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Edited by
Lars Johanson

in cooperation with
Hendrik Boeschoten, Bernt Brendemoen,
Éva Á. Csató, Peter B. Golden, Tooru Hayasi, László Károly,
Astrid Menz, Dmitrij M. Nasilov, Irina Nevskaya, Sumru A. Özsoy

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Manuscripts for publication, books for review, and all correspondence concerning editorial matters should be sent to Prof. Dr. Dr. h.c. Lars Johanson, Turkic Languages, Institute of Oriental Studies, University of Mainz, 55099 Mainz, Germany. The email address johanson@uni-mainz.de may also be used for communication.
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On some graphotactic rules exhibited by the Old Turkic *Irk Bitig* text: A case of incipient degraphemization?

Delio Vania Proverbio

Proverbio, Delio Vania 2014. On some graphotactic rules exhibited by the Old Turkic *Irk Bitig* text: A case of incipient degraphemization? *Turkic Languages* 18, 73–91.

The present contribution is aimed at describing some graphotactic rules which, within the *Irk Bitig*'s linguistic domain, govern the realization of the grapheme ‹A›. At first we will show that possible models based upon Talat Tekin's statement (the grapheme ‹A› represents exclusively *som*e hopefully non-random [-high][-round] [+low][±back] vowels) or upon Marcel Erdal's explanation (the opposition "grapheme ‹A› *versus* Ø" represents the opposition [+long] *versus* [-long]) can be discarded.
Eventually, we will observe that the phenomena focused by means of two different model-based analyses—a CVC model-based approach *versus* a CV model-based one—show (at least, the tendency to adopt) a *n-1* set-transcoding system by exhibiting an (incipient) degraphemization of ‹A›, which would become a macro-prosodic marker of the PW rightward boundary. In other words, the grapheme ‹A› (*versus* zero) seems to mark the rightward boundary of the PW by exhibiting a *stressed syllable nucleus*.

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. Introduction

The present contribution[1] is aimed at answering at least one question arising from even a cursory survey of what is to be considered an "open-air gold mine" for phonological research: the so-called Turkic *Book of Omens* (*Irk Bitig*),[2] a late (possibly,

1 I would like to express my earnest gratitude to Professor Éva Ágnes Csató Johanson for allowing me to present some issues of the present contribution in a seminary class held at the *Institutionen för lingvistik och filologi* of Uppsala Universitet (November 12, 2014). Furthermore, it is my pleasure to declare my gratitude to Professor Lars Johanson for sharing with me a chapter of a forthcoming publication of his dealing with "The East Old Turkic runiform script". In the following, I will refer to it as Johanson (2015) [forthcoming]. A special thanks to Nathan Light, to whom I am indebted for valuable observations and for improving my English.

2 Found at the site of the Mogao Caves, near Dunhuang, China, and now held at the British Library under the shelfmark Or. 8,218/161.

beginning of the 10th century)[3] but extensive record of an Old Turkic (sub)dialect, written in Runic script.[4] In order to preserve the consistency of the proposed synchronic description, we will proceed under the following, proactive premise: any synchronic statement or inferred rule discussed in the present paper is intended as exclusively referring to the linguistic domain of *Irk Bitig* (cf. Proverbio 2014: 138). Not limiting our concern solely to the *Irk Bitig*'s linguistic domain but considering a larger domain—such as a more or less substantial set of Runic texts—would inevitably result in a chaotic system. Here is the question:
What are the graphotactic (and/or phonological) constraints governing the realization of the archigrapheme {A}[5]—the grapheme ‹A› which, in the surface representation of /A/, alternates with ‹Ø›?

Or is the process in question simply not phonological? Thus, why do the two identical [-high][-round][+low] [±back] vowels occurring in the lexeme ‹k$_1$r$_1$A› 'kara', 'black', or in ‹t$_2$b$_2$A› 'deve', 'camel'[6] ($C_1V_1C_2V_2$) – I purposely avoid a more strict definition of these [+syll] segments—deserve a dissimilar surface graphic representation?[7]

At first glance, the orthographic behavior of the *Irk Bitig*'s scribe seems governed by a simple principle of maximized economy: instead of using a graphemic system based on a historically established set of four elements (‹A›, ‹İ›, ‹O›, ‹U›), he theoretically implemented a set of three elements + zero (‹Ø›, ‹İ›, ‹O›, ‹U›). In fact, the grapheme ‹A› *does* occur in some environments.

The question is if such behavior might receive a *formal* description.

Before entering the core of the present study, let us consider a simple phenomenon of alternation "vocalic grapheme *versus* Ø", which occurs as well within the *Irk Bitig* text: the case of the archigrapheme {İ}—the grapheme ‹İ› which, in the surface representation of /I/, alternates with ‹Ø›. We observe two distinct, and rather consistent paradigms: the series ‹b$_1$s$_1$l$_1$g$_1$› *bašlıg*, ‹d$_1$g$_1$r$_1$l$_1$k$_1$› *adgırlık versus* the series ‹r$_2$d$_2$ml$_2$İg$_2$› *ärdämlig*, ‹b$_2$g$_2$l$_2$İk$_2$› *bäglik*. From such a phenomenological distribu-

3 Hamilton (1975). Cf., among others, Doerfer (1995), who argues, in my opinion, conclusively, in favour of a relatively late datation.

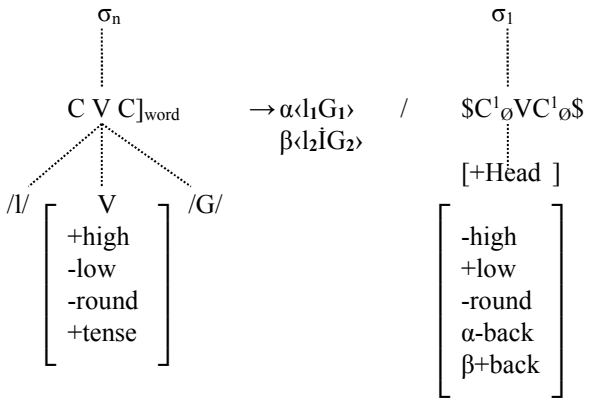
4 Regarding the conjecture according to which "eine Verwechslung von dunkle und helle Harmonie" would suggest a derivation of the *Irk Bitig*'s text from a *Vorlage* written in Uyghur script, cf. Erdal (1996: 67, note 1).

5 For the sake of simplicity and economy, throughout the present paper we will no longer maintain the formal distinction between the archigrapheme {A} and the grapheme ‹a›—which would consistently result in the strictly biunivocal transliteration of ‹ᛆ›; but since ‹ᛆ› represents the archiphoneme /A/ (here intended as the set of distinctive features shared by the minimal-pair phonemes /a/ and /ä/), in the following it will be transliterated as ‹A›.

6 For this latter see Clauson (1972: 447b–448a).

7 In proceeding further, we will find that the following question is a fairly more complicated one: why ‹n͡čA› 'onca', 'so, in that manner', is opposing to ‹n͡Tg$_1$›, Ancient Osmanlı *ândāq*, 'öyle', 'in that manner', or to ‹İg$_1$Č› 'ağaç', 'tree'?

tion, we may easily infer a simple statement of the environment, which may be summarized as follows: if the first nucleus contains the vowel /a/, i.e. if /a/ is the head vowel of the string, then the (possibly occurring) morpheme +lIG# will be written as ‹l₁G₁›; if the head vowel of the string is /ä/, the morpheme +lIG# will be written as ‹l₂İG₂›.[8]



2. A (C)VC model-based approach[9]

As already acknowledged since many years,[10] when analysing the surface graphic representation of a number of Runic texts, notably that of the *Irk Bitig*, we feel justified formulating the following graphotactic rule—provisionally hypothesizing a fictitious morphological syllabication:

(**1a**) Any [-high][-round][+low][±back] vowel which occurs in a closed syllable *with consonantal onset* ($C_1V_1C_2$) is deleted in the surface representation.[11]

8 Concerning the suffix *+lXg*, an anonymous reviewer remarks that it is important to note that this writing is specific to the Uyghur script, i.e. written without ‹I› in back environments and with ‹I› in front environments. This fact is most likely due to an influence of the Uyghur script on the orthography of the *Irk Bitig* text, the latter having been written within an Uyghur environment. According to this fact, the orthographic features of this text cannot be examined without considering the Uyghur script. Since the *Irk Bitig*'s scribe appears to have applied many orthographic rules of the Uyghur script, as a result this text differs greatly from the classical Runiform texts. The reviewer also remarks that it is a general rule that final vowels must be written with *scriptio plena*.

9 I am especially referring here to Szigetváry (1999).

10 Starting at least from Orkun (1938b: 9); Meyer (1965).

11 A compendious summary of graphotactic rules detectable in Runic texts is found in Róna-Tas (1991: 58 and foll).

The other vowels[12]—more precisely, all other occurrences of [+syll] segments—are (more or less) consistently (even if ambiguously) represented.

VC, CV	*vs*	CVC
‹Ak$_1$›, ‘ak’, ‘white’ (9r.5, 19l.8); ‹A**l$_1$A**› ‘alaca’, ‘motley, spotted’ (6l.2); ‹b$_1$Ut$_1$U**l$_1$A**mİs$_2$› #botola *-mIš#* (9l.4); ‹k$_1$Ul$_1$Un$_1$**l$_1$A**mİs$_2$›: #qulun *+lA -mIš#* (9r.6); ‹k$_1$Urk$_1$**mA**›: #qorq *-mA#* (7l.2); ‹b$_1$Uγ**r$_1$A**lk$_1$›: #buγra *+lXg#* (9l.7); ‹k$_2$**İČA**› ‘gece’, ‘night’ (6r.3, 22l.3); ‹Ü**zA**›.[postposition] (6l.6 and *passim*)		‹b$_1$r$_1$mİs$_2$›: ‘varmış’ (9l.2 and *passim*) ‹b$_2$g$_2$l$_2$İk$_2$› ‘being a *beğ*’ (10r.3-4) ‹k$_2$l$_2$mİs$_2$› ‘gelmiş’ (45l.5, 50l.9); ‹t$_2$Ü**k$_2$A**mzk$_2$n$_2$›: #tükä *-mAz -kAn#* (7l.4) ‹t$_1$p**l$_1$A**d$_1$Uk$_1$mİn$_2$›: #tap *+lA -dUK* +Xm +In# (7l.7): C$_0$AC$_0$ + C$_0$A ⋮ ⋮ C$_0$ØC$_0$ + C$_0$A

We may eventually notice that, in this respect, the *Irk Bitig*’s domain seems to staunchly differ from other Runic orthographic systems. Compare the following graphemic strings, which occur in the *Irk Bitig*, with strings representing the same syntagms in other manuscripts:

Irk Bitig	T II T 14:[13]
– ‹k$_2$n$_2$t$_2$Ü› ‘kendi’, ‘(one)self’ (56r.8) – ‹t$_2$g$_2$İr$_2$› ‘değ(-mak)’, ‘to reach’ #değ *+Ar#* (21r.3) – ‹y$_1$s$_1$l$_1$› ‘yeşil’, ‘green’ (44l.4) – ‹Umz› /umaz/ ‘u(-mak)’, ‘to be able’ #u *-mAz#* (55l.7) – Cp. the conditional converb suffix *+sAr#* in: ‹k$_2$l$_2$s$_2$r$_2$› ‘gel(-mak)’, ‘to come’ (48r.3)	– ‹k$_2$**A**n$_2$t$_2$Ü k$_2$**A**n$_2$t$_2$Ü› (l. 13) – ‹t$_2$**A**g$_2$İr$_2$› (l. 25) – ‹y$_1$**A**s$_2$İl$_1$› (ll. 26-27) – ‹Um**A**z› (ll. 24, 29) – *versus* ‹t$_1$Ut$_1$s$_1$**A**r› ‘tut(-mak)’, ‘to hold’ (l. 17)
	– U5 (= T.M. 342)[14]
– ‹s$_1$k$_1$İn$_1$mİs$_2$› ‘to think’ #saqın *-mXš#* (37r.1, 50l.3)	– ‹s$_1$**A**k$_1$İn$_1$t$_1$İ› #saqın *-DI#* (1b.1, 6)

Under thorough scrutiny, it appears that, as a result of the specific syllabic environment surrounding the [+syll] target segment, as it is defined in (**1a**) rule—a closed

12 Incidentally, we may observe that Talat Tekin explicitly called attention to some inharmonic features of the *Irk Bitig* vowel system: Tekin (1993: 5): “An important orthographic feature of the IB is the indication of the consonant /ş/ in the suffix *-miş* always with the front-vocal sign *s*. This may indicate that the suffix *-miş was inharmonic at least in the dialect of the author* [the *italics* are mine]”.

13 Cf. Thomsen (1910); Sertkaya (1985: 135–136); Yıldırım & Aydın & Alimov (2013: 454–455).

14 Cf. Le Coq (1909: 1056–1057); Sertkaya (1985: 135–136); Yıldırım & Aydın & Alimov (2013: 435).

syllable *with consonantal onset*—the aforementioned rule turns out to be unsatisfactory since it does not encompass occurrences such as ‹Akı›, ‹Arıtı›, ‹AlıA›. We will try to explain these forms within the frame of a more comprehensive graphotactic rule.

Thus, according to a new, less restricted formulation of (**1a**):

(**1b**) Any [-high][-round][+low][±back] vowel which occurs before a consonant coda is deleted in surface representation.

along with the following (provisionally formulated) Coda Condition: [15]

(**2a**) «In the first syllable of a lexeme, a vocalic coda is forbidden.»

An obligatory, unambiguous surface representation of the first syllable should be predictable. Instead, we observe an (apparent) conditioned violation of (**1b**) constraint. Such a conditioned violation appears to be triggered in every case in which an *etymologically* long /ā/[16] occurs in the first syllable.[17] This phenomenon has already been detected by, among others, Talat Tekin who, inverting the argument, observed that “In the Old Turkic ‘runic’ script […] a long *a* or *ā* occurring in initial or medial position can easily be determined: *if such a vowel is written* [the *italics* are mine] it should be a long one».[18]

15 Such an inferred Coda Condition is in accord with at least one historically-attested spelling syllabication: see the well-known fragmentary transcription of a Runic abecedary in Manichaean script (Rybatzki 2011: 212–213), preserved in a bilingual fragment, presently stored in the *Museum für indische Kunst*, Berlin, under the shelfmark MIK III 34b (T II T 20): Le Coq (1909: 1048–1052); Sertkaya (1985: 135–136); Yıldırım & Aydın & Alimov (2013: 456–457). Cf. Róna-Tas (1987: 8); Róna-Tas (1991: 57). Lastly, we have to take into account the insightful remarks made by Lars Johanson in Johanson (2015) [forthcoming]: “A set of characters [of the Turkic runiform script] designate consonants and potentially involved latent (‘inherent’, ‘implicit’) adjacent vowels […] The latent vowels normally *precede* the consonants, which is obvious from characters that go back to idiograms”. Cf. Avrutina (2011: 67-68).

16 Cf. Doerfer (1993: 31): “Beim Runetü. sind die Vokalquantitäten zu scheiden; so sind z.B. *ā* und *a* (etwa in dem minimal pair *bār* ‘es gibt’ und *bar* ‘geh’) genauso verschiedene Phoneme wie a und o”.

17 Cf. Meyer (1965: 188); Tekin (1968: 31); Tekin (1993: 4); Doerfer (1995: 328): “Das Material ist zu spärlich, als daß man eine Regel daraus ableiten könnte […] Immerhin spricht auch nichts gegen eine solche Vermutung”.

18 Tekin (1968: 151–152, note 1); Tekin (1995: 90–91). See also Erdal (1996: 68), who, as far as “die Nutzung der Pleneschreibung der A-rune im *Irq Bitig*” is concerned, agrees with Talat Tekin. In respect of the *Irk Bitig*’s vowel system, the statement provided by Clauson (1962: 82) is even more inadequate: “In closed Syllables long vowels were sometimes written […] this is particularly the case with *a:/e:* which, though invariably written

The following list of graphemic strings, which exhibit a conditioned violation of (**1b**)—here compared with a number of 'normally' constrained occurrences—is to be intended as exhaustive within the *Irk Bitig* text:[19]

(**1b**): $V_1C_0 \rightarrow \emptyset C_0 \; / \; \left[\begin{smallmatrix} V \\ \mu \end{smallmatrix} \right]$	$\neq$(**1b**): $V \rightarrow$ [- rule **1b**] $/ \; \left[\begin{smallmatrix} V \\ \mu\mu \end{smallmatrix} \right]$
‹Øb$_2$› 'ev', house' (12l.1). But. cp. ‹Øb$_1$#k$_1$A› 'av', 'hunt' (14r.2; 54r.3). ‹Ør$_2$› /är/ 'er', 'man' (9r.3, 10r.6, 11r.5, 14r.2, 25l.2, 27r.4, 28r.6, 31l.5, 31l.8, 41r.2, 45r.6, 47l.5). ‹Øt$_1$› /at/ 'at', 'horse' (17r.2, 18r.2, 19l.8, 43l.5, 55l.4). But cf. ‹Ør$_1$p›, ‹Ør$_1$mİs$_2$›, #ar-# 'to be tired' (18r.3, 31l.7). Cp. also ‹Øg$_1$pØn› 'to rise' (53l.3); ‹Øy$_1$k$_1$A›, ‹Øy$_1$› 'month' (51r.6, 57r.2).	‹Ak$_1$› /aq/ 'ak', 'white' (9r.5; 19l.8) ‹Al$_1$A› 'alaca', 'motley, spotted'[20] (6l.2) ‹Ar$_1$t$_1$› 'mountain pass' (10l.3) ‹Ar$_1$A› 'ara', 'between' (13r.4, 34r.2, 45l.1) ‹Az#t$_1$İ› 'az(-mak)', 'to diverge, go astray' (15l.7, 16r.1, 4) ‹At$_1$#Øn$_1$mİs$_2$› 'to be famous' (48r.4)

Tekin's and Erdal's assessments

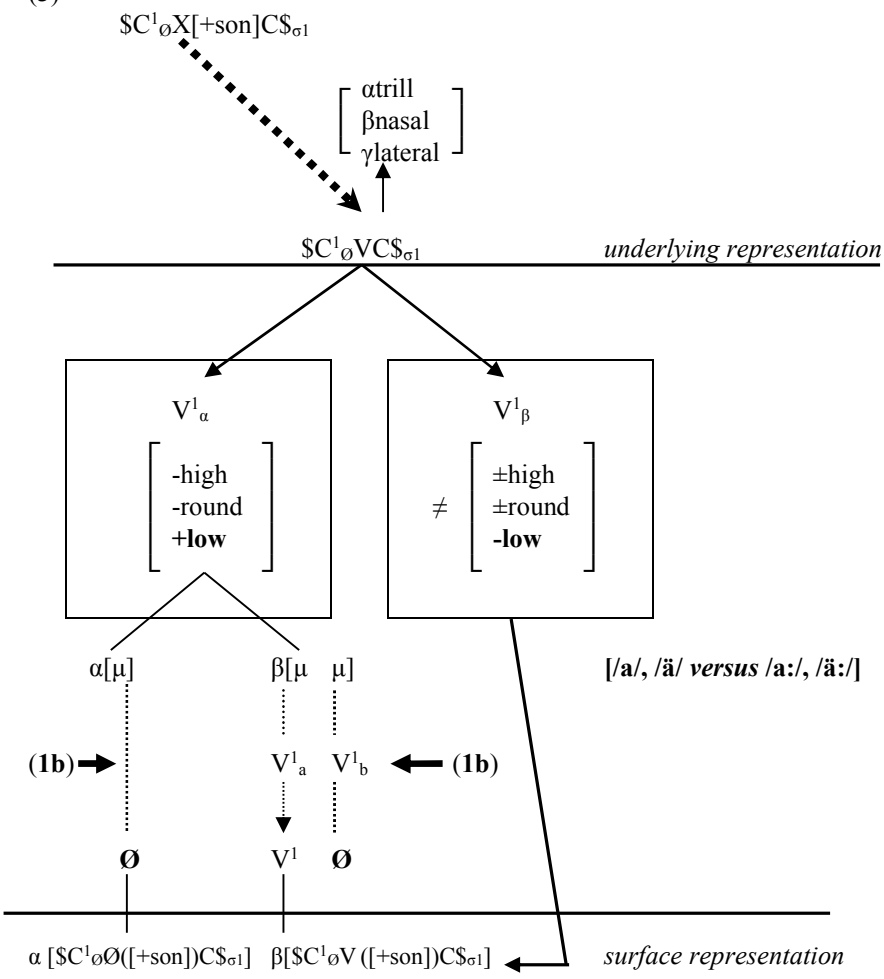
Here is a scheme of the graphotactic rule (written within the *SPE* theoretical framework; see Chomsky & Halle (1968)) which, summarizing Talat Tekin's statement, governs the deletion of ‹A› in the first syllable:

when representing a final long vowel, and usually, but not always, when representing an initial one, *or a long vowel in an open syllable*, seems never to be written to represent a long vowel in a closed syllable".

19 Cf. Tekin (2000: 25): "Doğu Turkistan yazmalarından Irk Bitig'de yazımda gösterilen sözbaşı uzun /ā/ ünlüleri için daha çok (*sic*) örnek vardır".

20 Erdal (1997: 73).

(**3**)



By the way, we may observe that a sort of graphic representation of long vowels as double-mora phonemes (‹AA›), somewhat indicative of a kind of speaker's consciousness, occurs, though sporadically, in some texts written in Uyghur script.[21]

21 According to Erdal (1996: 68), it deals with "die habituelle Doppelschreibung von Vokalen in uigurischer Schrift bei manchen Einsilbern". See also Eraslan (2012: 58): *Mükerrer ünlü yazılışı*: "Uygur yazımında *bazen* [the *italics* are mine] ünlülerin tekrar yazıldığı görülmektedir". For the string ‹AA›, cf. Tekin (1995: 92).

In basic terms: the deletion of ‹A› in the first syllable seems to be a process whose issues, appearing non-complementarily distributed (i.e. their opposition never being neutralized), turn out to denote a strong phonological pertinence.

Let us consider, within an Optimality theoretical framework, a minimal set of constraints:

> Ident: is a faithfulness constraint which requires a non-zero surface representation, i.e. it requires the preservation of correspondence between underlying and surface representation.
>
> Del: is a markedness constraint which requires the deletion of ‹A›, when occurring in σ_1, in surface representation.

$CV[-high, -round +low]C$ (σ_1)	Ident	Del
‹A›	!	
☞ Ø		*

$CV[-high, -round +low]C$ (σ_1)	Del	Ident
☞ ‹A›		*
Ø	!	

Marcel Erdal gave a different explanation of the appearance of ‹A› in the first syllable:

“In the runiform writing system, first syllable vowel length differences can be expressed only for /a/ and /ä/, since the presence of these sounds in first syllables is understood implicitly without recourse to the A character; other vowels have, in general, to be written out (although there are exceptions in some of the inscriptions). The explicit presence of this character can then in principle be used to mark /a:/ and /ä:/. This is done rather consistently for /a:/ in some mss. in runiform script, namely IrqB, Dispute and BlattRun: They have *a:gu* ‘poison’, *a:la* ‘motley’, *a:k* ‘white’, *a:rt* ‘mountain pass’, *a:ra* ‘between’, *a:š* ‘food’, *a:t* ‘name’, *a:z* ‘few’, *a:z-* ‘to stray’, *a:zu* ‘or’, *ba:-* ‘to bind’, *sa:kïn-* ‘to think’, *ta:š* ‘stone’, *ta:t-* ‘to taste’, *ya:š* ‘fresh grass’ and some derivates from these stems”.[22]

As far as the *Irk Bitig* is concerned, Erdal’s explanation turns out to be partly incorrect and partly unsatisfactory. Firstly, we ought to observe that not only ‹A$_1$t› ‘*ad*, name’ is opposed to ‹Øt$_1$› ‘*at*, horse’, whose orthography is consistent and regular, but also to ‹s$_1$Øk$_1$İn$_1$mİs$_2$› ‘to think’. Secondly, ‹Øb$_2$› ‘ev’, ‘house’ occurs along with ‹Øb$_1$› ‘av’, ‘hunt’. Furthermore, also the first syllable onset of syntagms such as ‹Øb$_1$#k$_1$A›, ‹Øg$_1$pØn›, ‹Ør$_1$mİs$_2$› and ‹Øy$_1$k$_1$A› should be etymologically and com-

22 Erdal (2004: 47). Cf. also Tekin (1968: 51), and Tekin (2000: 43–44).

paratively 'long'.[23] On the other hand, we may consider the string ‹y$_1$As$_1$› (18l.4) as a scribal error, an erratic infringement of the otherwise strictly observed graphotactic constraint (**1b**), as demonstrated by the twofold occurrence of the variant ‹y$_1$Øs$_1$› (18l.1, 46l.1). The same argument may be applied to ‹y$_1$Ay$_1$l$_1$g$_1$m› (48l.6) *versus* ‹y$_1$Øy$_1$l$_1$g$_1$m› (44l.05), ‹y$_1$Øy$_1$l$_1$g$_1$› (53l.2), ‹y$_1$Øy$_1$l$_1$y$_1$Ur$_1$› (53l.3, 55r.7).

Again, as far as the aforementioned statement by Talat Tekin is concerned,[24] it appears to disregard a further question: why should long *ā* not appear in surface representation when occurring in a CVC environment?

The unique and sole (apparent) exceptions to the (**2a**) condition are: ‹b$_1$A› 'to bind' (15r.6-7, .30l.4), ‹b$_1$Amİs$_1$› (15r.5), *versus* ‹b$_1$r$_1$› #ba -*r*# (19l.02); and ‹n$_2$A› 'what' (19r.3, 5), ‹n$_2$At$_2$g$_2$› #nä#:#täg# *versus* ‹n$_2$t$_2$g$_2$› (19r.9). In the following, we will endeavour to reduce such exceptions to a more general graphotactic rule.

2.1. Coda Conditions and syntagmatic boundaries

From having examined every occurrence of grapheme ‹A› within the *Irk Bitig* text, we can infer the following statement:

(**4**) In whatsoever position (from the second syllable onwards)[25] it may be triggered, the non-zero surface graphic representation of /A/ (i.e {A} represented by ‹A›) always coincides with (i.e. marks) the rightward boundary of a certain syntagmatic sequence—which, as we will attempt to argue in the following, we may assume to be the lexical root (+ first morpheme)—or the first morphemic stratum according to Ellen Kaisse's stratification model[26]—or the Phonological Word.

Furthermore, we may reformulate (**2a**) as follows:

(**2b**) «In every syllable of the assumed PW, from σ_1 to σ_{n-1}, a vocalic coda is forbidden. A violation of this Coda condition is possible only in (σ_n).

Any occurrence of a surface representation of archiphoneme /A/ throughout the *Irk Bitig* text should now be predictable by means of the following formula:

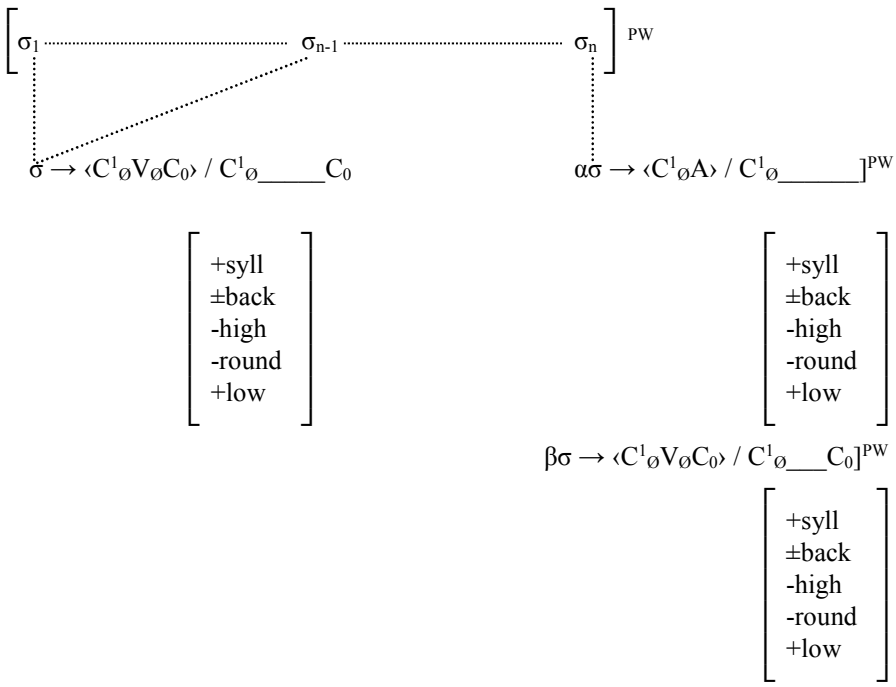
23 At least, according to Clauson (1972: 3a, 76b, 193ab, 265); cf. Tekin (1995: 100).

24 Cf. note 19.

25 This is tautologically obvious, since, according to (**2**), in the first syllable of a polysyllabic lexeme, the coda is always [+cont] → the surface representation of /A/ is always inhibited —except under the condition specified in (**3**).

26 Cf. Kaisse (1986: 237); Hahn (1991a: 91).

(**5**)



Regarding the predictive soundness of the afore-proposed formula, I shall provide here a first demonstration of it. Let us consider the two occurrences of the lexeme 'amga', 'wild goat': ‹Ømg$_1$k$_1$A› (42l.8: #amga# +dat) and ‹Ømg$_1$A› (43r.1). Now, in accordance with [σ_1 → ‹C^{1}øVøC$_0$› / C^{1}øAC$_0$], the surface representation of the first syllable is consistently ‹Øm› (ØC$_1$). Within the second occurrence, the next syllable turns out to be the last one: thus [σ_n → ‹C^{1}øA› / C^{1}øA]. Within the first occurrence, since the second syllable, by meeting the suffix *+kA#*, becomes the penultimate one, as a result of [σ_{n-1} → ‹C^{1}øVøC$_0$› / C^{1}øAC$_0$], its surface representation turns out to be ‹g$_1$Øk›; then follows a consistently structured last syllable: ‹A› (‹CøV›).

2.2. False morphological analysis

Now, let us refocus the fact that the observed syllabication does not result in morphological spelling, nor reflects a kind of 'etymological consciousness'—the mental

state of a scribe[27] who would have been somewhat conscious of the underlying morphological patterns.[28] A couple of remarks:

Consider some foreign loanwords which occur in the *Irk Bitig* lexicon: the graphemic sequence ‹mn^{1}İšt^{1}n^{1}t^{1}k^{1}İ› (where the lexeme ‹mn^{1}İšt^{1}n^{1}› comes from the Manichaean Parthian word *Mānistān*)[29] encodes for the syntagm #manistan *+dA +kI*# '(the one) who is in the monastery'. But, according to its orthography consistently analysed on the basis of (**3**), its syllabication turns out to be definitely non-morphological:

> $mØn^{1}$İs$_{1}$$t^{1}Øn^{1}$t^{1}Øk^{1}$İ$, *versu*s a hypothetically expected $mØn^{1}$İs$_{1}$$t^{1}Øn^{1}$t^{1}A$, #manistan *+dA*#.

Let us consider a couple of further occurrences: Un_{1}$A#$mØd$_{1}$$\widehat{wk}_{1}$$[30] *versus* $U#m$At_{1}$İn$. If the inferable syllabication of the first graphemic string appears clearly non-morphological, the morphemic sequence being: [#una]^{PW} *–mA +dOk*#, we may observe that even the second string denotes a non-morphological syllabication—since its morphemic sequence is #u *-mAtIn*#[31]—which eventually issues into a "transmorphemic" PW: [#u *–mA*#]^{PW}, engendered by a false morphological analysis: #-mA *+tIn*#.

Another case of a hypothetical "transmorphemic" PW is: k_{2}$Ør$_{2}$$Ak_{2}$Ü$. The graphemic string encoding for the monomorphemic lexeme «käräkü»[32] exhibits a surface graphic representation whose inferable syllabication is structurally identical to that of the syntagm #kara#:#kuš# '*karakuş*, (black) eagle': k_{1}$Ør$_{1}$$A#k_{1}$Uš$.

Additional examples of false morphological analysis: ‹k$_{2}$ÜŋAk$_{2}$#İ›, ‹k$_{2}$Ün$_{2}$Ak$_{2}$#İ› (49r.8, 49l.5); ‹t$_{2}$Üs$_{2}$n$_{2}$Ak$_{2}$#İŋA› (52l.5). In the aforementioned cases

27 Cf. Clauson (1970: 62).

28 Cf. Hahn (1991b: 21): "Since morpheme divisions do not necessarily correspond to the prescribed syllabic patterning, morpheme boundaries within a given sequence […] come to be ignored when syllabication takes place".

29 Yıldırım (2013: 143 no. 7).

30 ‹$\widehat{wk}_{1}$› = ‹wQ› according to Sertkaya (1985), ‹k$_{4}$› according to Róna Tas (1987); ‹$\widehat{wk}_{2}$› = ‹$\widehat{wK}$› according to Sertkaya (1985), ‹k$_{5}$› according to Róna Tas (1987). Cf. Erdal (1997: 69): "The labialised stop runes are not syllabic signs in the sense of the Semitic alphabets: They merely indicate that a rounded vowel is the kernel of the syllable they close […] These signs are used also when they occur as a second element in cluster, when, that is, there is a phoneme between them and the vowel: k$_{2}$ür$_{2}$wkl$_{2}$üg$_{2}$ (*ırk* 18 and 64) is *körklüg* 'beautiful'; it needs not be read as "*körüklüg*" […]". Cf. also Erdal (1997): 80. Why did the scribe write ‹k$_{2}$Ür$_{2}$$\widehat{wk}_{2}l_{2}$Üg$_{2}$› when he could well have simply written *‹k$_{2}$Ür$_{2}$k$_{2}$l$_{2}$Üg$_{2}$› (this form, by the way, never occurs in the *Irk Bitig*)? Thus, we observe ‹k$_{1}$Urk$_{1}$mA›, ‹k$_{1}$Urk$_{1}$mİs$_{2}$› *versus* ‹k$_{2}$Ür$_{2}$$\widehat{wk}_{2}l_{2}$Üg$_{2}$›.

31 Cf. Erdal (2004: 314).

32 /kere:kü/: Clauson (1972: 744).

the syllabication points to a false focusing of the morpheme *+kI#*,[33] while the lexemes are actually *könäk* and *tüşnäk*.

Another case of false morphological analysis is: ‹b$_1$UzAg$_1$Ul$_1$Øčİ› (35l.07,) *versus* the correct ‹b$_1$UzØγU› (36r.5). In the first case, the otherwise opaque verbal lexeme *buzagula*-(mak), from *buzagu*, '*buzağı*, calf'[34] appears to be wrongly syllabicated, apparently being syntagmatically analysed as [#buza]^{PW} + *-gUlX*(*k*) + *+čİ#*.

The proper name *İtačuk* seems to have been syllabicated as follows: $İt$_2$$A$čUk$, the last syllable having possibly been interpreted as an outward morpheme.

A case of false syllabication *not* supported by a hypothetically false morphological analysis is: $Ør$_1$$t$_1$At_1my$_1$İn$_1$$ (51r.07).

As far as the lexeme *busanç* 'grief, sorrow'[35] is concerned, its unique occurrence within the text of the *Irk Bitig* (‹b$_1$Us$_1$An$_1$n͡č#r$_1$A›, 45l.3-4) is an *hapax*. The fact that in both the aforementioned cases, the grapheme ‹A› occurs at the very beginning of a new line is a mere coincidence, without any graphotactic relevance.

2.3. Exceptions to the stated constraints

Now we may eventually reconsider the whole aforementioned exceptions to (**1b**), (**2a**) and (**2b**):[36]

‹Al$_1$A› (6l.2)	
‹Ar$_1$A› (13r.4, 34r.2, 45l.1)	
‹Ak$_1$›	All these exceptions to constraint (**1b**) are "neutralized" by the following counterexamples: ‹Øb$_1$›, ‹Øg$_1$›,‹Ør$_1$› and ‹Øy$_1$›: in consequence, they do not turn out to be marked as [- rule **1b**][- rule **2a**], but should be regarded as erratic, non-systemic violations of the aforementioned constraint, a set of graphemic strings which are
‹Ar$_1$t$_1$›	
‹At$_1$›	

33 Erdal (2004: 187–191).

34 Cf. Clauson (1972: 391a).

35 Cf. Clauson (1972: 374a). This lexeme appears to be connected with *busuş* 'grief, sorrow' (Clauson 1972: 374b).

36 Although we will endeavour to encompass all the exceptions to the proposed model, we must not forget that it "is to be expected that a margin of irregularity will persist in almost every aspect of the phonological description. Clearly, we must design our linguistic theory in such a way that the existence of exceptions does not prevent the systematic formulation of those regularities that remain"—Chomsky & Halle (1968: 172).

‹Az›	″stochastically not well-formed" in respect to *‹Øk$_1$›, *‹Ør$_1$t$_1$›, *‹Øt$_1$› and *‹Øz›.[37] From another point of view, we may say that these "neutralized" occurrences are sufficiently few to be filtered as Shannonian noise.
‹b$_1$A›, ‹b$_1$A#mİs$_1$›, ‹n$_2$A›, ‹n$_2$At$_2$g$_2$›	To these exceptions may be applied the following equation: $\sigma_1 = \sigma_n$. As far as the fourth occurrence is concerned, it is eventually "neutralized" by the counterexample ‹n$_2$t$_2$g$_2$›, even if, according to both (**1b**) and (**2b**), the graphemic string ‹n$_2$t$_2$g$_2$› turns out to be ambiguous, and would be syllabicated both as $än$täg$ (VCCVC$) and $nät$äg$ (CVCVC$). But see below, under the CV model-based interpretation.

2.4. Beyond classical explanations

To sum up: regrettably or not, possible models based upon Tekin's statement (the grapheme ‹A› represents exclusively *som*e hopefully non-random [-high][-round] [+low][±back] vowels) or upon Erdal's explanation (the opposition "grapheme ‹A› *versus* Ø" represents the opposition [+long] *versus* [-long], or [μμ] *versus* [μ]) should be discarded, and definitely, the syllable structure generated by (**1b**) and (**2b**) and schematized by (**5**) is to be considered as reasonably consistent with the observed linguistic evidence.

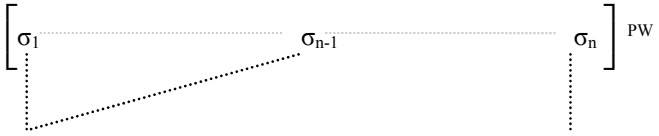
Let us go back to (**5**): considered as a primitive, axiomatic scheme, it simply illustrates the predictable surface representation of the syllable structure of a segment whose rightward boundary is possibly marked by ‹A›.
A different formulation of previous arguments:

(**6**) Let P(σ) denote the syllabic structure "$C^1_{Ø}V_1C_0$" and U be the set of the (σ_1, σ_2 … σ_{n-1}) syllables. Then: ∀(σ) P(σ).

From (**6**) we may obviously infer that each (σ_1, σ_2 … σ_{n-1}) is marked as [-syllabic coda]:

37 In other Runic domains which exhibit a sufficiently high orthographic consistency, such as the Kül Teğin inscription—cf., among others, Orkun (1938a: 22–96); Ölmez (2013: 77–126)—‹Øk$_1$›, ‹Ør$_1$t$_1$›, ‹Øt$_1$› ('horse') and ‹Øz› are the sole actually occurring forms. For *ad* 'name', besides the form ‹Øt$_1$›, we detect ‹At$_1$#İn$_2$›: Orkun (1938a: 33); Ölmez (2013: 21 (D 7)). By the way, we may observe that the vowel of the morpheme +*In*# appears definitely inharmonic.

(**7a**)

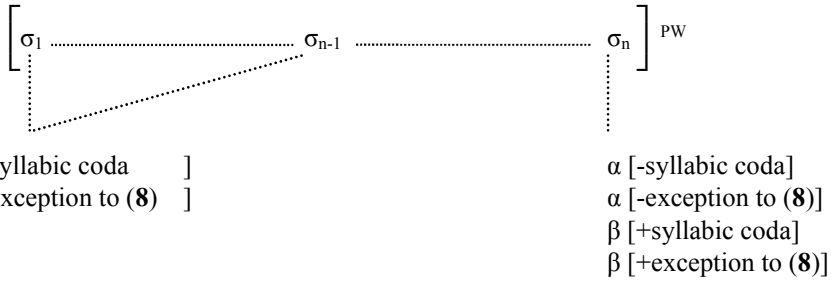


If we now enunciate the following generic local constraint:

(**8**) Any [-high][-round][+low][±back] is deleted in the surface representation.

we may say that, according to the axiomatic scheme (**5**), (σ_1, σ_2 … σ_{n-1}) are to be marked as normal in respect to constraint (**8**), while σ_n, under the strict condition of exhibiting the feature [+syllabic coda], is to be marked as exceptional in respect to (**8**):

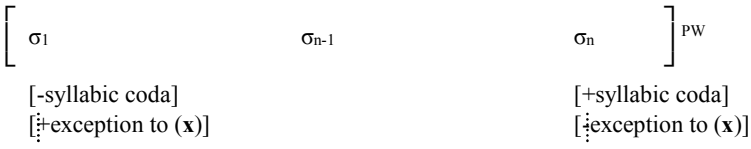
(**7b**)[38]



3. A CV model-based approach[39]

Let us consider, within the *Irk Bitig* text, the set of *all* the graphemic strings whose syllabication length is (σ)n+m – where σ_n is, by definition, the syllable in which oc-

38 As a mere theoretical possibility, we may as well hypothesize an *ad hoc* constraint (**x**) such as:



39 Cf. at least Denwood (2002); Harris & Gussmann (2002); Charette (2006).

curs a surface (non-zero) representation of /A/ (‹A›) and σ_{n+m} is the syntagm-final syllable (the syllable with an empty nucleus). Then, from this set, we will select the strings in which σ_{n+1}, like σ_n, exhibits a [±back -high-round +low] nuclear vowel.

O = Onset; N = Nucleus; ‹A› = graphemically ***non***-zero surface representation; ‹Ø› = graphemically zero surface representation in a non-empty Nucleus; |Ø| = empty Onset / Nucleus

σ_1		σ_{n-1}		σ_n		σ_{n+1}		σ_{n+2}		σ_{n+3}	
O	**N**	**O**	**N**	**O**	**N**	**O**	**N**	**O**	**N**	**O**	**N**
‹b$_1$›	‹U›			‹g$_1$r$_1$›	‹A›	‹l›	‹Ø›	‹k$_1$›	|Ø|		
‹t$_2$›	‹Ü›			‹k$_2$›	‹A›	‹m›	‹Ø›	‹zk$_2$›	‹Ø›	‹n$_2$›	|Ø|
|Ø|	‹U›			‹n$_1$›	‹A›	‹m›	‹Ø›	‹d$_1$›	‹Ø›	‹w͡k$_1$›	|Ø|
‹t$_1$›	‹Ø›	‹l$_1$	‹U›	‹l$_1$›	‹A›	‹p›	‹Ø›	‹n$_1$›	|Ø|		
|Ø|	‹U›	‹b$_2$k$_2$›	‹Ø›	‹w͡k$_2$l$_2$›	‹A›	‹p›	‹Ø›	‹n$_2$›	|Ø|		
‹y$_1$›	‹Ø›			‹r$_1$›	‹A›	‹g$_1$›	‹Ø›	‹y$_1$›	|Ø|		
				‹n$_2$›	‹A›	‹t$_2$›	‹Ø›	‹g$_2$›	|Ø|		

A question arises: why do $\sigma_{n+1,}$ and σ_n differ in surface representation, even if they appear to be structurally identical in underlying representation? This fact might be put in correlation with a possible *status* of rightward boundary of the syntagm [lexical root (+ first morpheme)] – which corresponds to the first morphemic stratum, according to Ellen Kaisse's stratification model[40] – held by $\sigma_{n.}$ In other words, the grapheme ‹A› (*versus* zero) seems to mark the rightward boundary of the PW by exhibiting a *stressed syllable nucleus.*

A possible remark: if we consider the comprehensive list of *all* the (well-formed) graphemic strings within the *Irk Bitig* text in which occurs the grapheme ‹A› – not counting the multiple identical sequences – it turns out that the majority of them exhibit the morphemes -mA#, #+rA#, +DA#, + (K)A#, i.e. "inflectional elements",[41] and then that the alternation ‹A› vs ‹Ø› simply marks the opposition [+derivational] vs [-derivational]. The aforementioned remark is easily disproved by the (relatively few) occurrences of "radical" ‹A›'*s*.

When we compare ‹b$_1$Amİs$_2$›, ‹Øb$_1$›, ‹n͡ČA› '*onca*, so, in that manner', ‹n͡Tg$_1$› '*andak*, so, in that manner', or to ‹İγČ› '*ağaç*, tree':

σ_{n-1}		σ_n		σ_{n+1}		σ_{n+2}	
O	**N**	**O**	**N**	**O**	**N**	**O**	**N**
		‹b$_1$›	‹A›	‹m›	‹İ›	‹s$_2$›	|Ø|

40 Cf. *supra*, note 26.
41 Cf. Pöchtrager (2013: 103).

		|Ø|	‹ø›	‹bɪ›	|Ø|		
|Ø|	‹ø›	‹n͡Č›	‹A›				
|Ø|	‹ø›	‹n͡T›	‹ø›	‹gɪ›	|Ø|		
|Ø|	‹İ›	‹gɪ›	‹ø›	‹Č›	|Ø|		

we find that a graphemically zero surface representation in σ_n, *always* corresponds in σ_{n+1} to an empty nucleus,[42] which, on the contrary, never appears after an occurrence of ‹A› in σ_n. Therefore, the opposition ‹A› *vs* ‹Ø› marks a syntagmatic boundary in complementary environment.

σ_n		σ_{n+1}	
O	N	O	N
non-empty	‹A›		
non-empty	‹A›	non-empty	non-empty
non-empty	‹Ø›	non-empty	empty
empty	‹Ø›	non-empty	empty

4. Conclusions

Let us finally come back to our friend, the anonymous Turkic copyist of the *Irk Bitig* manuscript: it seems (at least, it appears not entirely discardable) that the possible implementation of a set of *n-1* vowel graphemes + zero, *versus* a theoretically available set of *n* graphemes, would not have been unfamiliar to him.

Consider the same statement, enunciated in a bit more formal way: a set of *n-1* vowel graphemes + *zero*, once provided with a set of graphotactic constraints (rules) which disambiguate a zero segment-representation (‹Ø›) from an empty segment (|Ø|), could have encoded for a set of *n* vocalic segments.

Within contiguous Turkic writing systems, such as the Turkic Brāhmī one (or even the Tibetan script), in which "all consonantal letters have the inherent *a* if not otherwise indicated",[43] the *n-1* graphemic set is the normal environment of the transcoding output.

Now let us introduce a (crucially) simplified transcoding model by enunciating the following descriptive statement:

42 Cf. Charette (2006: 28): "A Turkish word is well-formed if it ends in a left-headed foot which has an empty V as its dependent".

43 Róna-Tas (1991: 93).

(**9**) Each graphic segment ‹$C^n_{Ø}$›, if *not* followed by a segment ‹V›—in any syllable, from σ_1 to $\sigma_{n\,(+\,m)\,-1}$, it may occur—turns out to be the transcoding output of the phonic segment /$C^n_{Ø}$A/. When occurring in a $\sigma_{n\,(+m)}$ syllable, it stands for /C|Ø|/.

As a result, within the frame of such a transcoding system, the grapheme ‹A› is to be regarded as simply 'extra-systemic'.

Precisely that kind of transcoding system turns out to be strictly implemented (without any positional restriction) in some Yenisey inscriptions, and particularly in the second Talas inscription.[44] Within these texts "the A (𐰀) sign is used as a [mere] *separating* sign".[45] More precisely, the graphotactic rule governing its occurrence seems to pertain to the suprasegmental level: it deals at least with the macro-prosody of a certain syntagm.

As far as the more complex (and only fairly consistent) linguistic domain of the *Irk Bitig* is concerned, we may say that the phenomena highlighted in the two different model-based analyses—namely the opposition [±exception to (**8**)] within σ_n (CVC model-based approach); or the opposition ‹A› *versus* ‹Ø› in a σ_n's non-empty nucleus (CV model-based approach)—show (at least, the tendency to adopt) a *n-1* set-transcoding system, by exhibiting an (incipient) degraphemization of ‹A›, which would become a macro-prosodic marker of the PW rightward boundary.

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44 For Talas-2: Yıldırım & Aydın & Alimov (2013: 285–287).

45 Cf. Alimov et al. (2010: 190–191).

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