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“Polish *trot* reflexes and the segmental properties of metathesis”

Abstract

Many proposals have been expressed about the historical derivation of the Polish *trot* reflexes. This paper proceeds from the Common Slavic construct **tǎřt*, in which both the vowel and the liquid are originally one-mora in length. The paper considers the issue of whether the vowel is actually *o* or *a* at various stages and whether it is long or short. Traditionally, as seen in a 1952 paper by Jakobson, modern Polish *o* of *trot* is viewed as an originally short vowel and the *a* of South Slavic and Czecho-Slovak *trat* as a generalization of length. However, this does not account for the fact that Polish *o* in *trot* behaves as a **long** vowel in its prosodic evolution; thus, Polish *trot* should be derived from **trōt*. This leaves the problem of an additional mora to the left of the liquid (evidenced by cases such as *we proch*), as discovered by Rozwadowski (1909). Timberlake’s (1985) relies on the concept of gradual change, using fractional mora sizes to explain the anomalies. The present paper proposes another explanation: if the change of short *ǎ* > *ǒ* preceded the loss of the liquid’s moraicity in **tǒřt*, the liquid’s loss of a mora and leftward compensation yielded the sequence **tǒřt*. Liquid metathesis specifies the liquid’s retraction by one segment, so everything depends on whether *ǒř* is phonemically one long segment or two short ones: the former would give *trōt*, while the latter would give pleophonic *tǒřt*. The prosodic shortening of accentual paradigms A and C would have been the major factor in phonologizing /*ō*/, by creating a series of long and short mid and low vowel phonemes (e.g. /*ǎ*, *ā*, *ǒ*, *ō*/ in the back vowels). I conclude that metathesis before the prosodic shortening (when /*ō*/ was not yet phonemic) would have resulted in pleophonic reflexes; this can explain East Slavic pleophony, where quantity was lost and no new quantitative oppositions were created by prosodic shortening. Polish *trōt* can thus be derived by assuming that metathesis occurred after /*ō*/ became a phoneme, guaranteeing a retraction of the liquid to the left of the /*ō*/, analogous to the more southerly development of *trāt*, where the phonemic status of /*ā*/ was never in doubt.

I. Introduction.

This paper¹ is concerned with the qualitative and quantitative evolution of the internal liquid diphthongs of Common Slavic (which will be referred to as **tǎřt*), particularly as manifested in the reflexes of modern Polish. It expands on the views I stated about the **tǎřt* groups in Feldstein (2003:272-275). The evolution of liquid diphthongs in Polish presents several special problems, which have received contradictory interpretations in the scholarly literature. A key issue has been the manner in which the originally long (i.e. two-mora)

¹ This paper is a revised version of a presentation planned for the conference “*Diachronia w badaniach nad językiem i w dydaktyce szkoły wyższej*,” at the University of Łódź, June, 2006.

sequence of Late Common Slavic has evolved into a similar two-mora sequence in the individual Slavic languages. On the one hand, the southern half of Slavic (i.e. South Slavic and Czech-Slovak zones)² has reflexes which can clearly be treated as originally consisting of two-mora vowels (the long *a* of *trat*, for example), and the East Slavic zone has two separate pleophonic vowels (*torot*), which each represent one mora. On the other hand, the modern reflexes of the Lekhitic-Sorbian zone (*trot*) contain the vowel *o*, which is generally recognized as the reflex of a Common Slavic short vowel. After reviewing some of the major scholarly opinions concerning the evolution of liquid diphthongs in Polish, I will suggest that the answer to the enigma is related to the incorporation of the new long mid-vowel phoneme in the Polish phonological system (*ē*, *ō*) and the relative chronology of prosodic shortening and liquid metathesis.

II. Roman Jakobson's treatment of Slavic liquid diphthongs.

Jakobson (1952:306-308) covers the evolution of **tǎřt* in all of the Slavic zones. It uses the construct **tǎrt*, a compromise symbol concerning the *a* or *o* status of the vocalic component of the diphthong. Although it is not stated explicitly, Jakobson's paper leads to the conclusion that the connecting thread of developments in the three major zones (henceforth to be referred to as South Slavic, Lekhitic-Sorbian, and East Slavic) are the two following changes:

1. The liquid's status is changed from moraic to non-moraic.
2. A compensatory vocalic mora appears, either to the left or right side of the liquid.

Jakobson's proposal about the evolution of **tǎřt* in the three main zones (1952:306-307) is illustrated in table 1.

² South Slavic and Czech-Slovak can collectively be referred to as the **southern zone**, with respect to this phenomenon.

Table 1. Jakobson's chronology of **tǎrt* evolution³ in three main Slavic zones.
(Moraic liquid is represented as *ř* for greater clarity.)

South Slavic/Czecho-Slovak	East Slavic	Lekhitic-Sorbian
1. tǎrt > tǎrt Leftward compensation before the liquid for loss of liquid moraicity.	1. tǎrt > tǎrǎt Rightward compensation after the liquid for loss of liquid moraicity.	1. tǎrt > tǎrt Liquid metathesis.
2. tǎrt > tǎrt > tǎrt Liquid metathesis.	2. No liquid metathesis, since the liquid is no longer in closed position after the first rule.	2. tǎrt > tǎrt > tǎrt Leftward compensation before the liquid for loss of liquid moraicity.
3. Change of long <i>ǎ</i> > <i>ā</i> .	3. Change of short <i>ǎ</i> > <i>o</i> .	3. Change of short <i>ǎ</i> > <i>o</i> .

One can say that Jakobson's proposal succeeds in treating all Slavic developments in terms the loss of the liquid's mora and the subsequent compensation adjacent to the liquid. The original bimoraic property of the sequence is preserved, whether that takes the form of a single long vowel in South Slavic/Czecho-Slovak, or a pleophonic sequence in the other zones. The major inadequacy of this explanation is linked to the fact that it treats the Lekhitic-Sorbian zone as having pleophony, on the strength of Rozwadowski's original observation of textual jer strengthening before **tǎrt* groups, e.g. *we proch*, which is assumed to derive from **vb pbroxъ*, the major evidence of Polish pleophony. This implies that Lekhitic-Sorbian liquid diphthong reflexes contained two short vowels, one of which was a jer that dropped in all positions. However, the remaining vowel behaves not at all like a short vowel in the history of Polish and Sorbian, as clearly stated by Timberlake (1985:422-423); the vowels in such liquid diphthong groups behave as long vowels. Jakobson, in the very same paper (1952:308), alluded to the basic problem with his scheme, which did not solve "the puzzling details, in particular the relation of the treatment of these groups to the pitch accent and especially to the so-called 'neo-acute'." Thus, the **tǎrt* vowels of Polish have short reflexes in the accentual paradigms A and C, and maintain their long reflexes in accentual paradigm B, exactly as do the Polish reflexes of nasal vowels, which also were originally long. This comparison can be seen in the first part of table 2.

³ Jakobson transcribes the low non-front vowel as *ǎ* until the later qualitative split into *ā* и *ǝ*; I prefer to use short and long *a*; cf. Stieber's argument (1969:18) that "w systemie prasłowiańskim...nie było samogłoski...o barwie o."

Table 2. Polish reflexes of liquid diphthongs, compared to long and short vowel reflexes.

Accentual Paradigm A	Accentual Paradigm B	Accentual Paradigm C
Shortened reflexes: krowa mięta groch gęba słoma pęto	Long vowels preserved: bruzda (brózda) mała król, króla kał płótno sąd, sądu	Shortened reflexes: głowa, głowę ręka, rękę proch sęp kłos mięso
	Short vowels preserved: osa koza żona pop kot	Short reflexes preserved: woda, wodę pot, potu dom, domu

Table 2 makes it clear that the behavior of the Polish vowel *o* in **tǎřt* groups and, by extension, the *e* in **tǎřt* (**těřt*) groups, reflects long, and not short vowel behavior. Liquid diphthong reflexes display length reflexes in all those accentual paradigm B instances in which long nasal vowel reflexes do, while short vowels of accentual paradigm B regularly display shortness reflexes. A simple comparison of the words *król/króla*, but *kot/kota* is sufficient to make this point; we can also clearly see the accentual paradigm B origin of these words in their Russian equivalents *ко́роля́, ко́та́*.

Thus, the notion that Polish liquid diphthong reflexes resembled the East Slavic pleophony with two short vowels simply does not explain the data. On the other hand, Rozwadowski's evidence for jer-like vowels in the first syllable of Old Polish words such as *głowa, młodość* creates a dilemma, since if we had both Rozwadowski's single mora jer-vowel, plus the long vowel needed to derive the correct long-vowel reflexes of *król, króla*, we would have Polish (and Sorbian) liquid diphthong reflexes consisting not of two moras, but of three! We will return to this issue later. For now, it should be clear that Jakobson's pleophonic explanation is inadequate for the Polish data, but that we cannot simply accept Rozwadowski's jer-vowel and also assume a second long vowel in the sequence.

Jakobson's scheme provides no real motivation for the differences between types of historical evolution represented in table 1. Although all Slavic languages have the common property of losing the moraic status of the liquid in **tǎřt* groups, the various branches of Slavic are seen to behave very differently both in their rightward or leftward compensation for this moraic loss as well as in the presence or absence of a liquid metathesis in these zones. This all appears to be very mechanical and one would prefer an explanation which showed more shared developments among the different Slavic zones, along with more motivated

linguistic reasons for the different outcomes. Later in this paper a proposal of this type will be offered.

III. Zdzisław Stieber's treatment of Polish **tǎřt* reflexes.

Stieber (1962:23) clearly realized the problem of deriving long vowel *król/króla* with an originally short vowel *o*, which is assumed by Jakobson and others, following Rozwadowski's pleophonic derivation. Yet, Stieber did not solve the enigma and expressed the difficulty of the problem as follows:

“Nie wiemy, jak długo działały na rozwój iloczasu dawne lechickie stosunki intonacyjno-akcentowe. Jeśli przyjmemy, że wyraz *król* pochodzi z stniem. *Karl*, to uderza tu fakt istnienia dawnej długości (dziś “pochylenie”), której nie możemy tłumaczyć ani wydłużeniem zastępczym (gen. *króla!*), ani tym bardziej ściągnięciem. Fakt, że i po czesku mamy tu długość (*král*, gen. *krále*), oraz akcent w rosyjskim *koról* każą przyjąć w praformie **korl'ǔ* intonację “nowoakutową”, która jeszcze widocznie w IX w. istniała i powodowała wydłużenie *o*.”

Stieber's assumption of neo-acute tone in *król* and similar words does not solve the problem either. The so-called “neo-acute” was not a third tone, alongside the old acute and circumflex, but simply an environment of pretonic rising pitch, which occurred in the syllable before a stressed jer within a paradigm of pretonic root vowels. So, the environment which gave us modern length reflexes in *król/króla* was not its tone as such, but the constant pretonic status of its root vowel. This same “neo-acute” property, however, was present in words such as *osa*, and the only way we can explain length in *króla*, but shortness in *osa* is by assuming original length in the Polish *o* and *e* reflexes of liquid diphthongs. Yet, in spite of these facts, Stieber (1969:40) maintains the notion that the *o* vowel of *trot* was short, in his statement that “na terenie Polski, a bezwyjątkowo na obszarze Łużyc zaszła metateza *tart* bez wydłużenia samogłoski, skutkiem czego powstały formy, jak pol. *wrona, broda, strona*.”

IV. Relative chronology of *ǎ* > *ǔ* and the development of Polish *trot*.

Stieber was certainly correct in his view that the Late Common Slavic value of **tǎřt* was *tart* and not *tort*, as often assumed (1969:36-37); i.e. Late Common Slavic originally had oppositions of long-short quantity without accompanying qualitative differences, which arose later. Thus, the change of short *ǎ* > *ǔ* occurred only during the period of individual Slavic language history.

In this context, Andersen (1973:10) appears to be the first scholar who convincingly explained why the vowels *a* and *ě* occur in the liquid diphthong reflexes of the southern zones of Slavic, with *o* and *e* occurring in the northern zones. Anderson states that this “does not reflect the supposed ‘lengthening’”, but is simply due to the qualitative change of short *ǎ* > *ǒ* and *ā* > *ě* **before** the “TORT changes” in the South Slavic and Czecho-Slovak *trat* zone, but **after** these changes in the Lekhitic-Sorbian *trot* zone. Andersen’s statement implies the following relative chronology, shown in table 3.

Table 3. Andersen’s implied relative chronology of quality change and **tǎřt* change.

Southern	Lekhitic-Sorbian
1. <i>tǎřt</i> > <i>trāt</i>	1. <i>ǎ</i> > <i>ǒ</i>
2. <i>ǎ</i> > <i>ǒ</i>	2. <i>tǎřt</i> > <i>tǒřt</i>
	3. <i>tǒřt</i> > <i>trōt</i>

Of course, some linguists may dispute the ultimate Lekhitic construct *trōt* on the basis of Rozwadowski’s arguments for **tbrot*. Nevertheless, Andersen’s clarification explains how it could be that we have *trat* vs. *trot*, going from South to North, yet both have vocalic length reflexes, a point which seemed counterintuitive to such esteemed Slavists as Jakobson, Stieber, and many others.

V. The Rozwadowski enigma and Timberlake’s solution.

Although Timberlake (485:426-7) did not refer to the **tbrot* construct as belonging to Rozwadowski, he referred to evidence that Upper Sorbian *trot* reflexes once possessed a vowel between the *t* and *r*, and considered the anomaly which I have been discussing; i.e. how can the Lekhitic-Sorbian *trot* reflex have had both a two-mora long *ō* and yet another mora between the *t* and *r*? Timberlake’s answer (1985:427) is that there were several gradual stages in the history of converting the bimoraic *tǒřt* to eventual *trōt*, including intermediate stages such as *t ǒř^ot*, *tǎř^ot*, and *t^orōt*. It certainly looks as if Timberlake is proposing instances of three or more moras for the solution of this problem. However, since Timberlake is well aware of the fact that the proposal of three moras is precisely the stumbling block in this construction, he suggests that at the phonetic level we are dealing with units such as .5 and 1.5 moras, so that each of his intermediate constructs totals exactly two moras! This seems overly mechanical, since Timberlake’s solution allows an unlimited number of vowel units to assume fractional values and eventually to be eliminated. The basic theoretical point appears to be that an intermediate phonetic stage may contain such constructs, but they eventually get resolved in a phonemic form which conforms to the accepted structure of the language. Unfortunately, Timberlake’s scheme does not establish the common elements in the development of liquid diphthongs going from south to north. Assuming that Andersen is right that the relative

chronology of $\check{a} > \check{o}$ is the main factor in the south-north split, then why are there so many other differences in the rightward and leftward compensation for the liquid's lost mora? Ultimately, Timberlake argues for a “non-discrete” model, in which liquid metathesis and prosodic shortening are simultaneous events. I would argue that Timberlake's “liquid metathesis” must first be split into the two components of moraic compensation and metathesis *per se*, and that a discrete, chronologically ordered model is possible.

VI. The crucial role of integrating new \bar{e} , \bar{o} into the phonological system.

I would suggest that the two most critical factors in the differential **tǎřt* reflexes across the Slavic world are the change of short low \check{a} , $\check{a} > \check{e}$, \check{o} and the subsequent problem of integrating the newly bimoraic and lengthened \bar{e} , $\bar{o} < \check{e}$, \check{o} in those zones which experienced compensatory lengthening for the moraic liquid **after** the qualitative change of shorts. This would have posed no problem at all in South Slavic and Czecho-Slovak, and these zones are never discussed in terms of this being a difficult issue. In the southern zone, the liquid would change from moraic to non-moraic, the immediately preceding short \check{a} would attract a compensatory mora as $\check{a}\check{a}$, which would be immediately evaluated phonemically as long \bar{a} , after which metathesis could occur. Compensation is only leftwards, as it is for later jer strengthening and compensatory lengthening. The sequence has been depicted in table 4:

Table 4. Compensation and metathesis in the southern zone.

South Slavic and Czecho-Slovak
1. $t\check{a}\check{r}\check{t} > t\check{a}\check{a}\check{r}\check{t}$ (liquid component loses moraicity and leftward compensation occurs)
2. $t\check{a}\check{a}\check{r}\check{t}$ is identified as $t\bar{a}\check{r}\check{t}$
3. $t\bar{a}\check{r}\check{t} > t\bar{r}\check{a}\check{t}$ (metathesis occurs)
4. $\check{a} > \check{o}$ (change of short vowel quality, with vacuous application to liquid diphthongs)

In the Lekhitic-Sorbian zone, the fourth change occurs first, which leads to new lengthened sequences $\check{o}\check{o}$ and $\check{e}\check{e}$, which cannot be so easily identified as the long phonemes \bar{o} and \bar{e} , since they were not yet members of the system. This is of importance for the metathesis that ensues after the liquid loses its moraicity. The phonological question is not that the liquid would just **gradually** metathesize (as implied by Timberlake), but that it would retract by one segment. The basic question, then, is how the $\check{o}\check{o}$ and $\check{e}\check{e}$ are evaluated: do they count as one long segment or two short ones. Interestingly, insofar as they are integrated in the system and count as single long units, the liquid would metathesize across the long segment, i.e. $\check{o}\check{o}r >$

rǫǫ. However, if the two short moras count as two short vowels, rather than a single long one, then the liquid would metathesize only to an intervocalic position between the two short moras, causing pleophony: *ǫǫr* > *ǫrǫ*. Of course, that is what happened in East Slavic, leading to the possibility that East Slavic and Lekhitic-Sorbian may have had the same liquid diphthong evolution, except for the fact that the new long mid vowels could be integrated as single segments in West Slavic, but could not do so in East Slavic, which was in the process of preserving stress as its only distinctive prosodic feature and had eliminated, or was soon to eliminate vowel quantity as a distinctive feature.

One of the factors which would most clearly influence the phonemic evaluation of new long phonemic mid vowels *ē*, *ō* is their opposition to both short *ě*, *ǫ* and the newly shortened *ǣ* /*ǭ*, in such cases as the accentual paradigm A shortening of *rākъ* > *rǣkъ*. Since pretonic *ā* did not shorten in paradigm B (*trāva*), the *ěě* and *ǫǫ* would have been able to acquire phonemic status by filling in the gaps in the system, during the process of prosodic shortening, leaving a system which had both long and short mid vowels and low vowels.

This leads to certain proposals in the area of relative chronology, as follows. The prosodic shortening would seem to be the major factor which could endow *ěě* and *ǫǫ* with their new phonemic status as single long segments. This status would guarantee that liquid metathesis would move the liquid to the left of the entire two-mora unit (*rō*), rather than to an intervocalic position (*ǫrǫ*); thus, phonetic compensation for the loss of liquid moraicity must have occurred before prosodic shortening, yet metathesis must have occurred after the shortening, as shown in table 5:

Table 5. Compensation and metathesis in the Lekhitic-Sorbian zone.

Lekhitic-Sorbian zone.
1. <i>ǣ</i> > <i>ǫ</i> (change of short vowel quality)
2. <i>tǫřt</i> > <i>tǫǫrt</i> (liquid component loses moraicity and leftward compensation occurs)
3. Prosodic shortening produces the phonemic oppositions of <i>ǫ</i> (<i>rǫkъ</i>) vs. <i>ǣ</i> (<i>rǣkъ</i>) vs. <i>ā</i> (<i>trāva</i>)
4. <i>tǫǫrt</i> is identified as <i>tōrt</i> and both mid and low vowels can be opposed by quantity
5. <i>tōrt</i> undergoes liquid metathesis to <i>trōt</i>

It is possible that the Rozwadowski construct (**tǫrot*) resulted from an earlier metathesis, prior to the phonemic integration of long mid vowels. In a similar way, these rules suggest that East Slavic may have experienced pleophony not just because of an accidental rightward compensation for loss of liquid moraicity (the usual explanation, although all other Slavic zones had leftward compensation), but for the specific reason that East Slavic did not experience either prosodic shortening or the institution of vowel quantity as a distinctive

feature. Thus, the two short mid vowels would have been viewed as two segments and any ensuing liquid metathesis would have retracted the liquid by one segment, placing it in intervocalic position. Kolesov (2005: 85) refers to this situation, stating that “разложение долготы на составляющие ее моры...происходило после утраты количественных противопоставлений.”

Recently, Zaliznjak (2004:40-1) has produced textual and dialect evidence of non-pleophonic liquid diphthong reflexes in Novgorod dialects (e.g. *zloto*). Since there are no length reflexes, we really do not know if they indicate that East Slavic had a long \bar{o} phoneme at the time of metathesis or whether East Slavic *zoloto* simply experienced the deletion of its first pleophonic vowel. Nevertheless, we have a model which states that integrated longs count as a single segment during metathesis and non-integrated longs count as two segments. This rule not only holds for the *torot* reflexes of East Slavic, but may also explain the numerous textual and dialect cases of second pleophony (i.e. *тѣрѣт*, see Zaliznjak 2004:49), in which there was a similar instance of liquid moraic loss and inability to integrate a *ѣ* sequence as one segment, after which the liquid retracts to intervocalic position. This issue does not arise outside East Slavic, since we either see long liquids themselves assume the role of bimoraic units (most of the southern *trat* zones) or a variety of other single long segments appear together with a non-moraic liquid (Lekhitic-Sorbian).

VII. Conclusion.

We have examined several different treatments of Polish **trot*, with particular reference to how one accounts for the quantity of the vowel *o*. At a minimum, this vowel must be considered as long in order to generate the correct modern reflexes. Our second point has been that Slavists have often suggested either leftward or rightward compensation for the liquid mora, without a clear motivation for the direction. It is suggested that leftward compensation may have been Common Slavic, with all of the subsequent differences traceable either to the relative chronology of $\check{a} > \bar{o}$ and the one or two-segment property of the vowel which preceded the liquid at the moment of metathesis.

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