

The Unified Monophthongization Rule of Common Slavic

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Abstract. The goal of this paper is to show that the Common Slavic monophthongization of diphthongs was a much more uniform process than has been thought. There are two main types of rules, depending on whether the two moraic components of the diphthong have a pure sonority contrast (\pm consonantal or \pm high) or a sonority contrast in addition to one of nasality or front/back. In the case of the pure sonority contrast, one of the input moras becomes the moraic unit of the new two-mora monophthong. The question of whether it is the first or second mora depends on the sonority distance between the diphthongal components; in the unmarked case of lesser sonority distance, the second component is generalized in the monophthong, but a greater sonority distance causes the first component to become the moraic unit of the monophthong. When the diphthongal contrast involves sonority plus nasality or front/back, the non-nasal or back component first experiences assimilation to nasality or frontness and then serves as the moraic model for the resulting monophthong. These two basic rule types can be readily applied to both glide and nasal diphthongs, with the proviso that non-high vowels must be considered low (*ä, a*), rather than the traditionally assumed mid vowels (*e, o*). However, in the case of liquid diphthongs, there is an important difference of relative chronology between southern and northern zones. Southern zones experience the change of short vowels to mid only after the monophthongization of liquid diphthongs, while the northern zones first undergo the change of short vowel > mid, and only then monophthongize the liquid diphthongs. The presence of unchanged low and high vowels (**tart* and **turt*) accounts for the southern reflexes, while the new mid vowel combinations of the North (**tort* and **tart*) account for the northern results. Thus, virtually all of the diphthongal reflexes of Slavic can be explained by: 1) recognizing differing monophthongization rules for pure sonority contrasts, as contrasted with sonority in combination with nasality or front/back; and 2) recognizing the differing northern and southern relative chronologies for monophthongization and short vowel > mid in the last set of diphthongs to monophthongize, which are the liquids.

1. Introduction

Numerous studies have been devoted to the evolution of the Common Slavic diphthongs. Bethin (1998) is one of the most recent and detailed of these studies.¹ Although innovative in many ways, it is also characteristic of many existing studies of the Slavic diphthongs, in that it provides separate and individual explanations for the various surface reflexes of diph-

¹ My review of Bethin (1998) touched on some of its inadequacies in the area of liquid diphthong evolution. This paper attempts to state my ideas more fully and explicitly and revises a number of my earlier conclusions (e.g., Feldstein 1976: 320–21).

thongs found in the modern Slavic languages, but no global rule for Slavic diphthongal evolution as a whole.

As is generally recognized, there are two main types of surface differences which occur among the diphthongal reflexes, as follows:

1. Firstly, the three major phonological types of diphthongs, based on the second diphthongal component (glide, nasal, and liquid), all have their specific evolutions.²
2. Secondly, the various Slavic geographical zones manifest their own particular dialect differences, especially as regards the evolution of the liquid diphthongs.

Thus, the actual reflexes are very numerous. Even the single subtype of liquid diphthongs has three major phonological types and five major zones (as enumerated in Jakobson 1952: 306–07). There has apparently been no attempt to state a general rule (or rules) which might have applied to all Slavic diphthongs in all zones. This paper is an attempt to explore this possibility. This is viewed as a desirable goal since the great multiplicity of Slavic diphthongal reflexes has obscured the commonly held assumption that they all resulted from the basic principles of the open syllable and rising sonority (Čekman 1979: 146–47). In other words, one would expect a greater uniformity of diphthongal reflexes if it is true that they all arose as a result of a single phonological principle. In fact, I hope to demonstrate that the various reflexes of monophthongization can receive a unified description, which would be preferable to the usual separate treatments of glide, nasal, and liquid diphthongs. If such a unified description can withstand further examination, it can support the notion that the varied surface processes of Slavic monophthongization are all related and motivated by a similar tendency. Čekman (1979: 152) has observed that “from the standpoint of their description, monophthongization, nasalization, and liquid metathesis are all phenomena of the same type, easily lending themselves to interpretation by means of a single ‘rule’, such as those often formulated in generative phonology.” However, the author does not provide the detailed answer as to how this was actually manifested in the history of the Slavic languages. The present paper is an attempt to demonstrate that these Slavic sound-changes really had much more in common than has generally been realized. As will become clear, this task can be facilitated by selecting the optimal Common Slavic phono-

² Examples of various types of Common Slavic diphthongs and their evolution have been placed in an appendix, at the end of this paper.

logical constructs, and by using relative chronology to account for how the differing zones might have applied the identical rules, although the rule ordering might have differed from zone to zone.

2. Definitions of the Common Slavic Diphthongs and Their Components

For the purposes of this paper I shall understand a diphthong to be a two-mora sequence, comprised of non-identical components which belong to the same syllable. It could be thought of as a moraic cluster. For Common Slavic, the significance of the moraic nature of both segments is in the fact that such diphthongs are prosodically equivalent to long monophthongal vowels. Such monophthongs differ from diphthongs only in that they are comprised of two identical moraic segments. I assume that any prosodic, or pitch contour that could characterize monophthongs can also apply to diphthongs. In view of this structural similarity, I will assume that Common Slavic diphthongs are defined as having both moraic components within the syllabic nucleus.

The Common Slavic moraic clusters which I am defining as diphthongs all conform to the structure $\check{V}S$ (where V = vowel and S = sonorant). Historically, these sequences were derived from long or short vowels which were followed by non-moraic sonorants (i.e., $\check{V}S$ or $\bar{V}S$), many of which were inherited from Proto-Indo-European, and some of which first developed in Balto-Slavic. Occasionally, these sequences are referred to as “diphthongs” even when their sonorants are non-moraic. I follow Zinder (1979: 209–10) in defining a diphthong as consisting of equal vocalic components, rather than a vowel plus a non-syllabic sonorant. Hence, the term **diphthong** will not be used in reference to sequences of a vowel plus non-moraic glide, nasal, or liquid. Proto Indo-European sequences of vowel plus non-moraic sonorant have often been referred to as diphthongs. However, I will consider this to be either an erroneous interpretation of their original value or simply a historical term, based on the later evolution of such sequences. Following Meillet (1964: 115) and Kiparsky (1973: 845), I assume that the original value of both components could not have been moraic, since the first, vocalic components of such purported diphthongs could occur both long and short. Therefore, in combination with an ostensibly moraic sonorant, a long first vowel component would imply an anomalous three-mora sequence, meaning that the inventory included an opposition between one, two, and three mora syllables (see Feldstein 1990: 47 for further discussion). In other words, if the maximal syllable contains only two moras, so-called “long” and “short” diphthongs

cannot be diphthongal by the definition I am using, since they would exclude the moraicity of the sonorant component.

The well-known Common Slavic tendency toward open syllables ushered in an important new period in the history of diphthongs. Although different aspects of the law of open syllables are often subsumed under one process, Bethin (1998: 27) made the useful observation that the law of open syllables can be broken down into a number of separate constraints. I shall assume that there are two significant chronological periods of the Common Slavic tendency toward the open syllable, as evidenced by the evolution of diphthongs. The earlier period of the open syllable law is marked by the generalization of moraic segments in the syllabic-final position, while the later period is characterized by the modification of all moraic sequences with falling sonority, which changed into monophthongs with level (i.e., unchanging) sonority.³ As described by Čekman (1979: 146), I regard the earlier period as equivalent to the **tendency to the open syllable** and the later period as representing the **tendency to rising sonority**.

The change from closed to open syllable in the earlier period could occur in one of two ways: either by removal of a non-moraic segment from the coda position (such as by deletion, reassignment to the next syllable, or metathesis⁴), or by changing a syllabic-final segment from non-moraic to moraic. Obstruents were frequently subject to deletion, while sonorants (glides, nasals, and liquids) were regularly changed from non-moraic to moraic (called the “moraic constraint” by Bethin 1998: 28). The change of North Slavic **art* groups to **rat*, which applied in all of East and West Slavic, except Central Slovak,⁵ was an isolated instance of liquid metathesis in this early period. As a result of the changes of the earlier period, all syllables came to end in a moraic segment, i.e., non-moraic codas were eliminated and all syllables became open.

I assume that when syllabic-final sonorants changed from non-moraic to moraic, there was a concomitant generalization of short (one-mora) quantity in the pre-sonorant vowel; i.e., the pre-sonorant vowel experienced a quantitative neutralization as short (see Stieber 1969: 17 and Feldstein 1990: 46–47 for further details). Thus, an opposition which origi-

³ Note that the change of falling to level sonority is tantamount to the change of diphthong to monophthong, i.e., monophthongization.

⁴ Nahtigal (1963: 42) exemplifies some of these possible outcomes, such as deletion (**u-sv̄p-nq-ti > u-sv̄-nq-ti*) and reassignment to the next syllable (**l̄z-ti > l̄-sti*).

⁵ Evidence of this early metathesis can be seen in the continuation of long/short reflexes in the **art* reflexes of this zone (both *rot* and *rat*), in contrast to the uniform *rat* reflexes of South Slavic.

nally could oppose long or short vowel, followed by a non-moraic sonorant, generalized the pattern of a diphthong, with a one-mora vowel in the first component and a one-mora sonorant (glide, nasal, or liquid) in the second component, which can be represented as the following change: $\check{V}\bar{S}/\bar{V}\check{S} > \check{V}\check{S}$.

These newly arisen $\check{V}\check{S}$ moraic clusters represent the phonological class most often known as the Common Slavic diphthongs and are the subject of this paper. Notably, North Slavic⁶ anlaut $\check{a}rt/\bar{a}rt$ groups never attained the status of diphthong by this definition, although their South Slavic counterparts did. In other words, since North Slavic has reflexes of both short and long vowels in its *rat* groups (e.g., Russian *ralo* 'plow' vs. *rovnyj* 'level', as contrasted to Serbo-Croatian *ralo*, *ravan*), no quantitative neutralization could have occurred in the North. As observed above, the syllabic-final liquid could not have attained moraic status, since that would have implied three-mora syllables, an unlikely assumption for Slavic. Therefore, I assume that North Slavic *art* experienced metathesis before the quantitative neutralization rule was applied, but South Slavic *art* was subject to this rule after quantitative neutralization, together with anlaut *tart* (see Andersen 1973: 10).

As noted, the first period of syllabic changes was marked by the generalization of the open syllable and a moraic segment in all syllable-final positions. Many of these open syllables were, nevertheless, diphthongal sequences with falling sonority, since the new moraic glides, nasals, and liquids were all lower in sonority than the first diphthongal components which preceded them. The second period of the open syllable law called for the elimination of such sequences with falling sonority, i.e., the transformation of two-mora diphthongal sequences ($\check{V}\bar{S}$) into monophthongs, referred to as the monophthongization of Common Slavic diphthongs. Since the diphthongal sequences originally produced by quantitative neutralization were comprised of two differing moraic segments and were changed into sequences of two identical moras, this process could also be termed a change of moraic clusters into moraic geminates. In essence, all monophthongization involves assimilation of one moraic segment to the other. All monophthongization can be divided into two types of assimilation:

⁶ For the purposes of anlaut *rat*, North Slavic refers to East and West Slavic, with the exception of Central Slovak.

1. A single, total assimilation of one such segment to the other.
2. A two-step process, consisting first of the assimilation of the feature of frontness or nasality by an opposite (back or non-nasal) segment, followed by the total assimilation of one segment to the other.

Details about this process are presented in the following sections of this paper.

3. Towards a Uniform Description of the Process of Common Slavic Monophthongization

The specific goal of this paper is the demonstration of the uniformity of the phonological change of Common Slavic diphthong > monophthong, as just described.⁷ The Common Slavic diphthongs, defined as having two moraic components, uniformly manifest a syntagmatic contrast of sonority. The specific nature of each sonority contrast depends on the second diphthongal component. In the case of glide diphthongs, the sonority contrast is realized by the feature \pm high, i.e., the first component is a non-high vowel and the second is high; the nasal and liquid diphthongs realize the sonority contrast by means of the \pm consonantal feature, where the first component is non-consonantal and the second is consonantal. In addition to the uniform sonority contrast, a subset of diphthongs could have a second contrasting feature: either \pm back, in the case of the glide diphthongs, or \pm nasal, as represented by diphthongs ending in a nasal. This paper's thesis is that there are only two basic rules for monophthongizing all Common Slavic diphthongs in the various Slavic zones, regardless of whether they ended in a glide, nasal, or liquid: either simple **segmental assimilation** or **feature assimilation plus segmental assimilation**.⁸ The choice of one or the other depends on whether the diphthong only has the primary contrast of sonority (realized by either vowel height or the consonantal feature), or whether there are both the primary contrast plus a secondary contrast of either front/back or nasality. After briefly summarizing the two major rules which apply to these types, the following sections will set forth my assumptions about the Common Slavic inventory of diphthongs and proceed to demonstrate that glide, nasal, and liquid diphthong

⁷ North Slavic *art* is not being defined as diphthongal and its evolution does not really belong to the topic of the change of diphthong > monophthong, although it is often included in the topic of diphthongal evolution.

⁸ The focus of this uniform rule is on the resulting monophthong and where it acquired its phonological features. Therefore, it does not make reference to changes in the sequence of liquids, such as liquid metathesis.

monophthongizations all conform to the basic rule of monophthongization, which can be described as follows:

1. When the two diphthongal components contrast only in sonority, the resulting monophthong always is a geminate of one of original components, i.e., one of the two diphthongal moras fully assimilates to the other, resulting in a sequence of two identical moras. Either the first and second diphthongal component can emerge as the resulting monophthong, depending on whether the sonority distance of the contrast between them is greater or lesser. For the purposes of calculating the sonority distance, non-high vowels act as the maximally sonorous elements, high vowels occupy a middle level, and consonantal moraic segments are the least sonorous, as follows:
 - a) Least sonorous: +consonantal ($\check{r}/\check{l}/\check{m}/\check{n}$).
 - b) Intermediate: +high, -consonantal (\check{i}/\check{u})
 - c) Most sonorous: -high, -consonantal ($\check{e}/\check{o}/\check{a}/\check{ä}$)

Lesser sonority distance can be defined as a sequence of contiguous units on this scale, such as non-high vowels plus high (e.g., *au*), or high vowels plus consonantal segments (e.g., *ur*). However, non-high vowels plus consonantal segments (e.g., *ar*) are an instance of greater sonority contrast.⁹ The determination of whether the first or second diphthongal component emerges as the ultimate monophthong depends on the sonority distance, as just defined, in the following manner:

- a) If the sonority distance is of the lesser type (e.g., *au/ur*), the second component, in geminate form, becomes the new mono-

⁹ A similar sort of sonority differentiation occurred in the Common Slavic rule which positionally changed short high vowels (\check{i}/\check{u}) into the so-called strong (i.e., non-high) *jers* when they preceded single moras which were either high or consonantal. The notion that strong *jers* developed before short high vowels (other *jers*) is well-known. I have tried to advance the idea that a similar change to non-high also occurred in the position preceding a consonantal mora, i.e., $\check{u} > \text{ə} / _ \check{r}$ (where the actual value of ə differs by Slavic zone), see Feldstein 1994: 38. A later rule then removed the moraicity of the remaining high vowels that had conditioned this lowering. In the case of high vowels, this led to total deletion, while the loss of \check{r} moraicity led to its change to a non-moraic liquid consonant.

phthong,¹⁰ i.e., *ǎǔ* > *ǔǔ* in all Slavic and *ǔř* > *řř*, as seen in Czecho-Slovak and South Slavic.

- b) If the sonority distance is of the greater type, the geminated first component undergoes metathesis and becomes the new syllabic nucleus (e.g., *ǎř* > *rǎǎ*). The loss of the moraic second component applies only when two conditions are met: the second component is a liquid and the sonority distance is of the greater variety. It is further characterized by a retention of the second component in non-moraic form, with accompanying metathesis of this component in almost all Slavic zones (e.g., *ar* > *ra*). Varying types of zonal variation are caused by differences of the relative chronology of such developments as the change of high and low short vowels to non-high and non-low (i.e., mid vowels), which will be discussed below in more detail.

I will refer to diphthongs with components that contrasted only in sonority as the pure sonority type. This type included glide diphthongs of the same front/back tonality as well as all of the liquid diphthongs.

2. The second type of diphthongal contrast, as stated, involves both the definitional sonority contrast that applies to all diphthongs, plus another one: either **front/back** (e.g., *ai/ǎu*) or **nasality** (e.g., *an/ǎn*). Monophthongization of this type does not result in the simple assimilation of one component to the other. Rather, the component that is unmarked for frontness or nasality (i.e., the back or non-nasal component) first assimilates the marked feature of frontness or nasality from the other component, only after which it emerges as the new two-mora monophthong (or moraic geminate). This second step can be interpreted as the assimilation of the originally front or nasal component to the one which assimilated the single feature of frontness or nasality in the first step. For example, input *ai* contrasts in both sonority and front/back. As a first step, the non-front segment assimilates marked frontness,

¹⁰ For those who are puzzled as to how *ur* diphthongs manifest the gemination of the second component, I am assuming that in South Slavic the diphthongal shape was indeed *ur* at the time of monophthongization, resulting in the long monophthong *řř*. On the other hand, such northern zones as Lekhitic and East Slavic already had experienced the change of short *ǔ* to a mid-vowel (such as *ɛ*) by the time of monophthongization, which meant that this sequence was one of lesser sonority distance in the South, but greater sonority distance in the North, for the purposes of the monophthongization rule.

yielding *äi*. Next, the originally front segment assimilates to the other one, resulting in monophthongal *äü*, or long *ä* (known as *jat'* and often symbolized as *ě*).

In the case of a front/back contrast (i.e., with a glide as second component), the assimilation of frontness can be either progressive or regressive, since either the first or second component could be front. However, in the case of nasal diphthongs, the nasality assimilation can only be regressive, since nasals could occupy only the second component slot of the input diphthong. The above types of monophthongization will be illustrated within separate sections, devoted to glide, nasal, and liquid diphthongs. The two main types of diphthongal feature contrast and their monophthongization rules can be shown on the branching diagram in Table 1.

Table 1. Four main types of monophthongization, based on type of input diphthong

Type of Monophthongization, Based on Input Diphthongal Contrast			
Sonority-Only Contrast		Sonority Contrast Plus Nasality or Frontness	
Greater Sonority Distance	Lesser Sonority Distance	Front/Back	Nasal/Non-Nasal
ǣ̃ > řǣ	ǣ̃ü > üü ǣ̃ř > řř	ǣ̃ĩ > ǣ̃ǣ̃ ǣ̃ü > üü	ǣ̃n > ǣ̃ǣ̃ ǣ̃ñ > ǣ̃ü
Resulting monophthong equals 1st component.	Resulting monophthong equals 2nd component.	Non-nasal or non-front component assimilates frontness or nasality; resulting monophthong equals this assimilated value.	

4. Assumptions about the Late Common Slavic Vowel System

For the earliest period of diphthongal change, which may be identified with the beginning of Late Common Slavic, I recognize a system of monophthongal vowels which had the distinctive features of quantity (long/short), height (high/low), and frontness (front/back), with a redundant rounding in the high back vowel. This may be depicted as:

Table 2. Assumed inventory of Early Common Slavic monophthongs

Short		Long	
ǐ	ǔ	ī	ū
ǎ	ǚ	ā	ā

As described by Skljarenko (1993: 64), the “diphthongs” of Early Common Slavic (and probably Baltic as well) had either a short or long vowel as the first component, plus a non-moraic second component that consisted either of a glide (*i̯, u̯*), nasal (*m, n*), or liquid (*r, l*). These early combinations of vowel + sonorant were not really diphthongs for the purposes of this paper, which defines diphthongs as a sequence of two non-identical **moraic** segments, and they will be referred to as pre-diphthongs. We can list the inventory of these pre-diphthongs as a series of sequences with glides, nasals, and liquids as second components, corresponding to the above chart (except for the exclusion of high vowel + glide sequences, which did not develop into diphthongs), as follows:

Table 3. Assumed inventory of Early Common Slavic pre-diphthongs, with a quantitative opposition in their first component

Short	
ǐm/ǐn/ǐr/ǐl	ǔm/ǔn/ǔr/ǔl
ǎi/ǎu/ǎm/ǎn/ǎr/ǎl	ǚi/ǚu/ǚm/ǚn/ǚr/ǚl
Long	
īm/īn/īr/īl	ūm/ūn/ūr/ūl
āi/āu/ām/ān/ār/āl	āi/āu/ām/ān/ār/āl

When they occurred in closed (or tautosyllabic) position, i.e., before a consonant or finally, there was an important change in the moraic properties of these Early Common Slavic pre-diphthongs, which caused the first component to neutralize shortness (or the value of a single mora), while the formerly non-moraic sonorant of the second component became moraic, i.e., part of the syllabic nucleus.¹¹ In other words, in closed posi-

¹¹ The formerly long and short pre-diphthongs did not completely merge, due to the fact that they were often prosodically different, with rising (acute) on the long diphthongs and non-rising on the shorts. Viewed in this light, the quantitative neutralization of first

tion the pre-diphthongs were transformed into real diphthongs, though they retained their former quality in open position. This led to the Late Common Slavic system of two-mora diphthongal sequences with a uniformly short vocalic first component and a moraic high vowel or sonorant as the second component, as follows:

Table 4. Assumed inventory of Late Common Slavic diphthongs, after the neutralization of quantity in the first diphthongal component, with each of the two segments quantitatively equivalent to a single mora.

Late Common Slavic Inventory of Diphthongs (glide, nasal, liquid)

	Front	Back
High:	ǐm̃/ǐñ/ǐr̃/ǐl̃	ǔm̃/ǔñ/ǔr̃/ǔl̃
Low:	ǎü/ǎm̃/ǎñ/ǎr̃/ǎl̃	ǎü/ǎm̃/ǎñ/ǎr̃/ǎl̃

Note that Table 4 is generally comparable to the more traditional listing of Common Slavic diphthongal types by Elkina (1960: 66).¹² At a certain point after the diphthongal inventory came into existence, as a result of the pre-sonorant neutralization of quantity, but as yet before the monophthongization of diphthongs, long \bar{u} must have lost its rounding and become redundantly long \bar{y} , leading to the following system of Late Common Slavic short and long monophthongs, which co-occurred with the diphthongal inventory just listed:¹³

diphthongal components could have represented the removal of redundancy and the emergence of pitch as an independent prosodic feature.

¹² However, one main difference is that Elkina's two vowel heights for the first diphthongal component use the symbols for high and mid (e.g., i/u and e/o), while my table uses high and low vowel symbols, which permit a more cohesive rule of monophthongization. Elkina and others (e.g., Breüer 1961: 70–75, and Shevelov 1965: 272–74; 286–88; 314–16; 392–93; 399–401; 467–78) have extensive lists of Common Slavic and later Slavic reflexes of Indo-European pre-diphthongs. A representative set of such diphthongal examples can be found in the appendix to this paper, grouped according to the traditional division into glide (i/u), nasal (m/n), and liquid (r/l) types.

¹³ As noted by an anonymous reader of this paper, the change of $\bar{u} > \bar{y}$ suggests the result of a push-chain type, due to the phonological pressure of the diphthong au , which was moving in the direction of \bar{u} . No Common Slavic unrounding occurs for short \bar{u} , which has rounded reflexes in many zones (e.g., the back jer reflexes of East Slavic and Macedonian), which indicates that it did not experience the pressure to unround that its erstwhile long partner did.

Table 5. The Late Common Slavic vowel system after the loss of rounding in the long high back vowel

	Short		Long	
	Front	Back	Front	Back
High:	ĭ	ŭ	ī	ȳ
Low:	ǎ	ǎ	ā	ā

A recognition of the above outlined reconstruction of the Common Slavic vowel system has led to my conclusion that a uniform rule of monophthongization can be posited for Common Slavic. I contend that one must not rely on the traditional reconstruction of *e/o* mid-vowels for Common Slavic since it obscures the rules of monophthongization and the uniformity of the process. Segmental units were constantly changing and it often happens that the assumption of one sort of input segment in the rule monophthongization results in a clear picture of the general tendency, while another choice of input segment does not. This is related to the question of the relative chronology of monophthongization as compared to a number of other sound changes, especially the change of high and low short vowels to mid vowels. Many studies of diphthongs operate with mid vowel diphthongal constructs such as **oi* or regard Common Slavic *jat'* as a long mid vowel *ě* (see Bethin, 42). Such a view errs either by introducing the irrelevant issue of a rounded *o* in the input diphthong, or by introducing long mid *ē* as the resulting monophthong. It is only by recognizing that the change of *ǎ > ǒ* occurs **after** the glide monophthongization, and only by assuming that the value of *jat'* is *ǎ*, and not *ē*, that one can achieve meaningful conclusions about the Common Slavic rules of monophthongization.¹⁴

Based on the reflexes of Common Slavic diphthongs, I shall assume that all of Slavic experienced the monophthongization of glide and nasal diphthongs before the change of short vowels to mid vowel height. However, the final monophthongization, that of liquids, must have straddled the change of short vowel *>* mid in the different zones, occurring before the change in the South Slavic and Czecho-Slovak, but after it in Lekhitic, Sorbian, and East Slavic.

¹⁴ Note that while Mareš (1965: 6, 15) correctly sets up low *ǎ/a*, rather than mid *e/o*, he also sets up delabialized (unrounded) short *ȳ* as a monophthong, but *u* as the second component of diphthongs. I posit the Common Slavic unrounding of long *ū > ū* (under pressure of *au > ū*), but no Common Slavic unrounding of *ŭ*.

5. Monophthongization of Glide Diphthongs

It is usually recognized that the glide diphthongs¹⁵ were among the first to be monophthongized in Slavic, since their reflexes are much more uniform than those of the liquid diphthongs, which are often considered to have experienced monophthongization much later, based on the significant diversity of their reflexes (see appendix for details). The glide diphthongs consisted of a low vowel as first component and high vowel as second, as shown in Table 4. It has been observed that there is an important structural difference between the monophthongization rules of glide diphthongs which agree in the frontness or backness of both segments, and those which disagree (Kolomijec' 1966: 51–52, Skljarenko 1993: 69). As indicated above in Table 1, the glide diphthongs can be divided into two groups, based on whether their two components contrast only in sonority (high vs. non-high) or in sonority plus the feature front/back. The contrast of rounding is not relevant in this regard, since a high back diphthongal component is redundantly rounded, while a non-high component was redundantly unrounded. The relevant glide diphthongs are:

1. Differing only in sonority: *au, äi*.
2. Differing in sonority plus front/back: *ai, äu*.

One of the two main theses of this paper is that diphthongs of type one, with a mere sonority contrast, become monophthongized by simply experiencing assimilation of the first component to the second. In fact, this information has been stated previously (Kolomijec' 1966: 51) and is not controversial. However, this paper's second main claim is that there is also uniformity in the evolution of the second diphthongal type, which has a contrast that goes beyond sonority. In the case of glide diphthongs, the additional non-sonority contrast is that of front/back. According to the general rule of monophthongization for such diphthongs, a type of mutual feature exchange occurs, where a +back vocalic feature in either diphthongal component assimilates to a –back (i.e., front vowel) specification in the other component, while the front vowel component assimilates all of the other features of the originally back vowel component. One could also say that the back vowel component first assimilates a non-back feature of the other component, after which the other component fully assimilates to it, i.e., the resulting monophthong is equivalent to a geminate value of the non-front component, except for the change to frontness.

¹⁵ Called "oral" diphthongs by Bethin 1998: 40.

As to the second pair of glide diphthongs which contrasted in more than just sonority, I am assuming that their value at the moment of monophthongization should be reconstructed as $\check{a}\check{i}$ and $\check{a}\check{i}\check{i}$. The additional distinctive contrast, in addition to sonority, as previously noted, was a tonality contrast of \pm back. In accord with the general rule of monophthongization being proposed, the front vowel segment contributes its feature of frontness ($-$ back) to the back vowel segment, while the latter contributes all of its other features to the originally front vowel component of the diphthong. Thus, one could say that once the back vowel mora switches its $+back$ feature to $-back$, it then emerges as one of the two identical moraic units of the new monophthong. The mechanism could also be described in a variety of other ways, although the primary object of this paper is to establish the existence of such a Common Slavic monophthongization rule for diphthongs which contrasted in sonority plus another feature (front/back or nasality). If the process is viewed as simultaneous, one can say that the back vowel segment assimilates to the other in the front/back feature, while the front vowel segment assimilates to the other in all other features, bringing about the identity of the two segments.

In the case of $\check{a}\check{i}$, the frontness of the \check{i} mora causes \check{a} to front to \check{a} , which then emerges as the moraic value of the new two-mora sequence: $\check{a}\check{a}$. Let us review how the rule of monophthongization works in this instance. Since ai has a $+back$ first component and a $-back$ second component, it qualifies as having both a sonority and a front/back contrast. The non-front first component assimilates to the frontness of the second component, which changes the first component to \check{a} . In geminated form, this is the resulting value of the diphthong, i.e., $\check{a}\check{a}$. I am assuming that it has the value of a long, low, front vowel, which matches the $\check{a}\check{a}$ that I have suggested.¹⁶ If, for the sake of argument, one were to assume that the ai monophthongized by means of two sequential rules, the first of which fronted a , and the second of which caused i to be assimilated to the fronted \check{a} , there would be an intermediate stage of $*\check{a}i$, equivalent to one of the other diphthongs, but which changed to \check{i} , rather than $\check{a}\check{a}$. This apparent contradiction can be solved either by assuming that the diphthongs with a sonority plus tonality contrast monophthongized only **after** those which had a simple sonority contrast, or by assuming that diphthongs with a sonority plus tonality contrast had a simultaneous feature interchange, rather than a sequential change in two steps. In other words, one can either assume a single change of $ai > \check{a}\check{a}$, without intermediate $*\check{a}i$, or an earlier change of $\check{a}i > ii$, followed by $ai > \check{a}i > \check{a}\check{a}$. I am inclined to assume the

¹⁶ Kolomijec' (1966: 55), among others, also assumes the value of long \check{a} for jat' .

former alternative of a simultaneous feature exchange, rather than the occurrence of two **äi* sequences in succeeding chronological periods, each having differing monophthongizations. The situation is somewhat complicated by the fact that in several morphological (desinential) positions, original *ai*, in fact, did merge with the results of *äi*, with both resulting in the long *i* monophthong. However, in view of the fact that this reflex is restricted to certain grammatical positions (such as the *ǫ*-stem nominative plural), I do not regard it as the regular evolution of *ai*. I would submit that the above outlined description fits the probable diphthongal evolution better than the thesis that Late Common Slavic *jat'* was a long mid \bar{e} (cf. Bethin 1998: 42) or diphthongal *ie* (cf. Jakobson 1929: 24). In virtually all Slavic zones, the raising of *jat'* from low to mid or upper mid was related to the loss of nasality, due to the threat of merger of the newly denasalized low front vowel with low front *jat'*, causing the latter to be raised (cf. Rigler 1986: 140). In any case, once long \bar{a} is posited as the Late Common Slavic value of *jat'*, its appearance can readily be explained by the basic diphthongal rule I have introduced.

The other glide diphthong which contains components that disagree in both sonority and front/back features, is assumed to have been $\check{a}\check{u}$ (often treated by scholars as *eu*, again placing the rise of short mid vowels earlier than I do). In this instance, the spread of the front vowel feature to the back segment changes the latter from \check{u} to $\check{ü}$, which is the value of the two moras of the resulting monophthong, which I posit as $\check{ü}\check{ü}$ or $\check{ü}$. This is often treated as being Late Common Slavic **ju*, due to the fact that it causes a jot palatalization in the preceding consonant. Indeed, it is very likely that the new $\check{ü}$ developed a preceding jot by a regular phonological rule, since it would have been a new instance of a front rounded vowel and the jot could have provided additional redundancy for the front vowel feature (as reconstructed by Kolomijec' 1966: 53). In any case, the emergence of the opposition /y/ vs. /u/ (resulting from the change of older long $\bar{u} > \bar{y}$ and $\check{a}\check{u} > \bar{u}$) gave a newly distinctive status to the feature \pm rounded, which first became distinctive for the high back vowels. The subsequent emergence of front rounded $\bar{ü}$ from the diphthong $\check{a}\check{u}$ represents a case of filling a "hole" in the system, by extending the rounding feature to high front vowels. There is a considerable body of scholars (including Fortunatov and Trubetzkoy 1954: 62; see also Lunt 1974: 20, who posits / $\bar{ü}$ / for Cyril's dialect), who have vigorously defended the notion that this vowel was indeed front rounded / $\bar{ü}$ / on the basis of the use of a separate symbol for it in Old Church Slavonic.

Thus, my assumption of a long $\check{ü}$ reflex, which later changes to *ju*, fits the monophthongization rule I am proposing. Andersen (1972: 22–23) cites

several examples of attested $\ddot{u} > iu > iju$ in Slovak and notes the substitution of English [iu] in loans which come from French and German \ddot{u} . The author (1998: 24) also cites the further development of $iu > \dot{i}$ in English. Thus, the assumption of a Slavic change $\ddot{u} > ju$ is backed up by independent linguistic evidence. On the other hand, it would be rather difficult to understand a direct change of the usually cited Slavic $eu > ju$, within the context of all of the other changes that were part of the process of monophthongization. Thus, Bethin (1998: 41) was not able to get at the true mechanism of this change, since all of her stages of development recognize a mid vowel e , rather than low \ddot{a} , as the value of the first component, and she does not reconstruct any stage with front rounded \ddot{u} monophthong, which I posit as the essential part of the Common Slavic monophthongization process.

6. Monophthongization of Nasal Diphthongs

Sometime during the final period of Late Common Slavic, as eventually manifested in Old Church Slavonic, there emerged two nasal vowels in place of the eight original diphthongs that can be assumed: front $\check{i}\check{m}/\check{i}\check{n}/\check{a}\check{m}/\check{a}\check{n}$ and back $\check{u}\check{m}/\check{u}\check{n}/\check{a}\check{m}/\check{a}\check{n}$. This was due to the neutralization of both the vowel height feature and the \pm coronal feature that opposed /m/ vs. /n/. Prior to this reduction of eight units to two, it is usually assumed that each of the nasal diphthongs neutralized only the opposition of the two nasal consonants, resulting in the following monophthongizations:

- | | |
|--|--|
| 1. $\check{i}\check{m}/\check{i}\check{n} > \check{i}$ | 3. $\check{u}\check{m}/\check{u}\check{n} > \check{u}$ |
| 2. $\check{a}\check{m}/\check{a}\check{n} > \check{a}$ | 4. $\check{a}\check{m}/\check{a}\check{n} > \check{a}$ |

Even though the eventual Late Common Slavic front nasal vowel reflex suggests a non-high / \check{a} / or / \check{e} / the evidence for / \check{i} / can be found in the progressive palatalizing effect on a following velar, in cases such as $*kuningas > *k\check{o}n\check{i}g\check{o} > *k\check{o}n\check{a}(d)z\check{o}$, as reflected in Polish *ksiądz* 'priest', Russian *knjaz'* 'prince'.

For the purposes of the general monophthongization rule under discussion, all of the nasal diphthongs can be defined as being of the second (**sonority plus**) type, in which the two components contrast in both sonority and another feature as well. In this case, the sonority contrast involves the feature $-$ consonantal in the first, vocalic segment, but $+$ consonantal in the moraic nasal sonorant of the second component. Obviously, the second contrasting feature is nasality, which is negatively specified in the first segment, but positively in the second. According to the general diphthongal rule, such a case gets resolved in the same basic way as the one in

which both sonority and front/back differ: the relevant non-sonority feature of nasality spreads to the non-nasal mora, which then essentially becomes the new monophthong in long form. Thus, each of the now identical moras has had the contribution of nasality (cf. frontness in glide diphthongs) from the segment marked positively for that feature, while all other features are copied from the originally non-nasal (cf. non-front in glide diphthongs) segment.

Late Common Slavic eventually neutralized the vowel height distinction in the four nasal vowels, which resulted in two nasal vowels opposed by \pm back.¹⁷ The Common Slavic front nasal which emerged was most likely / ä /, as clearly evidenced by a denasalized reflex that suggests front ä in such zones as Czecho-Slovak and East Slavic (e.g., Slovak *pät*, CSR *pjat* ‘five’). The back nasal with neutralized height gives evidence of being a neutralized high back nasal vowel / ɯ /, on the basis of the reflex that resulted after virtually all instances of early Slavic denasalization. In addition, even zones which denasalized to *o*, rather than *u* (e.g., Slovene), could have nasal doublets in *u* (cf. Stieber 1969: 27). The change of glide and nasal diphthongs first led to the following system of long monophthongs:

	High/Front		High/Back	
Oral	i	ü	u	y
Nasal	ĩ		ɯ	
	Low/Front		Low/Back	
Oral	ä		a	
Nasal	ã		ɑ	

However, the neutralization of the nasal vowel height opposition and the emergence of a new front rounded nasal morphophonemic variant / ü /, led to the following new system in which nasal vowels were redundantly rounded when high, and redundantly front when low. In other words, they could not simultaneously maintain the three features of nasality, rounding, and front/back, which the previous scheme required. In the new scheme, only two of these three features can be used at a time, accounting for the loss of nasal /*i*/ and /*a*/:

¹⁷ There was a possible third, front rounded nasal vowel, in some dialects (Lunt 1974: 20).

	High/Front		High/Back	
Oral	i	ü	u	y
Nasal	ÿ		ɯ	
	Low/Front		Low/Back	
Oral	ä		a	
Nasal	ǣ			

Since the monophthongization of nasals followed the changes of original \bar{u} > \bar{y} and $\check{a}\check{u}$ > \bar{u} , rounding had already become a distinctive feature in the high vowels. The systematic pressure to take maximum advantage of this new feature and fill the “holes” in the system can be seen both in the new combination of the features front and rounded, which resulted from the monophthongization of $\check{a}\check{u}$ > $(j)\bar{u}$, as well as the new morphophonemic alternate of a front rounded nasal \check{u} , for desinences which followed stems ending in palatal consonants ($*nesu/*noš\check{u}$, often transcribed as OCS $nes\check{o}/noš\check{o}$).

In any case, the application of the basic monophthongization rule to the Common Slavic nasal diphthongs is non-controversial, and less complicated than that of the glide diphthongs, since the marked, nasal mora could only occur as the second diphthongal component, and uniformly led to long nasal vowels as the monophthongal result.

7. Monophthongization of Liquid Diphthongs

The various sorts of Common Slavic liquid diphthongs have varied reflexes and have often been treated apart from the general rules of monophthongization. However, Andersen (1973: 10) made it clear that the basic difference between the two major Slavic zones is due to the relative chronology of the “qualitative differentiation of C[ommon] Sl[avic] long and short vowels,” with respect to the monophthongization of liquid diphthongs.¹⁸ I assume that there was a Common Slavic change which qualitatively differentiated long and short vowels by generalizing mid vowel height for shorts (non-high and non-low, in distinctive feature terms), according to which short $\check{a}, \check{a} > \check{e}, \check{o}$ and short $\check{i}, \check{u} > \check{a}$.¹⁹ Therefore, I

¹⁸ See also Timberlake (1985: 423, fn 7) for further discussion.

¹⁹ The *schwa* symbol is arbitrarily used to represent any of the ultimate “strong jer” reflexes of the various Slavic languages, which share the property of being lower and more

assume the following chronological order of events, including the aforementioned developments of glide and nasal diphthongs, plus the liquid diphthongs, which will subsequently be discussed in more detail:

1. East and West Slavic (but not Central Slovak or South Slavic) metathesize tautosyllabic liquids after word-initial (anlaut) vowels (both short and long): *ǣrt/ǣrt* > *rǣt/rǣt*.
2. Quantitative neutralization of vowels before tautosyllabic sonorants, and change of these non-moraic sonorants to moraic: *tǣrt/tǣrt* > *tǣrt*.
3. Monophthongization of diphthongs ending in moraic glides and nasals.
4. South Slavic and Czecho-Slovak monophthongization of diphthongs ending in liquids (with metathesis when liquids lost moraic status according to the rule of sonority distance shown above in Table 1): *tǣrt* > *trǣt* ; but *tǣrt* > *tǣrt*.
5. Low short vowels > mid: *ǣ, ǣ* > *ě, ǫ*.
6. North Slavic (East Slavic, Lekhitic, and Sorbian) monophthongization of non-high diphthongs ending in liquids (with metathesis when liquids lost moraic status): *tǣrt* > *trǣt* or *tǣrt*.
7. High short vowels > mid (*ĩ, ı̄*) in certain environments which immediately preceded low sonority moras, such as was the case when they immediately preceded moraic liquids.
8. North Slavic monophthongization of diphthongs ending in liquids (no resulting metathesis).²⁰

From the perspective of monophthongization, the major point is that the same basic rule applies to liquid diphthongs as to the other types (glide and nasal). As stated above, liquid diphthongs were diphthongs with a **sonority only** contrast (i.e., –consonantal in the first diphthongal mora, but +consonantal in the second), lacking an additional contrast of either frontness/backness or nasality. According to my basic thesis (shown in Table 1), when an input diphthongal contrast is of the sonority only

sonorous than the original high short *ĩ* and *ı̄*. In this paper, they will be symbolized either as *schwa* (*ə*) when no special reference is being made to frontness or backness, or as strong *jers* (*ɐ/b*).

²⁰ So-called “second *polnoglasie*” areas of the Northeast Slavic differed from the rest of this zone by experiencing this change with metathesis. Conversely, extreme Northwest dialects, such as Slovincian, experienced all liquid monophthongization before metathesis could reach it. Insofar as this is true, it would mean that some dialects of the North east uniquely admitted metathesis for all of its liquid diphthong monophthongizations, while the some zones of the Northwest could exclude it for all.

type, the resulting monophthong will be identical to one of the input moras. This is also the case for the other set of diphthongs (i.e., the glide diphthongs *au* and *äi*) which has a contrast of sonority only. However, two important differences apply to liquid diphthongs, due to the special nature of liquids:

1. In the first place, there can be either a high or low vowel in the first diphthongal component, i.e., *ar* and *ur* diphthongs both can occur, while a corresponding glide diphthong with a high vowel first component would not have been a diphthong at all, but a long monophthong (*ii*, *uu*). As such, liquid diphthongs were the only diphthongs which could have both a pure sonority contrast as well as two differing levels of sonority distance (vowel height) between component moras (e.g., both *ar* and *ur*). This led to a split Common Slavic treatment of liquid diphthongs, on the basis of whether the sonority contrast was greater or lesser, which, in turn, determined the choice of either first or second component for the resulting monophthong. However, both types still conformed to the general principle that resulting monophthongal moras are identical to one of the input moras, in the case of an input diphthong with a sonority only contrast. In terms of the various zonal reflexes of Slavic, the situation appears more complicated, due to a fact of relative chronology: the high vowel first components (*i*, *ü*) remained as high vowels at the time of the monophthongization process in South Slavic and most of Czech-Slovak, but eventually became lowered to non-high mid vowels in North Slavic, before monophthongization of liquid diphthongs occurred. This difference of relative chronology accounts for the fact that the South selected diphthongal **second** components for the mora(s) of the eventual monophthong (e.g., Serbo-Croatian *řř*), while the North selected first components (e.g., East Slavic *ŷr* > *vr* > *or*²¹).
2. In the second place, when the non-liquid (i.e., vocalic) mora becomes the choice for the new monophthong, the liquid component does not simply assimilate to the vowel, as is the case of the glide diphthongs. Rather, it changes into a non-moraic liquid consonant, which may or may not metathesize to prevocalic position.

²¹ North Central (Lekhitic-Sorbian-East Slovak) reflexes of **turt* are more controversial and will be dealt with in more detail below.

On the basis of these general considerations, each of the major types of liquid diphthong will be reviewed, and it will be shown that the reflexes conform to the general rule of monophthongization for sonority only contrasts, in which one of the two input components survives intact as a geminate. The traditional formulas of *art*, *tart*, and *turt* will be used to indicate initial, medial low, and medial high vowel liquid diphthongs.²²

A. Initial (**art*) Liquid Diphthongs

The concomitant changes of quantitative neutralization and change of liquid coda from non-moraic to moraic occur in South Slavic and Central Slovak only. In the other zones, this particular sequence experiences a metathesis at a time when neither of these changes had yet occurred. Therefore, in the southern zone, *art* joins *tart* as a diphthongal sequence. Since it is an open syllable (i.e., it ends in a moraic segment), it became subject to the regular rule of monophthongization that applied to all liquid diphthongs. In the North, since metathesis preceded the formation of liquid diphthongs in the *art* type, it never became diphthongal and preserves the original quantitative difference. I would maintain that this difference of relative chronology is sufficient to explain the Slavic zonal differences (i.e., modern *rot* vs. *rat* in the North, but only *rat* in the South), and that explanations based on intonational differences (e.g., Bethin 1998: 54–55) are an unnecessary complication of the situation.²³

²² Concerning initial liquid diphthongs in front and/or high vowels, I follow Jakobson (1952: 306), who stated that “there are no reliable examples” for either of these types.

²³ Furthermore, I would maintain that Bethin’s approach (1998: 54) is anachronistic regarding the difference of North Slavic *rat* reflexes (e.g., Russian *lakomstvo* ‘sweets’, *ralo* ‘plow’) and circumflex *rot* reflexes (e.g., Russian *lokot’* ‘elbow’, *rovnyj* ‘level’) as being due to an original difference of high-pitched acute and low-pitched circumflex. Since the *rat/rot* opposition is reflected identically in both stressed and unstressed position (e.g., Ukrainian *rokíta* ‘willow’, Russian *loktěj* ‘elbow, gen. plur.’), such a view is tantamount to the unacceptable notion that Slavic distinguished pitch in both stressed and unstressed syllables. To the contrary, if the first syllable was one of the pretonic syllables (as we might assume in **arkyta*, or the genitive plural **alkōtvjō*), there was probably an allophonic rising pitch, as noted by Jakobson (1971: 671), who indicated that apart from the single phonologically stressed ictus syllable of a Common Slavic word, “all other syllables of the word automatically had a redundant, predictable tonal characteristic” and that “syllables which preceded the acute shared its tonal rise.” The notion that all short **art* syllables had falling pitch, independent of word-stress, dates back to an earlier generation of Slavic accentology, which reconstructed individual pitch values for every Common Slavic word-syllable, in spite of strong typological indications that this was no longer a synchronic fact of Common Slavic. Therefore, I follow Jakobson in assuming a quantitative distinction in these syllables, but cannot agree with Bethin’s interpretation.

B. Medial Low Vowel Liquid Diphthongs (**tart*)

In South Slavic and Czecho-Slovak, the monophthongization rule occurs at the moment the shape of the low liquid diphthong is *tǎřt*, i.e., before the eventual change of short *ǎ* to mid vowel *ǔ*. As a sonority only contrast, *tǎřt* will have its diphthong change into a monophthong that is equivalent to one of the component diphthongal moras; furthermore, since the sonority distance between the two moras is of the greater, rather than lesser type (i.e., non-high vowel plus moraic liquid and not high vowel plus moraic liquid), it is the higher sonority first mora that emerges as the unit mora of the eventual monophthong. One can depict the moraic *ř* as first splitting into a moraic portion which fully assimilates to the preceding vowel, plus a non-moraic liquid component: *tǎřt* > *tǎǎrt*. The sonorant nature of the liquid would seem to be the factor which led to metathesis, rather than the deletion of *r*. One could also posit a simultaneous loss of the *r*-mora and ensuing metathesis. The next step had to be the identification of *ǎǎ* as equivalent to the single long vowel *ā*, since *r* metathesizes to the pre-vocalic position, but always treats the two-mora vowel as a single unit, resulting in *trāt* in the South Slavic and Czecho-Slovak zones.²⁴ As noted, South Slavic and Central Slovak have the same development for initial *art* as well, resulting in *rāt*, while Czech and the other Slovak dialects metathesized *art* earlier, when the vowel could be either long or short and the liquid had not yet become moraic. Notably, the ensuing change of *ǎ* > *ǔ* had no effect on the *trāt* or *rāt* groups of this zone, but did change Czech and non-Central Slovak *rǎt* to *rūt*.

Significantly, the *ǎ* > *ǔ* rule did not precede monophthongization in the South, but it did precede it in the northern zones of Lekhitic, Sorbian, and East Slavic, based on the reflexes in the modern languages. Thus, the input diphthong at the time of monophthongization was of the form *tǔřt*. The sonority distance was also of the greater variety, since the first mora was a non-high vowel and the second was consonantal, requiring that the higher sonority mora become the basis of the new monophthong. The next step was as in the preceding zone: *tǔřt* > *tǔǔrt*. At this point, the liquid monophthongization rule called for liquid metathesis. It occurred in all North Slavic zones, except for the extreme Northwest, but differed from the

²⁴ See Scatton (1968: 284–85) for a discussion of the criteria for treating these sequences as either two geminate moras or a single long vowel. I believe that Scatton's paper correctly presents the main lines of the East Slavic metathesis, but it is completely wrong about the Lekhitic/Sorbian facts, since it assumes no length at all in the *trot* groups, in spite of obvious evidence of quantitative differences in the different accentual paradigms, such as Polish *wrona* 'crow', but *bruzda* 'furrow' (a modern Polish spelling for original *brózda*).

southern metathesis due to the different segmental nature of the northern *ǫǫ* sequence, compared to its southern counterpart *ǣǣ*. While *ǣǣ* was immediately identifiable as equivalent to long *ā*, and the liquid always metathesized to the position before the entire unit long vowel *ā*, the matter was different in the case of the *ǫǫ* sequence. Very likely, the new mid vowel did not yet occur as a long vowel, since it had just developed its rounding as part of the process of the qualitative differentiation of long and short vowels. In other words, in the South there already was a unit long /*ā*/ in the phonemic system, permitting metathesis from the post-*ā* to pre-*ā* position, but in the North there was not yet an /*ō*/ phoneme, so that the northern zones treated *ǫǫ* as a sequence of two short vowels, rather than as a unit long.²⁵

Based on the modern reflexes, the precise model of *r* metathesis seems to present three different patterns in the South Slavic and Czecho-Slovak zone (*trat* reflexes), East Slavic (*torot* reflexes), and Lekhitic-Sorbian (*trot* reflexes). As noted, the pre-existing /*ā*/ phoneme permitted the southern zone to implement a simple rule which moved the liquid to the left of the long vowel. In East Slavic, there was a similarly simple rule which moved the liquid to the left of the rightmost of the geminate shorts (*ǫǫr* > *ǫrǫ*). This also bolsters the argument that East Slavic had a metathesis.

The transitional zone of Lekhitic-Sorbian is the most complex. On the one hand, there are two important pieces of evidence for an originally pleophonic sequence of the *VrV* type, with a vowel on either side of the liquid, similar to the *torot* reflex of East Slavic. The first such piece of evidence, found in Polish (see Rozwadowski 1909 and Łoś 1927), is the strong jer *e*-reflex in the syllable (such as a preposition) preceding *trot*, apparently testifying to a lost vowel between *t* and *r* (e.g., *we głowie* 'in the head'). The second piece of evidence, found in Lower Sorbian (Seliščev 1941: 238), relates to the fact that original Common Slavic sequences of voiceless stop + *r* + back vowel experience the change of *r* > *š*, e.g., *krajv* > *kšaj*. However, this change does not occur when the *kr* sequence is the initial of an original *tart* > *trot* group, implying that the *tart* group had a vowel between the initial consonant and liquid at the time of the change (e.g., Lower Sorbian *krowa* and not **kšowa*). One might easily posit a pleophonic **tvrot* sequence for both Lekhitic and Sorbian, as is often done (cf. Jakobson 1952: 307). However, those who do so often treat the *v* and *o* as each being single mora reflexes of the original long diphthong, much as the East Slavic

²⁵ Scatton (1968: 284) claimed that this was due to the incipient loss of quantity in East Slavic, but no such claim could be made about Lekhitic or Sorbian, in view of their different reflexes of *o*, which Scatton ignores.

pleoiphonic *oro* represents two moras. Stated as such, this claim runs into difficulty, due to the fact that the *o* of Lekhitic and Sorbian *trot* behaves like a long vowel, rather than a short, in its reflexes of original Common Slavic prosodic features. Thus, the *trot* groups reflect pretonic syllables differently than originally stressed syllables, which is the pattern for long and not short vowels. For example, the original long vowels of Polish reflect the difference between pretonic (*trąba* ‘pipe’, and also *plótno* ‘canvas’, *wrócę* ‘I will return’) and non-pretonic (*mięta* ‘mint’, and also *krowa* ‘cow’), while the original shorts treat these two positions the same (cf. pretonic *o*: *osa* ‘wasp’, and non-pretonic *o*: *wozu* ‘cart’). Therefore, the linguist is faced with the need to reconcile the apparently contradictory data of both disyllabic **tbro*t and long **trō*t in Lekhitic and Sorbian. Timberlake made an interesting suggestion in this regard (1985: 427), proposing that the metathesis represented a **gradual** regressive movement from the stage of *tort* to that of *trō*t, in which each step might have represented a fraction of a mora on the phonetic level. Timberlake’s reason (1985: 426) is that the general “notion of ‘metathesis’—as a sudden reversal of the linear order of segments—is somewhat suspect”. While I agree with the general suggestion of a gradual approach, I feel that one should further motivate the particular reason for this reflex in the Lekhitic-Sorbian zone. Moreover, an answer is needed to the question of why a *tart* reflex with the vowel *o* always involves some evidence of moras on either side of the liquid, even when the *o* itself behaves like a long, rather than a short (Lekhitic-Sorbian, in contrast to East Slavic). The answer, alluded to above, is the structural novelty of long mid vowels at the time of their appearance, and the fact that a period of “trial and error”²⁶ was needed before redundantly long *ā* and redundantly short *ǒ* could acquire quantitative pairs on the phonemic level. Of course, the same comments apply to the front vowels, long *ā̄* and short *ę*, which also acquired quantitative partners. The southern zone could easily experience a metathesis in which the liquid shifted to the left of long *ā*, and I do not believe that we must consider it to be gradual. The East Slavic zone, which may well have been in the process of permanently abandoning distinctive quantity, similarly experienced the most likely sort of metathesis for a non-quantitative system, in which *ǒǒ* counted as a two-vowel sequence, by moving the liquid one segment to the left (*tǒǒrt* > *tǒrōt*). Lekhitic-Sorbian, by contrast, was not in the process of abandoning phonemic quantity in favor of distinctive

²⁶ Isačenko applies this term (1970: 105, 106) to the period of adaptation to the consequences of jer-fall. I would suggest that a similar period of adaptation might explain the hesitation as to whether *ō* represents a single long segment or a sequence of two short ones.

stress; in fact, it was in quite the opposite process. So, the hesitation or gradual nature of the process of metathesis can help us to date it as being roughly simultaneous with the very first systematic efforts to eliminate the quantitative redundancy of *a* and *o*, on the heels of the recently completed change of $\check{a} > \check{o}$.

C. Medial High Vowel Liquid Diphthongs (**turt*)

The change of high shorts to mid vowels is often known as the **strengthening** of jers. I would maintain that the interaction of high vowels and moraic liquids is closely linked to the evolution of the jers, for which I assume the following major chronological stages:

1. Short high vowels \check{i} and \check{u} occur with no major allophonic differences. This is the last phonetic coincidence of the vowels which later became known as strong and weak jers.
2. Each of the high shorts undergoes positional changes which cause a phonetic (allophonic) difference between strong and weak jers.
 - a. Strong jers change their **+high** specification to **-high** when the next moraic segment is a single mora with a low sonority specification (either **+high** or **+consonantal**). The low sonority segment that can condition this change may either be an immediately following moraic liquid (within the same diphthong as the preceding jer) or a following jer vowel in the next syllable (i.e., either $\check{u}\check{r}$ or $\check{u}C\check{u}$).
 - b. Weak jers (those which remain as **+high** \check{i} , \check{u}) can be optionally deleted in elliptical style. Therefore, the elliptical style can abandon the principle of the open syllable. The moraic liquid seems to have followed the same pattern of optional moraicity as the weak jers (high shorts).²⁷ As shown by both Sidorov and Golyšenko (Sidorov 1966: 25), the liquid of *ur* diphthongs could appear as both moraic and non-moraic in the same Old Russian text.²⁸

²⁷ In a structural sense, I would claim that short moraic consonantal segments, such as \check{r} , were *jers*, along with the short moraic high vowels \check{i} , \check{u} .

²⁸ Moraicity is seen in the fact that liquids were the only consonants which could end a line, since other consonants always had to have a jer or other vowel written after them at the end of a line. However, liquids could also have artificially inserted jers, implying that they could fluctuate between moraic and non-moraic values, similar to the weak jers fluctuation between non-deleted and deleted.

3. The elliptical style (deletion of short high vowels) becomes the norm and the strong jers eventually merge with other vowels.

Common Slavic high and low short vowels both shared the fate of assuming a redundant mid vowel height, which eventually took over for their original shortness. North and South Slavic have just been shown to have experienced the low short > mid change before and after monophthongization, respectively, which led to the obvious differences in their evolution (to either *trat* or *t(o)rot* reflexes). In an analogous manner, the change of high short > mid also caused a North-South split in the reflexes of high vowel *turt*. At the same time, the *turt* reflexes follow the same general lines of development that apply to all Common Slavic monophthongizations. If the monophthongization occurred at a time when the high vowel was still the first diphthongal component (i.e., the diphthongs were *ur/ir*), I contend that the diphthong had a contrast of sonority only, opposing a non-consonantal first mora to a consonantal second mora. This caused one of the two components to emerge intact as one of the moras of the new monophthong. As to the other main variable, the selection of the first or second component as the monophthongal value, it depended on the sonority distance between diphthongal components, just as in the case of the low liquid diphthongs (*ar/är*). As noted above, the low vowel *ar* diphthong had a first component which far surpassed the sonority of the second (as both non-high and non-consonantal), and it emerged as the mora of the eventual monophthong. However, the high vowel diphthong *ur* had an opposite, minimal sonority contrast since its two components contrasted as +high and +consonantal, which meant that the **second** diphthongal component would emerge as the vowel of the monophthong, as in the case of glide diphthongs *au* and *äi*. This accounts for the long *řř* result of South Slavic and Czecho-Slovak.²⁹

Thus, the *trat* reflex zones tend to have a syllabic liquid for their *turt* reflexes, since they put through monophthongization before both of the rules which generalized mid vowel position for shorts (low short > mid and high short > mid), permitting *tart* to change within a system that still possessed low vowel shorts, and permitting the *turt* monophthongization in a system which still had high vowel shorts in its liquid diphthongs. Contrary to this pattern, the *tort-torot* zones of the North (most clearly seen in East Slavic and Upper Sorbian) agree in their lack of syllabic reflexes for *turt*, and this may be attributed to northern monophthongizations which

²⁹ Later prosodic readjustments shortened the *ř*, like all other inherited long vowels, under various prosodic conditions in the individual Slavic language zones.

occurred after the short > mid rule took effect, as applied to both low and high vowels. The low vowel situation has already been discussed above and is less complex than the issue of *turt* reflexes. Let us now turn to the question of whether the Northern *turt* reflexes can also be interpreted as following the uniform Common Slavic monophthongization rule for which I have been arguing.

If the *turt/tirt* groups experienced the change of high short > mid before the monophthongization took place, then the monophthongization rule would have to apply to sequences of the type ɚ .³⁰ Since the non-high ɚ formed a greater sonority contrast with ř than would have been the case with a high vowel first component, it was the ɚ , rather than the liquid, that would emerge as the surviving mora in the resulting monophthong. Insofar as quantity could still exist in the dialect in question, the loss of liquid moraicity would potentially lead to the change: $\text{ǎř} > \text{ǎřr}$. In some zones, such as East Slavic, certain northern dialects (with so-called *second pleophony*) still maintain the evidence of a two-mora jer reflex, and apparently experienced this change before the loss of the liquid metathesis rule, e.g., *virx-*, *gurb-* > Russian dialect *verex* 'peak', *gorob* 'humpback' (Ivanov 1983: 174). The more widespread East Slavic development does not reflect metathesis (*verx*, *gorb*), which suggests that some dialects experienced a change of $\text{ǎř} > \text{ǎřr}$, while others had no moraic compensation for the loss of moraic ř , i.e., $\text{ǎř} > \text{ǎr}$, perhaps the result of an earlier quantitative loss in some East Slavic dialects. The Upper Sorbian evolution of *turt* is similar to that of East Slavic in that the vowel of the resulting monophthong is always non-high³¹ and is followed by the liquid.

The remaining North Central Slavic zone, including Lower Sorbian, Polish, and East Slovak, has had the most complicated evolution of *turt*. Judged on the basis of my proposed uniform rule of Slavic monophthongization, the major puzzle of this zone is the fact that in certain environments we get the unusual combination of high vowels plus non-moraic liquids (e.g., Polish *wilk* 'wolf'). At first glance, this looks like a refutation of the uniform diphthongal rule I have been assuming throughout this paper. Yet, it seems strange that the uniform rule would work for all diphthongs other than a small subset of the *ur* type in single North Central subzone of North Slavic. Taken together with the fact that Czech dialects and old texts with syllabic liquids often have variations with high vowels *i/u* (e.g., *Birido* ~ *Brido*, *Chulm-* ~ *Chlum-*; Komárek 1969: 60–61), I assume

³⁰ Alternatively symbolized as $\underline{\text{vr}}$, $\underline{\text{vr}}$.

³¹ Which demonstrates that monophthongization, manifested as the loss of liquid moraicity, occurred only after the short high vowel changed to non-high.

that the North Central high vowel *ir/il/tu* reflexes point to an earlier syllabic liquid stage and monophthongization before the short high > mid rule.

The complexity of the Polish/Lower Sorbian zone is usually treated as being due to the fact that many different vowel reflexes can occur for original *ur/ir/ul/il*, rather than just the usual strong jer reflex. Some of the various reflexes are restricted to a particular consonantal environment. Two basically different hypotheses have been advanced to explain this situation. According to one theory, a long moraic liquid first emerged as the monophthongal solution in all of the consonantal environments, but it was subsequently changed to various vowels plus non-moraic liquid, depending on the consonantal environment. A number of objections have been raised against this theory (see Shevelov 1965: 472 and Schaarschmidt 1998: 76), such as the fact that a large variety of different inserted vowels would have to be assumed in the environment of syllabic liquids, although they do not otherwise occur in the language. In a previous paper (Feldstein 1994: 39), I suggested that the solution may lie in the fact that some environments (particularly those with high vowel reflexes) have gone through a stage of being syllabic liquids, while others can be derived directly from the original short high (jer) vowels which preceded the liquids. Based on the present paper's claims about the relative chronology of the short high > mid change and monophthongization, I would now suggest that in some environments, *turt* groups experienced monophthongization before the *ũ > ə* change occurred (as in South Slavic and Czecho-Slovak), while in others the change *turt > t̄art* occurred before monophthongization. In other words, the North Central zone of Polish/Lower Sorbian/East Slovak is transitional between the South and the northern peripheral zone of East Slavic/Upper Sorbian. Moreover, in several environments, southern and northern Polish (along with Lower Sorbian) disagree in their *turt* reflexes, with the more northern areas having jer reflexes in *turt* (e.g., southern and standard Polish *wilga* 'oriole', compared to northeastern *úelga*;³² cf. Dejna 1973: 71). This means that southern Polish must have first experienced monophthongization in certain *turt* environments, after which the rule short high > mid occurred, and the remaining environments were monophthongized. However, as the isogloss of *turt* monophthongization moved northwards, the short high > mid rule may have advanced more rapidly, so that in northern Poland (as in the whole of East Slavic), many more *turt* groups acquire mid vowels before monophthongizing, in com-

³² The acute over labial consonants is used by Polish dialectologists to represent palatalization.

parison with the southern Polish zone that borders on Czech and Slovak dialects.

Thus, without citing all of the details of the Polish *turt* environments, which falls beyond the scope of this paper, one can point to groups such as *vilg-*, in which the first consonant is a labial and the last is something other than a hard (non-palatalized) dental,³³ as one which may well have passed through a syllabic liquid stage in the South, but not the North, as exemplified above. Another important North-South difference is found for southern and standard Polish *tłut* reflexes, which appear as *tolt* in Northern toponymics and Kashubian (e.g., *Stolp* for *stúp* ‘pole’, *tolmač* for *tlumacz* ‘translator’, Klemensiewicz et al 1964: 121). Polish *turt*, with the *ur* sequence, leads to the modern sequence *ar* (e.g., *targ* ‘fair’) in both southern and northern Polish, although “frequent *yr*” reflexes have been pointed out by Stieber (1962: 53) in southern and central dialects. It appears that all of these instances indicate the development of syllabic liquids in more phonological environments of southern Polish, and fewer and fewer as one goes North, towards Kashubian. Although the *ar* reflex might not appear to be a derivable from *u > ə*, it could well be the reflex of a two-mora sequence: *ar < ǣr < ŭř*. Since a sequence of two *schwas* did not otherwise occur outside such groups, it could be assumed that the regular development was *a*, especially since the *ar* reflex is found not only in Polish, but Lower Sorbian and East Slovak as well. Polish qualitative differentiation (*pochylenie*) of originally opposed long and short reflexes indicates that the original value of the pre-liquid vowel was indeed a long, two mora vowel (Stieber 1962: 52). In the case of *tirt*, with *ir* followed by a consonant other than a hard dental, Old Polish texts give evidence of an *ir* reflex, but dialects of Polish and Lower Sorbian have *er* (e.g., Polish *wierzba*, Lower Sorbian *wjerba* ‘willow’), and Stieber (1934: 38) originally assumed the appearance of *er* in the “most ancient period.”

In conclusion, I would assume that the Polish zone’s evolution of high vowel plus liquid diphthongs can be divided into the following periods:

1. Early monophthongization of *tirt*, *tilt*, and *Tult* (where *T* represents a hard dental). Prior to the short high > mid change, monophthongization occurred on the South Slavic/Czecho-Slovak model in

³³ Polish consonantal environments are often split into hard dental and elsewhere, since a number of vowel changes were restricted to the position preceding hard dentals. The non-hard dental environment includes non-palatalized labials and velars as well as any palatalized consonant.

tirt/tilt groups,³⁴ i.e., *tirt/tilt* > *tr̥t/tl̥t*. The modern Polish reflexes are *er*, due to the later lowering of *ir* > *er* in Polish, e.g., *pierwszy* 'first'; and *il*, e.g., *wilk* 'wolf', restricted to labials in the originally pre-diphthongal position. The *Tult* groups, which began with a dental, also gave syllabic liquids (and the modern Polish reflex of *tl̥t*, e.g., *stupa* 'pillar'). It is necessary to state how the front and back varieties of *tl̥t* were differentiated, in view of the differing reflexes. Shevelov (1965: 472) presented convincing arguments against a palatal or palatalized syllabic liquid, but I assume that a certain *i* or *u* onset to the syllabic liquid may have been present, very much like the type actually registered in the Czech dialects of Silesia (Bělič 1972: 31–32).

2. Later monophthongization of *turt* and *Cult* (where *C* represents a consonant other than a hard dental). I assume that only after sequences of the earlier period had resulted in monophthongization to syllabic liquids in specific environments (mainly *ir/il*), the remaining *ur/ul* groups experienced lowering of the high vowel that constituted the first diphthongal component, analogous to all jer strengthening. This would then be followed by a loss of the moraicity of the liquid, e.g., **kūr̥k-* > **kār̥k-* > **kǎr̥k-* > *kark* 'nape of the neck'.
3. Final elimination of any syllabic liquids that had developed as a result of monophthongization of high vowel liquid diphthongs. The syllabic liquids, which were differentiated into high and low tonality types by virtue of onset vowels, did not continue as such. As pointed out by Pauliny (1963: 167), Slavic languages could opt for either syllabic liquids (with merger of front and back vowel types) or consonant palatalization, but not both.³⁵ Pauliny's typological observation can be linked Shevelov's doubts as to whether moraic liquids can realize the opposition of palatalization. In any case, as a North Slavic language in the process of establishing its first phonemic palatalization in the period of optional weak jer deletion, we can assume that Polish (along with other North Central Slavic) finally eliminated its last remaining moraic liquids: e.g., *v'ilk̥v* > *v'ilk* 'wolf'.

³⁴ Unless they had been previously backed to *turt/tult*, in environments where the liquid was followed by a hard dental, e.g., Polish *pełny* 'full'.

³⁵ Of course, they may also lack both syllabic liquids and palatalization.

8. Conclusion

On the basis of the totality of Slavic diphthongal reflexes, this paper has demonstrated that pure sonority contrasts (*au/äi* and liquid diphthongs), based strictly on the features \pm high or \pm consonantal in a moraic segment, lead to monophthongal results which reproduce one of the two original moras intact: generally, the second mora, except when the extreme sonority contrast of **non-high plus consonantal** is present, in which case the first mora is generalized. When a contrast is other than that of pure sonority (defined as \pm high or \pm consonantal), due to an additional contrast of nasality or frontness/backness, the monophthong does not copy one of the original components. Rather, the component which is unmarked for nasality or front/back (i.e., the non-nasal or back segment) assimilates the feature of nasality or frontness, and then serves as one of the identical moras of the resulting monophthong.

While the Slavic results are rather uniform in the case of glide and nasal diphthongs, the case of liquid diphthongs appears more complex on the surface. As the very last diphthongs to be subject to monophthongization, their moraic modifications preceded the change of short high vowels to non-high only in the southern zones of Slavic, but not the northern ones, a difference of relative chronology which led to a large number of differences in the realization of the uniform rule of monophthongization. The only instances which may, in fact, be violations of the rule of monophthongization, pertain to the *turt* type diphthongs of the North Central zone. As such, they may well indicate the final abandonment of this uniform principle in the very last diphthongal type to be eliminated, within the restricted North Central Slavic zone that includes Polish, Lower Sorbian, and East Slovak. Thus, the complexity of *turt* reflexes in this zone may, in fact, be the best proof of a uniform monophthongization rule in all other sequences and zones, other than the high vowel liquid diphthongs of the North Central zone.

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Received: January 2001
 Revised: July 2002

Appendix: Representative Slavic Diphthongal Reflexes

Changes indicate the change of Early Common Slavic diphthongs to Late Common Slavic monophthongs, with examples of modern Russian reflexes. In those instances in which my Early or Late Common Slavic reconstruction differs from the traditional one, the latter is supplied in parentheses with a notation to that effect (trad.).

1. Glide diphthongs:

A. *u*-diphthongs:

au: *soux- (trad. *soux-) > *sūx-, CSR sux(oj) 'dry'

äu: *läud- (trad. *leud-) > *lūd- (trad. ljud-), CSR ljud(i) 'people'

B. *i*-diphthongs:

ai: *laiv- (trad. *loiv-) > *lāv- (trad. lěv-), e.g., CSR lev(yj) 'left'

äi: *zäim- (trad. *zeim-) > *zīm-, e.g., CSR zim(a) 'winter'

2. Nasal diphthongs:

um/um: *dumti-³⁶ > *dūti (trad. *dōti), CSR dut' 'blow'

in/im: *-mint- > *-mīt- > *-māt- (trad. *-meṭ-), CSR (pa)mjat'
'memory'

an/am: *anzu- > *āzu- > *ūzъ- (trad. *oZъ-) > *uzъ-, CSR uz(ok)
'narrow'

än/äm: *pänt- > *pāt- (trad. *peṭ-), CSR pjat' 'five'

3. Liquid diphthongs:

A. Anlaut:

är-/äl-: *ärv

North Slavic: > *rāv- (trad. *rov-), CSR rovnyj 'level'

South Slavic: > *ǎrv- > *rāv-, SC r âvan 'equal'

ār-/āl-: *ārm

North Slavic: > *ārm- > *rām-, OR ramo 'shoulder'

South Slavic: > *ārm- > *ǎrm- > *rām-, SC rām(e) 'shoulder'

B. Inlaut non-high:

tart/talt: *karva > *kǎrva

North Slavic: > *kōrva, CSR korova, P krowa 'cow'

South Slavic: > *kǎrva, SC kràva 'cow'

tärt/tält: *bärg- (trad. *berg-)

North Slavic: > *běrg-, CSR bereg, P brzeg 'shore'

South Slavic: > *bǎrg- (trad. *běrg-), SC Jekavian br̃ijeg
'shore'

C. Inlaut high:

turt/tult: *turg-

North Slavic: > *tǔrg-, CSR torg 'trade', P targ 'fair'

South Slavic: > *tǔrg- > *tr̃rg-, SC t̃rg 'town square'

tirt/tilt: *zirn

North Slavic: > *zǔrn-, CSR zern(o), P ziarno 'grain'

South Slavic: > *zǔrn- > *zr̃rn, SC z̃rno 'grain'

³⁶ Kuznecov (1961: 105) reconstructs the Early Common Slavic infinitive as *-t(i)*, while Szemerényi (1996: 325) gives it as **-tei*.