but before the rise of nasal vowels. The opinions differ however on the exact course of events. Not much can be said about the fate of final *_l_: it scarcely occurred in PIE, namely only in the nominatives of the _l/n_-stem *_séh₂-ul_ 'sun' (OCS _slъnьce_, Ru. _sólnce_) and the _l_-stems *_h₂éb-ōl_ 'apple' (Cz. _jablo_, OCS _ablъko_ (dim.), Lith. _obuolỹs_) and *_séh₂-l_ 'salt' (OCS _solь_, Ru. _sol'_, Latv. _sàls_). Clearly *_l_ has not been preserved in final position in Proto-Slavic. Final *_r_ was eliminated together with other resonants after PIE long *_ē_ and *_ō_, after they caused raising of the vowels to _-i_ and _-y_ (Kortlandt 2011c, 162). There are three examples of this loss of resonants:[15]

- OCS _mati_ 'mother', gen.sg. _matere_, cf. Lith. _mótė_, Latv. _mãte_, OPr. _mūti, mothe, muti_, Skt. _mātár-_, also _mātā́_, Gr. μήτηρ, Lat. _māter_ < PIE *_méh₂tēr_;
- OCS _kamy_ 'stone', gen.sg. _kamene_, cf. Lith. _akmuõ_, Skt. _áśman-_ 'stone, rock', Gr. ἄκμων 'anvil, meteor, heaven' < PIE *_h₂ekmōn_;
- OCS _dъšti_ 'daughter', gen.sg. _dъštere_, cf. Lith. _duktẽ_, OPr. _duckti_, Skt. _duhitā́, duhitár-_, Gr. θυγάτηρ < PIE *_dʰugh₂tēr_.

The raising of *_ē/ō_ happened before *_r_ was lost since it also affected *_-ō_ the word for 'four', where *_-r_ was preserved due to the secondary addition of the suffix *_-es_: OCS _četyre_ < *_ketūr-es_ < post-PBS *_kʷetūr_ < *_kʷetuōr_ (cf. Beekes 1987). Additionally, the gen.sg. ending _-a_ is usually thought to go back to PIE *_-ōd_ > PSl. *_-ō_ after the loss of the final stop. Since PSl. *_-ō_ gave _-a, -y_ cannot go back to the same. It is therefore assumed that *_-ō_ developed into *_-ū_ when the following resonant was still there. In light of the fact that raising is specific to Slavic, the loss of *_-r_ in Baltic is probably an independent development, with a parallel in the Sanskrit forms _mātā́_ and _duhitā́_. The result of these sound changes is that sequences of a long vowel + resonant were banned in word-final position.

The fate of final *_n_ and *_m_ after short vowels is a lot more complicated as it also involves the nasalization of vowels, an issue which is not completely solved. The central question that we are concerned with here is when word-final nasals were lost and whether it happened before or after the loss of final *_s_. The answer lies in the fact that various similar-looking sequences in PIE have different outcomes in Slavic. We have the endings *_-om_ > OCS _-ъ_ (soft, i.e. umlauted, _-ь_), *_-oms_ > _-y_ (soft _-ę_), *_-ont_ > _-ǫ_. Next to this, the active present participle ending of the nom.sg.m., going back to PIE *_-onts_, gave _-y_ (soft _ę_). This participial ending _-y_ is attested as nasalized /yN/ in early OCS in the form of a dedicated Glagolithic sign ⰹ, as in _nesyN_ 'carrying' (Kortlandt 1979a, 260). This means there are at least four different (hard) reflexes of word-final nasals after the same PIE vowel in OCS. The fact that

[15] As an alternative to the explanation in sound change, some scholars adhere to the view that the loss of _-r_ is specific to these forms and that it was a consequence of morphological levelling with the feminine _i_-stems (Shevelov 1964, 164; Birnbaum and Schaeken 1997, 35). The proposed analogy has no motive, however. Note also that _-r_ is present in oblique case forms and, in case of _mati_, in derivatives such as OCS _materьstva_ 'old age' < *_materьstvo_ 'motherhood' (Derksen 2008, 303).

the endings did not merge has several implications for the relative chronology. The issue has been explained in various ways (e.g. Olander 2010) but the best explanation is probably the one offered by Kortlandt (1979a) as he takes into account accentological matters and details that are sometimes neglected in other works. I therefore follow his ideas on this problem. For the sake of clarity I have listed all relevant sound changes with their effects on the relevant endings in the required relative order in table (1), from Proto-Balto-Slavic to the attested outcome in Old Church Slavonic. Empty slots indicate that the sound change to the left did not affect the form in that column. Asterisks are omitted.

Table 1			**1sg. them.aor.**		**acc.pl. *o*-stems**		**acc.pl. *u*-stems**		**3pl. them.aor.**		**pres.ptc. nom.sg.m.**	
	Stage[16]	**Sound change**	**-om*		**-ons*		**-uns*		**-ont*		**-onts*	
a	PBS	Raising of **-om# > -um#*	*um*									
b		Loss of **-t/d#*							*on*			
c	Early Slavic	Nasalization (not before a tautosyllabic stop)	*uN*		*oNs*		*uNs*		*oN*			
d		Denasalization of high vowels	*u*				*ūs*					
e		Raising before **-s#*			*uNs*							
f		Delabialization of **o, ō* (not affecting **oN*)									*ants*	
g	Early Middle Slavic	Umlaut	*u*	*jü*	*uNs*	*jüNs*	*ūs*	*jῡ̄s*	*oN*	*jöN*	*ants*	*jänts*
h		Nasalization before a tautosyllabic stop									*aNs*	*jäNs*
i		Loss of **-s#*			*uN*	*jüN*	*ū*	*jῡ̄*			*aN*	*jäN*
k	Late Middle Slavic	Delabialization of *u*-vowels	*y*	*ji*	*yN*	*jiN*	*ȳ*	*jī*				
l		Denasalization of **yN*[17]			*ȳ*							
m		Lowering of *iN*				*jeN*						
n		Raising of low nasal vowels									*yN*	*jeN*
o	OCS	Outcome	ъ	ь	*y*	*ę*	*y*	*i*	*ǫ*	–	*yN*	*ę*

[16] Based on Kortlandt's (2011c) division of Slavic (pre)historical phonology into stages. The division between Early Middle Slavic and Late Middle Slavic, for example, is mostly based on the fact that during the latter the major dialect divisions emerged. Here the stages are merely given to express that the developments in the table took place over a extended period of time.

[17] Denasalization of nasal vowels happened at least twice throughout the (pre)history of Slavic, once early in Proto-Slavic (d) and once late (l). The denasalization in (l) is the only way in which the acc.pl. ending of the *o*-stems can be accounted for. The fact that **yN* was denasalized is likely due to its complex phonetic nature: cross-linguistically speaking, denasalization of closed nasal vowels is a recurrent process.

p	OCS	Example	*sědъ* ‘I sat down’	*vlъky* ‘wolves’	*syny* ‘sons’	*sědǫ* ‘they sat down’	*nesyN* ‘carrying’

The presence/absence of *-*s* and *-*t* explains why none of these endings fully merged. An important aspect is the following: the fact that the ptc. ending *-*onts* underwent delabialization to *-*ants* while the 3pl. aorist ending *-*ont* did not can only be explained if we assume that this delabialization did not affect nasalized **oN* and therefore that *-*onts* was not nasalized at this point. This, in turn, must mean that the nasal was still followed by the stop, which initially blocked the nasalization of the vowel. As such it could remain distinct from *-*ont*, which had developed into *-*oN* by this point. Only at a later stage did *-*ants* develop into nasalized *-*aNs*, as the early OCS reflex *yN* shows. The participial ending thus reveals that the loss of nasal consonants after vowels took place in two stages: firstly in Early Slavic, in all positions except before a tautosyllabic stop (i.e. including in word-final position) and secondly in Early Middle Slavic before a tautosyllabic stop. Only the former is relevant for our purposes, since this caused an opening of syllables. Another implication is that word-final *s was preserved until quite late: it was probably lost only after the new nasal vowels arose before stops. The consequence of first the loss of word-final resonants and then *s was that words could only end in a vowel or a laryngeal, which was still a regular consonant at the time.

§2.1.4 Loss of laryngeals in pretonic and post-posttonic syllables

In the Early Slavic period, laryngeals were lost in pretonic or post-posttonic syllables, with compensatory lengthening of a neighboring vowel. It is dated to the period between the loss of word-final resonants and the nasalization of vowels. The examples (provided by Kortlandt (2011c, 163)) are:

- PIE *golH-u-eh$_2$ > PBS *golʔwàʔ ‘head’ > *golwòʔ > OCS *glava* ‘head, chapter’, Ru. *golová*, SCr. *gláva*, cf. Lith. *galvà* (AP 3, reflecting the original presence of a laryngeal in the root), maybe Lat. *calva* ‘bald head, skull’
- PBS instr.sg. *suʔnumì ‘son’ > *sūnumì > OCS *synъmь*, cf. Lith. *sūnumì* (AP 3)
- PBS *pʔilàʔ ‘(she) drank’ > *pīlòʔ, cf. OCS *piti* ‘drink’, OPr. *pōuton*, Gr. πί̓νω, Aeol., Dor. πώνω
- PBS *òpsnowaʔ ‘base, foundation’ (*ob + *snouH- ‘to warp’) > *òpsnowō > Ru. *osnóva*, Sln. *osnȏva*
- PBS instr.pl. *gènaʔmiʔs̩ ‘woman’ > *gènoʔmīs̩ > *ženàmī > Sln. *ženâmi*, cf. OCS *žena*, SCr. *žèna*, OPr. voc.sg. *genno*

At first sight this sound change looks relevant for our purposes as it affects the structure of clusters and syllables – at least on the surface level. If we look closely, however, we see that in some forms the laryngeal is lost in the coda creating an open syllable (*sūnumì, *òpsnowō), in another case its loss

yields a simplification of a word-initial cluster (**pīlòʔ*) and in yet other cases it renders a simplification of a cluster in the coda (**golwòʔ, *gènoʔmīṣ*). A possible underlying phonotactic rule or pattern can hardly be discerned. In addition to this, laryngeals in stressed and posttonic syllables were not affected which creates the impression that this sound change was triggered purely by prosody rather than anything related to phonotactics. The fact that it led to more open syllables is probably not meaningful in the context of this study.[18]

§2.1.5 Monophthongization

All PSl. diphthongs were monophthongized at a certain point, such that **ai* > **ē*, **ei* > **ę̄*, **ui* > **ȳ*, and **au* > **ō*. The Umlaut-variants underwent the same process: **äi* > **ę̄*, **üi* > **ȳ*, **äu* > **ō̤*. Since the outcome of **äi* is not ***jā̤* but **ę̄*, it looks like monophthongization occurred posterior to Umlaut. Monophthongization can be dated quite precisely, to the period between the first palatalization and the phonemicization of the second palatalization of velars (see §2.1.8), because **ę̄* from **ai* feeds into the second wave of palatalization while it cannot have been a front vowel at the time of the first wave. Monophthongization arose before the moment that the second palatalization became contrastive, otherwise the new palatal consonants would have caused umlaut in the diphthong **oi*, which would have developed into **ei* > ***i* instead of *ě* (Vermeer 2014, 188). Note that the northern peripheral dialect of Novgorod-Pskov forms an exception, because diphthongs were monophthongized after the second palatalization could reach the area, i.e. the second palatalization could not take place there (Vermeer 1986, 150). The loss of diphthongs may have taken place either before, during or after the simplification of consonant clusters (that is, gemination; §2.1.8). This cannot be determined with certainty due to a lack of interaction between these sound changes. However, monophthongization after the simplification of clusters is not the most likely option. This will be discussed in §2.1.8. Another piece of evidence for its place in the relative chronology is the fact that **ui* partook in monophthongization. The only source of this diphthong is **oi* that was raised before word-final **s* (or **h* for that matter) at an earlier stage, so clearly this type of raising is older than monophthongization.[19] The eventual loss of **-s* is dated by Kortlandt after diphthongs were monophthongized around the end of the Early Middle Slavic period as he assumes there is a connection with the rise of prothetic glides in the early Late Middle Slavic period (Kortlandt 2011c, 163). Unfortunately this is hard to prove and it is probably equally possible that final **s* was lost shortly before monophthongization. Anyway, the result of monophthongization was

[18] The same goes for Meillet's law, the follow-up development by which sequences of *VH were analogically replaced by *V̄ in barytone forms in mobile paradigms (Kortlandt 2011c, 163).
[19] Kortlandt thinks that the loss of **-s* went through a stage of **-h*, and that it had already developed into **-h* at this point. This does not matter for the argument, however, because the principle is the same.

obviously that the semi-vowels were lost in coda position. Those syllables where the original glide was not followed by two consonants, were opened, creating hiatus in prevocalic position.[20]

§2.1.6 Metathesis of liquids

Sequences of **er, or, el, ol* underwent metathesis in Slavic. The diversity in which they are reflected is quite striking, but what most cases have in common is that they led to opening of the syllable. There are basically two major chronologically distinct processes going on: first metathesis affected the sequences when in word-initial position. This affected all of Slavic but it did so in different ways. The accent was at play in West and East Slavic. Cf. PSl. **òrdlo* 'plough' > OCS *ralo*, Ru., Blg. *rálo*, Cz. *rádlo*, SCr. *ràlo*, cf. Lith. *árklas*, and PSl. **orbòta* 'work' > OCS *rabota*, ORu., Cz., Pol. *robota*, SCr. *ràbota*, Blg. *rábota*, cf. Go. *arbaiþs* 'labour' (Pronk 2014, 26). In South Slavic, lengthening of the vowel was involved. The southeastern periphery, including OCS in some cases but not in others, has a number of exceptional forms that were not affected by metathesis, e.g. *al(ъ)dii* 'boat' vs. the more frequent form *ladii* and *alъkati* 'to be hungry' vs. the less frequent form *lakati* (ibid.). This issue remains an open question. In word-internal position the variation in reflexes is greater – this testifies to its more recent date. As a rule South Slavic (including OCS) and Czecho-Slovak give *ra, la, rě, lě* and Polish has *ro, lo, rě, lě* (Pronk 2014, 28).[21] East Slavic goes through "polnoglasie" (or "pleophony") giving *olo, oro, ere*, of which an example is the word for 'side, land': PSl. **stornà* > OCS, Cz., Slk. *strana*, Pol., US, LS *strona*, SCr. *strána*, but Ru. *storoná*. Cf. also Plb. *stornə*: in Northern West Slavic, **or* was unaffected. In fact, there are some indications that all metathesis of liquids went through a stage of VRV (or ъ/ьRV) rather than jumping from VR to RV, at least in West Slavic.[22] These are the unexpected vocalization of the jer in the preposition in OPol. *we błocie* 'in the swamp', which must come from **vь bьlotě* < **vь boltě*, and also the Lower Sorbian reflex of e.g. **kr* in *krowa* 'cow' < **korva*, where instead of voiced *r* the expected reflex would be devoiced *kš* (Kortlandt 2011d). The following relative chronology has been established by Kortlandt for liquid metathesis (Kortlandt 2011b, 252; 2019, 31–32):

1. Rise of geminates in clusters with **j* (see §2.1.8);
2. Word-initial metathesis of liquids (Pan-Slavic);
3. *tl/dl* > *l* in South and East Slavic (see §2.1.7);
4. Word-internal metathesis of liquids in South Slavic and Czecho-Slovak;
5. Rise of new timbre distinctions (Kortlandt 2011c, 168–69; see also below);

[20] Much later in the history of Slavic, diphthongs would emerge again as a result of vowel loss or reduction and prothesis of the palatal glide.
[21] But Upper Sorbian gives *ro, lo, re, le* and Lower Sorbian varies between the Upper Sorbian and Polish reflexes. Northern West Slavic leaves **or* unaffected.
[22] Bidwell (1961, 118 fn. 22) adduces evidence from the treatment of Vulgar Latin toponyms in Slavic that may speak in favor of this idea.

6. Loss of **j* and later degemination // Spread of word-internal metathesis of liquids to Polish and Sorbian (the order of these two sound changes cannot be determined).

The rise of geminates in clusters with **j* (1) must have preceded all forms of liquid metathesis (2, 4, 6), otherwise **j* would still have been a regular consonant at the time of metathesis, meaning that we would expect forms with such clusters to partake in metathesis, which they certainly did not. Cf. OCS *volja*, Ru. *vólja* 'will, wish, freedom' (Kortlandt 2019, esp. 31). The argument for the order of word-initial metathesis (2) before *tl/dl* > *l* (3), is based on the geographical distribution of the outcomes of both sound changes. The area where *tl* and *dl* remain unaffected is larger than the area where we find West Slavic *ro-, lo-* instead of South Slavic *ra-, la-* (for the entire argument see Kortlandt 2011b, 252). The idea that, on the other hand, word-internal liquid metathesis (4) is posterior to *tl/dl* > *l* (3) is based on the preservation of the cluster in e.g. the word for 'chisel': SCr. *dlijèto*, Blg. *dletó*, Sln. *dlę́tọ* 'chisel' < PSl. **deltò* (Kortlandt 2011c, 168).[23] Furthermore metathesis predated the rise of the new timbre distinctions in South Slavic and Czecho-Slovak (i.e. 4-5), where metathesis was concomitant with vowel lengthening, because of the timbre in the outcomes. In the rest of West Slavic these two developments took place in the reverse order (i.e. 5-6; Kortlandt 2011c, 168). Importantly, the loss of **j* in clusters and subsequent degemination of original clusters (6) should be dated after the rise of new timbre distinctions ((5), see §2.1.8), which is why it must have postdated metathesis as well (2, 4).

§2.1.7 *tl/dl* > *l* in South and East Slavic

The sequences *tl* and *dl* developed into single *l* in South and East Slavic, including OCS and the dialect of the Kiev Leaflets (spoken in Pannonia). The sound change also hit Central Slovak. There are some regions where original *tl/dl* did not simplify to *l*, like in West-Slavic: northern Slovene, the dialect of the Freising Fragments (southern Austria) and the northwestern part of Russian (Pronk 2021, 6).[24] An example is the verb for 'to pray': PSl. **modliti* > OCS *moliti*, Ru. *molít'*, SCr. *mòliti*, Cz. *modliti se*, Pol. *modlić*. On the one hand, this sound change could be regarded as a plain instance of assimilation, since the segments in *tl* and *dl* were (probably) homorganic. The question then arises whether it should be interpreted as an instance of a syllable-opening sound change, because in this case, more than with the other relevant sound changes, it is perhaps not necessary to assume that it is the result of a drive toward open syllables. On the other hand, it will be discussed in §2.1.8 that there are reasons to think that other consonant clusters went through a stage of gemination before they were simplified and opened the syllable. The parallel case of *tl/dl* can therefore best be explained in the same way.

[23] Note that several Čakavian dialects also have forms with initial *l* such as Vrgada *lītö* (Derksen 2008, s.v. *deltò). These look like recent innovations. Cf. SCr. *dlȁn* 'handpalm', always with *dl-*.

[24] In some regions *-tl-/-dl-* gave *-kl-/-gl-* due to Baltic substrate influence. Other apparent counterexamples arose by metathesis or certain developments involving jers (Shevelov 1964, 370–74). Next to **tl/dl*, the sequences **tn, dn* are sometimes simplified to *n, m*, but only in a handful of words. See Vaillant (1950, 90–91).

Though earlier scholars such as Vaillant (1950, 89) believed the opposite, Kortlandt has characterized it as "one of the oldest isoglosses" in Slavic (2011b, 248), cf. Pronk (2021). The cases that probably looked recent in Vaillant's eyes were in fact due to later metathesis of liquids (cf. §2.1.6). The idea that this sound change is old explains its atypical geographical distribution. Notably, there are two other developments in Proto-Slavic that show a similar geographical distribution, with West Slavic being (largely) unaffected while South and East Slavic undergo the same change. These are the development of velars followed by **w* after the second palatalization (cf. unpalatalized *k-* in Cz. *květ* vs. SCr. *cvìjet* 'flower'), and a certain development in the palatal series. In light of the aberrant behavior of West Slavic in all three sound changes, they are dated to around the same period by Kortlandt (2011c, 163). We have seen in §2.1.6 that, based on the geographical distribution of the outcomes, Kortlandt dates the change of *tl/dl* > *l* after the metathesis of liquids in word-initial position. However, the argument is not compelling, and the reverse order seems to be possible as well. In this case it came into being not long after the rise of gemination.

§2.1.8 Simplification of consonant clusters with and without **j*

Virtually all Proto-Slavic word-internal consonant clusters were resolved in one way or another. The simplification of consonant clusters is sometimes divided into two groups based on the processes that underlie their simplification, namely clusters with **j* in the second slot and those without. The latter group has not received a lot of attention in most works on the historical phonology of Slavic, while on the other hand the loss and later reemergence of the phoneme /j/ play an important role in the literature on the development of the Slavic proto-language as there is a lot of interaction with other sound changes. For both groups of clusters, it has been attempted to explain their development through a stage of gemination. This is important because intervocalic geminates are uncontroversially thought to occupy both the coda position and the following onset position at the same time (e.g. Ringen and Vago 2011), which means that at first no opening of the syllable is involved. The questions that we must find an answer to are therefore the following: 1. Did consonant clusters really go through a stage of gemination? 2. If so, at what point were the geminates simplified, that is, when were the relevant syllables opened? 3. Does the treatment of consonant clusters with **j* differ from those without, and if so, how? Let us begin with a discussion of clusters without **j*. Clusters consisting of two consonants were treated in a remarkably uniform way. The tendency was to simply drop the first consonant and retain the second, as in the following examples from OCS (after van Wijk 1931, 51–53):

- **pt* > *t*: inf. *greti* 'to dig' next to pres. *grebǫ* 'I dig'
- **kx* > *x*: sigmatic aor. *rěxъ* 'I said' next to pres. *rekǫ* 'I say'
- **ts* > *s*: sigmatic aor. *čisъ* 'I read' next to pres. *čьtǫ* 'I read'
- **pn* > *n*: PSl. **supnum* > *sъnъ* 'sleep' (cf. Lith. *sãpnas* 'dream')

The treatment of prepositions shows that geminates were affected in the same way, also the ones that arose from voice assimilation, e.g.:

- *oplotъ* 'fence' < **ob plotъ* lit. 'around-fence'
- *be zъloby* 'without fault' < **bez zъloby*

Since the coda consonants were lost without a trace, we could simply assume that this development was caused by a general loss of coda consonants, though a structurally more plausible explanation is probably the one proposed by among others Shevelov (1964, 188). He stated that the coda of a heterogeneous cluster would undergo total assimilation to the following segment, thereby changing into a geminate, after which it was simplified like other geminates due to "a Proto-Slavic constraint on geminates" (referring to the law of open syllables). There are some exceptions to the rule stated above by which consonant clusters were simplified by loss of the coda consonant. It is commonly assumed that these exceptions can be explained by the fact that they could all occur word-initially, implying that the non-simplified consonant clusters in word-internal position could survive because the syllable boundary would shift to the position before the cluster (van Wijk 1931, 47–51).[25] The general rules for consonant clusters may therefore be summarized as: what is allowed word-initially is preserved word-internally by shifting of the syllable boundary; what is not allowed word-initially is simplified by loss of the coda.

The development and chronology of consonant clusters with **j* are a lot more intricate compared to the clusters that were discussed above. The relevant clusters are velar **kj, gj, xj*; dental **tj, dj*; sibilant **sj, zj*; resonant (minus **m*) **rj, lj, nj* and labial **mj, bj, pj, vj*. The labial clusters form an exception in this series, because they developed an epenthetic **l* resulting in **mlj, blj, plj, vlj* (which would later change into **Mĺ*, i.e. loss of **j* as a separate segment when this phoneme was eliminated from the system; see below). Especially the velar and dental clusters are interesting, so we will focus on them in what comes next. It will however be argued that the other clusters (the sibilant and resonant clusters) behaved in the same way as **tj* and **dj*. When our clusters were still regular clusters with consonantal **j*, they underwent a lengthy sequence of events beginning with the palatalization of velar consonants before **j* (parallel to the palatalization of velars before front vowels, i.e. the "first palatalization") and eventually ending with the loss of **j* in postconsonantal position (Vermeer 2014, 182). A complicating factor is that just after the beginning of the second palatalization, the first dialectal differences started to emerge in Slavic, meaning that the events affected some dialects in a slightly different order, or in some cases, as a result of the different order, not at all. On top of that, dialect levelling or convergence took place continuously. Below we will take a look at the sequence of events as Vermeer (2014; 2020) reconstructed it for Central Slavic, viz. the early dialect that gave rise to the eastern half of Serbo-Croatian (Štokavian, including Torlak) and East Slavic except for the very north. The consonant systems

[25] The exception of *tl/dl* does not fit this explanation. See §2.1.7. Another apparent exception is the cluster *-gd-*, as in *jegda* 'when', *kogda* 'when, sometimes, one time'. However, there is a trace of a jer in between *g* and *d* in these forms (Derksen 2008, 227).

found elsewhere in Slavic can all be explained on the basis of deviations from the Central Slavic order (Vermeer 2014; 2020 esp. 333-337, 344), which will be mentioned wherever they are relevant.

When the first palatalization of velars had taken place, by which **k/g/x* > **č/dž/š* before front vowels, most consonantal developments that followed it relate to either the velars or the dental stops **t/d* before **j*. First the velars **k/g/x* were affected by palatalization again, by a process called the second palatalization. The evidence suggests that this first happened only allophonically at a pre-dialectal stage and that the second palatalization became contrastive some time later, after the monophthongization of diphthongs had given rise to a new front vowel (Vermeer 2014, 187–88). After the allophonic stage of the second palatalization had begun, the first dialectal differences started to emerge. This is the moment that assimilation must have taken place in the clusters **tj* and **dj*, which led to allophonic palatalization and likely gemination, giving rise to something like [t́t́] and [d́d́]. The idea that geminates were involved in the development of the clusters **tj/dj* is based on both structural and direct evidence. A direct argument can be found in the treatment of these clusters in Bulgarian-Macedonian. Here the reflexes *št, žd* reflect earlier [śt́], [źd́], which probably arose from [t́t́], [d́d́] by dissimilation (Vermeer 2014, 199–200; Kortlandt 2011c, 167; 2016, 467). Dissimilation happened early on, before the Pan-Slavic degemination of geminates could take place. The dissimilated reflexes were therefore not affected (ibid.). The explanation in gemination goes back to Potebnja (1879, 597–601), and up to this day it appears to be the only way to account for the Bulgarian-Macedonian outcomes of **tj/dj*. Not long after the geminates [t́t́/d́d́] had arisen, the cluster **kt* before high front vowels merged with the reflex of **tj* – they are both reflected as *št* as in e.g. OCS *noštь* 'night'. Importantly, **kt* in this position was not followed by **j*, which opens the door for the reconstruction of gemination in **kt* [tt] in other positions than before a front vowel. This implies that gemination was not necessarily limited to palatalized clusters but that it could also occur in clusters without **j* that were discussed above. This is probably the moment that **nj*, **lj* (and other clusters with **j*) became geminated as well and developed into [ńń] and [ĺĺ] (cf. Kortlandt 2011c, 167; 2019, 29–30).

Back to our sequence of events that eventually led to the loss of **j*. After gemination had arisen in **tj/dj*, the palatalized character of **tj/dj* [t́t́/d́d́] led to affrication, giving rise to [ć] and [dź]. Affrication also affected other palatalized stops, namely the velars that were still allophonically palatalized due to the second palatalization, such that they developed into **ć/dź/ś*. These were then phonemicized when the second palatalization became contrastive. The new phoneme **dź* was soon simplified to **ź* because of its redundancy within the system (a process also known as spirantization). The result was that Proto-Slavic had two perfectly parallel palatal series, being **č/š/ž* from the first palatalization and **ć/ś/ź* from the second. According to Vermeer, the functional load of these contrasts was relatively low, and this is why **ć/ś/ź* underwent depalatalization to **c/s/z*. Notably, this did *not* affect the phonetically palatalized affricate [ć], nor [dź], which reflect **tj/dj*. Therefore the idea is that they were phonemicized only later, as a consequence of the loss of the phoneme **j* in postconsonantal position. The geminates are assumed

to have retained **j* in the second slot (on a phonological level), and thus the loss of **j* is equated with the loss of gemination by Vermeer (2014, 200, 221), who followed Kortlandt's original ideas on this (2011a, 153 (first published in 1982); 2011c, 167, 169; for Kortlandt's more recent theory, see below).

What the paragraphs above shows is that gemination must have been present in the sequences **tj/dj* for some time, at least longer than the very short period that is often suggested in the literature (e.g. Shevelov 1964, 188). Between the assimilation of **tj/dj* to [ć́t/ǵ́d] (i.e. the rise of gemination) and the loss of **j*, a number of sound changes took place: at least affrication of **tj/dj* and **k/g* before front vowels, the phonemicization of the reflexes of the second palatalization, spirantization and depalatalization happened in between, as we have seen above. Kortlandt (2011c, 165–69) dates a large number of sound changes between the rise of geminates and the loss of **j*, including several accentological developments (such as Illič-Svityč's law, Pedersen's law, Dolobko's law), the prothesis of glides and the rise of new timbre distinctions, but also the metathesis of liquids (see below).

The question is still: how exactly did the loss of **j* affect the geminates? And what does this imply about the chronology of the loss of the other possibly geminated clusters with and without **j* that we have seen above? In the original formulation of van Wijk's law as used in Kortlandt (2011c, 169), long consonants were shortened with compensatory lengthening of the following vowel, i.e. CCV > CV̄. Cf. SCr. *gȉnē* 'perishes' < **gýnne* < **gúbne*. The assumption is that sequences with postconsonantal **j*, being geminates, would undergo the same sound change: *CjV > ĆĆV > ĆV̄, as in SCr. *pîšē* 'writes' which would reflect **píšše* < **pę́šje* < **péisje*.[26] With this interpretation of van Wijk's law, all geminates ceased to exist at once, and we could date this process to the moment that **j* was lost in this position. However, in recent years it has turned out to be necessary to revise van Wijk's law for several reasons (Kortlandt 2015; see also 2016; 2019). Firstly, compensatory lengthening of a following vowel is in itself peculiar, since CL typically affects the vowel preceding the affected consonant(s). Secondly, it is very well possible and probably more likely that **j* was preserved as a phoneme in the sequence **tj/dj*, such that it was ĆĆjV at the time of van Wijk's law. Thirdly, the length of the thematic vowel in *ne*-presents (such as SCr. *gȉnē* 'perishes', see above) is probably rather analogical after the corresponding *je*-presents. For this reason it is no longer necessary to assume that the long vowel in e.g. *gȉnē* arose from compensatory lengthening when **-nn-* was simplified, so from **gýnne* < **gúbne* (for the entire argument see Kortlandt 2015, 66). Indeed, nowhere else did the simplification of consonant clusters that did not contain **j* lead to lengthening of the following vowel. Based on this, it may be inferred that van Wijk's law apparently only affected postconsonantal **j* and that it was **j* that was vocalized (probably to *ъ), leading to vowel contraction (Kortlandt 2019, esp. 30-31). The idea that **j* vocalized to *ъ may be supported by the fact that, at this point in time, the phonemes /j/ and /i/ were in complementary distribution as a result of the earlier processes of umlaut of back vowels after a preceding **j*, monophthongization and word-initial

[26] Interestingly, the loss of postconsonantal **j* is characterized as "the culmination of the law of open syllables" in Kortlandt (2011a, 153).

prothesis of the glide **j* in the position between a word-final and a word-initial front vowel, a process by which hiatus at word boundaries were resolved (Kortlandt 2019, 31). The reformulated version of van Wijk's law may be represented as: ĆĆjV (from *CjV) > ĆĆьV > ĆĆV̄. Examples are SCr. *vȍlja* < **wòl̥ā* < **wòlja* 'will, wish' and *pîšē* < **píšje* 'writes' (Kortlandt 2015, 68). Since in general **j* is more likely to vocalize after a consonant cluster – compare the somewhat similar phenomenon of Sievers's law in Germanic – it looks like gemination was lost only afterwards. This means that van Wijk's law/the loss of **j* and degemination cannot be equated after all, contrarily to Kortlandt's (2011c, 167, 169) earlier ideas, which were followed by Vermeer (2014, 200, 221; 2020, 344) as we have seen above.

What we can conclude from all of the above about the relative chronology of the simplification of consonant clusters is the following. We have seen that consonant clusters with **j* are likely to have passed through a stage of gemination, based on the Bulgarian-Macedonian dissimilated reflexes of **tj/dj*. By analogy, but also based on independent ideas on their development, it is reasonable to think that consonant clusters without **j* developed into geminates before they were simplified as well, though there is no direct evidence for this. Therefore there is a possibility that they behaved differently and that they simplified earlier than the clusters with **j* did so. However, if clusters without **j* were indeed geminates and if they remained as such up until the moment that **j* was lost in clusters containing this phoneme, then from that moment onwards there was no longer a difference between geminates with and without **j*, which means that we may expect them to behave the same and lose gemination at the same time. In other words, the geminates without **j* were lost together with geminates with **j* at the latest, but possibly before that. The absence of variation in the reflexes of clusters without **j* within Slavic may perhaps speak in favor of an earlier date of simplification, though this argument is far from compelling because pan-Slavic changes kept on coming even when the first dialect differences had long arisen. Otherwise there is no way of telling this, as far as I am aware. What we can determine is that gemination in clusters with **j* arose after:

1. The allophonic phase of the second palatalization (see above; Vermeer 2020, 329–33; Kortlandt 2011c, 165);
2. Monophthongization, maybe: on the basis of the material, it can only be determined that monophthongization preceded the contrastive phase of the second palatalization, therefore it is equally possible that monophthongization took place shortly after gemination (Vermeer 2020, 333).

The geminates with **j* arose before, and were degeminated after:

3. Affrication of **tj/dj* in nearly all Slavic dialects (see above; for exceptions see Vermeer 2014);
4. The contrastive phase of the second palatalization with subsequent spirantization and depalatalization (in Central Slavic; Vermeer 2014, 197; see above);

5. Prothesis of glides (see above; Kortlandt 2011c, 166; 2015, 64–65; 2019, 31). Since prothesis postdated the loss of final **s* (Kortlandt 2011c, 165–66), the loss of this phoneme also belongs here, or possibly in the list above as it might have preceded monophthongization (see §2.1.5).
6. Metathesis of liquids (see §2.1.6 and below; Kortlandt 2019, 31–32);
7. Development of *tl/dl* > *l* in South and East Slavic (perhaps before 6);
8. Rise of new timbre distinctions, because new long **ē* that arose by van Wijk's law did not merge with earlier **ē* due to the fact that the latter had already developed into *ě* (Vermeer 2014, 197; Kortlandt 2011c, 169);
9. Loss of postconsonantal **j* by van Wijk's law (see above).

The loss of **j* in clusters by van Wijk's law, and therefore also the later change of degemination, postdated the rise of new timbre distinctions for the reason mentioned under (8), while metathesis of liquids predated the vowel shift, since clusters with **j* did not partake in metathesis (see §2.1.6). Another argument for metathesis preceding degemination is the origin of the Austrian toponym *Flättach*. Holzer proposed that this is a borrowing from Slavic **blātʲāxu*, the metathesized form of earlier **bālʲtʲāxu* (Holzer 1996, 93). The cluster /tj/ was borrowed as a geminate *tt*, suggesting that gemination was still a feature of this type of clusters of contemporary Slavic. The relative chronology as a whole shows that gemination apparently survived as such for quite some time, and up until a late stage of Proto-Slavic. Degemination, i.e. opening of the syllable, postdates even the development of *tl/dl* > *l* and the metathesis of liquids, which means that this sound change is the latest instance of a syllable-opening mechanism in Proto-Slavic. An important question for us to answer next is whether the loss of gemination, apparently a very late change, happened early enough for it to have been a result of contact. If it turns out to not be the case, then this instance of the Opening of Syllables can only be regarded as the result of Slavic-internal processes.

§2.1.9 The beginning and end of the Opening of Syllables

After the developments described in the sub-sections above, the Opening of Syllables, whatever the nature of this phenomenon, came to an end due to the loss of jers.[27] The first signal that the jers were bound to get lost came soon in the form of retraction of the stress from word-final jers. It certainly postdated the rise of the new timbre distinctions because it gave rise to new long vowels (Kortlandt 2011c, 170). This automatically means that the retraction also postdated the metathesis of liquids, one of the last syllable-opening sound changes (§2.1.6). Whether it also succeeded degemination cannot be determined with certainty, because the two sound changes do not interact. In theory it is possible that before the last instance of the Opening of Syllables, i.e. degemination, the first sound change leading to

[27] Kortlandt (2011c, 170) puts it this way: "The redundancies which the trend toward rising sonority had created evoked a reaction, which eventually led to the disintegration of the prosodic system and to the rise of new closed syllables". This statement more or less reflects the consensus when it comes to the closure of syllables.

the loss of the jers was already in process. The retraction of the stress from word-final jers must have preceded Dybo's law, a fact that will help us in determining the absolute chronology of the loss of the jers (see the introduction of §2.2). After Dybo's and Stang's laws, the second step in the loss of the jers was taken. Merger of the jers happened in Serbo-Croatian, Slovene and Czech, after which Lechitic followed, this being one of the last (partly) common innovations in Slavic. Though it cannot be ruled out, gemination is unlikely to have survived until this point. Not long after that the jers were eventually eliminated by loss or by merger with other vowels through language-specific processes (Kortlandt 2011c, 170–73).[28] This third development would cause large-scale closure of the syllable, thus leading to a natural end of the Opening of Syllables. It happened at a stage when Slavic was in the process of disintegrating since it affected individual languages. Gemination was lost certainly before Slavic entered this stage, given the relatively uniform character of degemination (Vermeer 2020).

As to the other end of the timeline, we have seen in §2.1.1 that the loss of word-final stops (**t*/*d*) took place in Balto-Slavic times already. The vocalization of the syllabic resonants (§2.1.2) that followed it also did, but this led to closure rather than opening of syllables. In light of these two facts it makes little sense to subsume the loss of word-final stops and the post-Balto-Slavic changes under one and the same phenomenon, when looking for possible influences by language contact at least. As we will see in chapter 3, Avar entered the scene millennia too late for it to have influenced the syllable structure of Proto-Balto-Slavic. To summarize the findings of this section, we arrive at the following relative chronology of sound changes that are apparently part of the Opening of Syllables and that were hypothetically induced by contact:

1. Loss of word-final resonants
2. Nasalization of vowels
3. Monophthongization (maybe after 6)
4. Loss of word-final **s* (perhaps before 5)
5. Rise of gemination in consonant clusters
6. Metathesis of liquids in word-initial position
7. *tl, dl* > *l* in South and East Slavic (perhaps before 7)
8. Metathesis of liquids in word-internal position
9. Degemination of original consonant clusters

We will have to dive into the absolute chronology of these sound changes in order to find out more about their distribution over time and to find answers to the Avar contact hypothesis (section §2.2). But first, we will briefly consider the supposed role of sonority in the Opening of Syllables.

[28] Only in Slovene have they retained their status as a phoneme. For details see Shevelov (1964, 432–65).

§2.1.10 Relative chronology and the role of sonority

The relative chronology that has been established in the previous sections for the syllable-opening sound changes can help us in finding out to what extent sonority may have played a role in the phenomenon of the Opening of Syllables. It is good to consider this matter before further exploring the contact hypothesis, because if it turns out that such an underlying mechanism was the driving force behind the Opening of Syllables, then we may have to adjust our expectations of the phonology of the donor language. That is, if the observed sound changes are a result of the speakers' preference to rising sonority within the syllable, then, on the one hand, we expect to see such a preference in the contact language as well, and on the other hand, it becomes unnecessary to assume that each observed sound change in Slavic has a directly correlating sound pattern in the contact language. Moreover, if the tendency toward rising sonority in the syllable really is responsible for the Opening of Syllables, as many have claimed (cf. chapter 1; van Wijk 1931, 46–47; Kortlandt 2011c, 164, 166, 170), the question is whether a language-external explanation is even necessary or desired. Before we start to explore the role of sonority, however, a disclaimer is in place: whether this interpretation of the Opening of Syllables turns out to be justified or not, we may of course question its explanatory power. The concept of sonority is notoriously ill-defined and far from understood, and it is still subject of intense debate in the domain of theoretical linguistics.[29] This is something to keep in mind at all times when trying to explain diachronic behavior of segments through sonority.

If a tendency toward sonority is responsible for our sound changes, we may expect syllables to exhibit a less and less sharply falling sonority cline through time. This means that it is to be expected that with each new sound change, syllables with the sharpest drop in sonority after the nucleus (the sonority peak) are affected in such a way that the cline becomes less steep. Since we are dealing with syllable-opening sound changes, this automatically comes down to the cline ending in a peak. This hypothesis can be tested by checking whether the relative order of the sound changes and their effect on the sonority cline of the affected syllables matches with the predictions the sonority hierarchy makes on the relative order of the loss of segments. There is some disagreement on the details of the sonority hierarchy, though by far most scholars agree on the following basic order, going from lowest to highest sonority: obstruents > nasals > liquids > glides > vowels (Kiparsky 1979; Selkirk 1984; Clements 1990). A relevant detail for us is that a number of scholars argue that "obstruents" should be broken down into stops > fricatives, meaning that /s/ is more sonorous than the stops (Kiparsky 1979; Selkirk 1984). Accordingly, it is predicted that our sound changes first affected the stops, because in a sequence VT, the sonority cline shows the sharpest possible drop. After that, /s/ was affected, thirdly the nasals, then the liquids and lastly the glides.

[29] For arguments in favor of sonority as a phonologically or prosodically active phenomenon, see Parker (2011). Important studies that argue against sonority are Ohala (1992) and Harris (2006). An up-to-date reference work is Parker (2012), containing various studies that look at the phenomenon from a different angle.

The relative order established in chapter 2 (see §2.1.9) shows that the prediction on the stops is partly correct, since the sound change leading to their loss in word-final position, the first syllable-opening mechanism, took place extremely early on. But after the first sound change, two problems arise. One of them is that after the loss of word-final stops, the inherited syllabic resonants were vocalized (§2.1.2). Rather than leading to rising sonority, the new post-vocalic resonant (from *R̥ > VR) lead to closure of the syllable and falling sonority. The existence of this sound change alone is hard to unite with a trend toward rising sonority. We may go as far as saying that, if there was a trend toward rising sonority, we would expect the syllabic resonants to vocalize as RV rather than as VR. An option would be to assume that the loss of word-final stops was not part of the tendency toward rising sonority, and that this tendency came into being only later. However, this assumption is probably nothing more than ad hoc. A second problem with the relative order of our sound changes after the loss of word-final stops and the dissolution of the vocalic resonants is that the predictions match less well with the actual order. As we have seen in §2.1.3, **s* in word-final position was lost only after the nasalization of vowels.[30] Moreover, the nasalization of vowels probably postdated the early loss of word-final resonants (including liquids), so this is another mismatch with the predicted relative order. The relatively late loss of post-vocalic glides through monophthongization actually fits with the predicted order in that they were lost after stops, word-final resonants and nasals in general were affected, but here the problem is that monophthongization took place before the loss of coda liquids by metathesis, which is not what the sonority hierarchy would predict (cf. §2.1.8). The place of the simplification of consonant clusters within the relative order is, as discussed in §2.1.7, complicated. As to the rise of gemination, this did not lead to opening of the syllable in most cases, and because of the affricated or plosive character of most geminates (such as **tj* [t́t́] and **pt* [tt]), these cannot be regarded as instances of the tendency toward rising sonority. A rising sonority cline in the relevant syllables was only reached when degemination took place in late Proto-Slavic, after the loss of coda liquids by metathesis.

It can however be argued that there was an intermediate step in some cases, that is, in those clusters that consisted of a stop followed by a more sonorous segment such as a nasal or a liquid. We have seen that in most cases, the coda consonant, i.e. the stop, assimilated to the following segment. The cluster **pn*, for example, developed into *n* probably through a stage **nn* (cf. §2.1.8). The coda segment developed into a more sonorous segment in this type of clusters, which means that the sonority cline of the syllable ending originally ending in the stop dropped less sharply after gemination took place. If it is correct that gemination of clusters without **j* arose around the same time as gemination in clusters with **j* – which is not necessarily the case – then this intermediate development in clusters preceded the metathesis of liquids (see §2.1.8). In any case the relatively late degemination in original consonant clusters is

[30] It was mentioned before that Kortlandt (2011c, 163) has proposed that the loss of **s* passed through an intermediate stage **h*. Given that /h/ is a fricative like /s/, the argument adduced here is independent from the realization of this phoneme.

unexpected and quite striking from the perspective of the sonority hierarchy. The predicted relative order in which segments are affected on the basis of the sonority hierarchy and the actual order of the sound changes that was established in §2.1 are summarized in the table below for the sake of clarity. The table is to be read chronologically from top to bottom.

Predicted order	**Actual order**
Stops	Loss of word-final stops (**t/d*)
/s/	Loss of word-final resonants
Nasals	Nasalization of coda nasals
Liquids	Monophthongization of diphthongs by loss of glides
Glides	Loss of word-final **s*
–	Rise of gemination
–	Metathesis of post-vocalic liquids
–	Loss of gemination

The mismatches described above show that barely any evidence can be found for the hypothesis that syllables exhibit a less and less sharply falling sonority cline through time. Even if we divide the set of sound changes into two according to the position that the affected segment is in, namely word-final vs. word-initial/internal, the order of sound changes is not in line with what the hierarchy would predict. The question is then whether this means that the hypothesis that sonority is involved in the Opening of Syllables is to be rejected overall or not. Unfortunately this question cannot be answered conclusively at this point, if ever. What we can conclude is that is not especially likely that sonority played a role, for the fact that the order of the loss of segments is not in line with the sonority hierarchy, and because it is somewhat strange to assume that a tendency toward rising sonority was strong enough to give rise to sound changes, but that these sound changes appeared in what seems to be a random order. If we add to this the overall uncertainty regarding the mechanisms of the concept of sonority, it is probably safer to not involve this phenomenon in our analysis of the Opening of Syllables. This means that the sound changes leading to the Opening of Syllables likely originate somewhere else, maybe in an external source. We now have more than enough reasons to further explore the Avar contact hypothesis.

§2.2 Absolute chronology and geographical distribution

It is clear already at first glance that our sound laws span a huge time period (see the list in §2.1.9). The estimates of the date of the end of the Balto-Slavic period vary. While for example Kortlandt (2011a, 150) based on a rough approximation, puts it as late as 1000 BC, others date it to the (early) second

millennium BC (Pronk and Pronk-Tiethoff 2018, 279).[31] Based on relative chronology we know that it is somewhere in the beginning of the early Slavic period, not long after the dissolution of Proto-Balto-Slavic, that the first sound changes, viz. the loss of word-final resonants and the nasalization of vowels, started to come into being. Additionally, relative chronology tells us that the last sound changes leading to opening of syllables took place around the time that the major dialect divisions established themselves, still some time before the last common innovations took place and before Proto-Slavic finally disintegrated. This latter event is often dated to around the end of the 9th century AD. This date is in fact relatively secure: it is based, among other things, on the appearance of the first written evidence of Slavic and the source of the Proto-Slavic word for 'king', **korljь*, which is in all likelihood borrowed from the West Germanic name *Karl* denoting the Frankish king Charlemagne who lived between 742-814. This happened at the time when Proto-Slavic was still a unity because the word underwent some of the common innovations – including liquid metathesis, as we will see in §2.2.5 (Pronk-Tiethoff 2013, 111–12). Importantly, it also regularly underwent Dybo's law, implying that this sound change was in process after the word was borrowed, i.e. somewhere in the 9th century. Since the retraction of the stress from word-final jers (discussed in §2.1.9) preceded Dybo's law and postdated the rise of new timbre distinctions and since these two sound changes took place in the beginning of the 9th century at the earliest, the stress retraction can be dated to the (early) 9th century as well. The two subsequent sound changes, i.e. merger and, finally, loss of the jers, took place a while after Dybo's and Stang's laws (Kortlandt 2011c, 172–73), the latter of which is thought to have taken place in the 9th or early 10th century. It was mentioned in §2.1.9 that the last syllable-opening sound change, viz. degemination, was probably lost before or not long after Dybo's and Stang's laws. An additional factor that speaks in favor of this dating of degemination is that the earliest written material, found in Latin texts, dates to the late 9th century, and the earliest Slavic texts and inscriptions to the 10th or 11th centuries. These considerations provide us with an insight into the largest possible timeframe for the Opening of Syllables, approximately 2000 BC (or 1000 BC at the very latest) – 900 AD. The question that emerges from this observation, and an essential one for the contact hypothesis, is whether we find any clustering of sound changes somewhere within this time span or not. If we do, then we will have to investigate whether the dating of the observed cluster matches the period in which contact with the Avars was theoretically possible. If we do not, then this is a setback for the hypothesis that the Opening of Syllables as a whole was due to contact (but still it would not rule out the possibility that one or more sound changes are induced by contact with Avar, or any other language). The implications of the presence or absence of a chronological cluster of sound changes will be discussed in the following chapters. First we will have to determine when and where the sound changes took place, if this is possible at all.

In principle, insights into the absolute chronology of sound changes may come from Slavic forms that were borrowed into other non-Slavic languages, borrowings from non-Slavic languages into Slavic,

[31] This is mostly based on a connection with the Middle Dnieper culture, dated from 2800-2600 to 1900-1800 BC.

onomastic material such as toponyms or hydronyms, and the appearance of forms in datable texts. The findings in the sub-sections below are mostly based on the following sources: Shevelov's monograph (1964) on the historical phonology of Slavic where a lot of attention is devoted to chronological details; Bidwell's study (1961) of the implications of Vulgar Latin loans – mostly toponyms – for the chronology of Common Slavic sound changes; Kallio's article (2006) on the earliest Slavic loanwords in Finnic; Pronk-Tiethoff's monograph (2013) on the Germanic loanwords in Slavic; Derksen's paper (2020) on the earliest Slavic borrowings in East Baltic, and Vermeer's work (2020; 2014) on the chronology of sound changes affecting the consonants of the emerging Slavic dialects.

§2.2.1 Loss of word-final resonants

The early loss of word-final consonants after PIE **ē, ō* cannot be dated with precision, unfortunately, because the evidence is simply too scarce: only three words were affected (see §2.1.3) and none of these is useful for the strategies mentioned in the previous sub-section because they are all inherited from PIE. There appears to be no other material that could help decide on the matter either, so at this point all we know is that which relative chronology tells us, which is that it took place very early in Proto-Slavic.

§2.2.2 Nasalization of vowels

There is plenty of evidence for the occurrence of nasal vowels in loanwords from non-Slavic languages in Slavic and also in loanwords from Slavic in non-Slavic languages. Vulgar Latin sequences of VN yielded Slavic *ę* or *ǫ*, as can be observed in e.g. the VL placename *Bassantem* > PSl. **bosǫtŭ* > *Bosut* (Bidwell 1961, 117). The same goes for Germanic borrowings, cf. West Germanic **stampa-* 'pestle, mortar' (cf. OHG *stampf, stamph*) > PSl. **stǫpa* > CS *stupa*, Ru. *stupa*, Pol. *stępa*, Plb. *stǫpo*, Sln. *stǫ́pa* 'id.' (Pronk-Tiethoff 2013, 94, 124) and Northwest Germanic **grindila-* or **grendila-* 'bar, bolt' (cf. OHG *grintil*) > PSl. **grędelja* 'plough-beam, axis' > Ukr. *hrjadíl*', *hradíl*' 'plough-beam', Pol. *grządziel* 'pole on a plough', OCz. *hřiedel* 'axis, pivot', Sln. *grę́dəlj* 'pole, plough-beam', Blg. *gredél* 'id.'. It is a relatively late borrowing as it postdated Germanic *i*-umlaut of the original form **grandila-*. Therefore it is likely borrowed after the seventh or eighth century (Pronk-Tiethoff 2013, 105–6). The problem is that these forms do not reveal as much as we would like. What they tell us is that, obviously, at the moment of borrowing, the sequence VN in borrowings was interpreted as a nasalized vowel by the Slavs. What they do not tell us, however, is when the process of nasalization actually began, because neither Germanic nor Latin (nor Finnic) had nasal vowels. Baltic did, but the earliest Slavic borrowings into East Baltic are much too late to be of use. Where the Slavic forms have a reflex of nasalized **ę*, Lithuanian has *ė* and Latvian *ē*, as in PSl. **męta* 'mint' (cf. OCS *męta*, Pol *mięta*) > Lith. *mėtà*, Latv. *mẽtra*. Where PSl. has **ǫ*, Lithuanian has *ū* and Latvian *uo*, as in PSl. **mǫka* 'torment' (cf. OCS *mǫka*, Pol. *męka*) > Lith. *mūkà* (OLith., dial.) 'torment', Latv. *muõka*. The absence of nasalization in Baltic points to the period after denasalization, which took place very late, shortly before the jers were merged

in Serbo-Croatian, Slovene, Czech and slightly later in Lechitic (Derksen 2020, 35–36). According to Būga (1912, 1–2; 1925, 25–34) there are a few Slavic loanwords in Lithuanian where the nasal element is in fact reflected, e.g. *pundùs* (Žemaitian, AP 3) and *pùndas* (AP 1/3) 'pood (a unit of weight)', but at this point their origins are too uncertain for us to draw any conclusions (cf. Derksen 2020, 36–37, 45–49).[32]

This means that, "whether CS had a sequence of a vowel followed by a nasal consonant (CVNC) or a nasal vowel (CѶC), its counterpart in the neighboring languages was in any case vowel + nasal consonant (CVNC)", as Shevelov (1964, 326) has pointed out. To give an example, the rendition of WGmc. **stampa-* as PSl. **stǫpa* could mean that at the time of contact the Slavic form already had nasalized **ǫ*, but it could also mean that it yielded **am* first, after which it developed into **ǫ*. A different aspect of the same problem – the fact that borrowings do not reveal anything about the starting point of nasalization – can be illustrated by the late date of borrowing of Northwest Germanic **grindila-/grendila-*. The fact that it was borrowed with a nasal vowel even after the seventh or eighth century forms a total mismatch with what we have concluded about the relative chronology of this type of nasalization and the absolute date that we would expect on the basis of it, namely that it took place at a very early stage, which has been roughly dated to 1000 BC – 0. As we have seen in §2.1.3, the early relative dating of the emergence of nasal vowels, based on Kortlandt (1979a), is more or less secure because the assumed sequence of events is the only way to explain the attested outcomes. Therefore it is not a good option to move the start date of nasalization forward in time in order for it to match with the date of borrowing of **grindila-/grendila-*. Rather, the only reasonable explanation for this seems to be that nasalization of vowels in this position was an automatic process for a very long period of time.

Quite strikingly, in his discussion of the behavior of borrowed sequences of VN, Shevelov (1964, 326–27) derives the word for 'flag, banner' from "Mongolian (probably Avar)": the forms Ru. *xorúgv*' (where it means 'gonfalon', a specific type of flag or ensign), Slk. *korúhev*, Cz. *korouhev*, Sln. *korọ́gla*, SCr. *hòrugva*, Blg. *xorágva*, OCS *xorǫgy* and Pol. *chorągiew* would come from **(h)oruŋgo* 'sign, flag'. It is somewhat strange that this Mongolian or Avar form apparently did not have a nasal vowel while the underlying assumption in the literature is that the nasalization of Slavic vowels, as one of the driving forces behind the Opening of Syllables, was due to contact with Avar. In theory it is not unthinkable that the Slavic nasalization of vowels was only triggered by a contact-induced tendency to open syllables and not directly by the presence of nasal vowels in the contact language, so absence of nasal vowels in the source language does not immediately refute the contact hypothesis. However, any explanation of the tendency through contact would certainly be more plausible if the driving forces, that is, the sound

[32] The problem with the Baltic forms *pundùs* and *pùndas* is that they were possibly borrowed directly from Germanic, rather than from Germanic through an East Slavic intermediary. Interestingly, the forms Lith. *pū́das* (AP 1), Latv. *puõds* are also attested with the same meaning, going back to PSl. **ǫ*, but for some reason not reflecting the nasal element. The other examples that Būga mentioned are *unguras* 'Hungarian' and *lénkas* 'Pole'. For the problems with these etymologies, see Derksen (2020, 36–37).

changes, in Slavic would have a directly correlating pattern in the contact language. This raises the question whether Avar had nasal vowels at all. These matters will be dealt with in more detail in §3.2.

§2.2.3 Monophthongization

The process of monophthongization was one of the first sound changes to occur after "the latest reconstructible pre-dialectal stage" (Vermeer 2014, 218).[33] This is based on the notion that it was chronologically close to a larger cluster of sound changes mostly affecting the original dental and velar stop series, like affrication (**t́, d́ > ć, dź*), the phonemicization of the second palatalization (**k, g, x > *ć, dź, ś*), spirantization (**dź > *ź*) and depalatalization (**ć, ś, ź > *č, š, ž* by merger with the pre-existing **č*-series), all of which emerged when the proto-language was dissolving into dialects (for more on these developments, see §2.2.7); this follows from the fact that they affected various regions in different orders (Vermeer 2014; 2020). Naturally this points to the period of the great expansion, or shortly after that. The beginning of the great expansion of Slavic is generally dated to the beginning of the sixth century, which provides a terminus post quem for monophthongization (Vermeer 2014, 220; Timberlake 2013).[34]

Vermeer also postulates a more direct argument for the idea that monophthongization started when Slavic had already spread, even to the Balkans south of the Danube, namely that we have to assume that toponyms such as *Ptuj* in Slovenia and *Luga* in Northern Russia, though they are very far apart, were apparently already part of the language when diphthongs were monophthongized (Vermeer 2014, 218). *Luga* came from Finnic, cf. Finnish *Laukaa(njoki)*, which gave PSl. **laugā > Luga*. If it would have been borrowed after monophthongization affected Slavic, then the Finnic diphthong **au* would have been more likely to yield Sl. *ov* or *av* (Mikkola 1906, 10). The same principle applies to Vulgar Latin borrowings: in early borrowings, VL **au* was initially rendered as PSl. **au*, as in Finnic borrowings, while **au* in late VL borrowings gave PSl. *av* or *ov*. Cf. the Christian name *Laurentius > Lovreč*, which was borrowed some time after 750 AD, when monophthongization apparently was no longer an active sound law (Bidwell 1961, 121, 126). As for *Ptuj*, this came from Vulgar Latin **pétoi̯io* (cf. Lat. *Poetovio*) > PSl. **pitouju > *pьtujь* (cf. Bidwell 1961, 119–20). Notably, the Slavs overran Ptuj already at a very early stage, possibly even by 580 (ibid.). Other parts of the Balkans were colonized at the very

[33] This subject should be treated with a lot of caution. This is a good moment to repeat that Proto-Slavic did not dissolve in a "linear" way as certain sound changes affected only certain regions while changes that affected the entire area kept on coming as well. Vermeer (2020, 337–38) has put this as follows: "The prevalence of dialect levelling needs highlighting because it is sometimes believed that once an isogloss has arisen somewhere, further linguistic fragmentation is preordained and the only way left for events to move in. Although that may well be true in certain situations, it is not the only possibility and definitely does not fit the Slavic case. Once the earliest Bul[garian]-Mac[edonian] and North Russian isoglosses had arisen, for instance, those areas did not embark on specifically Bul-Mac or North Russian separate ways, but went on taking part in Common Slavic innovations as if those local isoglosses did not exist."

[34] Perhaps beginning as early as 400 AD, but certainly by 500 AD, according to Timberlake (2013, 331).

end of the 6th or beginning of the 7th century, as the historical evidence suggests (see §2.2.8 and §3.1). Therefore monophthongization is likely to have begun shortly after 600 AD.

Interestingly Vermeer speculated that monophthongization may be due to substrate influence from Late Latin and/or Greek, for the fact that Latin had no *i*-diphthongs and Greek no *i*- or *u*-diphthongs. We have seen already that monophthongization affected the variety of Novgorod-Pskov some time later than the rest of Slavic. In theory this fact could be explained by the fact that Baltic and Finnic did have diphthongs, for which reason the speakers shifting to Slavic retained them a little longer. As such "the factor for monophthongization in the south was absent in the north" (Vermeer 2020, 341).

§2.2.4 Loss of word-final *s

I have not been able to find evidence in Slavic borrowings in Finnic or in East-Baltic that is telling for the dating of the loss of word-final *s*. Borrowed Vulgar Latin placenames are useful only to some degree. We find VL *Savus* > Sl. *Sava*, *Dravus* > *Drava*, *Pagus* > *Pag* and Lat. *Cormones* (attested like this in 610 and 628, corresponding to VL *kormǫ́nes*) > *Krmin*. These were likely borrowed at the time that Slavic-speaking groups settled in the Balkans, an event that can be dated to around 600. Furthermore, the personal name *Gregorius* is borrowed into Slavic as *Grgur*, which was part of a later stratum of borrowings. It being a Christian name, it must postdate the Christianization of that area, i.e. after ca. 750. Since the Slavic forms were not attested in early manuscripts, they are unfortunately not very revealing as to when this sound change became active: it may well have begun before the moment that the placenames were borrowed. Interestingly, there is some Slavic onomastic material in Greek sources that can be dated to as far back as the 6th century (probably 550-570), in which names occur that end in *-s*. Could these perhaps tell us anything? The names in question are *Dabragezas*, *Suarunas* and *Dauritas*. They can be etymologized with known Slavic elements, and in all likelihood, they referred to Slavic-speaking individuals so the fact that they are Slavic is highly likely (Vermeer 2015). What is interesting about them is that they are declined in the Greek sources according to the type *-as*/*-an*, rather than the most common type of *-os*/*-on*. It is therefore likely that they still had the nom.sg. ending in *-*a* in Slavic (rather than later *-*u*), but it is equally well possible that they still had the ending *-*as* (Vermeer 2015, 5). It cannot be determined which of the two endings the names had in Slavic, so unfortunately they are not helpful in this respect.

An argument that Shevelov (1964, 227) uses for a late dating of the loss of *-*s* is the Proto-Slavic word **kъnędźь* 'prince, ruler', attested as such in OCS, cf. also CS *kъnęgь*, ORu. *knjazь* 'prince, bridegroom', Pol. *ksiądz* 'ruler (arch.), priest' and SCr. *knêz* 'prince'. It was likely borrowed from a West Germanic source, cf. Proto-Germanic **kuningaz* 'king, ruler', OHG *kuning, kunig* (Pronk-Tiethoff 2013, 134). The final *-*z* was still present in Germanic at the time that it was borrowed into Finnic as **kuningas* (which became widespread in Finnic, cf. Est., Fi. *kuningas*, Veps *kunigaz*, Votic *kunikaz*). Note that there is a

small chance that Finnic and Slavic borrowed it at different times and that *-*z* was already lost in Germanic when Slavic borrowed this word. But if this is not the case, and Slavic would turn out to have borrowed it with final *-*z*, we might be inclined to say that PSl. *-*s* was lost after this word was borrowed. The question is then of course when that was. This is not entirely straightforward. Additional problems are that the word may have been borrowed in a non-nominative case form, i.e. without *-*s* in Germanic in the first place, and that, in the hypothetical case that it was borrowed in the nominative with *-*s*, it is conceivable that Slavic speakers cut off the ending (in case their knowledge of Germanic allowed them to). To conclude, there are a few too many uncertainties to use this word as an argument for the dating of the loss of final *s. It will remain an open question. Our dating of this sound change will therefore lean on the dating of monophthongization, which presumably took place not long before (or perhaps after) it.

§2.2.5 Metathesis of liquids

As to the absolute dating of word-internal liquid metathesis, the word for 'king' proves to be useful once again (see the introduction of §2.2). It was borrowed before the sound change had taken place as it underwent metathesis in a completely regular way: Germanic **karl* gave PSl. **krāĺь*, whence OCS *kralь*, Ru., Ukr. *koról*', Pol. *król*, OCz. *král*, Slk. *král*', arch./dial. LS *krol*, SCr. *krâlj*, Blg. *kral*. The metathesis of liquids may therefore be dated to at the earliest the end of the 8th century (Pronk 2021, 3). Examples of Vulgar Latin placenames that show metathesis are many. It almost certainly postdates the colonization of the Balkans around 600. E.g. VL *Scardona* > Sl. *Skradin*, *Melita* > VL **Mélta* > *Mljet*, *Serdica* > *Srědĭcĭ*. On the basis of the Latin material (in combination with the word for 'king'), Bidwell dates the beginning of liquid metathesis to around 750 (1961, 125–26). Note that there are also a few forms without metathesis, where the VL vowels *a* or *e* are rendered as PSl. **ŭ* or **ĭ*: *Tarsatica* > **tŭrsatŭ* > *Trsat* and *Bergona* > *Brgin*. Bidwell's suggestion is that the forms without metathesis were borrowed at a later point (1961, 117–18).[35] The internal Slavic evidence points to an earlier date of metathesis in word-initial position (see §2.2.8), though the Vulgar Latin material does not require such a chronological distinction. There is no direct linguistic or historical reason to assume that the placenames VL *Arba* > Sl. *Rab* and *Albona* > *Labin* were borrowed at an earlier stage than the forms cited above. Rather, it looks like they were all borrowed when the Slavs settled in the Balkans, around 600 (ibid.). We may therefore simply assume that metathesis of word-initial liquids started earlier but was still active when word-internal liquids started to be metathesized as well.

It has been mentioned already that a significant amount of lexical items does not partake in the southeast (in what is now eastern Bulgaria), as in the example *al(ъ)dii* 'boat' vs. the more frequent form *ladii*.

[35] In borrowings that are much more recent, VL *-ar-* or *-er-* are often adopted as vocalic *r* in South Slavic, as in *Bernardino* > SCr. *Brnardin*.

Another exceptional treatment of post-vocalic liquids is found in Polabian, where **or* is left unaffected (§2.1.6). These could be explained by their peripheral location, especially so because in these centuries most sound changes seemed to have spread from the south to the rest of the Slavic-speaking territory to the north, northeast and east. In light of the fact that the Avars had their center of power in the Pannonian Basin, the geographical distribution of this sound change is particularly interesting. We will discuss the whereabouts of the Avars in chapter 3.

§2.2.6 *tl, dl* > *l* in South and East Slavic

Direct textual evidence for the dating of the development *tl/dl* > *l* in most of South Slavic and East Slavic is provided by the Freising Fragments. Here the dative plural form *crilatcem* 'angels' is attested rather than ***cridl-*. This points to the sound law being active by 850 (Shevelov 1964, 373). Slavic toponyms in Greece were also affected in the regular way (Pronk 2021, 6), pointing to a date after the settlement of the (southern) Balkans around 600. Other than this, it is difficult to date this sound change more precisely. However, the geographical behavior of this sound change certainly speaks in favor of an early date, that is, the 7th century or perhaps even the end of the 6th century.

§2.2.7 Simplification of consonant clusters with and without **j*

It has been discussed that we do not have any traces of gemination in clusters without **j*, and that geographical variation in the outcomes was absent (except for *tl/dl*). Also, the simplification of these clusters had already happened before the first written records appeared in the 10th and 11th centuries. Examples of borrowings in which cluster simplification took place can be found in Vulgar Latin toponyms that were borrowed when the Slavs settled in the (southern) Balkans from 600 onwards: *Apsarus* > *Osor*, *Massarum* > *Mosor*, *Ad Musculum* > *Omišalj* and *Muccurum* > *Makar* (Bidwell 1961). This material does not tell us much, apart from the fact that cluster simplification was either active or yet to begin around 600. As a consequence we can only infer details on the absolute chronology of this type of clusters from details of the other type of clusters, viz. those with **j*, where we do find evidence for geographical variation and earlier gemination.

The rise of gemination in clusters with **j* occurred, like the process of monophthongization, after the first palatalization and between the allophonic and the contrastive phase of the second palatalization. The first palatalization was probably completed when the Slavs settled in the Balkans around 600 at the earliest (Bidwell 1961, 126). As we have seen, monophthongization may be dated to the early 6th century. The phonemicization of the second palatalization probably did not occur before the mid 6th century, though Vermeer adds that "since a terminus ante quem appears to be lacking, it may well be later" (Vermeer 2015; 2020, 340–41). This is based on among other things the Slavic name *Kelagastu*, attested in Greek sources, without the effect of the second palatalization, which occurs in the text in

combination with events of the early 560s. Note that this example could well be an instance of phonological substitution, since the name in question is only attested in Greek sources.[36] If this is the case, this argument cannot be used. Determining an absolute date for the phonemicization of the second palatalization is however possible. Firstly, Vulgar Latin toponyms on the Balkans underwent the palatalization regularly, pointing to a date after 600 (Pronk 2021, 5–6 with examples). Secondly, Pronk (2021, 3–4) adduces the word for 'church', Cz. *církev*, Pol. *cerkiew*, Ru. *cérkov*', SCr. *cȓkva*, Sln. *cę́rkev*. This was borrowed from Germanic **kir(i)k* or **ker(i)k*, but interestingly, not just once but several times into different dialects, as suggested by the differences in vocalism (ibid., for all the forms and their reconstructions see fn. 1). Therefore the palatalization was apparently not yet completed at the time of borrowing, which was somewhere in the first half of the 9th century when the Slavic speaking region was Christianized. As for the rise of gemination, this results in the rather large time frame of somewhere between the early 6th century, perhaps earlier, and the middle of the 9th century, perhaps slightly later.

The evidence for relative chronology puts the loss of gemination after the metathesis of liquids and the rise of new timbre distinctions. We have seen that these sound changes can be dated with fairly secure evidence. Liquid metathesis is assumed to have happened at the end of the 8th century at the earliest. With regard to the vowel shift, Vermeer (2020, 341), following Holzer (1996, 92), argued that the earliest credible examples of Slavic borrowings in non-Slavic languages containing the new vowel distinctions (that is, *o* for earlier **a*) date to the late 810s. This would be a terminus ante quem for the vowel shift and it thus provides us with a rough idea of when degemination may have happened, namely somewhere after 810, but probably well into the 9th century or even later. The earliest texts date to the 10th and 11th centuries, so this, on the other hand, shows that degemination took place before that.

§2.2.8 Mapping the chronology of sound changes onto the (pre)historical spread of Slavic

In this section we will attempt to find out where the sound changes discussed above took place. The question of the Slavic homeland and of how the language and its speakers spread through time has always received lots of attention not only from linguists but also from historians and archaeologists. The result is that the amount of literature on this subject is vast.[37] In what follows most statements on the geographical whereabouts of the speakers of Slavic will be based on a recent overview paper by Timberlake (2013), who presented the matter in a lucid and thorough way, informed by linguistics, archaeology and, as far as possible, history.

[36] For a perfectly parallel case of substitution, cf. Fi. *kimalainen* 'bumblebee', probably from Sl. *čьmelь* (T.C. Pronk, p.c.).

[37] Some important works are the following: Gimbutas (1971), Gołąb (1992), Nichols (1993), Barford (2001), Curta (2001) and Holzer (2004). A brief and helpful overview of the hypothesized locations for the Proto-Slavic homeland and the problems with some of them is provided by Pronk-Tiethoff (2013, 59–69).

Though there are many options, perhaps the most trustworthy hypothesis for the earliest reconstructible homeland of the Slavs places it in what is today Ukraine, in what Timberlake calls the Ukrainian "mesopotamia": the area between the rivers Prut and Dniester to the west and the river Dnieper to the east, bordered to the south by the littoral steppe north of the Black Sea and to the north by the southern boundary of the marshy basin below the river Pripyat. This area roughly matches with the slightly less well-defined region to the northeast of the Carpathian mountains, where scholars such as Holzer locate the homeland nowadays (2014, 1118). Three early cultural complexes have been attested in this area with some degree of overlap in their cultural features, such as ceramics (with typical tulip-shaped pots) and architecture (subterranean houses) and the fact that the dead were cremated. These cultures range from the second half of the second millennium BC (the Komarov complex), to the period 1100-900 BC (Belogrudov) up to 800-500 BC or later (Černoles). From around 500 BC onwards, the demographic make-up of the Ukrainian "mesopotamia" starts to change drastically with the entrance of groups such as the Greeks, Scythians, Romans (around the turn of the millennium) and Goths (from 166 AD). Moreover, the archaeological continuity in this specific area comes to an end with the rise of the Černjaxovo cultural complex, which is characterized by cultural features such as superterranean houses, burial of the dead (i.e. inhumation) and angular decorated wheel-thrown pottery. Timberlake observes that "[e]vidently Černjaxovo culture syncretized Wielbark culture brought in by Goths from the north and Pontic cultures (Roman, Greek, perhaps Sarmatian)" (2013, 333). The Černjaxovo culture was disrupted probably when the Huns invaded the area, which led the Goths to leave in 376 AD. Not long after that, from around 500, the pottery in the style of the Černoles culture, rather than that it faded away, is found in cultures surrounding the Černjaxovo complex that lay in the heart of the interfluvial zone. These cultures are now called Korčak, Penkova and Prague. Pottery related to these cultures is found not only in Ukraine but all the way to the Danube in the southwest and the Elbe and Vistula in the (far) northwest in the second half of the first millennium AD. Based on this continuous historical chain from the prehistoric Komarov-Belogrudov-Černoles complexes through the Penkova-Korčak-Prague complexes up to attested Slavic communities, though mostly based on pottery, Timberlake (2013, 333–34) concludes that the Slavic culture and by extension the Slavic ethnos was mostly continuous through history (apart from the very different Černjaxovo culture). This provides a strong argument for the Slavic homeland being located between the rivers Prut and Dniester on the one side and the river Dnieper on the other side in the period between 1500 BC to about 500 AD. An additional argument for this location comes from evidence in hydronymy. On the basis of the distribution of archaic Slavic hydronyms in combination with that of Baltic hydronyms and the distribution of the various types of pottery, it can be established that post-Černoles and post-Černjaxovo Slavs inhabited a belt-like zone around the mesopotamia.[38] It must have been from these regions that around 500 AD the expansion started in all

[38] The material on hydronymy on which Timberlake (2013, 335–36) builds comes from the work of Toporov and Trubačev (1962) and Trubačev (1968).

directions (Timberlake 2013, 335–36). From this we may conclude that all sound laws that occurred in early Proto-Slavic, up until the moment the expansion started around 500, took place in or around the Ukrainian homeland. The date of 500 AD is supported by the fact that no mention was made of Slavs in the works of classical authors before the 6th century, while the Romans and Greeks were usually very interested in the peoples neighboring them. This means that the Romans and Greeks were simply not familiar with the Slavs before they were first mentioned in the middle of the 6th century (Pronk-Tiethoff 2013, 59–60).[39]

While spreading along the Dnieper to the north, the Slavs encountered Baltic and also Finnic groups (the latter to the far north). This is when Slavic began to be under substrate influence from at least Finnic but probably also Baltic (Timberlake 2013, 337–38). Those Slavic groups spreading to the far west went in various directions. Following the Vistula, some groups ended up in southern Poland, while others moved into Bohemia (i.e. the western part of the Czech Republic) and up the Oder and Elbe rivers. There are some archaeological indications that these western areas were not inhabited at least shortly before the entrance of the Slavs, probably because the Huns had chased the Germanic tribes away. Contact with Germanic speakers was presumably of slightly later date (Timberlake 2013, 338). Then there were also Slavic groups who went into the direction of the Balkans, and this is where it gets interesting for our purposes. The Huns, after they attacked the Goths in 376 AD and went westwards, were possibly followed or accompanied by the Slavs on their raids until Attila's death in 453. Not long after, another Turkic group of invaders was active in the area, namely the Bulgarians (Timberlake mentions the Cotrigurs specifically; 2013, 339). Raids on the Roman Empire were conducted from 490 through around 525. It is almost certain that the Slavs were in some way involved in these raids. Even later in the 6th century the Avars entered the Balkans. There is some historical evidence for the Slavs and the Avars carrying out raids together, which continued into the seventh century (Timberlake 2013, 339). This evidence will be discussed in the following chapter. For now it is important to know that certainly by 558, but perhaps already more than a hundred years before that, the Slavs were in contact with the Avars (and other presumably Turkic-speaking groups).[40]

Up until this point in history the Slavs remained along the northern shore of the Danube, but slightly later, they crossed the river and eventually settled on the southern side as well (cf. Holzer 2014, 1122). According to Timberlake it is unclear when exactly this happened, though he adduces evidence from tulip-shaped pots, or rather shards, found in Silistria (in northeast Bulgaria on the south bank of the Danube). These are reminiscent of the pots that belong to the prehistorical Korčak culture (see above).

[39] The earliest evidence for individual Slavic-speaking persons in Central Europe comes in the form of personal names such as Davragezas, the name of an officer of Antean (= Slavic) descent who worked in the Roman army somewhere around 550 (Vermeer 2015; 2020, 339). They were mentioned in §2.2.6.

[40] It is probably good to know that the Hungarians arrived on the scene quite a lot later and reached the Pannonian Basin only by 895 (Pronk 2021, 2). Therefore Hungarian-Slavic contact at a stage this early is completely out of the question. The arrival of the Hungarians, by the way, is the main cause for the split between North and South Slavic since this is how these groups came to be geographically separated from each other (Pronk 2021, 4).

On top of this, the dwellings in this complex are comparable to those of the Černoles culture. The sites where these features have been found are dated to the end of the sixth century by Vážarova (1965; 1976). Though Timberlake seems to have been unaware of this, the archaeological evidence matches very well with Bidwell's (1961) important findings that the Slavs settled in the Balkans around 600, which he based on the Slavic treatment of Vulgar Latin placenames. Before their final settlement, the Slavs were already present south of the Danube. As stated by Pronk (2021, 1), the Byzantine historian Procopius makes mention of frequent raids by groups called Antes and Sclaveni, who were likely Slavic, into Byzantine-controlled regions at the time of the reigns of Justin (518-527) and Justinian (527-565).[41]

Considering all of the above, even without a precise absolute dating, we know enough to state that the loss of word-final resonants and the nasalization of vowels happened at a time when Proto-Slavic was only spoken in the Ukrainian homeland, because they must be dated to a very early stage of Proto-Slavic (not too long after the dissolution of Proto-Balto-Slavic). The sound changes were roughly estimated to before or around the year 0, while the Slavs inhabited the homeland from around 1500 BC to 500 AD. Since contact with Avar was impossible at that stage – the speakers of those languages had simply not arrived in Europe yet – the possibility that these developments were due to language contact can be ruled out. In theory, a possibility would be that these early syllable-opening sound changes were the result of contact with the Turkic Huns, who made their way to Europe already in the late 4th or early 5th century, passing through the Pontic-Caspian steppes not far from where the Slavs were. This scenario is however far from attractive. Not only would it require us to date the loss of word-final resonants and nasalization centuries later than expected, there is also hardly any historical evidence for contact between the Huns and the Slavs (in contrast to the Avars), so the assumption of strong Hunnic influence on Slavic is unwarranted.

Conversely, the evidence suggests that the other sound changes that were discussed happened shortly before, during or (long) after +/- 500 AD, when Proto-Slavic rapidly spread from Ukraine into Europe. Chronologically speaking, there is therefore at least a theoretical possibility that these sound changes were induced by contact with Avar. To sum up, these are:

- Monophthongization: 6th century, affecting most of Slavic around the same time when the very first dialectal differences emerged, except for North Russian.
- Loss of word-final **s*: probably somewhere around the time of monophthongization, presumably affecting all of Slavic around the same time.
- Rise of geminates in clusters with and maybe without **j*: somewhere between the early 6th century and the 8th century, affecting all of Slavic roughly around the same time;
- Word-initial metathesis of liquids: somewhere in the 7th, maybe 8th century; affecting all of Slavic but only partially in the far southeast.

[41] This date is also suggested by evidence from coins (Timberlake 2013, 339).

- *tl/dl* > *l*: late 6th or 7th century, affecting only South and East Slavic with some exceptions.
- Word-internal metathesis of liquids: late 8th or 9th century, affecting South Slavic and Czecho-Slovak, later spreading to Polish and Sorbian. Northern West Slavic does not metathesize **or*.
- Degemination of original clusters with and maybe without **j*: late 8th, 9th or even 10th century, affecting all of Slavic around the same time.

The list is a result of the combined evidence from relative and absolute chronology. On the basis of this, the time frame that was initially set to 1000 BC – 900 AD in the introduction of this section can be reduced to four centuries, from around 500 AD to 900 AD. No clear signs of chronological clustering of sound changes can be observed within this time span. If we want to explain this set of sound changes as a contact phenomenon that arose from contact with Avar, we certainly want to see solid historical evidence for contact between the Avars and the Slavs at the beginning of the 6th century at the earliest.

§3 Reconsidering the contact hypothesis

Now that we know more about when and where the relevant sound changes took place in Slavic, it is time to consider the Avar side of things. It has been mentioned in the introduction that there are some historical indications for Avar presence in Central Europe in the form of a kingdom or "khanate" and that, historically, they are thought to be a likely candidate for language contact with Proto-Slavic. Firstly, this chapter will discuss the historical evidence for these assumptions, in order to answer the question whether the Avars really were in the right place and time for their language to have induced the set of syllable-opening sound changes that were discussed in chapter 2. The evidence will for a large part be based on Walter Pohl's (2018) comprehensive study of the history of the Avars. Secondly, we will consider the (very little amount of) evidence for the Avar language, in order to see whether the observed sound changes in Slavic possibly reflect features of the Avar sound system and the implications for the contact hypothesis that this has.

§3.1 The Avars: who, where and when?

The Avars left barely any written sources – all historical accounts that make mention of them are from their neighbors. However, having left great numbers of artifacts and graves, among other things, the Avars are archaeologically well-attested (cf. Stadler 2008). They played an important role in Central Europe for around 250 years, to such an extent that the impact they had on contemporary Europe may even be compared to that of the much more famous Huns (Pohl 2018, 2).[42] The first source that tells us of Avars is a Byzantine record from around 463 AD in which groups of central Asian nomads (Sabirs,

[42] The reason that the Avars are more or less neglected in modern European historiography may be that they were mostly oriented towards the south (the Byzantine Empire), whereas the Huns went westwards (Pohl 2018, 2).

Onogurs, Ogurs and Saragurs) are migrating westwards, after they were chased away from the east by the Avars (Pohl 2018, 28).[43] The real beginning of Avar history in Europe is marked by a source from 558 telling us that an embassy of Avars is sent from the steppes north of the Caucasus/the Black Sea to Constantinople. Where they came from before the Avars entered this part of the steppes is controversial. Though they are likely (partly) ethnically Turkic, the historical evidence makes clear that the Avars in Europe cannot be identified one-on-one with any groups in the east. This is confirmed by the archaeological fact that there are no traces of a homogeneous culture imported into the Carpathian Basin, where the Avars ended up, from another region (Pohl 2018, 45–46). In the area where they came to live we see traces of all kinds of cultures and lifestyles from eastern central Europe and also central Asia, so a "purely" Avar culture or identity was probably absent (Pohl 2018, 116). Instead the Avars are best defined by how they were organized in the political and military sense, in the form of an (emerging) state. Some historians, like Pohl, hypothesize that the Avars continue the Rouran empire, the dominating power in Central Asia in the 5th and 6th centuries that was mostly based in the area of Mongolia, before it fell in 555 due to the Turkish expansion (Pohl 2018, 33–36). Even if the connection between the Avars and the Rouran empire does not hold there is no evidence for a long-lasting Avar presence north of the Black Sea. But if it turns out to be valid, then it would mean that the Avars, before they reached the Pontic-Caspian steppes and Constantinople in 558, were not even slightly close to the Slavs, who were expanding to Europe at that point. This therefore makes contact before this date unlikely. When they had finally arrived in the steppes north of the Black Sea the Avars successfully waged war on several (nomadic) peoples that were present there too, many of which were subjugated (between 559-561). It is interesting to see that the Antes are mentioned in a list of the contemporary historian Menander as one of these subjugated peoples, since they are generally thought to be Slavic-speaking (Pohl 2018, 48). Also relevant is Menander's account of negotiations between the Avar khagan and the Slavic representative Mezamir, the brother of Kelagast (who was probably the leader of the Antes and whose name was discussed in §2.2.7). This is likely to have been the first encounter between Avars and Slavs.

When the Avar embassy made it to Constantinople in 558 they declared to the emperor that they were willing to destroy the empire's enemies on the condition that they would receive "the most valuable gifts, yearly payments and very fertile land to inhabit", according to Menander, an offer that the emperor accepted (Pohl 2018, 22). At that time, the Balkan provinces of the Byzantine Empire had been experiencing pressure for at least a century from groups of nomads that had arrived earlier in Europe, such as the Huns (especially under Attila's reign until 453-454).[44] Incursions deep into Byzantine

[43] Note that early Greek and Byzantine sources (from the 5th and 6th centuries) regularly used the umbrella terms "Huns" or "Scythians" to refer to the various nomadic peoples, including the Avars. In later sources (7th century), the term "Bulgars" is sometimes used. In Pohl's monograph, much of this confusion in primary sources is filtered out.

[44] There is a small amount of historical evidence for contact between the Huns and the Slavs. We know for example that the Cutrigur Huns under Zabergan crossed the Danube together with a number of Slavic bands in late 558 (Pohl 2018, 25). However overall the Huns are less well-attested than the Avars, and for all we know their relation

territory were carried out frequently by these groups, also by the Slavs (e.g. in 545, 548 and 550-552; Pohl 2018, 23). After some turbulent years of war in the Pontic-Caspian steppes, the Avars joined in the practice of raiding the Byzantine borders when they reached the lower Danube in 562/563 (Pohl 2018, 50).[45] They demanded the emperor to give them Pannonia so that they could settle there, and after many negotiations with the emperor and some wars with the inhabitants of Pannonia of that time (the Gepids and the Langobards) they eventually got their way in 567. During this ten-year period of negotiation and war, the Avars also campaigned in the northwest and waged war against the Franks, which is how they spread all the way to the Elbe within just a few years (Pohl 2018, 53). But however far they spread into the rest of Europe, the Pannonian Basin is where they initially consolidated their power, which took another ten years, and where their new ruling elite developed. It would remain the Avar heartland for centuries up to the point that the empire collapsed.[46] From the 580s onwards, the Avars emerged as the major military power on the Balkan Peninsula with enough of a basis to wage war with the Byzantine Empire (which was already struggling enough due to their war with the Persians). The Avar khagan could develop into what Pohl defines as the lord of all barbarian (i.e. non-Byzantine) warriors active in the area (Pohl 2018, 82).

In the early Avar period the geopolitical role of the Slavs, still based on the lower Danube, is complicated, especially because they were decentralized and therefore did not necessarily act as a unified state-like unit. What complicates the matter even more is that the question of Slavic identity is a difficult one (as with the Avars, which was discussed above). It is therefore even harder to draw any solid conclusions on the relations between the two groups. Many historians have theorized on the matter but no consensus has been reached yet. The question is whether the Slavs, who must have formed an important part of the Avar society, should be considered the subjects of the Avars – some have even argued for a relation in the form of Avar nomadic overlords vs. Slavic slaves, Avar cavalry and siege troopers vs. Slavic foot soldiers, or Avar nomadic marauders as military elite vs. Slavic client ethnos as agriculturalists (Pritsak 1983, 353–55; cf. Timberlake 2013, 340–42). The reality is that such a characterization probably oversimplifies the actual historical situation. What the evidence, though a bit patchy and varied, suggests is the following. While the Avars had become a major military power in the Balkans, the Slavs had retained a certain degree of independence. Often they would raid the Balkan provinces independently (Slavic raids had begun already under the reign of Justin (518-527)) and initially they did not feel the urge to subject to the Avar khagan. In 578, for instance, raids by groups of Slavs in the Byzantine province of Thrace climaxed. The Avars counter-attacked on request of the Byzantine emperor and asked for negotiations, but the Slavic chief Dauritas was not tempted and had

with the Slavs was completely different than the Avar-Slav relation. Since we have barely any solid evidence for contact, and practically no evidence for their language, the scenario of contact with the Huns will not be explored any further.

[45] The Avar raids against the Byzantine empire may seem contradictory in light of the alliance they had. This was however characteristic to the foreign policy of the Byzantine emperor, and simply a way to keep his enemies close.

[46] I refer to Pohl (2018, 70–71) for a map.

the Avar envoys killed (Pohl 2018, 80–82). The seventh-century Frankish *Chronicle of Fredegar* also testifies to cold relations, telling us that the Avars slept with the wives and daughters of the Slavs and caused the Slavs to undergo "many other burdens" (Pohl 2018, 138). These are just some examples that show that in these years the relationship between the Avars and Slavs was probably as hostile as can be.

But this was certainly not always the case. The Avar khagan's policy reflects the fact that he also saw that the Slavic expansion was useful for his empire as well, rather than it being a threat. To quote Pohl (2018, 143): "The advance of Slavic settlement provided a welcome infrastructure to Avar rule and secured distant boundaries". This is why sometimes the Avars supported the Slavs, for example by distracting the Byzantines with attacks elsewhere or by waging war against those who attacked the Slavs, and in later years they would collaborate more and more in wars against their common enemies (such as the Byzantines, Franks, Lombards and Bavarians). The Slavicization of Greece in the last decade of the 6th century was probably only successful because of help from the Avars (Pohl 2018, 136–38). Generally speaking the Avar policy led to the fact that the sphere of Avar influence in Europe corresponds neatly to the territory into which the Slavs spread. Still, there is more evidence to suggest that the Slavs fought for or with the khagan on an involuntary basis than voluntarily. In this context a specific historical event deserves attention. This is the rebellion of the early 7th century (also attested in Fredegar's chronicle). Somewhere near the eastern border of the Frankish realm a group of Slavs rebelled against Avar rule in 623/624, under the Frankish warlord Samo, whom they had chosen as their leader. The Avars and also the Franks responded with a number of attacks, but the Slavs under Samo were able to maintain their minor kingdom until their leader died in 658. The kingdom would dissolve into the Avar empire again.

Up until now we have only considered the political and military aspects of the relation between the Avars and the Slavs, for which we have a considerable amount of evidence from primary sources. This is in sharp contrast with other facets of the Avar and Slavic world. Barely any information on e.g. their culture and economy has been passed down to us, subjects in which the Byzantine historians and also the Germanic neighbors, were hardly interested. This disinterest applied also to the linguistic dimension, unfortunately, which is why we have almost no direct evidence on the linguistic situation. No mention was made of translators at court, for example. Four decades ago, an interesting theory on the language spoken in the Avar empire was postulated by Omeljan Pritsak (1983). He proposed that Proto-Slavic served as the (or a) lingua franca throughout the entire region in the 7th and 8th centuries, an idea which is nowadays followed by many others (e.g. Lunt 1985; Curta 2004; Holzer 2014). The main argument for this hypothesis is that in these centuries, there is a certain degree of dialect levelling within Slavic in the form of "consolidation as shown by a large number of important innovations taking place in the same way everywhere", after a period of many innovations and "rapidly increasing fragmentation" in the 6th and early 7th centuries, as Vermeer concluded from his study of the emergent dialectal differences

in the consonant system (2014, 220).[47] As is often stated the period of consolidation is especially remarkable since it happened when Slavic had already spread over a vast territory in Europe. The hypothesis of a Slavic lingua franca involves the idea that there was a substantial period of bilingualism among the Avars. Another possibility is that the Avars shifted to Slavic not long after they came into contact with each other. At this point it is difficult to provide a more nuanced picture of the linguistic situation in the Avar empire. For the Avar language itself, see the next section.

In the paragraphs above it was stated where the Avars came from when they entered Europe, when and how they came to settle in the Pannonian Basin, what their (political) relation with the Slavs was like in the early period of the Avar empire and whether Proto-Slavic may have served as a lingua franca. As for the later Avar empire (early 7th – early 9th century), it is rather poorly attested. The few available sources tell us that the Avars ruled over a large part of central Europe (their center of power was still in the Pannonian Basin) and that they fought numerous wars with neighboring peoples. Overall the Avar empire was largely stable. However a serious threat was posed when Charlemagne became king of the Franks at the end of the 8th century. Beginning in 788, he started a series of campaigns and wars, thereby substantially weakening the Avars. An interesting detail is that in 795, a combined army of Franks and Slavs attacked the Avars – apparently these Slavs were independent enough from the Avars to treat them as their enemy. The final blows to the Avar empire came in the last years of the 8th century and the first years of the 9th. The last attestation of Avars is in the form of an Avar embassy at the Frankish court in 822. After this, they would completely disappear from the historical record, much like the Huns had vanished a few centuries before that (the Slavs living in the former Avar empire were subjected to the rule of the Frankish empire). What happened exactly to the Avars is unknown, but it is conceivable that their language disappeared with them. Therefore it is unlikely that the Avar language influenced Slavic after the early 9th century. All of the above may be summarized as: (1) historical evidence demonstrates that Avars and Slavs almost certainly had some form of contact; (2) contact must have taken place between 558 (perhaps a few years before that) and +/- 800 (in case speakers of Avar had not shifted to Slavic before that) and (3) contact took place in the Avar heartland of the Pannonian Basin, in the Balkans north and also south of the Danube, and probably also in the rest of the Avar empire, though boundaries in this part of Europe are hard to define.

§3.2 The language of the Avars

First and foremost, it is unclear what language(s) the Avars originally spoke. The amount of linguistic traces that the Avars left is extremely low, so in what follows it will not be possible to move beyond

[47] The representation of the hypothesis of Slavic as a lingua franca is somewhat oversimplified here. Cf. the account of Andersen (2020), where it is argued that the situation was not as black-and-white as sometimes thought.

speculation.[48] In general scholars have searched in the direction of the Turkic language family, which is perhaps the best candidate based on the scarce linguistic material and the possible historical background of the Avar people (e.g. S. Stachowski 2014, 1199). Others have suggested a connection with the Mongolic (e.g. Menges 1986) or Tungusic (Helimski 2004) language families. The evidence is mostly onomastic. We have early Avar personal names, late Avar titles and some minor inscriptions in runes (for a more detailed discussion of each element, see Pohl 2018, 271–73; cf. Szadeczky-Kardoss 1990, 221–25). The problem is that the material points in various directions, because some elements recur in one or more of the many languages that the steppe peoples introduced in Europe during the Migration Period. It can hardly be determined in which of the languages specific elements originated. A more general problem is that this type of material is known to be misleading, because titles are especially liable to borrowing and a personal name does not always reflect a person's ethnolinguistic background. As for the runic inscriptions, we face the practical problem that they are still virtually undeciphered.

At this point, we could either leave our inquiry at this, which would obviously be the safest option. Our conclusion would be that we know practically nothing about the Avar language. As for testing the contact hypothesis, we would be completely dependent on the historical evidence as discussed in the previous sub-section. Another option is to assume for the moment that Avar was a Turkic language, and then, by way of a thought experiment, see if we can find any evidence in this language family that might explain our set of Slavic sound changes (see §2.2.8). We have to keep in mind that it is a controversial assumption, of course, but at the least the option is worth exploring. On the basis of their chronology it was concluded in chapter 2 that the following sound changes could in theory be due to contact with Avar: monophthongization, the loss of word-final **s*, cluster simplification through gemination with subsequent degemination and metathesis of liquids in word-initial and word-internal positions. If these were due to contact, then we would expect them to reflect the following hypothetical features of Avar: a lack of diphthongs, lack of word-final *s*, absence of (word-internal) consonant clusters, presence of gemination (but perhaps not necessarily), and no liquids in coda positions. In the following we will take the liberty to project the features that we expect in Avar on the Turkic family as a whole.

In an interesting monograph from 2002 Lars Johanson studied the linguistic (structural) factors at play in language contact, with the Turkic family as a useful testing ground. Many Turkic languages have been involved in intense contact situations in the past few millennia, both as recipient languages and as donor languages. Part of the study was to compile a list of "properties typical of the Turkic languages" that "are absent or occur to a lesser degree in their contact languages" (Johanson 2002, 19). Whether Avar had these patterns as well will always remain an open question, but it is a rather natural assumption

[48] In fact the only certain trace that we know of in the Slavic lexicon is the ethnonym of the Avars themselves (ORu. *Ob(ъ)rinъ*) of which the meaning later developed into a type of giant in stories and fairy tales in West Slavic (cf. Pol. *olbrzym*, Slk. *obor*, US *hobr*), according to Stachowski (2014, 89).

that Avar was similar to the rest of Turkic (or at least not totally different). In his list of 46 typical Turkic properties, a number of highly interesting features can be found (Johanson 2002, 32):

1. The Turkic languages typically have a "tendency towards monophthongs", or in other words, an "aversion against diphthongs".
2. Nasal vowels are atypical.
3. The affricates [č] and [dž], cross-linguistically "atypical", occur frequently in Turkic. The affricates [ts] and [dz], on the other hand, are atypical.
4. Turkic words generally have a constraint on liquids in initial position (the resonants *l, m, n, r* do not occur in this position).
5. There is an "extreme aversion" against certain consonant clusters in certain positions. In coda position, a cluster is maximally allowed to consist of two consonants, and only if one of them is a liquid, nasal or sibilant. This means that a sequence of up to three consonants can occur at syllable boundaries. In non-Turkic material borrowed into Turkic, inadmissible consonant clusters are often changed in order to make them fit these constraints, for example by vowel epenthesis, syncope, apocope or by metathesis.
6. Consonant assimilation is considerably to highly frequent in all Turkic languages. That is, neighboring consonants will undergo full assimilation, as in Kazakh *at* 'horse' + *-lar* (plural suffix), which gives *attar*.

In this list we find two striking correspondences for our Slavic sound laws. Firstly, the plain absence of diphthongs (1) in Turkic corresponds perfectly with the Slavic process of monophthongization. Secondly, feature 5 and 6 form a parallel to the Slavic treatment of consonant clusters, which simplified via a stage of gemination involving assimilation or through loss of the coda (in clusters that did not geminate and that were not allowed in word-initial position). The fact that coda clusters are governed by stricter constraints than onset clusters in Turkic as well as in Slavic is also striking. Furthermore, that assimilation of PSl. **tj/dj* gave rise to the allophonically geminated affricates [č] and [dž] fits well with the fact that these phonemes, though cross-linguistically not very frequent, occur in Turkic (3). Not only that, the development of consonant clusters in Slavic is also chronologically striking when compared to the Turkic features above. After all, gemination arose after the Slavs came into contact with the Avars, and was lost somewhere in the 9th, maybe 10th century after the Slavs and the Avars had lost contact. This in itself makes a strong case for influence from Avar, under the obvious condition that Avar was a Turkic language.

As for the loss of final **s* in Slavic, no parallel can be found in Turkic. No specific behavior of this phoneme is mentioned by Johanson, nor are there any boundary phenomena that could account for it. There is therefore no reason whatsoever to assume that the loss of **s* should be due to influence from Avar. The behavior of liquids (features 4 and 5) in Turkic is striking, because it is the opposite of what

would be expected. Turkic generally disfavors liquids in onset position word-initially on the one hand, and on the other hand it allows liquids as one of the two consonants in coda clusters (where for example obstruents are not allowed). The Slavic pattern of metathesis of liquids from coda to onset positions is therefore very difficult to explain as a reflection of the situation in Turkic and, by extension, Avar. It likely had a different Slavic-internal or external source. As for feature 2, this was listed because nasalization of vowels was also part of the Opening of Syllables as we have seen in chapter 2, though it probably happened way before the 6th century. Even if one insists on dating this process to much later, within the timeframe in which contact with Avar was possible, the fact that nasalization of vowels is generally absent in the Turkic languages suggests that it cannot have been a result of contact with Avar.

This leaves us with two good candidates for syllable-opening phenomena induced by contact with Avar, viz. monophthongization and the treatment of consonant clusters. This does not mean that we can instantly say that they are indeed contact-induced. Some remarks should be made especially with regard to the former. Firstly, Vermeer has suggested that monophthongization may have been due to influence from Latin and/or Greek (§2.2.3). This is a possibility to be reckoned with, but at this point not much else can be said about it. Secondly, it was discussed already that scholars such as Vermeer date monophthongization on the basis of onomastic material. The argument rests mostly on the etymology of the name *Kelagast*, which Vermeer, following Stieber (1969, 68), takes to be from **kěl-* < **kail-* 'whole, intact, healthy' with an original diphthong. The second element cannot be etymologized. Kelagast, a chief and member of the Antes-tribe, was mentioned by the Byzantine Menander as the brother of Mezamir who was involved in negotiations somewhere in the 580s or 590s (see §3.1). If it is true that *Kelagast* had already undergone monophthongization by then, this confronts us with the problem that monophthongization was too early to have been a result of contact. After all, the first contacts with the Avars were in or around 558, and in the following decades contact mostly meant war. The two groups were still completely independent of each other and had no intensive contacts in this early period. Considering also that it generally takes some time, maybe a few generations, for a sound change to develop, it is not likely that monophthongization arose from contact with Avar if it was already in process in the 580s or 590s. However, there is a good chance that the etymology is not correct (remember that *-gast* cannot be etymologized within Slavic), or that the *e* is a result of substitution, since it was written down by a speaker of Greek, not Slavic. In cases like this, it is probably wise to not put too much weight on onomastic evidence, even more so since the name is only attested indirectly in Greek sources.

§4 Conclusion

The aim of this study was to gain a better understanding of the Opening of Syllables. This is necessary because the concept is vague and problematic in several ways, as was pointed out in the introductory chapter. Most of all, the nature of the phenomenon is unclear. Is the Opening of Syllables best

characterized as a goal-oriented tendency, driven by a constraint on closed syllables, or is it merely a descriptive term or a label for a set of sound changes that happen to yield the same structural outcome? And was it the product of language-internal factors, or could it have been induced by contact with other languages? It was argued in chapter 1 that the latter, more concrete, question may shed light on the former, which is why it is the focus of this thesis. The language of the Avars, a nomadic people from the Eurasian steppes, is the natural place to look. This is both because of Herbert Galton's (1994, esp. 83; 1997) claims that Slavic syllable structure has underwent influence from Turkic and because in the past decennia, historical studies have demonstrated more and more clearly that the Slavs stood in contact with the Avars for a considerable period of time (especially Pohl 2018; first published in 1988).

In order to test the hypothesis that the Opening of Syllables arose from contact with Avar, we set out to specify *which* sound changes affected the Slavic syllable structure in such a way that they yielded an opening of syllables, *when* these sound changes must or may have taken place based on their place in the relative and absolute chronology, and *where* they took place (chapter 2). It was concluded that two sound changes date back to Balto-Slavic times, which means that they probably happened somewhere in the second millennium BC. These are the loss of word-final stops (i.e. **t/d*) and the vocalization of the inherited syllabic resonants (which led to a closure rather than opening of syllables). Given their extremely early date, it was excluded that they arose from contact with Avar (§2.1.9). The loss of laryngeals in pretonic and post-posttonic syllables was excluded because it only partially caused an opening of syllables and because the rule seems to have been prosodically motivated rather than phonotactically (§2.1.4). It likely occurred in early Slavic, not long after the break-up of Proto-Balto-Slavic, just like the loss of word-final resonants and the nasalization of vowels. The relative chronology points to the latter two sound changes being in process way before the first dialectal differences emerged in Proto-Slavic. It is hard to provide an absolute date, as we have seen, though they are quite unlikely to have occurred anywhere near 500 AD when Slavic started expanding. This means that they affected Slavic when it was still (only) spoken in the Transcarpathian homeland (for which see §2.2.8). The previous considerations left us with the following set of five sound changes: monophthongization, loss of word-final **s*, metathesis of liquids in word-initial and later word-internal position, *tl/dl* > *l* and cluster simplification through gemination and subsequent degemination. It was found that each of these probably took place at a given point between roughly 500 – 900 AD (see the list in §2.2.8 for details). It was also concluded that the relevant sound changes do not show any clear signs of chronological clustering within this time span, that is, they are spread out more or less evenly. The same goes for the geographical evidence: no clear geographical clustering of sound changes can be found (apart from that the peripheral dialects are less often affected. This is however natural and to be expected in any case, also when contact did not play a role. The first sound changes that eventually led to the loss of the jers in the 10th century or later, were in process in the 9th century (see the introduction of §2.2). Logically, the loss of the jers means the end of the Opening of Syllables as it led to large-scale closure of syllables.

Chapter §3.1 then focused on the history of the Avars and especially the evidence for their connection to the Slavs. It turned out that the question "were the Avars in the right place and time for their language to have induced our set of syllable-opening sound changes?" is to be answered positively. There is historical evidence for encounters between the Slavic and Avar military leaders very shortly after the arrival of the Avars in Europe in 558. It is likely that contacts intensified around the turn of the 5th to the 6th century, when the Avars settled in the Pannonian Basin and started to build their empire that would cover a large part of the territory into which the Slavs expanded as well, until it vanished around 800. Influence from Avar after this date is not to be expected, so our window of Avar-Slavic contact can be set to roughly 558 – 800. Compare the time frame of 500 – 900 for the sound changes in Slavic. An uncertain factor in our account is that it is as good as impossible to tell whether the Avars shifted to Slavic early on, or whether there was a period of prolonged bilingualism. Note that it has been argued by some that Proto-Slavic served as a lingua franca in the Avar empire, which is sometimes used to explain a certain dynamic in the development of Proto-Slavic. Otherwise there is probably not much to say for or against it. In §3.2 it was discussed that it is unknown which language the Avars spoke originally. It was argued that if we choose to remain agnostic on the genetic affiliation of Avar, it is impossible to say whether the observed sound changes in Slavic may reflect features of the Avar language and in this case, all we could say is that our set of syllable-opening sound changes may or may not originate in Avar. However, the sparse linguistic material together with the historical evidence point in the direction of Avar being a Turkic language (though there are other possibilities). On the basis of a list of typical traits of the Turkic languages, it was concluded that, of our set of five sound changes, only two were possibly induced by contact with Avar. These are monophthongization and the simplification of consonant clusters (including *tl/dl*) through gemination or coda deletion. The metathesis of liquids, on the other hand, is unlikely to have been induced by contact, and the loss of **s* is ambiguous due to absence of evidence (§3.2). Whereas the rise of gemination is likely a contact feature, this does not seem to apply to the loss of gemination. Degemination of original consonant clusters only started in the 9th or perhaps even 10th century, while the Avar empire ceased to exist in around 800. What this means is not entirely straightforward, because we do not know when exactly Avar ceased to be spoken, or rather, until when Avar could have an effect on Slavic. However, considering the time gap in combination with the fact that gemination in assimilated consonants is a widespread feature in the Turkic languages, what seems to be most probable is that the loss of gemination is a purely inner-Slavic affair of post-contact date. In other words, syllables closed by original consonant clusters, at least those with **j*, remained closed during the entire period of Avar-Slavic contact. This leads to the conclusion that the supposed overarching tendency to open syllables that gave rise to cluster simplification and monophthongization cannot be attributed to contact, while the individual sound changes can.

In this thesis, the question whether the Slavic Opening of Syllables may have been induced by contact with Avar has mostly been treated as an isolated problem. However, it is good to briefly consider other

evidence for influence from Avar in order to form a well-founded judgment on our two candidate sound changes, monophthongization and the simplification of consonant clusters. There are basically two pillars supporting the contact hypothesis. One is formed by just a handful of lexical borrowings, in the most optimistic view, and some of these may even be from other Turkic languages (see S. Stachowski 2014). The obvious obstacle here is that we have practically no material on the language. The other pillar is that of synharmony, which was at the core of Galton's (1994; 1997) theory of Turkic-Slavic language contact, as was mentioned in the introduction.[49] Explaining Slavic synharmony as a result of Turkic vowel harmony looks promising at first sight. However, the Turkologist Marek Stachowski has criticized this idea and found a number of "doubts, inaccuracies and open questions" which led him to conclude that "it will be more prudent to not ascribe the origin of Slavic soft consonants to a Turkic influence" (2020, 131). Of his main arguments against the contact hypothesis, one comes down to the lack of a contact scenario ("the problem of time and space"; ibid., 130) and the second to the lack of other linguistic traces of contact in Slavic (for the third, more complex argument see M. Stachowski 2020, 127–30). Both are not entirely valid, however. As we have seen in §2.2.8 and §3, a good case can be made for contact between the two groups, and also, the lack of other traces is probably at least partly due to the fact that nobody has looked for them; the debate on Turkic-Slavic contact has traditionally only focused on the problem of synharmony and loanwords. It may be interesting to see whether other typically Turkic traits are reflected in the grammar of Slavic (an example may perhaps be the Slavic prothesis of glides, since vowel hiatus is generally avoided in the Turkic languages; Johanson 1998, 31). Does this mean we may reconsider synharmony as a contact feature? If we take a look at the dating of the processes of Umlaut and the first palatalization, the answer would probably still be no. They must be dated before the monophthongization of diphthongs, which means they happened in the beginning of the 6th century, though probably even some time before that, as has been discussed in this thesis. Since these two sound changes form the basis of what would later develop into synharmony, it should be concluded that synharmony was apparently already developing when contact between the Slavs and the Avars was first possible (in 558). This means that Stachowski (2020) was probably right after all in saying that it is safer to assume that synharmony was not contact-induced. This is important because, what is by tradition the most important argument supporting the Slavic-Turkic/Avar contact hypothesis, turns out to be less strong an argument than is sometimes thought. As a result, the argument of synharmony cannot be used to support our hypothesis that monophthongization and the treatment of consonant clusters are contact-induced. The implications for our theory on the origins of these two sound changes are the following: as for a rather trivial development like monophthongization, it cannot be excluded that it developed language-internally or even by contact from Latin and/or Greek, as has been discussed. However, we have a good scenario for Avar-Slavic contacts, and the possibility of it being

[49] Though he did not always specify "Turkic" (often he kept it at "Altaic"), here it will be interpreted as "Avar", since this is the one Turkic language for which we have a strong historical case for contact.

induced by contact from Avar should be taken seriously. With regard to the treatment of consonant clusters, i.e. the loss of coda consonants in some cases and gemination in other cases, the Slavic developments are quite specific and the chronology of the developments does make a strong case for them originating in contact with Avar. We will however have to await further scrutiny of the Avar-Slavic contact hypothesis before drawing any further conclusions.

More broadly speaking, we can also draw conclusions that are a bit more solid. Firstly, it was concluded in §2.1.10 that the Opening of Syllables can hardly be explained by a supposed tendency toward rising sonority within the syllable. Whereas we would expect the syllable-opening sound changes to occur in an order that would fit with the sonority hierarchy, the relative order that was established in §2.1 looks random. Equating the Opening of Syllables with such a tendency is therefore not particularly attractive. Another conclusion is that we know now for certain that the Opening of Syllables as a whole, referring to all of the sound changes that led to open syllables as discussed in §2.1, was *not* induced by contact with Avar, nor with any other language. The time frame between the earliest and the latest sound change is huge, after all, spanning from 2000 BC (or 1000 BC at the very latest) – 900 AD. The possibility of contact with one and the same language throughout this entire period can be ruled out. In the case of Latin and Greek, for example, about the first half of the entire set of sound changes had already taken place before first contacts were even possible.[50] The fact that it extends over such a long period of time raises more urgent questions about the very nature of the phenomenon, most importantly whether we can speak of an integrated whole at all. The (Balto-)Slavic of 2000/1000 BC is not the same language as the Slavic of 900 AD. We should ask ourselves the question how much sense it makes to subsume sound changes under one and the same tendency when they are separated by, say, two thousand years. Perhaps Shevelov (1964, chap. 13) came closest to a rational explanation of the facts. In his account the Opening of Syllables is a sort of self-fulfilling prophecy in which (type and token) frequency of syllable patterns plays an important role. Rather than it being an integrated tendency in which all sound changes are related to each other because of their common goal, each sound change is only connected to the next sound change because it yields new open syllables and thus a basis for even more open syllables. Still, this leaves many questions unanswered, such as whether a "preference" (as Shevelov calls it) for certain phonotactic structures really exists within languages and whether this may really trigger sound change. Moreover, Shevelov's (ibid.) ultimate explanation is that the trend toward CV-syllables flows from the fact that Proto-Slavic had many vowels in its system and many oppositions on vowels, and that this richness of oppositions led the language to develop from a "phonemically vocalic language" with a high number of vocalic phonemes toward a "phonetically vocalic" language with a high usage frequency of vowels.

[50] For the Latin contact hypothesis, cf. footnote 10.

Finally, some suggestions may be made for the starting point of further research into the Opening of Syllables. First of all it should be interesting to investigate from when until when jers were inserted in disallowed consonant clusters in loanwords and why the simplification strategy in loanwords apparently differs from the treatment of the clusters that we have seen. Secondly, an analysis of similar phenomena in other languages would probably contribute to a better understanding of the diachronic behavior of syllables and its relation to sound change. In Proto-Greek and between Proto-Italic and Latin, for instance, a number of sound changes can be observed that resulted in a simplification of syllable structures, much like in Proto-Slavic. A third, more general suggestion is to test the intriguing hypothesis forwarded by Maddieson (2013, sec. 4) that cross-linguistically syllable complexity correlates positively with the size of the consonant inventory – whether such a correlation also exists for the size of the vowel inventory, as Shevelov predicts, has not been investigated yet. As for Slavic, the correlation between syllable complexity and the size of the consonant inventory could relatively easily be tested diachronically. If it turns out that there is a causal relation between the two, then this may provide important answers as to the diachronic development of syllables.

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