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Autor: Proverbio, Delio V.

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An Old Turkic text in Tibetan script: A case of hyperphonetic transcription?

Delio V. Proverbio

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The original aim of the present study was to add to the discussion on the phonological status of the Tibetan grapheme *a-chuṅ* written in Tibetan script in non-Tibetan texts. As a result, the article argues that Sinologist Weldon S. Coblin was substantially right in stating that "neither 'nasalization' nor anything else can explain all the varied foreign elements represented in our data by ʿ *a-chung* plus following consonants" (Coblin 2002: 181). Thus, according to Coblin's statement, at least in some contexts, the grapheme *a-chuṅ* seems to occur quite randomly. Some scholars have argued that this is a consequence of careless and loose employment of the Tibetan alphabet, a widespread habit among many copyists from Dunhuang.

In this article, this historical perspective is challenged by applying a new approach to the allographic context exhibited in Ms. Paris, BnF, Pelliot tibétain 1292, an Old Turkic text written in Tibetan script. Far from being a poorly transliterated text, it will be shown to be the complex (and obviously not entirely consistent) product of a "hyperphonetic" transcription process: a sort of phonetic pronunciation guide for non-Turkic Buddhist monks.

Delio V. Proverbio, Scriptor Orientalis, Keeper of the Oriental Collections. Vatican Apostolic Library, Cortile del Belvedere, 00120, Vatican City State.
E-mail: proverbio@vatlib.it

1.1. Introduction

The original aim of the present study was to add to the long-lasting discussion on the underlying phonological encoding which involves the Tibetan grapheme *a-chuṅ,* by examining a particular Old Tibetan written document: *Ms. BnF, Pelliot tibétain 1292* [quoted in the following as PT 1292].[1] This is an anopisthographic paper singleton which exhibits a (semi-)cursive Buddhist *dbu-med* (headless) script-style, and is datable to the end of the 10th-century;[2] see Moriyasu (1985: 46); Róna-Tas

1 It is my pleasure to express my sense of gratitude to Prof. Marcel Erdal, who afforded me manifold remarks and observations. I am also indebted to Sam van Schaik. Obviously, I take entirely upon myself the responsibility for what I state.

2 Though indirectly, Rybatzki (2011: 222) disagrees with this date, starting: "The earliest extant texts in *dbu med* script, falling into several different types, seems to date from the 12th century […]".

(1991: 107); Schaik (2013: 124, 127). It is an allographic (heterographic) Old Turkic text written in Tibetan script; see Róna-Tas (1991: 92–110). Regarding the Mainz series of Old Turkic fragments in Tibetan script, see Maue (1996: 210–222).

At first, I endeavored to establish a minimal set of graphotactic laws and/or constraints which assumedly govern the behavior of the grapheme *a-chuṅ* within the aforementioned text. As a result, I discovered that—at least as far as particular graphotactic contexts are concerned—Weldon South Coblin was substantially right in stating that "neither 'nasalization' nor anything else can explain all the varied foreign elements represented in our data by *ʿa-chung* plus following consonants. The only possible and reasonable conclusion would seem to be that *ʿa-chung* functioned as an abstract marker which modified basic Tibetan consonant letters […]" (Coblin 2002: 181). Even Hill, who disagrees with Coblin (2002) on his core thesis, is compelled to admit that "in Old Tibetan the final *v-* [i.e. the *ʿa-chung*] occurs with mysterious inconsistency" (2005: 115).[3]

Just to briefly summarize Coblin's argumentation: at least in some specific contexts, the grapheme *a-chuṅ* seems to occur randomly.

Thus, according to some scholars, a local implementation of a sophisticated transcoding system, such as the Tibetan alphabet, is—in this specific case—a system implemented by learned Tibetan scribes with the support of Uyghur monks; see Kara (1978), Klimkeit (1990: 59–60), Takata (2000). Hill (2005: 118), among others, has concluded that "the transcribers were imperfect in their transcriptions", resulting in a careless and loosely employed transcription. Schaik (2014: 328–331) depicted at length the typical "bad writer" "with only a limited grasp of the art of writing", specifically referring to part of the manuscripts production in Dunhuang.[4]

3 As far as the graphotactic contexts are concerned in which the grapheme *a-chuṅ* would have occurred in later times, i.e. from the beginnings of Classical Tibetan, see the insightful *résumée* by Ligeti (1961: 225–228).

4 This is probably not the case, but the application of such a category of "unskilled copyist" risks appearing—at least, within some particular historical contexts—as an epistemological escape, adopted by someone who is trying to avoid at any cost a substantial change of perspective. In this respect, the highly controversial debate around the so-called Artemidorus Papyrus is illuminating. (I limit myself to referring to the exhaustive analysis by Condello 2011, still the most complete bibliographic survey on this subject.) Against the overwhelming arguments which have been accumulated in favor of the hypothesis of a forgery—as a straightforward way of explaining the manifold inconsistencies of *P. Artemid.*—some researchers have begun to introduce the idea of a "subliterary product", due to an inexperienced, non-professional scribe (Condello 2011: 172). An evolution of this generic perspective is the thesis according to which *P. Artemid.* was the unfortunate product of an untrustworthy antigraph and an even worse apograph, the errors of (at least) two "totally unreliable" copyists having merged in the final result (Condello 2011: 212). Here we arrive at the ultimate *coup de théâtre*: even the possible forger might have pretended to impersonate the character of the "incorrect copyist" (Condello 2011: 212).

The aforementioned historical perspective, within which previous scholars have evaluated the linguistic data from PT 1292, will be challenged in the present paper by applying an opposite approach to the allographic context exhibited by PT 1292. Far from considering the text to be poorly transliterated, my approach is to regard it as a complex (and obviously not entirely consistent) product of a 'hyperphonetic' transcription. In other words: PT 1292 is not to be regarded as the careless scribblings of an untrained copist, as commonly thought (in previous perspectives), but the sophisticated product of a highly cultivated monk (in the new perspective).

I will here try to briefly expand on the concept of hyperphonetic transcription. In the present contribution, the term "hyperphonetic" does not simply refer to the asymptotic "ideal of faithful transcription" (Coulmas 2003: 26–33), which may have been meant by Otto Jespersen's "hyperphonetic" notation among others; see Jespersen (1889). It was once assumed that "the transfiguration of audible into visible sign requires interpretation"—and therefore, at any rate, "is bound to be imperfect" (Coulmas 2003: 32). What I mean is that the scribe of PT 1292, far from employing an (asymptotically) fully underspecified system of notation, i.e. a maximally economical notation set which encodes exclusively for articulatory gesture features denoting a phonemic status, endeavored to register any "acoustic variants" of the same phonological segment, according to a local, not always consistent, interpretation. Similarly, Jespersen, though with otherwise sound claims of consistency, tended to distinguish, in his "hyperphonetic" notation, even idiosyncratic utterances.[5]

Such a new perspective will trigger, in turn, a series of arguments, the first of which pivots around a new interpretation of the phonological status of the Tibetan grapheme *a-chuṅ*. Eventually, we will come to delineate some major phonological features exhibited by PT 1292.

1.2. A preliminary consideration

Let us begin by assuming that the following empirical inference is a general statement whose truth is intrinsically universal:

(1) The transcoding (i.e. surface representation) of whatsoever set of *n* phonological—at least, phonetic—objects [I mean: a given set of *permitted* surface phonological/phonetic objects within a defined linguistic domain even not considering

5 See, for example, Jespersen (1889: 49): "Welsh *nh* in *nhad*, as pronounced by *Dr. Sweet* and *Prof Rhys* [italics are mine]:

=	β0	—	"
	γ „	—	7
	δ2	0	. .
	ε3	—	ı

(Cf. Sweet, *Spoken N. Welsh*, 10, 11). The same articulation is often found in a *scornful pronunciation* of Danish [italics mine]: "[*n* h æ.] for [n ae.] 'no'". Jespersen was here quoting Sweet (1885: 10, 11).

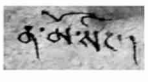
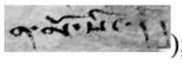
the (possibly minimal) set of graphotactic constraints which may govern the simplest of any possible syntagmatic positional behavior] is generally implemented by means of a set of *n-m* graphemic objects, where $n > m$ and $m \neq 0$. Roughly speaking: within natural languages, a perfectly biunivocal phonological (phonetic) transcription system is only asymptotic, since the set of graphic signs that are used in writing a natural language is generally (if not always) smaller than the set of sounds to be represented.

Now, let us consider an actual set of *p* graphemic elements, for example the *complete* set of Old Tibetan graphemes (T_1); in analyzing the transcoding process from the actual set K of *n* phonological—at least, phonetic—objects, pertaining to (a specific) Old Turkic (sub-)domain, to the actual surface representation in T_1, we would expect that, according to (1), $p = n\text{-}m$. This is definitely true. But what we might further ascertain is that K appears to be *not entirely* represented within T_1. More than that: the merging of two or more items of K into one element of T_1 (i.e. the apparent unfaithfulness in transcoding them) is reverted; what we actually observe is that at least two elements of T_2 (the set encompassing the *p* elements of T_1 plus *at least* one extra element: T_2 $\{p_1 \ldots p_n, p_{n\text{-}m}\}$) seem to encode one item of K in the surface representation. To better illustrate such an assessment, let us consider the following example.

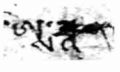
Apparently, until now no one has noticed that there seems to be (at least) one extra element in the graphemic set exhibited by PT 1292, within whose text we observe two "variants" of the grapheme ‹s›. Regarding this grapheme, Maue and Röhrborn stated: "mit den 4 Sibilanten genügt das tib. Alphabet dem uig. Lautinventar völlig, soweit der Anlaut der "Silben" betroffen ist. Im Auslaut dagegen läßt die tibetische Orthographie nur ‹-s› zu" (1984: 302); "Im [Auslaut der 'Silbe'] ist nur ‹-s› zugelassen, und nur dieses Graphem kommt auch tatsächlich vor" (1984: 303); and "[...] Im Auslaut der 'Silbe' ist ‹-s.› Archigraphem für alle Sibilanten" (303, note 92).

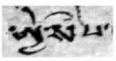
On the contrary, in PT 1292 we detect two apparently distinct graphemes (in facts, allographs):

The grapheme (allograph) ‹ས› (= Northern Brāhmī  , Modern Devanagari श), which occurs at least four times:

II. 1c  ‹n꞉m(o$^{\uparrow}$)꞉s(i$^{\uparrow}$)ŋ꞉› (*versus* 44: );

2:  ‹b(ɹ$_{\downarrow}$)(i$^{\uparrow}$)s꞉›;

8:  ‹l(s$_{\downarrow}$)꞉[[°]](ɹ$_{\downarrow}$)[[g]]꞉›;

27:  ‹l(y$_{\downarrow}$)(e$^{\uparrow}$)s(i$^{\uparrow\rightarrow}$)ṣ꞉›)

versus the otherwise ubiquitous three-stroke grapheme ‹ 𑖱 › (= Northern Brāhmī 𑀱, usually transliterated as ‹ṣ›; Modern Devanagari ष); see Schaik (2013: 124). A question arises: Are we observing two (diachronically)[6] divergent variants of the same grapheme? I discussed this question with Sam van Schaik himself.[7] According to him, it was fairly common for Dunhuang scribes to mix together different letter-forms, even in the same manuscript; see, for example, Schaik (2012: 425) on Ms IOL Tib J 1459.

To sum up, I think that we truly do have to do with an *enlarged* set of Old Tibetan graphemes, but enlarged for what purpose? We will eventually return to this last question when we reexamine PT 1292 in light of a (quasi-)hyperphonetic transcription system. For the moment, we may simply note that a straightforward, unsophisticated use of a defined set of symbols is incompatible with the systematic, though apparently obscure, employment of some extra 'diacritic' such as ‹ɜ›.

Before reaching the crucial point in which the vowel system denoted by PT 1292 will be described within the frame of the new approach, I must ask the reader to provisionally accept the following, entirely arbitrary transliteration code.

‹($o^{\uparrow}$)› = [o_1]
‹($ɜ_{\downarrow}$)($o^{\uparrow}$)› = [o_2]
‹($y_{\downarrow}$)($o^{\uparrow}$)› = [o_3]
($w_{\downarrow}$)($ɜ_{\downarrow}$)($o^{\uparrow}$) = [o_4]

‹($u_{\downarrow}$)› = [u_1]
‹($ɜ_{\downarrow}$)($u_{\downarrow}$)› = [u_2]
‹($y_{\downarrow}$)($u_{\downarrow}$)› = [u_3]

‹($i^{\uparrow}$)› = [i_1]
‹($ɜ_{\downarrow}$)($i^{\uparrow}$)› = [i_2]
‹($y_{\downarrow}$)($i^{\uparrow}$)›, ($y_{\downarrow}$)($i^{\uparrow\rightarrow}$)› = [i_3]
‹($i^{\uparrow\rightarrow}$)› = [i_4]

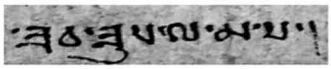
6 See Schaik, (2012: 416): "[…] the theory that *dbu med* developed out of *dbu can*—rather than being invented at the same time based on a different Indic script—is supported by a lack of exemplars in the Indic manuscript and epigraphic sources".

7 In a private communication dated on January 7, 2015 Sam van Schaik stated: "[…] In the case of *sa*, I would argue that the change in form can be explained by the scribe not taking the pen from the paper, and therefore the "leg" on the left side of the letter gradually disappears […] On the other hand, there is a strong tradition in Tibet that the *dbu med* forms came from a different script. It is not my view, but I would be interested in your argument if you follow this route. The Brahmi *ṣa* is a candidate, though one still has to explain why the top horizontal line disappeared in the Tibetan form".

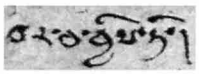
‹(e$^{\uparrow}$)› = [e$_1$]
‹(ཨ$_{\downarrow}$)(e$^{\uparrow}$)› = [e$_2$]
‹(y$_{\downarrow}$)(e$^{\uparrow}$)› = [e$_3$]
‹C$_0$Ø› = [a$_1$]
‹C$_0$(ཨ$_{\downarrow}$)› = [a$_2$]
‹(y$_{\downarrow}$)Ø› = [a$_3$]

2.0. Previous assessments

Let us analyze the following graphemic strings:



12: ‹zbཨz(u$_{\downarrow}$)ṣཨlཨmཨsཨ› *sab sözlä* {-mA} {-sA}



30: ‹brཨčཨb(y$_{\downarrow}$)(i$^{\uparrow}$)ṣཨt(i$^{\uparrow}$)ཨ› *barca bıš* {-dI}

At first glance, we may be led to infer (at least) two elementary graphotactic rules:

(2) → $\sigma_{n\text{-}m}$(‹C$_1$ØC$_2$›) / $\sigma_{n\text{-}m}$(‹ཨC$_1$C$_2$ཨ›)
↓
CAC

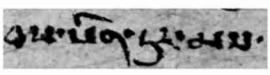
(3) → $\sigma_{n\text{-}m}$(‹C$_1$Ø›) / $\sigma_{n\text{-}m}$(‹ཨC$_{n=1}$ཨ›)
↓
CA

This is to say that

(2) a syllable represented (in surface representation) as a string of graphemes occurring between two *tsegs* is a syllable of the type ‹C$_1$AC$_2$›;

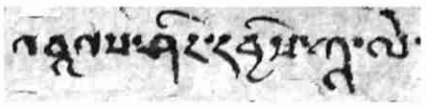
(3) a syllable represented (in surface representation) as a single grapheme occurring between two *tsegs* is a syllable of the type ‹C$_1$A›.

A question arises: instead of a possibly expected *‹bṣཨśཨ(i$^{\uparrow}$)ŋཨ› *baş* {+sIn}, parallel to the string



43: ‹bṣཨṣ(i$^{\uparrow}$)nཨd(u$_{\downarrow}$)rཨmṣཨ› *basındur* {-mAz}

why do we actually observe such a kind of monstrosity as the graphemic cluster ‹ཨb(ཨ$_{\downarrow}$)ཨ›?



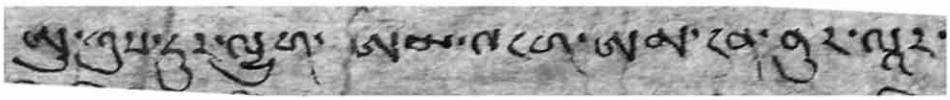
23: ‹ɜb(ɜ↓)ɜṣ𐨎ś(i↑)ŋ𐨎db(y↓)(i↑)ṣ𐨎g(ɜ↓)𐨎l(e↑)𐨎› *baş* {+sIn} *bıč* {-gAlI}.

On the other side, scribes such as the one who wrote MS Mainz 712 (Maue 1996: 219–222) seem to accurately avoid the grapheme ‹ɜ› in any context, with the exception of the lexeme ‹mɜ𐨎t(i↑)r𐨎›, Sanskrit *Maitreya* (see 2.2.5.1. for a phonetic explanation of such an occurrence).

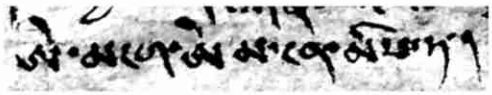
2.1. Róna-Tas' explanation

One of the most concise and to-the-point elucidations of a possible phonological function of *a-chuṅ* is that of Róna-Tas (1991: 101): "[…] A word like Written Tibetan *dge-'dun* is pronounced as [gendun]. Therefore [?] we find the *a-chuṅ* in non initial position in such cases as in *am-'ṅag* where the *a-chuṅ* is the marker of the nasal consonant, as can be seen [?] from the parallel forms where the same word is *"e-mṅag*, and *"am-'ṅag*". See also Coblin: "[The *a-chuṅ* is] a mark of nasalization or prenasalization" (2002: 170); and Hill: "In Old Tibetan *v-* before a consonant represented the nasal homorganic to that consonant" (2005: 114–115).

The examples cited by Róna-Tas concern the following lexemes: *ämgäk* (*emge:k*) 'pain' (Clauson 1972: 159*a–b*), and *ämgän-* 'to suffer pain':



3: ‹l(u↓)𐨎k(u↓)ṣ𐨎t(u↓)r𐨎l(u↓)g𐨎l𐨎m𐨎ɜŋg𐨎l𐨎m𐨎ŋn𐨎n(u↓)r𐨎l(ɜ↓)r𐨎› *üküş törlüg ämgäk ämgänürlär*;



33: ‹l(e↑)𐨎mŋg𐨎l(e↑)m𐨎ŋn𐨎m(i↑)ṣ𐨎t𐨎›, *ämgäk ämgän* {-miş} {+de}.

What does Róna-Tas mean? Does he mean that the grapheme ‹ɜ› encodes for a segment exhibiting, among other things, nasality? If so, according to Róna-Tas, the syllable encoded in Runic writing as $g_2(ä)k_2$ (*Irk Bitig* § 57, see ms. British Library, Or. 8212, f. 49[verso], l. 3):

Ø	m	g_2	Ø	k_2	𐨎	İ

in Tibetan script would possibly have appeared both as $mŋ(ä)g$, and $ɜŋ(ä)g$ respectively. Therefore, the graphemic clusters ‹mŋ› and ‹ɜŋ› would both correspond to the Runic grapheme ‹g_2›. It is definitely the case that "the particular idea that *'a-*

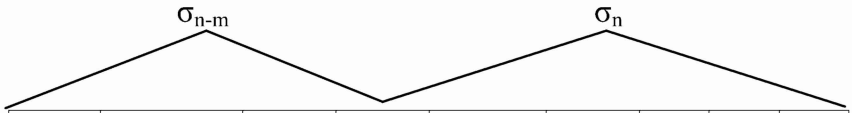
chung was somehow inherently nasal encounters further and even more vexing obstacle in examples such as [the aforementioned ones]" (Coblin 2002: 176).

Let us consider the following synopsis:

Onset				Onset				
ི	Ø	m	ཟ	ཨ	Ø	ŋ	G	ཟ
ི	(e↑)		ཟ	m	Ø	ŋ	G	ཟ
ི	Ø	m	ཟ	ŋ	Ø	n		ཟ
ི	(e↑)	m	ཟ	ŋ	Ø	n		ཟ

Does the grapheme ‹ཨ› simply encode for a (monosegmental) vocalic onset—as can be inferred from Coblin's statement: "a vowel or essentially vocalic element of some sort" (Coblin 2002: 170)? If we start from such an assumption, we might interpret the first two occurrences—even though they denote two different syllabications: σ_1[VC_1], σ_2[VC_0] (ཨམ་ངང་); σ_1[V], σ_2[C_1VC_2] (ཨེ་མངང་)—as pointing to the reading /ämäŋχ/ (with progressive nasal assimilation of the consonantic coda), which can be compared with Osmanlı *ėmek*, Azerbaijani *əmək*, versus OT *ämgäk*, Kyrgyz *эмгек*.

Such an interpretation relies on a poorly-founded assumption (a hidden claim) according to which the first occurrence of the *tseg* in the string ‹ི(e↑)ཟmŋgཟ› does *not* infringe on any graphotactic well-formedness condition. But if we assume that the first *tseg* may have merely been misplaced, we obtain the following, much simpler scheme:



ི	Ø / (e↑)	m	ཟ	Ø / ཨ	ŋ	Ø	g	ཟ
ི	Ø / (e↑)	m	ཟ		ŋ	Ø	n	ཟ

A variety of crucial observations can be drawn from this scheme. We choose to focus on the alternation between Ø and ‹ཨ›. Such an even distribution of opposite occurrences across our textual specimen would be regarded as the result of an oscillation between two asymptotic, polar systems; i.e. it would be considered a generalized case of the "indifference stage" already foreshadowed by Johanson (1978–1979). In other words: The system is in the process of evolving from one pattern to the other.

On the other hand, and from a strictly synchronic point of view, if we take into account the categorial opposition between *absence* (zero) and *non-occurrence*—according to the general definition suggested by Haim Baruch Rosén, see Shisha-Halevy (1986: 8)—since Ø and ‹ཨ› are co-occurring within the same specific envi-

ronment (and not in complementary, "suppletive" distribution), "the (non-) attestation may be interpreted as mere (non-) occurrence" (Shisha-Halevy 1986: 8; brackets are mine). In very simple words: the opposition is devoid of any significance: Again, the *a-chuṅ,* though ubiquitous, appears to be meaningless.

2.2. A provisional hypothesis

In order to overcome such an aporia, we deem it appropriate to undertake a Copernican change of perspective by assuming the following: Ms. BnF, Pelliot tibétain 1292 has been written with an (at least partially) hyperphonetic transcriptional system.

This idea is by no means new: in reference to an Uyghur transcription of a Tibetan text, Kara wrote: "[…] the given text is not merely a transliteration, but probably a "reading style" form in which one can observe Tibetan dialectal features somewhat coloured by the Uigur pronunciation […]" (1978: 165). This same idea clearly underlies the following statement by Hill: "The transcriber had done his best to *capture* the foreign sound in his own orthography" (2005: 119).

Now we may introduce a provisional hypothesis on some properties of *a-chuṅ* as a (possible) phonetic marker:

(4) In pre-consonant position—more precisely, when occurring before a grapheme which encodes for a [-sonorant] segment—the grapheme ‹ꟻ› is the marker of a consonant lenition, notably denoting a weakening of closure, along the coordinate of progressive sonorization,—as illustrated in Károly (2012: 11)—*versus* a fortis articulation (the strongest segment type being a voiceless stop); see Lass (1984: 178); Kirchner (2001: 86, § 2); Szigetvári (2008: 96). From a comparative point of view, see Hill (2005: 119–122).

2.2.1. Dentals

Here are four sets of occurrences of the lexeme *andaγ* '*andak*, like that', each denoting a slightly different graphemic string:

12, 13; 34: ‹lnƨꟻdgƨ›; 27: ‹lnƨꟻd(ꟻ↓)gƨ› vs 11, 19, 24: ‹lnƨtgƨ›; 21, 30, 36: ‹lnƨdgƨ›. To be compared with Brāhmī *āndaχ*,[8] ‹āndaγ›, ‹āndah› (von Gabain 1954: 85), Runic ‹n͡dγ› (Orkun 1941: 10), and Syro-turkic ‹lnθɬx› (Yoshida, Jun'ichi & Chimeddhorji 2008: 246

8 According to Proverbio (2014a), the grapheme ‹γ› represents, at least within an idiosyncratic Old Turkic Brāhmī domain, the phoneme /ḫ/. Erdal (personal communication) insightfully remarked that, "regarding Brāhmī *āndaχ*", which derives from "a morphologization of the sequence *anı* (or possibly *an-*) *täg*—such a morphologizations being more common with pronouns than with nouns—I am not aware of a general rule of final devoicing in Old Uyghur before the arrival of Mongol influence (Classical Mongolian showing final devoicing)". The question deserves more discussion. I merely observe that, even within the limited corpus-based survey done by von Gabain (1954), there seems to be some evidence of such a phenomenon.

no. 128 l. 10). On the opposition between the graphemic clusters ‹nd› ( ) and ‹nt› ( ) in Brāhmī script, see Johanson (2013: 178).

According to statement (4), we may derive the following transcoding schema (see Szigetvári 2008: 100):

[+anterior] [+coronal]		+/– tense		
‹ɹd›	[ð]	– –	[+continuant] [+voice]	Puppel's C-Domain
‹d›, ‹t› (‹t‘› occurs in very few cases)	[d̥] ([t])	– –	[-continuant] [-voice]	Puppel's V-Domain

Incidentally, we may observe that, if we compare this schema with the source-filter model sketched by Stanisław Puppel (Puppel 1992), a phonological 'trans-domain' dichotomy emerges: the opposition between /ð/ and /T/. But if we merge the two allophonic variants encoded by ‹d› and ‹t›—by hypothesizing, for ‹d›, an actual (slightly) devoiced pronunciation: [d̥]—the phonological opposition coincides with Puppel's dichotomy.

Thus, we are now able to tabulate the occurrences of the lexeme *anday*:

l	n	ƨ	ɹ	d	(ɹ ↓)	g	ƨ	1	[a$_1$nða$_1$χ][9]
l	n	ƨ	ɹ	d	Ø	g	ƨ	3	

Along with these two series, we observe also the following variants:

l	n	ƨ	Ø	d	Ø	g	ƨ	3	[a$_1$nd̥a$_1$χ]
l	n	ƨ	Ø	t	Ø	g	ƨ	3	[a$_1$nta$_1$χ][10]

Since [ð], [d̥] and [t] seem to occur stochastically within the very same environment, at first glance they all appear to be allophonic variants. See Kirchner: "noncontrastive features lack faithfulness constraints altogether" (2001: 85), i.e.: a noncontrastive feature is never preserved, at least consistently, in surface representation. Now:

9 We may recall that in Old Tibetan "all finals are pronounced as voiceless, despite being written as voiced" (Hill 2010: 123).

10 See von Gabain : *āntāh* M [= T II Y 3], l. 20 (1954: 85).

if, by hypothesis, such a phonological feature is [+ continuant], one wonders why, in the aforementioned context, it is not *always* preserved.

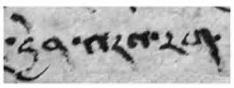
Here, a peculiar triggering of the phonetic imperative—insightfully named by Kirchner (2001: 85 § 2.2.) as LAZY: "Minimize articulatory effort"—takes place. The phenomenon is similar to that analyzed by Kirchner (2001: 88) within an Optimality Theory context. In fact, as already stressed by Johanson (2013: 177), we are in the presence of "an uncomfortable sequence of two continuants". The allophonic variant [d̥] ([t]) occurs as a result of a positional (conditioned, context-sensitive) faithfulness constraint violation, which outranks the general faithfulness constraint PRES(continuant), i.e. prevents, as a *more expensive* option, the preservation of the feature [+continuant] *in the presence of a sequence of two continuants*. We may call it $\text{LAZY}_{2\text{cont}}$:

/d/	$\text{LAZY}_{2\text{cont}}$	PRES(continuant)
d	*	
☞ ð	**!	**!

According to Johanson: "Diese Erscheinung wäre als Assimilation im Sinne von Verlust des Merkmals [+ frikativ] zu verstehen" (2013: 31). Regarding the allophone "[ð] als dominierende Variante", see the detailed discussion in Johanson (1979: 32 § 5.3). In a sense, we may say that [ð] is *partially* "unanchored", since there is no corresponding voiced stop (Cser 2003: 51 § 3.4.6).

See the following cross/dissimilating variants:

29: ‹ƨd(y↓)(e↑)nƨɘdɘƨrgƨ› [ɖe$_3$nða$_1$ʔra$_1$χ][11] *dendar* {+Ag}



(26), 30: ‹ɘ(o↑)lƨɘd(y↓)nƨdrƨ› [olð(e$_3$)nɖa$_1$r] *ol dendar*

Compare with the *non*-dissimilating occurrence 23:

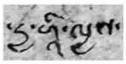
‹ɘd(i↑)ƨɘd(y↓)(i↑→)mƨg(l↓)(ɘ↓)gƨ› [ðiði$_3$mła$_2$χ] '*provided with a tiara*'—where ‹ɘd(i↑)ƨɘd(y↓)(i↑→)m› is a foreign word.

Because at least two graphemes encode for two distinct apico-alveolar [±voiced, +coronal, +anterior, -distributed] phonemes (*i.e.* /s/ and /z/), the allophone(s) denoted by ‹d› (‹t›) must be [-continuant]. Their somewhat retracted, definitely apico-

11 Regarding the *non-sublinear* post-vocalic occurrence of the grapheme ‹ɘ›, see 2.2.3. below.

alveolar character emerges clearly from the graphemic opposition between the strings ‹dg(l↓)› and ‹d(l↓)›:

3, 29: ‹l་dའg(l↓)(ཨ↓)gའ›, [a$_1$ḍɬa$_2$χ] *atlıg*, versus 3: ‹d(y↓)(i↑)nའl(ཨ↓)gའ›, [d̪i$_3$nla$_2$χ] *tınlıg*;

7: ‹t(y↓)འg(ཨ↓)(i↑)འl(y↓)ཨའ›  [d̪a$_3$xi$_2$la$_3$ʔ] *tägil* {-A} [CONV], *değil* {-A}.

The graphemic cluster ‹g(l↓)›—in Written Tibetan, ‹ག› is one of the six *silent* consonants to which ‹ྲ› may be subjoined—which encodes for the articulation of a lateral approximant immediately adjacent to ‹d›, is opposed to ‹l›, which encodes for the articulation of a lateral approximant immediately adjacent to the alveolar nasal [n] (n̪). Roughly speaking: the graphemic cluster ‹dg(l↓)› cannot encode for the consonant cluster [θl].

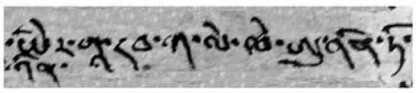
Compare 2: ‹l(i↑)འč(i↑)nའdཨའ›, [i$_1$ʃi$_1$nða$_1$ʔ][12] *için* {+dA} with the dissimilating occurrences 26, 31: ‹l་rgའdཨའ›, [a$_1$ra$_1$χd̪a$_1$ʔ] *arıg* {+dA};

The apico-alveolar place feature of the allophone denoted by cluster ‹g(l↓)› is also evincible by occurrences such as 22: ‹l(u↓)འgl(y↓)(u↓)ṣའ› [ułu$_3$s] *uluṣ*; see immediately below.

Similarly, in the aforementioned transcription of a Tibetan text in Uyghur script edited by Kara, the Tibetan clusters /bda/ [βða], /bla/ [βla] ("an alveolar fricative mainly preceded by a labial one" (Kara 1978: 165)) is rendered as ‹uda›, ‹^{u}la›. Again, these data could be interpreted as reflecting the hyperphonetic nature of the transcription. For a Uyghur reader, the grapheme ‹w› would in fact have denoted the allophone [u̯], more akin to the voiced bilabial continuant [β] than to the high back rounded cardinal vowel /u/.

Thus, in the Old Turkic hyperphonetic system denoted by PT 1292, ‹l(u↓)འg› = [u], *versus* ‹l(u↓)› = (until now [u$_1$]) = [u̯]:

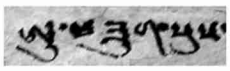
22 ‹l(u↓)འgl(y↓)(u↓)ṣའ› [ułu$_3$s] (a disharmonic vowel sequence!)	*ulu*
31: ‹l(u↓)འgzཨའt(i↑)འ	*uzat* {+i}
31: ‹l(u↓)འgz(u↓)nའ [uzu̯n]	*uzun*
	ün {-DI}

32: 

‹y(e↑)r[k(i↑)n]འg(ཨ↓)འdbའkའl(e↑)འ[[l(e↑)]]འ(u↓)འn[[(i↑)n]]འt(i↑)འ›, *yerga tapqalı ünti*—my reading differs from that of Maue & Röhrborn (1984: 309): "'u-ni*d*-ti".[13]

12 As usual, morpheme #+dA# is opaque to rightward palatal vowel harmony; see Proverbio (2012: 209–211).

31: ‹l(u↓)ꡀ[[ṣ]]z(u↓)gꡀṣ(u↓)ṣ› *üzügsüz*[14]

 [ụzụχṣụs]

This last example gives us an opportunity to illustrate a peculiar feature which emerges as a consequence of the hyperphonetic notation used by the scribe, the synchronic co-existence of two different gestures: tachysyllabication (quick syllabication) and bradysyllabication (slow, detached syllabication). What follows is our chain of reasoning:

At least twice (31: ‹l(u↓)ꡀ[[ṣ]]z(u↓)gꡀṣ(u↓)ṣ› and 2:  ‹ʁb(o↑)ʁꡀ[[ṣ]]z(i↑)ŋꡀṣr›), the scribe initially wrote the grapheme ‹ṣ›, but then crossed it out and subjoined the grapheme ‹z›. What happened? In both cases, he transcribed the words hyperphonetically: he firstly registered the issue of a tachysyllabic pronunciation, i.e. "la pronunciation moyenne [...] la plus normale et naturelle", but afterwards, with an "effort de réflexion et d'analyse phonématique" consequent to an "articulation phonique [...] lente" (Kasser [1982: 27]), he interpreted the previous utterance as an issue of a regressive assimilation:

	$\sigma_{n\text{-}m}$		$\sigma_{n\text{-}m}$
	⋮		⋮
	O		N
→	[+voice]	/	[+sonorant]

The compulsory strength of this process of autocorrection, as a consequence of bradysyllabication, is here proved by the fact that in the second case the scribe made a hypercorrection, since ‹z(i↑)ŋꡀṣr› *sansar* comes from Sanskrit: संसार *samsāra*. We must notice that in this position (onset of the first syllable), in Old Turkic as well as in Middle-Mongolian, there is no phonological opposition between [s] and [z]. But precisely in Middle-Mongolian we observe ‹zr› for *sara*, versus ‹sqi› for *saqi-* (Tumurtogoo & Cecegdari 2010: 168).

A detached syallabication is clearly implied by many of PT 1292's transcriptions, such as the followings:

13 Erdal (personal communication) accurately observes that "As Moriyasu, you see *uninti* against M&R's *unıdtı*. [But] *ün-* does not suit the context, since the person then remains standing on one leg for 7 days. Perhaps one should emend to *unıttı* since, in Brāhmī, *t* and *n* are graphemically ambiguous (cp.see *ni / ti*; , *no / to*)." In fact, this would have been theoretically possible only if we assume that the scribe *transcribed* a Brāhmī *Vorlage*.

14 See also *üç, üküş, üzä, üztün*.

3: ‹lmའགའགའ› *ämgäk* [a_1m…ʔŋχa_1]
7: ‹lགའགའ(ག↓)གའ› *ag* {-A} [CONV] [a_1ʔ…χa_2ʔ]

2.2.2. Labials

Let us consider the following statement by Róna-Tas (1991: 101) as a starting point for our analysis: "[…] as preradical [the *a-chuṅ*] served to ensure the voiced feature of the following consonant […] Quite different is the case with Turkic /b-/. This has been […] written […] in the overwhelming majority of cases with *a-chuṅ* + *b*".

We can compare such an assessment with Csongor's view (1960: 111 note 50): "The occurrence of *b* among these data suggests a sound value like *w*, *β* of this *akṣara* [i.e. ‹གb›] in Old Tibetan"; and that of Hill: "The combination *vb* [i.e., ‹གb›] could easily represent a voiced bilabial fricative [β]" (2005: 119). See also Uray: "[…] a zöngés /b/ szókezdőt pedig a ʾb jegykapcsolattal adták vissza" (1980: 105).

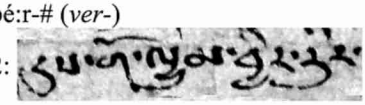
Again, according to statement (4), we can derive the following transcoding schema:

[+ labial]		+/– tense		
‹གb›	[β]	– –	[+continuant] [+voice]	Puppel's C-Domain
‹b› (‹p› occurs in two conditioned cases only)	[b̥] ([p])	+ +	[-continuant] [-voice]	Puppel's V-Domain

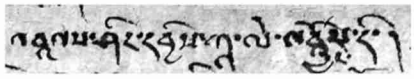
Again, [β] appears to be *partially* "unanchored", since there is no corresponding voiced stop (Cser 2003: 48–49 § 3.4.1).

On the basis of such a scheme, we are now able to examine a number of specimens:

#bé:r-# (*ver-*)

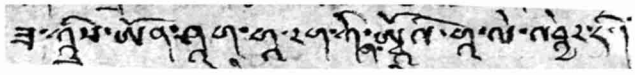
22: 

‹d(u↓)ཤའg(o↑)འl(y↓)(u↓)mའb(y↓)(e↑)rའr(u↓)rའའ› [tụsχo_1lu_3mḅe_3rụr], *tüş kolum bér* {-Ur}

23: 

‹གb(ག↓)གཤའś(i↑)ŋའdb(y↓)(i↑)ཤའkགའl(e↑)འགb(ག↓)(y↓)(e↑)[[ཤ(i↑)]]rའd(i↑)ཨའ›,[15] *bašın bıč* {-gAlI} [CONV] *bér* {-dI}. Maue & Röhrborn: "ließ seinen Kopf [mit tausend Diademen] abschneiden" (1985: 72).

15 Maue & Röhrborn (1984: 308): *ẖbyēr.di*; Moriyasu (1985: 9): *'byēr di*.

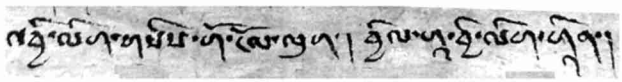
23: 

‹z꭪k(ɜ↓)(r↓)(i↑)ṣ꭪l(o↑)n꭪śɜg꭪gɜ꭪rg꭪k(i↑)(n↓)꭪l(w↓)(ɜ↓)(o↑)ɜ(i↑)꭪g(ɜ↓)꭪l(e↑)[16]꭪ɜb(ɜ↓)(y↓)(e↑)r꭪d(i↑)꭪꭪›

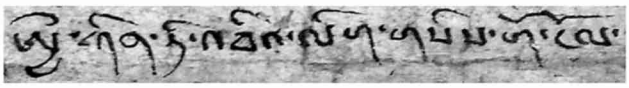
According to Maue & Röhrborn: *säkiz on čag* (*čaq*) *karak* {+In} *öy* {-gAlI} [CONV] *bér* {-dI} (1985: 72–73).

2	ɜ	B	(ɜ↓)	(y↓)	(e↑)	r	꭪
1	Ø	B	Ø	(y↓)	(e↑)	r	꭪

#bil-#*: biliglig* ‘wise, possessing knowledge’; *biligsiz* ‘ignorant’; *bilgä bilig* ‘wisdom’.

40: 

‹ɜb(y↓)(i↑)꭪l(i↑)g꭪gṣ(i↑)ṣ꭪g(o↑)꭪ŋ(o↑)l꭪l(u↓)g꭪꭪b(y↓)(i↑)l꭪g(ɜ↓)꭪b(y↓)(i↑)꭪l(i↑)g꭪g(ɜ↓)(i↑)n›,
[βi$_3$li$_1$χsi$_1$sko$_1$ŋo$_1$lu̯χb̯i$_3$lγa$_2$b̯i$_3$li$_1$χi$_2$n], *biligsiz köŋülüg bilgä biligin*

8: 

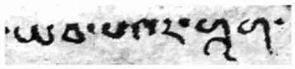
‹l(y↓)(i↑→)꭪k(i↑)n꭪t(i↑)꭪ɜb(i↑)ɜ꭪l(i↑)g꭪gṣ(i↑)ṣ꭪g(o↑)꭪ŋ(o↑)l꭪›, *ikinti biligsiz köŋül*

8	ɜ	b	Ø	(i↑)	ɜ	꭪	l	(i↑)	g	꭪
40a	ɜ	b	(y↓)	(i↑)	Ø	꭪	l	(i↑)	g	꭪
40c	Ø	b	(y↓)	(i↑)	Ø	꭪	l	(i↑)	g	꭪

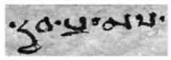
We can compare such occurrences with the testimonies of, on the one hand, Ms Mainz 329, on l. 5 (Maue ‹ɜb(y↓)(i↑)l꭪k(y↓)꭪ɜb(y↓)(i↑) l(i↑)g꭪l(i↑)[g]›, [βi$_3$lka$_3$ βi$_3$li$_1$χli$_1$χ] (1996: 216–218); and, on the other hand, the orthographic variant exhibited by Ms Mainz 712, on l. 12 (Maue: ‹b(y↓)(i↑)l꭪l(i↑)g꭪ l(i↑)g› (1996: 219–221). As already observed above, in this latter manuscript the grapheme ‹ɜ› *never* occurs in pre-consonantal position, thus denoting a graphemic system which does not disambiguate between [β] and [b] ([b̯]).

16 ‹꭪l(w↓)(ɜ↓)(o↑)ɜ(i↑)꭪›: Maue & Röhrborn (1984: 308): “’yōẖi: Ursprüngliches ‹’yō-› zu ‹’ō-› korrigiert? Falls ‹’yō-›, dann ungewöhnliche Anordnung der Grapheme: ‹’yhō-› statt ‹’hyō-›”. At any rate, the grapheme ‹(w↓)› seems not to have not been detected (and, eventually, transcoded) by Maue & Röhrborn.

As far as PT 1292 is concerned, the only two examples of Turkic lexemes in which the grapheme ‹p› occurs actually exhibit the strings ‹bཱིp›, which would represent the voiceless stop [p]:

26: 

‹ybཱིpɹrཱིg(ɹ↓)g› [ya$_1$pʔa$_1$rγa$_2$χ] *yapırgak* (*yapïrγaq*);

42: 

‹d(y↓)bཱིp(r↓)ཱིmṣ› [d̥a$_3$pra$_1$ma$_1$s] *täprä* {-mAz}, to be compared with 32: ‹dbཱིkཱིl(e↑)ཱི› [d̥a$_1$b̥ka$_1$le$_1$] *täp* {-gAll}.

2.2.3. Dorsals

As far as the set of graphemes encoding for dorsal consonants is concerned, we would have expected to discover a graphemic opposition analogous to those identified for coronals and labials. In fact, we actually find out that the graphemic cluster *‹ɹg› never occurs. As a possible explanation of such an apparent graphotactic inconsistency, we may recall that in the sub-dialectal phonemic system sketched in Proverbio (2014a: 146–147), dorsal consonants turn out to be underspecified for the feature [voice].[17] Roughly speaking: a phonemic opposition is detectable only between a [+continuant] unvoiced dorsal archiphoneme and a [-continuant] unvoiced one (Proverbio 2014a: 144).

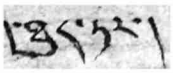
[+ dorsal]		+/– tense	
‹g›	[x], [χ] (+front, +back allophonic variants), perhaps [γ] after a liquid sonorant	– (+)	[+continuant] *([-voice])
‹k›	[k], [q]	+ +	[-continuant] *([-voice])

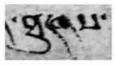
2.2.4.

The reversed grapheme ‹ʃ›, ‹k$^{\text{ʿ}}$› occurs in two cases only, while the grapheme ‹ཀ›, ‹t$^{\text{ʿ}}$› occurs five times, but only in the graphemic cluster ‹t$^{\text{ʿ}}$(u$_1$↓)›. According to Hill: "[…] in contrast to Written Tibetan, aspiration in Old Tibetan is subphonemic, the simplex syllable initial of a word being aspirated and a simplex syllable initial within a word unaspirated" (2010: 117§ 3.1).

17 See footnote 5 above.

Thus, strings such as:

25, 26  ‹t'(u↓)dཀtrཀ› [tuḍar], *tut* {-Ar};

14:  ‹t'(u↓)d[[n]]ཀṣཀ› [tuḍsa] *tut* {-sA};

versus 13:  ‹t'(u↓)d[[n]]ཀmཀṣཀ› [tuḍmasa] *tut* {mA} {-sA},

would at a minimum denote acoustic variants.

2.2.5. Vocalic system

In searching for a possible underlying adjacency constraint, let us observe the following distribution of occurrences:

2, 5, 6, 31, 34	‹ཨb(o↑)ཨཀ›, ཀབཀ·	*bu*, see Erdal & Schönig (1990)
14, 17, 18, 40	‹ཨb(o↑)ཀ›, ཀབ·	

A preliminary remark: Even if we discarded the hypothesis according to which the subscribed (antevocalic) grapheme ‹ཨ› is phonemically meaningless—and therefore randomly distributed—we would nevertheless be compelled to observe that, in the aforementioned case, the graphemic opposition ‹(o↑)ཨ› *versus* ‹(o↑)›, which might be generally intended to represent (encode for) the opposition /ō/ *vs* /o/ [± length],[18] appears to hold no phonological meaning as a semantic distinctive feature.

Let us now reconsider the opposition between the strings ‹ཨb(o↑)ཨཀ› and ‹ཨb(o↑)ཀ›.

14: ‹ཨb(o↑)ཀl(o↑)nཀ›
18: ‹ཨb(o↑)ཀl(i↑)ṣཀ›
40: ‹ཨb(o↑)ཀlØlཀ›
17: ‹ཨb(o↑)ཀlØཀruཀ›; we may assume that on ll. 5, 6, the very same string has been erroneously written as ‹ཨb(o↑)ཨཀlØཀruཀ›.

18 Róna-Tas estimated that "The opposition of the long and the short vowels was not identical with the etymological shortness and length, it depends on prosodic reasons" (1991: 105). On the other hand, Coblin thought that: "[…] in O(ld) T(ibetan) […] we also note that *'a-chung* was not normally or systematically used as a subscript to represent long vowels in transcriptions of Sanskrit […]" (2002: 170). The same orthographic device is detectable throughout the text of the so-called Mongolian monuments in ḥP'ags-pa script, see Erdal (1973: 271).

See also 44: ‹ཨཱལ(k$_{\downarrow}$)Ø(o$^{\uparrow}$)འལ(o$^{\uparrow}$)གའ›.

On the other hand:

2: ‹ཨb(o$^{\uparrow}$)ཨའ[[ཞ]]z(i$^{\uparrow}$)ŋའ›
31: ‹ཨb(o$^{\uparrow}$)ཨའb(e$^{\uparrow}$)ཞའ›
34: ‹ཨb(o$^{\uparrow}$)ཨའg(o$^{\uparrow}$)ŋའ›
See also 8: ‹ཨb(i$^{\uparrow}$)ཨའl(i$^{\uparrow}$)གའ›

The following adjacency constraint (5) seems to emerge:

If a certain syllable exhibits a vocalic onset, a possibly occurring vocalic coda in the preceding syllable turns out to be unmarked in respect to a certain feature marked by the grapheme ‹ཨ› [-feature]. On the contrary, if a certain syllable exhibits an (*n*-) consonant onset, a possibly occurring vocalic coda in the preceding syllable turns out to be marked in respect to the aforementioned feature [+feature].

(3) → $\sigma^{vc}_{n\text{-}m\text{-}1}$ (‹ཨb(o$^{\uparrow}$)འ›) / $\sigma^{vo}_{n\text{-}m}$ [= C_A] $‹ཨb(o$^{\uparrow}$)Øའ$
(4) → $\sigma^{vc}_{n\text{-}m\text{-}1}$ (‹ཨb(o$^{\uparrow}$)ཨའ›) / $\sigma^{co}_{n\text{-}m}$ [= C_B] $‹ཨb(o$^{\uparrow}$)ཨའ$

If we took into account the apparent violations of constraint (3), we would be compelled to admit that ⌐($C_A \cap C_B = Ø$); in other words, the opposition [-feature] *vs* [+feature] would seem to be neutralized in favor of [+feature].

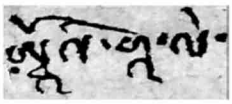
But what is such a feature?

2.2.5.1.

Consider the opposition between ‹ཨ(o$^{\uparrow}$)ལའ› ཧཱལ་ (12 occurrences) and ‹འ(o$^{\uparrow}$)ལའ› ཨཱལ་ (4 occurrences) *ol*, in light of Hill's view: "The letter *q*- [i.e., ‹འ›] has already been shown to represent vocalic onset. Old Tibetan *is unlikely* [italics mine] to use both *q*- and *v*- [i.e. ‹ཨ›] to represent vocalic onset, and indeed much evidence points to the pronunciation of a simple initial *v*- as [γ-]" (2005: 113). In fact, as already advocated by Hill (2009)—though partially retracted in Hill (2010: 115–116)—the grapheme ‹ཨ› in *non-sublinear* antevocalic position—more precisely, when occurring before a grapheme which encodes for a [+sonorant] segment, thus including sequences such as ‹ཨr› and ‹ཨŋ›—would represent [ɣ], or better the approximant [ɯ̯], as well as the simple glottal stop [ʔ].[19] Now let us analyze the following strings:

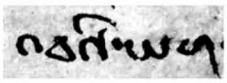
19 As was already recognized by Bernhard Karlgren regarding the ancient Chinese texts in ḥPʿags-pa transcriptions, see Ligeti: "Dans les transcriptions 'phags-pa du chinois, à l'initiale, le *'a-čuṅ* figure tout régulierement. Conformément à la restitution de M. B. Karlgren, il fallait attributer à ce signe la valeur phonétique du *glottal stop*" (1961: 229). On this topic, see Coblin (2007: 45–49), particularly: "In Karlgren's "Ancient Chinese" system, syllables written with the 'Phags-pa letter were supposed to have a glottal stop initial" (2007: 45); and "Since our task in the present study has been to arrive at a pho-

23: ‹ʔl(w↓)(ɜ↓)(o↑)ɜ(i↑)ʔg(ɜ↓)ʔl(e↑)[20]



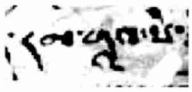
([o4ɯi1xa2le1], [o4ʔi1xa2le1]

22: ‹ɜbɜ(i↑)ʔygʔ›



[βa1ɯi1ya1χ]

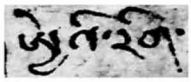
25: ‹dmʔg(ɜ↓)ɜʔṣ(e↑)ʔ›



[ḍmxa2ʔse1] *tamga*

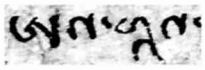
{+sI}

12: ‹l(y↓)(e↑)ɜ(i↑)ʔr(i↑)gʔ›,[21]



[e3ɯi1ri1χ] *äyrig*

7: ‹lɜʔg(ɜ↓)ɜʔ›:



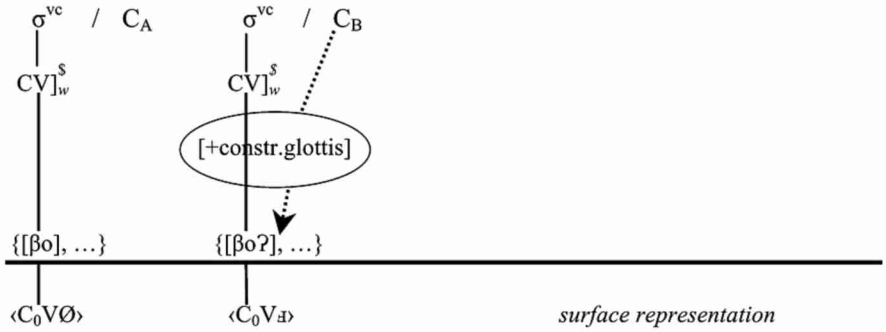
[a1ʔχa2ʔ] *ağ* {*-A*}

[CONV]

see ‹ybʔpɜrʔg(ɜ↓)g›,

[ya1ɸʔa1rγa2χ]

All the evidence appears to indicate that *non-sublinear* post-vocalic occurrences of the grapheme ‹ɜ› also encode for a phoneme denoting, among other things, the feature [+constr. glottis]. We may now infer the following rule (6):



As a further step, we may extend the adjacency constraint (5) by including the case in which $\sigma^{vc}_{n\text{-}m\text{-}1} = \sigma_n$, i.e. a final syllable marking a caesura, or end of an intonational phrase (whose punctuational closure is *šad*): 4: ‹ʔl(y↓)(o↑)lʔtʔ›, [ölta][22] *öl* {+dA} (Context A [C_A]); *versus* 2: ‹l(i↑)ʔč(i↑)nʔɜdɜʔ›, [iʧĩnða?] *için* {+dA} ($\sigma^{vc}_{n\text{-}m\text{-}1} = \sigma_n$).

netic interpretation rather than a strict phonemic one, we can consider the job done at this point and interpret [*a-chuṅ*] a [ñ]" (2007: 48).

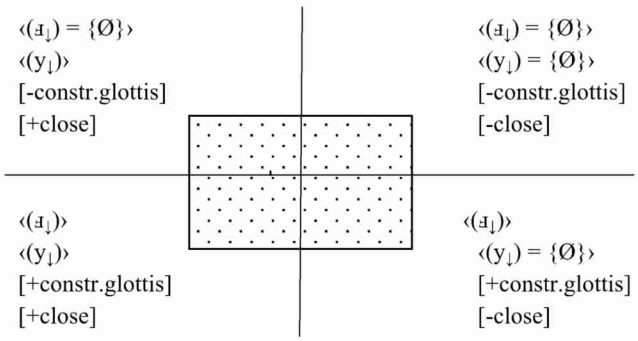
20 See *supra,* note 16.

21 Maue & Röhrborn (1984: 308): *'yeḫi-rig*; Moriyasu (1985: 7): *''ye'i rig.*

22 See note 9.

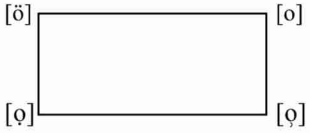
2.2.5.2.

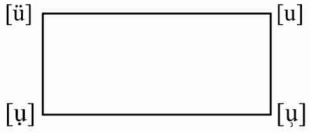
We have begun reasoning about a special case—the complementary distribution of $ɜbo$ and $ɜboɜ$—in which a σ^{vc} in fact coincides with a monosyllabic morpheme. Now we may generalize the local correlation between the feature [+constr.glottis] and the grapheme ‹ɜ›, by passing all its occurrences in post-vocalic (sequential and sub-linear) positions—not taking into account Sanskrit words or foreign proper names—through the sieve of the following diagram, which encompasses the co-occurrences of two graphemic oppositions: ‹(ɜ$_{\downarrow}$)› *versus* Ø, and ‹(y$_{\downarrow}$)› *versus* Ø:



As a result, we can put forward a preliminary sketch of the vowel system according to the observed hyperphonetic transcription denoted by PT 1292:

‹(o$^{\uparrow}$)›	imputed (asymptotic) phonetic value = [o]
‹(ɜ$_{\downarrow}$)(o$^{\uparrow}$)›	imputed (asymptotic) phonetic value = [o̟] ([ɔ])
‹(y$_{\downarrow}$)(o$^{\uparrow}$)›	imputed (asymptotic) phonetic value = [ö] ([ɵ])
‹(w$_{\downarrow}$)(ɜ$_{\downarrow}$)(o$^{\uparrow}$)›	imputed (asymptotic) phonetic value = [o̟] ([ɞ])



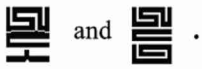


‹(u$_{\downarrow}$)ƨg›	= [u]	‹C$_0$Ø›	= [a]
‹(ɜ$_{\downarrow}$)(u$_{\downarrow}$)›	= [u̟]	‹C$_0$(ɜ$_{\downarrow}$)›	= [a̟] ([ɐ])
([ʊ])		‹(y$_{\downarrow}$)Ø›	= [ä] ([æ])
‹(y$_{\downarrow}$)(u$_{\downarrow}$)›	= [ü]	(probably) ‹lƨg›	= [a̟]:
([ʉ])		according to Maue & Röhrborn (1984: 308)	
‹(u$_{\downarrow}$)›	= [u̟]	the graphemic sequence 12: ‹lƨgz(u$_{\uparrow}$)gƨ› is to be regarded as a scribal error: "'a-[[g]]zug"!). In fact,	
‹(e$^{\uparrow}$)›	= [e]	‹lƨgz(u$_{\uparrow}$)gƨ› *äzüg* should be read as [a̟zu̟χ] versus	
‹(ɜ$_{\downarrow}$)(e$^{\uparrow}$)›	= [e̞]	14: ‹lƨzgƨ› [azaχ] *azak*.	

([ɛ])
‹(y$_{\downarrow}$)(e$^{\uparrow}$)› = [ë]
([ɜ])
‹(ɤ$_{\downarrow}$)(y$_{\downarrow}$)(e$^{\uparrow}$)› = [ę]
([ɔ])

‹(i$^{\uparrow}$)› = = [i]
‹(ɤ$_{\downarrow}$)(i$^{\uparrow}$)› = = [į]
‹(y$^{\downarrow}$)(i$^{\uparrow}$)›, (y$^{\downarrow}$)(i$^{\uparrow\rightarrow}$)› = = [ï]
([ʏ])
‹(i$^{\uparrow\rightarrow}$)› = = [į]
([ɨ])
as already observed by Joseph Hackin, see Miller (1966: 142).

We may notice that the graphemic strings ‹l(y$_{\downarrow}$)(o$^{\uparrow}$)› and ‹l(y$_{\downarrow}$)(u$^{\uparrow}$)› are sequentially homologous to the following Middle Mongolian strings, written in the (Tibetan-derived) ḥP'ags-pa script:[23]

 and .

2.3. Issues of an acoustic-hyperphonetic transcription

We are now able to determine some of the main factual issues of such an acoustic-hyperphonetic transcription. First, we can note that different gestures of an individual utterance segment may be transcribed differently, as a consequence of different acoustic "impressions". The comparison between different transcriptions of the very same acoustic segment turns out to be very insightful. Let us consider the example of the lexeme *almïr* 'greed'. It occurs three times:

I	8: ‹lꡁl(y$_{\downarrow}$)(i$^{\uparrow}$)mꡁm(i$^{\uparrow}$)rꡁ›	[alïmir]
Ii	38: ‹lꡁl(i$^{\uparrow}$)mꡁm(i$^{\uparrow}$)rꡁ›	[alimir]
Iii	13: ‹llꡁm(i$^{\uparrow}$)rꡁ›	[almir]

Whether or not the second occurrence might be considered as merely defective variant of the first one or not, it seems clear that the first and the third transcriptions denote a different *degree of bradysyllabication*: the epenthetic vowel [ɨ]—inserted after the sonorant liquid /l/ (in fact, the velarized allophone [ɬ])—emerges as an acoustically audible sound in consequence of a detached syllabication. This

23 As far as the ḥP'ags-pa script is concerned, notwithstanding the many recent studies dealing with it, see, among others, Coblin 2007: 1–67–the best introductory tool remains Nakano (1971: 7–58).

reasoning remains valid even if, according to Erdal, we regard the third occurrence as a secondary, "syncopated form".

As far as the second transcription is concerned, below we will immediately see that it has to be discarded since it is "defective", in the sense that the graphemic string is simply not well-formed according to the following RDMM constraint (regular disharmony-triggered morphemic marking: see Proverbio (2014b): the nucleus of syllable σ_n must be disharmonic with respect to the Head vowel—or the Head vowel must not be zero-marked:

	Head vowel	σ_n nucleus
38: ‹l꞉l(i$^{\uparrow}$)m꞉m(i$^{\uparrow}$)r꞉›	[i]	[i]

Instead, the following couple of transcriptions represent truly acoustic variants, perfectly normal in respect to the aforementioned RDMM constraint:

3, 29: ‹ld꞉g(l$_{\downarrow}$)(ɹ$_{\downarrow}$)g꞉› [adˌɬaχ]
32: ‹ld꞉g(l$_{\downarrow}$)(y$_{\downarrow}$)g꞉› [adˌɬäχ]

In some cases, we might believe ourselves to have detected truly erroneous transcriptions, such as: ‹l꞉r(e$^{\uparrow}$)g꞉›, [areχ] (Maue & Röhrborn: "‹e› lapsus stili?" (1984: 307, note c)) *versus* 14: ‹l꞉rg꞉› *arıg* (*arïγ*). Actually, the question is a bit more complicated than it appears. Though the lexeme *arïγ* may be seriated with *atlïγ* and *balïq*, as a consequence of the present acoustic-hyperphonetic approach, we observe in fact the following "acoustic variants" of the same disharmonic archiphoneme:

[areχ] [adˌɬaχ] [adˌɬäχ] [bˌaläχ][24]

24 Marcel Erdal suggested the idea that such "acoustic variants" as [bˌaläχ] or [adˌɬäχ] would represent an attempt to encode for a [-high], [-low], [-front], [-back] vowel ([ɔ]), according to a previous statement of his own (Erdal 2004: 92): "In contiguity with /g r l/, what we would expect to be /ï/ is quite often spelled with alef (e.g. amal 'spiritual peace', *tatag* 'taste', *bar-amlg* 'well to do', *yaran* 'tomorrow' *or +lag* for *+lXg*)". Such an observation is perfectly sound. But Erdal (2004: 58) already observed that "most of the writing systems used for writing Old Turkic do not have a special character for [ï] and generally use for it the same character as for [i]. There is, however, one alphabet […] with which a distinction does appear to be made". It is precisely the Tibetan alphabet: we have already shown (§2.2.5.2.) that the TP 1292 writing system distinguishes among [i], [i̱], [ï] and [i̱].

2.4. RDMM constraint

According to the aforementioned local RDMM constraint, disharmonic vowels appear either to be underspecified for the ATR feature in respect to the Head vowels, or to exhibit an ATR shift:

[-constr.glottis] [+close][ä]	[-constr.glottis] [a][-close]
[+constr.glottis][ạ] [+close]	[ạ][+constr.glottis] [-close]

In terms of an Optimality Theory constraint:

(5) IDENTITY INPUT-OUTPUT [-constr] ∧ IDENTITY INPUT-OUTPUT [-close]: corresponding input-output segments must have the same specification for the feature [-constr] OR for the feature [-close].

Moreover, either disharmonic vowels properly mark the rightward morphemic boundary of a PW (C_A), or they mark the opaqueness of a monosyllabic affix to rightward harmony (C_B):

C_A

		Head vowel [INPUT]	Disharmonic vowel [OUTPUT]
3, 29: ‹lʔdʔg(l$_{\downarrow}$)(ɜ$_{\downarrow}$)gʔ› *atlıg*	[aɖɬąχ]	[a]	[ą]
20: ‹lʔɜb(ɜ$_{\downarrow}$)gʔ› *abıg*	[aβąχ]		
27: ‹lnʔɜd(ɜ$_{\downarrow}$)gʔ› *andak*	[anðąχ]		
29: ‹lʔd(ɜ$_{\downarrow}$)gʔk(i$^{\uparrow}$)nʔ *adak* {+In}	[aɖą^{h}kin]		
25: ‹dmʔg(ɜ$_{\downarrow}$)ɜʔṣ(e$^{\uparrow}$)› *tamga* {+sI}	[ɖamχąʔse]		
26: ‹ybʔpɜrʔg(ɜ$_{\downarrow}$)g›	[yapʔarɣąχ]		
12: ‹zrʔṣ(ɜ$_{\downarrow}$)gʔ› *sarsig* (*sarsïγ*)	[zarsąχ]		
22: ‹bʔl(y$_{\downarrow}$)gʔ › *balık* (*balïq*)	[ɓaläχ]	[a]	[ä]
25: ‹yrʔl(y$_{\downarrow}$)gʔg(ɜ$_{\downarrow}$)(i$^{\uparrow}$)nʔ› *yarlıg* {+In}	[yarläχįn]		
42: ‹d(y$_{\downarrow}$)bʔp(r$_{\downarrow}$)ʔmṣ› *täprä* {-mAz}	[ɖäpramas]	[ä]	[a]
18: ‹d(y$_{\downarrow}$)ŋʔŋʔś(i$^{\uparrow\rightarrow}$)ʔṣ(i$^{\uparrow}$)ṣʔ› *täŋäš* {+I} {+sIz}	[ɖäŋaʃįsis]		
35: ‹g(ɜ$_{\downarrow}$)ʔčgʔ› *kačıg* (*qačïγ*)	[χąʧaχ]	[ą]	[a]
23: ‹gɜʔrgʔk(i$^{\uparrow}$)(n$_{\downarrow}$)ʔ› *karak* {+In},	[χąra^{h}kin]		

to be compared with 44:
‹d(i$^{\uparrow}$)nƨl(g$_{\downarrow}$)(i$^{\uparrow}$)gƨ› *tinlıg* {+Ig},
[d̯inlaχiχ] *versus* 19: ‹d(i$^{\uparrow}$)nƨl(ʁ$_{\downarrow}$)gƨ›
[g̣inlạχ].

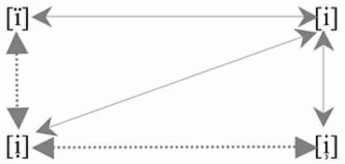
C_B

7: ‹lʁƨg(ʁ$_{\downarrow}$)ʁƨ› *ag* {-A} [conv]	[aʔχạʔ]	[a]	[ạ]
29: ‹ƨd(y$_{\downarrow}$)(e$^{\uparrow}$)nƨʁdʁƨrgƨ›	[g̣ënðạraχ]	[ạ]	[a]

Regarding the [+high; -low] vowel series, at least within the C_B context, we are compelled to consider a more restricted formulation of constraint (5), since it appears that:

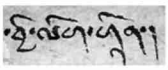
*INPUT-OUTPUT [+constr] ∧ * INPUT-OUTPUT [+close]

(6) corresponding input-output segments which have the same specification for the feature [+constr], OR for the feature [+close], are prohibited.



C_A

23: ‹ʁd(i$^{\uparrow}$)ƨʁd(y$_{\downarrow}$)(i$^{\uparrow\rightarrow}$)mƨg(l$_{\downarrow}$)(ʁ$_{\downarrow}$)gƨ› '*provided with a tiara*'	[ðiðïmɬạχ]	[i]	[ï]
40: ‹b(y$_{\downarrow}$)(i$^{\uparrow}$)ƨl(i$^{\uparrow}$)gƨg(ʁ$_{\downarrow}$)(i$^{\uparrow}$)nƨ›	[bï̯liχi̯n]	[ï]	[i]



40: ‹ʁb(y$_{\downarrow}$)(i$^{\uparrow}$)ƨl(i$^{\uparrow}$)gƨgʂ(i$^{\uparrow}$)ʂƨ›	[βïliχsis]	[ï]	[i]
‹l(y$_{\downarrow}$)(i$^{\uparrow\rightarrow}$)ƨk(i$^{\uparrow}$)nƨt(i$^{\uparrow}$)ƨ› 'ikinti', *versus* 16, 19: ‹l(i$^{\uparrow\rightarrow}$)ƨk(i$^{\uparrow}$)nƨt(i$^{\uparrow}$)›	[ïkinti]	[ï]	[i]

C_B

18: ‹d(y$_{\downarrow}$)ŋƨŋƨś(i$^{\uparrow\rightarrow}$)ƨʂ(i$^{\uparrow}$)ʂƨ› *täŋäš* {+I} {+sIz}	[d̯äŋaʃïsis]	[i̯]	[i]
10: ‹d(i$^{\uparrow\rightarrow}$)ƨl(i$^{\uparrow}$)nƨ› *til* {+In}	[d̯i̯lin]	[i̯]	[i]
40: ‹b(y$_{\downarrow}$)(i$^{\uparrow}$)ƨl(i$^{\uparrow}$)gƨg(ʁ$_{\downarrow}$)(i$^{\uparrow}$)nƨ› *bilig* {+In}	[bï̯liχi̯n]	[i]	[i̯]

Apparently, we encountered only one case that violates the RDMM constraint:
10: ‹g(ʁ$_{\downarrow}$)ƨm(ʁ$_{\downarrow}$)gƨ› [χạmạχ].

2.5. Alternating consonants

Consider the following paradigms

kačıg		35: ‹g(ʁ↓)ʔčgʔ›	[χaʈʃaχ]
andak		27: ‹lnʔʁd(ʁ↓)gʔ›	[anðaχ]
adak	+In	29: ‹lʔd(ʁ↓)gʔk(i↑)nʔ	[aˌdˌaʰkin]
karak	+In	23: ‹gʁʔrgʔk(i↑)(n↓)ʔ›	[χaˌraʰkin]
tinlıg		19: ‹d(i↑)nʔl(ʁ↓)gʔ›	[ˌdinlaˌχ]
	+Ig	44: ‹d(i↑)nʔl(g↓)(i↑)gʔ›,	[ˌdinlaχiˌχ]
bilig		36, 43: ‹b(y↓)(i↑)ʔl(i↑)gʔ›	[ˌbʲiliχ]
	+In	40: ‹b(y↓)(i↑)ʔl(i↑)gʔg(ʁ↓)(i↑)nʔ›	[ˌbʲiliχˌin]
yarlıg	+In	25: ‹yrʔl(y↓)gʔg(ʁ↓)(iˌ↑)nʔ›	[yarläχˌin]

To begin with, we might remind ourselves of a plain statement such as “in Turkish, laryngeal contrasts are either preserved or neutralized, in an *apparently unpredictable pattern* [italics mine]” (Gouskova 2012: 117).

If we were to describe such “alternating vs. nonalternating” behavior not “in terms of underlying representations […] but rather in terms of lexically specific constraint ranking” (Becker & Ketrez & Nevins 2011: 110), we would be compelled to adopt the conflicting ranking analysis exploited by Becker and Ketrez and Nevins:

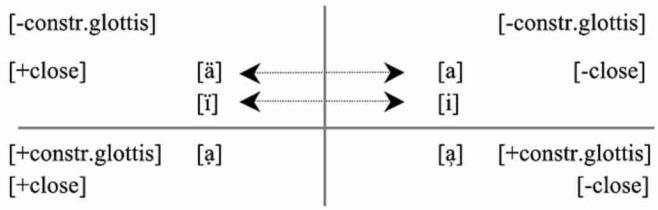
a. *VCV(change into stop) is a markedness constraint which requires a shift from [+continuant] to [stop].
b. IDENT[+continuant] is a faithfulness constraint which requires the preservation of feature [+continuant].

c. [aˌdˌaχ] {+In} → [aˌdˌaʰkin] requires *VCV(change into stop) >> IDENT[+cont]
d. [ˌbʲiliχ] {+In} → [ˌbʲiliχˌin] requires IDENT[+cont] >> *VCV (change into stop)

We would submit to the reader a slightly more in-depth analysis. In fact, what we actually observe may be summarized in the following terms:

Within the limited extent of the aforementioned lexical paradigms, consonant C_n (→ C_{n-1}), as a result of the affixation process, may shift from fricative to stop, or preserve the feature [+continuant].

Let us recall here a representation of the vocalic space divided in four quadrants:



Now, we may proceed to compare the sequence of vocalic features observed in the input (the lexical items prior to the affixation process) with the sequence observed in the output:

	Input		Output	
	V_1	V_2	V_1	V_2
[aḍạ^{h}kin]	[-constr.][-close]	[+constr.][-close]	[=]	[=]
[χạra^{h}kin]	[+constr.][-close]	[-constr.] [-close]	[=]	[=]
[ḍinlaχiχ]	[-constr.][-close]	[+constr.][-close]	=	[-constr.][-close]
[ḅïliχịn]	[-constr.][+close]	[-constr.][-close]	=	=
[yarläχịn]	[-constr.][-close]	[-constr.][+close]	[=]	[=]

In terms of an Optimality Theoretical analysis, we obtain the following scheme:

PRES[in-out] is a faithfulness constraint which requires the sequence of vocalic features to be preserved in the output (i.e.: after affixation).

ID[-close] is a markedness constraint which requires both V_1 and V_2 to exhibit feature [-close].

ID[-constr.] is a markedness constraint which requires both V_1 and V_2 to exhibit feature [-constr.].

SHIFT is a markedness constraint which requires C_n ($\rightarrow C_{n-1}$ in the output) to shift from [+ continuant] to [stop].

PRES[+cont] is a faithfulness constraint which requires that C_n ($\rightarrow C_{n-1}$ in the output) must preserve feature [+ continuant].

	PRES[in-out]	ID[-close]	ID[-constr.]	SCHIFT	PRES[+cont.]
[aḍạ^{h}kin]	*	*		*	
[χạra^{h}kin]	*	*		*	
[ḍinlaχiχ]	!	*			*
[ḅïliχịn]	*		*		*
[yarläχịn]	*		*		*

Roughly speaking: if ID[-close], then [χ] → [k]; if ID[-constr.], then [χ] → [χ].

For a variety of reasons, we must exclude the lexeme *tinlıg* ([d̥inlą̊χ]) from the aforementioned paradigms. Firstly, its output derives from a different affixation process. Secondly, it does not comply with PRES[in-out], as all the other lexical items do.

3. Conclusions

Let us summarize the previous discussions in the following assessment:

PT 1292 exhibits a fairly consistent (quasi-)hyperphonetic transcription system.

Within this system, the grapheme *a-chuṅ*, when occurring in pre-consonant position, discriminates between Puppel's feature domains ([+continuant], [+voice] *versus* [-continuant], [-voice]).

The Old Turkic dialect denoted by PT 1292 is characterized by a bidimensional phonological system of obstruents, which appears to be underspecified for the feature [voice]:

	[+ dorsal]	[+ labial]	[+coronal]
[+continuant]	/Ḫ/	/β/	/ð/
[-continuant]	/K/	/P/	/T/

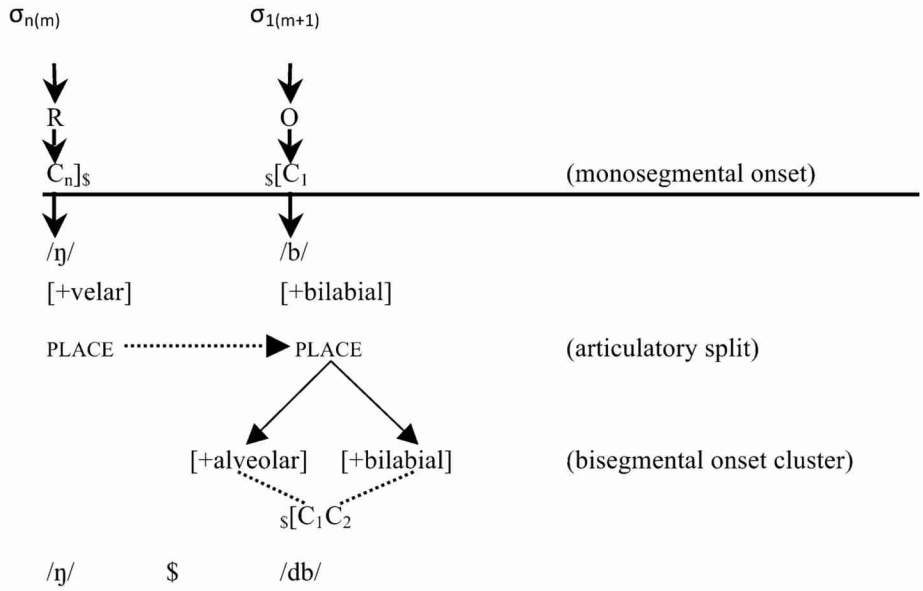
4. Excursus

On l. 23 of PT 1292, we observe the string ‹db›,[25] which occurs as a syllable-onset cluster. The comprehensive comment by Maue and Röhrborn is not so illuminating: "Daneben finden sich noch antekonsonantisches ‹d-› und postkonsonantisches ‹-r-›. Für ‹d-› gibt es 2 Belege: ‹dbis.kā-le.› und ‹dmyiṅ.›. Es sei daran erinnert, daß ein solches ‹d-› auch im Tib.—das Khams ausgenommen—in der Aussprache unberücksichtigt bleibt" (1984: 305). Róna-Tas made two different remarks which result in a contradiction:

Róna-Tas: "The *voiced* character is indicated in a very few cases with a prescribed *d-* [in fact, an anteconsonantic *d-* occurs only twice, i.e. in the two aforementioned cases] -as in *dbyis-ka-le = bič γali*") (1991: 101); *versus* "The curious transcription of *miŋ* 'thousand' as *dmyiṅ* is a Tibetan orthographical feature […] The transcription *dm-* points to a kind of *unvoiced m-*" (1991): 104).

We would propose, at least for the first occurrence of the string ‹db›, a different explanation. Such a phenomenon may be interpreted as a case of "insertion of an intermediate articulation", in order to perform a smoother contour-segment. For a variety of reasons (for example, problems in the discrimination between certain "non-native" sounds), the contiguity between "distant" gestures has been perceived as articulatorily difficult (see Lass (1984: 184) for a more abstract motivation):

25 Perfectly normal in Old Tibetan, at least until the 10th century; see Che (1990: 83–85).



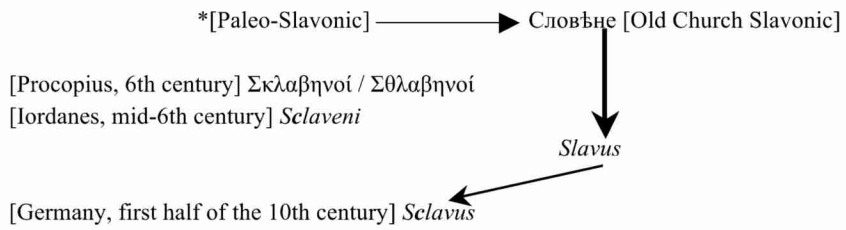
Now, such a peculiar outcome—a speech misperception originating from a segmental contiguity between a velar and a bilabial gesture (and visually represented by a sequence of two Tibetan graphemes)—is not only far from being an isolated case, but it also seems to extend its roots into the neurological foundations of language. See Kuhl: "One of the most compelling examples of the polymodal nature of speech representations is auditory-visual illusions that result when discrepant information is sent to two separate modalities. One such illusion occurs when auditory information for /b/ is combined with visual information for /g/ […] Perceivers report the phenomenal *impression of an* intermediate articulation (/da/ or /tha/) [the italics are mine] […] This is a very robust phenomenon […]" (1999: 109b–110a). Diachronic linguistics supplies us with many examples of such auditory illusions which arise from the perception of a non-native sound pattern:

Example of articulatory shift: Diachronic shifting of cluster [γł] → [wδ] (Tenišev (1984: 202); Johanson (2013: 179).

Old Turkic *tay* 'mountain' → Tatar, Kazakh, Bashkir, Karakalpak [taw].[26] In Bashkir, the plural form *[tawlar] has further developed into [tawδar].

Example of articulatory split: Diachronic shifting of cluster [sł] → [sdl] (Verlinden 1942):

26 As a result of a phonetic process well illustrated in Károly (2012: 7).



Old French esclave ('slave')

Modern Standard Italian schiavo ('slave') [sk^{y}a:vo] — slavo ('Slavonic') [zla:vo]

MiddleSpanish esdlavo

Modern Spanish esclavo
Modern Portuguese escravo

See *Modern Sicilian* [Agrigento][*z**d**la:vo], ('Slavonic'), to be compared with

5. Transliteration

I generally conform to the transliteration system detailed in Uray (1980: 106–107), with the following differences:

‹𑖽› = ‹·› the intersyllabic dot (*cheg*)
‹𑖿› ‹𑖼› (*šad*)
‹𑖼› = ‹𑖀› (*a-chen*)
‹𑖾› = ‹𑖁› (*a-chuṅ*)[27]
‹𑖼(𑖾$_{\downarrow}$)› = ‹𑖂› (*a-chen* + subscript *a-chuṅ*)
‹𑖼(w$_{\downarrow}$)› = ‹𑖃› (*a-chen* + subscript *wa-zur*)
‹𑖼(i$^{\uparrow}$)› = ‹𑖄› (*a-chen* + superscript *i*)
‹𑖼(i$^{\uparrow\rightarrow}$)› = ‹𑖅› the reversed *i-graph* (a-*chen* + superscript rightward i)
‹č› = ‹𑖇›

σ^{vo} = a syllable with vocalic onset
σ^{co} = a syllable with an (n-)consonant onset

27 See Róna-Tas (1991: 100–101).

σ^{vc} = a syllable with vocalic coda
σ^{cc} = a syllable with an (n-)consonant coda
C_A; C_B, … = Context A; Context B, etc.

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