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Reviews

Jan-Olof Svantesson, Anna Tsendina, Anastasia Karlsson and Vivan Franzén (2005). *The phonology of Mongolian*. (The Phonology of the World's Languages.) Oxford: Oxford University Press. Pp. xix + 314.

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This book describes the phonology of Halh (Khalkha) Mongolian in detail, and provides an overview of ten other modern Mongolic languages (Buriad, Kamnigan, Oirad/Kalmuck, Dagur, Shira Yugur, Monguor, Santa, Bonan, Kangjia and Moghol). Its empirical focus is on vowel harmony, epenthesis and syllabification, laryngeal oppositions, reduplication, loanword phonology, historical vowel shifts and consonantal phonemicisation. The book largely takes a historical-comparative approach, and is presented within the framework of CV Phonology (Clements & Keyser 1983), with a highly articulatorily based approach to features (*à la* Wood 1979, e.g. [velar], [pharyngeal], [palatal] as features corresponding to action of the styloglossus, hyoglossus and genoglossus muscles respectively). The authors (henceforth STKF) form a team of experts on historical phonology, Old Mongolic texts, and prosody and intonation; the second author is a native speaker of Mongolian.

In this review I will provide an overview of the phonology of Mongolian, based on the book, and attempt to make clear the importance of the phenomena for phonological typology and phonological theory. What follows will be a description of Halh, the standard dialect of Ulaanbaatar, unless otherwise noted.[1]

1 Consonants

STKF claim that laryngeal oppositions within obstruents in Halh are between values of [±spread glottis] rather than [±voice].[2] They endorse Ramstedt's (1903) observations that the fortis series is postaspirated in word-initial position and preaspirated elsewhere. The lenis series are 'ordinary voiceless unaspirated stops, similar to those found in Russian or French' (p. 12). The writing system for Mongolian used in the Republic of Mongolia is the Cyrillic alphabet, and the obstruents are written with the voiceless and voiced symbols in Cyrillic, e.g. <т> denotes [tʰ] and <д> denotes [t]. Like Icelandic (Thráinsson 1978), vowels preceding preaspirated stops are partially devoiced (p. 14).

Aspirated consonants do not undergo passive voicing when vowel initial suffixes are added, e.g. [xɔtʰ] 'town', [xɔtʰɔs] 'town-ABL'. (In this way they are

[1] I follow STKF in all spelling and transliteration conventions, except for substituting [ts ʧ ʃ] for their [c č š].

[2] Buriad and Kalmuck <д>, however, are [+voice] [d] (p. 17).

like the fortis stops of Turkish, in the analyses of Avery 1996 and Petrova *et al.* 2006). STKF claim that /s/ is [+spread glottis] (p. 18; cf. Iverson & Salmons 1995, Vaux 1998). The fricatives [s ʃ] are postaspirated (as is clearly shown in spectrograms on p. 19).

Velar [ŋ x] *vs.* uvular [ɴ χ] are in complementary distribution, according to the [±Advanced Tongue Root] ([±ATR]) harmony value of the word as a whole, e.g. [ʧooŋ] 'few' *vs.* [ɔɴ] 'year' (pp. 28–29). Velar /g/, however, may occur in morpheme-final position in pharyngeal (e.g. [−ATR] harmonic) words, e.g. [pag-as] 'team-ABL' (*vs.* [paɢ-as] 'small-ABL'). Halh has the lateral fricative /ɮ/, but no plain /l/, and voiced /g gʲ ɢ/, but no /k kʲ q/. The glide /w/ developed from Old Mongolian **p* postvocalically, hence *w* is mostly not found initially (though in loanwords e.g. *waar* 'tile') from Chinese) and *p* is mostly only found initially and after [m w ɮ] (p. 29). They can contrast underlyingly /aɮp/ 'service' *vs.* /aɮ-w/ 'to kill-PAST', but on the surface the latter will undergo epenthesis, becoming [aɮəw]. A series of palatalised consonants (/pʲʰ tʲʰ pʲ tʲ gʲ xʲ mʲ nʲ lʲ rʲ wʲ/) derive historically from a following **i* (p. 28), to be discussed further below.

2 Vowels

Halh contrasts long and short vowels (though there is no short /e/, and short /o/ may be closer to [ɵ]; p. 4). According to STKF, long vowels are found only in initial syllables (p. 22). Although STKF do not commit themselves as to where main word stress is ('our conclusion is that word stress is not phonologically relevant in Mongolian' (p. 96)), one might infer that since the long–short vowel contrast is only in the initial syllable, this is where stress is located.[3]

In non-initial syllables the distinction is not between long and short, but rather between full and reduced vowels. While full vowels in non-initial syllables derive historically from long vowels, in Modern Halh they are equal in duration to initial short vowels (p. 3). Thus, even though they are written as doubled vowels in Cyrillic (e.g. *миний* 'my'), they are represented as short by STKF: [mini] (p. 25). Reduced vowels in non-initial syllables are centralised variants of the vowel in the preceding syllable (p. 6), unless preceded by an alveopalatal sibilant or a palatalised consonant, in which case they are [i]-like (p. 23). STKF claim that these reduced vowels are inserted epenthetically (ch. 6), and thus Cyrillic *ажил* [aʧiɮ] 'work' is underlyingly /aʧɮ/ (p. 25).[4]

(1) *Vowel inventory of Halh*

i	u
	ʊ
e	o
	ɔ
	a

[3] This is indeed 'the opinion of almost all native Mongolian scholars' (p. 96). The stress rule assumed for Halh by Hayes (1980) (based on Street (1963), and most subsequent work in generative phonology, is that stress falls on the first long vowel (e.g. long initial vowel or full non-initial vowel), otherwise on the first syllable.

[4] Kalmuck uses Cyrillic in a way similar to STKF's analysis for Halh: epenthetic vowels are not written, and non-initial long vowels are written with a single rather than a double letter (p. 40); compare Halh *улаан баатар* [ʊɮaŋ paːʰtar] 'red hero' with Kalmuck *улан баатр* [ulan baːtʰr̩].

The most important division in the vowel system is between [+ATR] [u e o], [−ATR] [ʊ ɔ a] and neutral [i]. (STKF use privative [pharyngeal], but I will use [±ATR] here.) The Halh [+ATR] vowels have a higher F1 and lower F2 than their [−ATR] counterparts, resulting from a wider pharynx (based on x-ray evidence in Cenggeltei & Sinedke 1959), which leads to an articulatory basis similar to what Lindau (1979) proposes for such contrasts. This division between the vowel sets is relevant for vowel harmony, and also affects the distribution of velar *vs.* uvular consonants, as well as palatalised variants of many of the consonants.

The basics of [±ATR] harmony are shown below, with the causative suffix.

(2)	it-uɮ	'eat-CAUS'	ʊʊrʃ-ʊɮ	'evaporate-CAUS'
	uts-uɮ	'see-CAUS'	saat^{h}-ʊɮ	'be delayed-CAUS'
	xeeɮ-uɮ	'decorate-CAUS'	ɔr-ʊɮ	'enter-CAUS'
	og-uɮ	'give-CAUS'		

Rounding harmony occurs only among the [−high] vowels. It is shown here for the past tense suffix, which is underlyingly [−high].

(3)	it-ɮe	'eat-PAST'	ʊʊrʃ-ɮa	'evaporate-PAST'
	uts-ɮe	'see-PAST'	saat^{h}-ɮa	'be delayed-PAST'
	xeeɮ-ɮe	'decorate-PAST'	ɔr-ɮɔ	'enter-PAST'
	og-ɮo	'give-PAST'		

Interestingly, high [+round] vowels block harmony from occurring, even when a [+round, −high] vowel is further to their left.[5]

(4)	og-uɮ-ɮe	'give-CAUSE-PAST'
	ɔr-ʊɮ-ɮa	'enter-CAUSE-PAST'

However, the vowel /i/ is transparent to both ATR and rounding harmony, as can be seen in the following examples.

(5)	t^{h}ax^{j}i-ɮa	'to be bent-PAST'
	ɢʊwʧ^{h}i-ɮa	'to be hollow-PAST'
	ɔɮ^{j}i-ɮɔ	'squint-PAST'

In addition, with the diphthongs /ai ɔi ʊi ui/, only the nucleus is relevant for vowel harmony, confirming this as another case of /i/-transparency, since this /i/ is demonstrably a vowel and not a glide (see below). However, STKF claim on p. 9 that the realisation of /i/ is different after [+ATR] *vs.* [−ATR] words in their F1 and F2 values.[6] Stems with only /i/, or with /i/ in the initial syllable, are [+ATR] (p. 192).

[5] STKF (p. 54) find this 'difficult to explain'. This property of Mongolian's rounding harmony, called 'defective intervention' in the analysis of Nevins (in press: ch. 4) – where a full analysis of Halh harmony based on STKF's description is provided – is that harmony is initiated as a search for [+round] by the needy vowel, with a copying condition that a valid feature source must be of the *same height* (much like Yawelmani; Kuroda 1967); otherwise the search results in failure, and default [−round] is provided.

[6] However, as Välimaa-Blum (1999), Gordon (1999) and Kim (2005) point out for Finnish, transparent vowels that undergo gradient coarticulation may differ from

Velar [g] and uvular [ɢ] are epenthesised before vowel-initial suffixes (p. 55), depending on the harmony value of the word. STKF claim that dorsal is the unmarked place for consonantal epenthesis (which raises interesting issues; cf. Blevins 2008), perhaps since it is already part of the feature specification of all vowels (cf. Howe 2004).

(6)	xuu	'boy'	cf.	ar	'back'
	xuu-ger	'boy-INSTR'		ar-ar	'back-INSTR'
	xuu-giŋ	'boy-GEN'		ar-iŋ	'back-GEN'
	sana	'thought'			
	sana-ɢar	'thought-INSTR'			
	sana-gin	'thought-GEN'			

Interestingly, however, when the vowel immediately following the dorsal is /i/, the consonant has a velar realisation, even in [−ATR] harmonic words (p. 55): cf. [sana-gin] in (6). This suggests that the [g/ɢ] alternation is determined by the following vowel, and that [i] is in fact [+ATR], even though it is transparent for harmony.[7]

3 Syllabification

Halh disallows complex onsets, but allows superheavy syllables, such as [nuurstʃʰ] 'coalman', [ʊʊrstʰ.ɧa] 'to be angry-TERM-REFL' (p. 64). The consonants /ŋ ɧ w ɾ/ are not allowed word-initially (p. 26), and /ŋ/ is not allowed syllable-initially, changing to [n] in case of resyllabification (p. 63).

Halh has a bimoraic minimal word requirement (p. 78), satisfied either by coda consonants or long vowels. It allows two-consonant codas that obey a sonority decrease, and has place assimilation of nasals in codas, except for [m], which can occur before coronal stops. It allows three-consonant codas where the first element is either a sonorant or /g/ (but not /ɢ/), the second is a fricative and the third a coronal stop, such as [tʃimstʰ] 'having fruit', [ʃarxtʃʰ] 'coroner', [tsigstʃʰ] 'warbler' (p. 68).

Epenthetic vowels are inserted 'as far to the left as possible' (p. 69), e.g. [ɢʊ.təmtʃ] 'street', not *[ɢʊt.mətʃ], from /ɢʊtmtʃ/, [ɢʊ.rənts] 'emery', not *[ɢʊr.nəts], from /ɢʊrnts/.[8] Other examples where the last two consonants cannot form a coda include [xit.məŋ] 'pear', [tʃʰotʰ.gər] 'devil' and [gur.wəɧ] 'lizard'. Schwa–zero alternations provide additional evidence for an epenthesis analysis. The nine successively morphologically derived words in (7) show this (p. 71); fleeting schwas are underlined.

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categorically changing harmonic vowels, which show insensitivity to speech rate, clear bimodal distribution of harmonic variants' formant values and consistent effects throughout the duration of the vowel. STKF do not conduct any of these comparisons, and treat /i/ as phonologically transparent throughout the book.

[7] A similar case of a harmonically transparent vowel conditioning local consonantal allophony is described in Blumenfeld & Toivonen (2009) for Votic.

[8] The latter example shows that Syllable Contact Law cannot determine the placement of epenthesis (as opposed to in Chaha, where it does; Rose 2000) and that a directional algorithm for syllabification such as Itô (1989)'s is preferable for Halh.

(7)	uiɮ	'action'
	uiɮ.ʧʰə̱ɮ	'to serve'
	uiɮʧʰ.ɮuɮ	'to cause to serve'
	uiɮʧʰ.ɮu.ɮəgʧʰ	'customer'
	uiɮʧʰ.ɮu.ɮəg.ʧʰə̱t	'customers'
	uiɮʧʰ.ɮu.ɮəgʧʰ.tiŋ	'of the customers'
	uiɮʧʰ.ɮu.ɮəgʧʰ.tiŋx	'customers' belongings'
	uiɮʧʰ.ɮu.ɮəgʧʰ.tiŋ.xə̱t	'customers' belongings-DAT'
	uiɮʧʰ.ɮu.ɮəgʧʰ.tiŋx.te	'customers' belongings-DAT-REFL'

In the examples above, since /gʧʰ/ can never form a complex onset, the schwa before it stays, but other schwas are deleted as soon as coda consonants become resyllabified as onsets.

The apparent complete predictability of schwa placement is challenged by minimal pairs such as [tso.wəɮ.ɮo] 'advise-DIR PAST' *vs.* [tsow.ɮə.ɮo] 'his advice'. STKF propose that their morphological structure is responsible for the difference in syllabification (p. 73), with a cyclic constraint prohibiting schwa deletion from already-formed stems (cf. Bobaljik 1997 for related discussion). Thus, [tso.wəɮ] is syllabified as a verb, with the direct past added, forming [tso.wəɮ.ɮo], with no loss of the schwa from the verbal stem. By contrast, [tso.wəɮ] becomes a noun due to the nominalising suffix [-ɮ], causing schwa deletion and insertion at the end: [tsow.ɮəɮ]. Subsequent addition of the possessive cannot induce deletion of the schwa from the nominal stem: [tsow.ɮə.ɮo].

Halh differentiates /i/ and the palatal glide /j/ in underlying representations (cf. Levi 2004). These are distinguished in orthography as glide-final *vs.* diphthongal rhymes (cf. *ая* [aj] *vs.* *аӣ* [ai] below), and according to STKF, offglide sequences have steeper formant movements than *i*-diphthongs (p. 11). For example, the glide-final words in (8a) differ from the ones in (8b) in that the latter trigger hiatus-breaking [G]-epenthesis with the instrumental suffix *-Er* (p. 77).

(8) a.	aj	'melody'	aj-ar	b.	ai	'category'	ai-Gar
	Gɔj	'elegant'	Gɔj-ɔr		ɔi	'forest'	ɔi-Gɔr
	uj	'joint'	uj-er		xui	'group'	xui-ger
	pij	'body'	pij-er		xii	'air'	xii-ger

In addition, in careful pronunciations, the offglide sequences trigger schwa epenthesis when a vowel follows, e.g. [pair] 'place' *vs.* [pajər] 'happiness' (p. 78).

4 Historical phonology

Old Mongolian had the vowel system in (9), with [±back] harmony between /y ~ u/, /ø ~ o/ and /e ~ a/, with neutral /i/ (p. 114). Old Mongolian had no rounding harmony.

(9) *Vowel inventory of Old Mongolian*

i	y	u
e	ø	o
		a

STKF posit that the first stage of its vowel shift was pharyngealisation of the back vowels, whereby /u o/ became /ʊ ɔ/.[9] This created a 'vacuum' for the vowels /y ø/ to undergo backing, becoming /u o/, with the two processes together composing a kind of pull chain. Modern Halh /u o/ thus correspond to Old Mongolian (OM) **y ø* and /ʊ ɔ/ to **u o*. Kalmuck did not undergo any of these changes, and Shira Yugur did not have backing of **ø*. Dagur underwent a further step than Halh, merging /o/ with /u/ and /ʊ/ with /ɔ/ (p. 180). These four daughter languages are compared below.

(10)	*Old Mongolian*	*Kalmuck*	*Shira Yugur*	*Halh*	*Dagur*	
	*ʧøp	zøw	ʧøp	tsow	ʧuu	'right'
	*k^{h}yr	k^{h}yr	k^{h}ur	xur	k^{h}ur	'reach'
	*tolahan	dolan	tɔlɔɔn	tɔɮɔ	tɔlɔ	'seven'
	*sur	sur	sʊr	sʊr	sɔr	'to learn'

As a result of these developments, Kalmuck retains [±back] harmony, while the rest now have [±ATR] harmony (see Svantesson 1985, which corrects the majority of earlier theoretical literature, which assumes that Halh harmony is [±back]).

OM /i/ in initial syllables underwent an interesting process of assimilation to the following vowel in words with following [+back] (corresponding to Halh [−ATR]) vowels, leaving palatalisation of the preceding consonant, e.g. OM **k^{h}ilpar* > Halh [x^{j}alpər] 'easy'; OM **siŋk^{h}or* > Halh [ʃɔŋxər] 'falcon' (p. 195).[10] Dagur underwent a similar process with initial /u/, yielding labialised consonants: OM **tumta* > Dagur [t^{w}ant] 'middle'; OM **kurpan* > Dagur [k^{w}arpə] 'three' (p. 197). Non-initial /i/ in [+back] harmonic words was deleted entirely, leaving a trace of palatalisation: OM **t^{h}apin* 'fifty' > Halh [t^{h}aw^j], OM **alima* 'fruit' > Halh [aɮjəm] (p. 209). As a consequence of the general loss of non-initial vowels, STKF mention that while Old Mongolian had no complex codas, Halh has 157 different complex codas, and while two-thirds of Old Mongolian words were bisyllabic, two-thirds of Halh words are monosyllabic.

In many dialects (though not Halh), Old Mongolian aspirated stops underwent a Grassman's Law-like process of deaspiration when an aspirated stop or /s/ occurred in the following syllable. In Chahar, OM **t^{h}at^{h}a* 'to pull' > Chahar [tat^h] (cf. Halh [t^{h}at^h]); OM **t^{h}osun* 'fat' > Chahar [tɔs] (cf. Halh [t^{h}ɔs]) (p. 206). Perhaps most interestingly, Monguor displays an aspiration 'flip-flop', whereby unaspirated–aspirated sequences become aspirated–unaspirated: OM **tot^{h}ara* 'inside' > Monguor [t^{h}utor], OM **pat^{h}u* 'firm' > [p^{h}ati]; OM **pyse* 'belt' > Monguor [p^{h}usee] (pp. 207–208). As STKF note, this flip-flop might result if the partial devoicing effect that preaspirated stops have on preceding vowels (mentioned above in §1) could be reinterpreted as postaspiration of the initial consonant (cf. Ohala 1981). Again, the fact that /s/ patterns with the aspirated stops in all of these processes is further evidence of its [+spread glottis] character.

[9] This context-free change can be perhaps understood as a response to the feature co-occurrence constraint *[+back, −low, +ATR] (Calabrese 1988).

[10] Old Mongolian already did not contain sequences of /t/ or /t^h/ before /i/, which STKF attribute to affrication, yielding /ʧ ʧ^h/ in pre-Mongolic (p. 121).

5 Loanword phonology

As a result of the consonantal inventory and phonotactics of Halh, loanwords from Russian can undergo a number of processes of phonological restructuring. Since there is no initial /r/, loanwords such as [ˈradʲiɐ] 'radio' are usually pronounced with an initial vowel ([aratʃəw]; p. 30). Russian [f] becomes /pʰ/, e.g. [fɪˈgʲurɐ] 'figure' > [pʰigur] (p. 31). [k] is sometimes retained, but may also be changed to /x/ ([ˈxasɐ] 'cash-desk' > [xaas]) or to /g ~ ɢ/ ([kəlbɐˈsa] 'sausage' > [ɢaɣəwsa]).

Stressed vowels in Russian become long vowels in Mongolian (e.g. long in initial syllables and full/phonemic in non-initial syllables; p. 32). They also determine the vowel harmony class of the word. Russian *o* [ɔ] thus decides the harmony class of words such as [vɐˈgɔn] 'coach' > [pɔɢɔŋ] (unless palatalised consonants determine that the harmony class is [−ATR], as in [mʲɪˈnʊtɐ] 'minute' > [mʲanʊtʰ]). Initial clusters are broken up by a copy of the stressed vowel (e.g. [ˈbraʃkɐ] 'mash' > [paraʃək], [ˈpʲitkɐ] 'stove' > [pʰiɣitʰəg]), but if it begins with /sC/, an initial /i/ may be inserted (e.g. [ˈspʲirt] 'alcohol' > [ispʰirtʰ], [ˈʃkaf] 'cupboard' > [iʃkaw]) (cf. Fleischhacker 2001 for discussion of similar patterns).

Final unstressed vowels are deleted (e.g. [ˈdramɐ] 'drama' > [taram]), and unstressed vowels are deleted when not required for syllable structure (e.g. [ɐftɐˈmat] 'slot-machine' > [awtʰmatʰ]). Perhaps most interesting is loss of [i] after palatalised consonants, e.g. [ˈʲimɐˈnat] 'lemonade' > [ɣʲamnat], [mʲɪˈnʊtɐ] > [mʲanʊtʰ], consistent with the phonotactics of Halh, in which Cʲ is not found before [i].

6 Reduplication

Halh has fixed-segment coda *w* (p. 58) for intensive adjective reduplication.

(11)	xar	xaw xar	'very black'
	nɔɢɔŋ	nɔw nɔɢɔŋ	'very green'
	ʊɣaŋ	ʊw ʊɣaŋ	'very red'
	iɣəŋ	iw iɣxəŋ	'very clear'
	poorəŋxi	pow poorəŋxi	'very round'
	xuitʰəŋ	xuw xuitʰəŋ	'very cold'

Vowel length and the second half of diphthongs are ignored in the reduplicant,[11] leading STKF to adopt a CV-slot analysis, along the lines of Marantz (1982). Note that the fixed segment is a *p* in the Turkish equivalent (Kelepir 2000), as well as in Eastern Mongolian dialects (p. 59), and recall that Halh postvocalic **p* has gone to /w/.

Nouns can form echo reduplication, with the associative plural semantics ('X and such things', 'X and people like him/her', with a slightly pejorative flavour). This is formed by an *m-* prefix that appears in the onset of the reduplicant (12a), unless the base begins with *m*, in which case it is [ts] (12b). This process cannot be treated as complete overwriting of the onset in the

[11] STKF mention that, according to Mönggöngerel (1998: 85), length does transfer to the reduplicant in Naiman Mongolian: compare [xiip xiitʰen] 'very cold' with Halh [xuw xuitʰəŋ].

reduplicant, because of the interesting fact that palatalisation is transferred from the corresponding consonant in the base (p. 60) when *m-* is chosen, resulting in [mʲ] (12c). However, as /ts/ has no palatalised counterpart, no transfer occurs when [mʲ] is the base (12d).

(12)	a.	tʰaɮx maɮx	'bread and such'
		ɢɔiməŋ mɔiməŋ	'noodles and such'
		ontəg montəg	'egg and such'
	b.	maɮ tsaɮ	'cattle and such'
		miɮxi tsiɮxi	'frog and such'
	c.	pʲasɮəg mʲasɮəg	'cheese and such'
		xʲaam mʲaam	'sausage and such'
	d.	mʲaɢmər tsaɢmər	'Tuesday and such'
		mʲaŋɢ tsaŋɢ	'thousand and such'

The statement of palatalisation preservation requires a representation in which the secondary articulation of the base is preserved even under replacement of the primary features of the consonant (as STKF note on page 61, this supports a representation where palatalisation is on a separate tier), and is deleted if incompatible with the primary articulation.[12]

7 Concluding remarks

A large portion of the book consists of comparative tables of words in Old Mongolian and the eleven modern Mongolic languages, as well as tables showing vowel and consonant developments in schematic format. In my opinion, an accompanying CD or website would make these much easier to traverse and search for particular patterns.

The authors refrain from developing theoretical models of many of the phenomena (in contrast to most other volumes in this series), but they do organise the presentation of the phenomena in a way that makes them accessible for interested researchers of all stripes. In addition to its own important empirical contributions, given the paucity of literature on the phonology of Mongolian in English, this book is a useful synthesis of much existing literature (it contains twelve detailed pages of annotated notes on sources and literature written in Mongolian, Russian, Chinese and other languages). The sketches of the non-Halh Mongolic languages are limited but informative. The authors do not attempt a genetic subclassification of the Mongolic languages, doubting the appropriateness of a family tree model for this, in light of the complicated history of language contacts (p. 217).

The book as a whole is organised in a way that is challenging for a linear reading (e.g. there is a presentation of Kalmuck orthography in Chapter 4 before we know anything about Kalmuck; there is no discussion of stress until Chapter 7; presentation of loanword phonology – which could have been a chapter in its own right – comes before the epenthesis rules are introduced). It is

[12] Interestingly, this stability of secondary articulation of the overwritten element would seem to require faithfulness between the fixed segment and its corresponding element in the base in Optimality Theory, which is incompatible with the assumptions of Alderete *et al.* (1999).

worth the effort, however: many of the phenomena mentioned above have not yet been given a full treatment in contemporary phonological theories of vowel harmony, syllabification, reduplication or loanword phonology, making this book a ripe source for interested researchers.

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