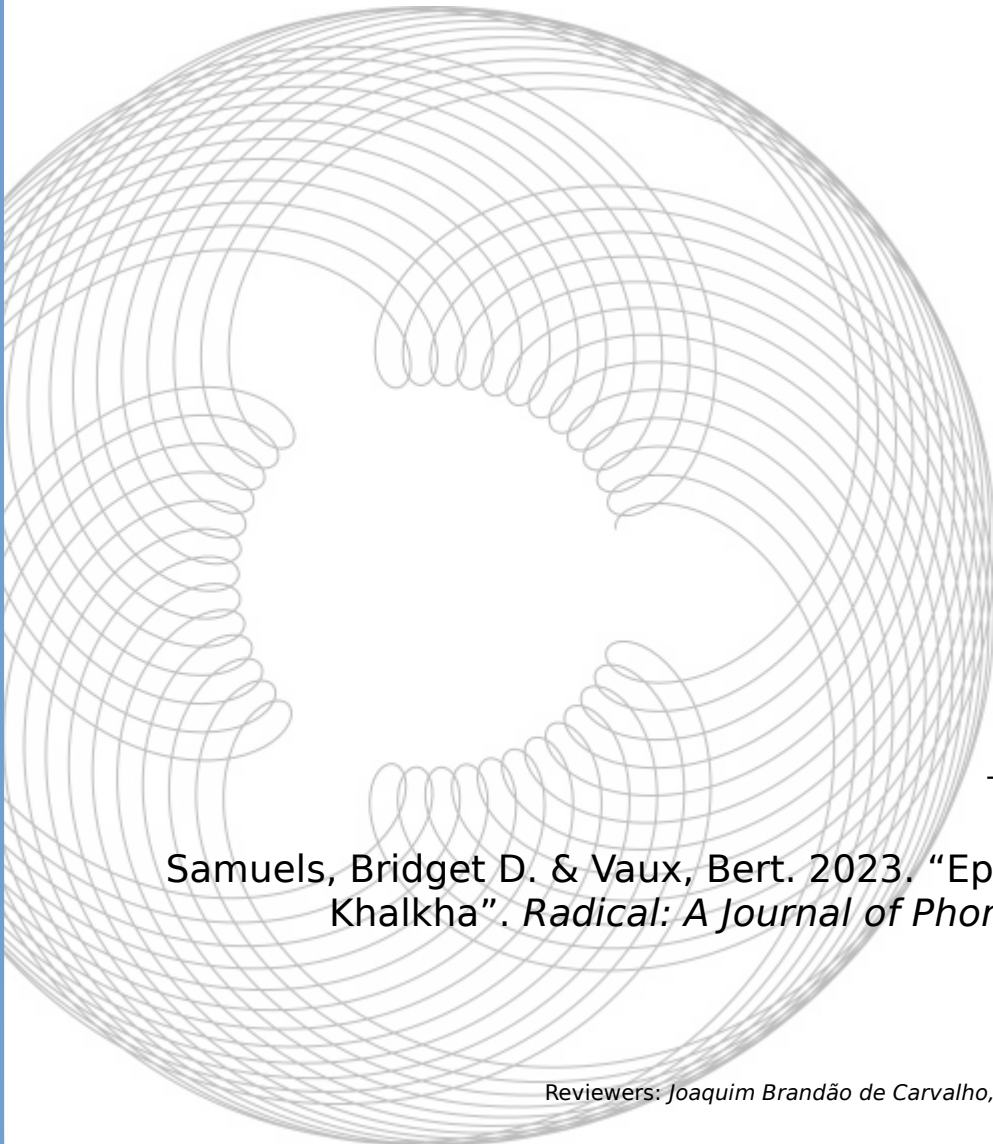


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EPENTHETIC DORSALS IN KHALKHA

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Many of the modern Mongolic languages display alternations between /g/ and zero. These cases are among a very small number of putative dorsal stop epenthesis patterns known in the phonological literature, and epenthesis of these consonants is considered in some theories to be highly marked or even impossible (see e.g. Lombardi 2002, de Lacy 2006, Uffmann 2014). In recent years, multiple accounts of these /g/-zero alternations (GZA) have been proposed, some of them attributing the observed patterns to allomorphy (de Lacy & Kingston 2013) or a phonological process of ‘splitting’ (Staroverov 2014) rather than true epenthesis. In the present work, we describe GZA from both diachronic and synchronic perspectives with the aim of documenting its historical development and providing an insightful analysis of the process as it occurs synchronically in Khalkha Mongolian. We argue that GZA arose diachronically from reanalysis of the lenition and eventual loss of intervocalic *g, which took place prior to the breakup of Common Mongolic. We establish that GZA should not be characterized as a synchronic process of /g/-deletion, though it arose from the aftermath of such a process historically. We further detail the shortcomings of describing GZA in terms of allomorphy, as well as the theoretical and empirical problems with treating consonant-zero alternations as splitting rather than insertion. We conclude that the Khalkha pattern is most insightfully described as epenthesis of a phoneme /g/ with varied surface manifesta-

tions. Since both markedness-based and splitting-based accounts face difficulties with GZA and other patterns of its type, these patterns may require a return to a constraint-based approach without a fixed markedness hierarchy, or a rule-based account such as the one we present.

Consonant epenthesis, Dorsal, Mongolic, Reanalysis

INTRODUCTION¹

The landscape of epenthetic consonants is of considerable interest for phonologists, as competing theories make significantly different predictions about which consonants should and should not be eligible for insertion by phonological processes. In a rule-based approach (e.g., Halle & Idsardi 1997) or a constraint-based approach without an immutable markedness hierarchy, insertion of any consonant (henceforth C) is theoretically possible. However, numerous constraint-based approaches have attempted to limit the range of possibilities and predict the identity of epenthetic Cs based on markedness (e.g., Lombardi 2002, de Lacy 2006). These approaches encounter a number of difficulties, which we largely set aside here as they are discussed at length by Vaux & Samuels (2017).

The status of putative cases of “grammatical” C epenthesis (Żygis 2010) is crucial to understanding the landscape of variation, and therefore to deciding among different phonological theories. Grammatical C epenthesis patterns are idiosyncratic, involving a number of Cs that may individually be rare in epenthetic contexts but collectively appear to

¹ We would like to thank Tuya Shagdar for pronouncing most of the Modern Mongolian forms employed in this article. Our IPA transcriptions render her pronunciations, which sometimes differ from those reported by Svantesson et al. (2005), particularly in showing some long vowels in non-initial syllables. We also thank the audience at NAPhCX in May 2018 and Samuel Andersson, Dave Odden, and Ollie Sayeed for their thoughtful comments on earlier drafts. Thank you to Joaquim Brandão de Carvalho, Christian Uffmann, and Paul de Lacy for reviewing the manuscript.

constitute a relatively large class. Also, these cases are typically morphologically restricted to some extent, making morphological alternative explanations attractive. In recent years a variety of competing accounts have emerged, some of which attempt to explain the choice of C in such cases via faithfulness, whereas others reclassify these patterns as allomorphy or deletion. The time is therefore ripe to consider specific cases in detail.

Here we focus on Modern Mongolian, which displays an extensive set of alternations between the phoneme /g/ and zero (henceforth “/g/-zero alternations” or GZA) that have traditionally been interpreted as the result of a synchronic process of /g/ insertion. We find Mongolian interesting for a number of reasons. First, epenthetic /g/ is unusual and difficult to explain through either markedness or faithfulness, particularly in theories such as those of Lombardi (2002) and de Lacy (2006), in which Dorsal is marked. Second, a variety of very different accounts of the phenomenon can be found in the recent phonological literature and can therefore be compared on their merits. Third, the history of Mongolian is relatively well documented so we can investigate how the synchronic pattern emerged. The /g/-zero alternations with which we will concern ourselves here are illustrated by the Khalkha (Halh) Mongolian patronymics in (1).

(1) GENITIVE CASE SUFFIX DORSAL ALTERNATIONS

	NAME	GLOSS
a.	Цэндийн Нямдорж Tsend-iin Nyamdorj [tsin'di:ŋ 'nʲɛmdɔrtʃ]	Patronymic from 'Tsend' + given name 'Sunday thunderbolt'
b.	Халтмаагийн Баттулга Khaltmaa-giin Battulga [χalt'maɡiŋ ,pa ^h tə'βɛɖ]	Patronymic from 'Khaltmaa' + given name 'solid hearth'

These patronymics are formed by suffixing the genitive case ending to the name of an individual's father. The normal form of the genitive suffix is -ийн [-iŋ], which surfaces as such after C-final stems, as in the patronymic of former Speaker of the Mongolian Parliament, Tsendiin Nyamdorj (1a). However, when the genitive is added to a stem ending in what is written in Mongolian orthography as a long vowel or diphthong, it surfaces as -гийн [-giŋ]. This can be seen in the patronymic of the former President of Mongolia, Khaltmaagiin Battulga (1b).²

The alternation between [-iŋ] and [-giŋ] in (1) is a typical example of GZA; parallel alternations for the Ablative and Instrumental can be seen in (2a-b) and (2c-d) respectively.³

² Note that there are two series of labial and dental stops, traditionally termed 'strong' and 'weak,' which are represented in the Cyrillic Mongolian script as voiceless and voiced, respectively. However, Svantesson et al. (2005:12ff) establish that aspiration is the relevant contrast. The 'strong' series are voiceless postaspirated word-initially and voiceless preaspirated elsewhere. The 'weak' series are voiceless unaspirated. Velar, palatalized velar, and uvular stops employ only a single manner of articulation and are typically voiced; they pattern as such phonologically.

³ Following Svantesson et al.'s (2005) notation, capital letters in the underlying representations (URs) indicate vowels that participate in rounding and pharyngeal harmony controlled by the stem. The phoneme /g/ in this position, whether underlying or epenthetic, surfaces (modulo voicing assimilation) as [g] or [ɣ] in non-pharyngeal words or before [i], and as [ɢ] or [β] in pharyngeal words. We discuss the allophonic variation of /g/ further in Section 3.

(2) REPRESENTATIVE ABLATIVE AND INSTRUMENTAL GZA IN KHALKHA (MODIFIED FROM SVANTESSON ET AL. 2005:55FF)⁴

			UR	SR	GLOSS	
ABLATIVE	a.	C-final stem	нoмooс	/нoм-Es/	[нoмoс]	book-ABL
	b.	V-final stem	нoхoйгooс	/нoхEi-Es/	[нoхo(ε)кpс]	dog-ABL
INSTRUMENTAL	c.	C-final stem	apaap	/ar-Er/	[arar]	back-INST
	d.	V-final stem	caнaaraaп	/sana-Er/	[sanagar]	thought-INST

One also finds GZA with stems ending in syllabic consonants in the Mongolic languages that have them. Chinese loanwords ending in syllabic *ʒ* show this pattern in Khorchin Mongolian, for example: when one adds the Mongolian Ablative *-/Es/* to *tʃaʃʒʒ:* ‘supermarket’, for instance, the result is *[tʃaʃʒʒ:ɡɔ:s]* (Puthuval 2013:45).

GZA is found in all of the modern Mongolic languages except for the peripheral languages Moghol in Afghanistan and Bonan and Santa in the Gansu province of China.⁵ Another geographical outlier in the family, Kalmyk, spoken on the northwest coast of the Caspian Sea, does display GZA, as does its parent language Oirat, from which it split in the seventeenth century.

The widespread distribution of GZA across the Mongolic family might lead one to conclude, as does Skribnik (2003:107), that it was a feature of Common Mongolic, the shared ancestor of the modern Mongolic languages, which Janhunen (2003) dates to the time of Chinggis Khan (12th-13th century CE). Moghol developed from the language spoken by the Mongol soldiers who were garrisoned in the Khwarizm-Shah state conquered in 1220 by Chinggis Khan and later in part of the satellite Ilkhanid state until the

⁴ Following standard convention, we write the underlying forms of suffix segments that participate in harmonic alternations with capital letters.

⁵ Moghol employs deletion rather than insertion between long vowels (Poppe 1955); other cases of vowel hiatus insert (IPA) *j* or *n* (Weiers 1970:119). There is no evidence of GZA in Bonan (Chuluu 1994, Hugiiltu 2003) or Santa (Field 1997, Kim 2003).

mid-14th century. According to Weiers (2003: 248), this community did not have any subsequent contact with their kin in Mongolia. It is possible, then, that the separation of Moghol may represent a *terminus post quem* for the development of GZA.

In this paper we provide a diachronic overview and reconstruction of the development of GZA in Mongolian (focusing on the standard variety of Mongolian spoken in Mongolia, known as Khalkha or Halh), together with a close look at its synchronic manifestations. We then evaluate whether the synchronic pattern can be satisfactorily described in terms of deletion, allomorphy, or ‘splitting’ in the sense of Staroverov (2014). We conclude that Modern Mongolian GZA is most insightfully characterized as the product of synchronic phonological /g/ epenthesis, which developed diachronically from reanalysis of a process of intervocalic /g/ deletion.

1 OVERVIEW OF MONGOLIAN SYNCHRONIC PHONOLOGY

Before delving into the nuances of GZA in Khalkha, it will be helpful to review certain basic components of Mongolian synchronic phonology that will be relevant to our discussion. Because there is a significant diversity of opinions in the analysis of the facts of Mongolian phonology, we will for the sake of consistency cleave where possible to the relatively well-known description and analysis by Svantesson et al. (2005). According to these authors, Khalkha possesses the vowel phonemes in (3).

- (3) MONGOLIAN VOWEL PHONEMES (MODIFIED INTO IPA FORM FROM SVANTESSON ET AL. 2005: 22-23).

i i: u u:
 ɯ ɯ:
 e e: o⁶ o:
 a a: ɔ ɔ:

diphthongs: ai ɔi ɯi ui

“marginal diphthongs”: ɯa aɯ

“marginal triphthongs”: ɯai

Long vowels are found only in initial syllables. Short /e/ occurs only in non-initial syllables.

Svantesson et al. propose the underspecified underlying privative place feature representations in (4) for the “seven basic vowels in Mongolian”. They use privative features “P” (palatal), “F” (pharyngeal), etc., but we have employed “+” here for expository convenience.

- (4) UNDERLYING FEATURE REPRESENTATIONS OF THE SEVEN BASIC VOWELS IN MONGOLIAN (SVANTESSON ET AL. 2005: 22, 44).

	i	e	a	ɔ	o	ɯ	u
palatal							
pharyngeal			+	+		+	
velar							
round				+	+	+	+
open		+	+	+	+		

⁶ Realized as [ə] according to Svantesson et al. (2005:22).

Following application of the redundancy rules in (5), these vowels surface with the representations in (6).

(5) REDUNDANCY RULES FOR MONGOLIAN VOWELS (ADAPTED FROM SVANTESSON ET AL. 2005: 45)

[]	→	[palatal]	i
[+round]	→	[palatal, velar, round]	u
[+open]	→	[palatal, open]	e
[+open, +round]	→	[velar, open, round]	o
[+pharyngeal, +round]	→	[palatal, velar, pharyngeal, round]	ɤ
[+pharyn., +open, +round]	→	[velar, pharyngeal, open, round]	ɔ

(6) SURFACE FEATURE REPRESENTATIONS OF THE SEVEN BASIC VOWELS (SVANTESSON ET AL. 2005: 44)

	i	e	a	ɔ	o	ɤ	u
palatal	+	+				+	+
pharyngeal			+	+		+	
velar				+	+	+	+
round				+	+	+	+
open		+	+	+	+		

According to Svantesson et al., Khalkha possesses the consonant phonemes in (7).

- (7) MONGOLIAN CONSONANT PHONEMES (MODIFIED INTO IPA FORM FROM SVANTESSON ET AL. 2005: 25). PHONEMES IN PARENTHESES OCCUR ONLY IN LOANWORDS AND ONOMATOPOETIC FORMS.

(p ^h)	(p ^j)	t ^h	t ^j			
p	p ^j	t	t ^j			
				g ^j	g	ɠ
		ts ts ^h	tʃ tʃ ^h			
		s	ʃ	x ^j	x	
m	m ^j	n	n ^j	ŋ		
		ɮ	ɮ ^j			
		r	r ^j			
w	w ^j			j		

Svantesson et al. propose the privative place feature representations for these phonemes in (8).

- (8) FEATURE REPRESENTATIONS OF MONGOLIAN CONSONANT PHONEMES (SVANTESSON ET AL. 2005: 45).

class	phonemes	place features
labials	p ^h p m w	[labial]
palatalized labials	p ^h p ^j m ^j w ^j	[labial, palatal]
dentals	t ^h t t ^h t ^s s n ɮ r	[apical]
alveopalatals	t ^j t ^j tʃ ^h tʃ ʃ ɲ ɮ ^j r ^j	[apical, palatal]
palatals	ʃ ʃ ^j j	[palatal]
velars	g x ŋ	[velar]
uvulars	ɠ	[velar, pharyngeal]

Svantesson et al. later propose that the [velar] specifications of vowels, velar consonants, and uvular consonants are predictable and therefore underlyingly unspecified⁷, presumably being inserted by a redundancy rule at the end of the derivation. The authors do not explicitly provide such a rule, but (following the format of their redundancy rules for vowels in (4) on p. 45) it would likely have the form in (9):

(9) redundancy rule inserting [velar] in segments lacking an oral place of articulation
 [] → [velar]

This redundancy rule plays a central role for Svantesson et al. in explaining why it is /g/ rather than another consonant that is inserted to break up vowel hiatus, as we shall see later.

A final feature of Mongolian phonology that will be relevant in our discussion of GZA is its systems of [pharyngeal] and [round] harmony. According to Svantesson et al. (2005:53), underlying specifications for the features [pharyngeal] and [round] can spread rightward from a vowel in an initial syllable of a root morpheme to following vowels in a non-compound word. When in non-initial syllables, “schwa [i.e. epenthetic—BV&BDS] vowels [...] are transparent to vowel harmony” (ibid., 57). Similarly, underlying /i/ “is transparent in the sense that it is completely ignored by vowel harmony. It is not affected by vowel harmony, nor does it interfere with vowel harmony” (ibid., 48). In their system the statements about epenthetic schwa and underlying /i/ amount to the same thing, as both vowels are assumed to enter their respective points in the derivation with no place features (cf. (5)). It also follows from this fact that “the vowel i [...] functions as a non-pharyngeal vowel when it appears in the initial syllable, forcing the vowels fol-

⁷ “The feature [velar] is redundant for the Halh vowels, and it is possible to specify the consonants as well without referring to it, so that velars are unmarked consonants without any place feature, and uvulars are specified as [pharyngeal]” (Svantesson et al. 2005:55).

lowing it to be non-pharyngeal” (ibid., 46). Being devoid of specifications for the harmonic features [pharyngeal] and [round], underlying /i/ is unable to spread either of these features to following vowels and they surface with the values for these features assigned by the redundancy rules at the end of the derivation.

As for suffix vowels, according to Svantesson et al. (ibid., 47) the vowels allowed in lexical entries in this context are /i/, /E/, /U/, /Ei/, and /Ui/. Given their representational system (see (5)), /E/ is the same as /e/ (i.e. specified for [open] but no other features) and /U/ is the same as /u/ (i.e. specified for [round] but no other features).

Pharyngeal harmony works simply as described above, but rounding harmony displays a few additional conditions. According to Svantesson et al. (ibid., 50, 54), “rounding harmony can similarly be analysed as spreading of the feature [round], but the target segments are only the open vowels [i.e. [e o a ɔ]—BV&BDS], and the non-open rounded vowel U blocks rounding harmony [...] and following open vowels must be unrounded.” They add that “o and ɔ can occur in a non-initial syllable only if they are preceded by the same vowel o or ɔ (except that i can intervene, as in pharyngeal harmony)”. This restriction appears to apply only to native forms (or perhaps derived contexts), as suggested by the existence of loans such as *radio* ‘radio’ and *transformator* ‘transformer’. Finally, “the vowel ɔ cannot be followed by a [in derived contexts—BV&BDS], but o can be followed by e” (ibid., 46).

Pharyngeal and round harmony normally affect only vowels, but the former also affects dorsal consonants in pharyngeal harmony spans. As Svantesson et al. put it, “the uvulars [ɴ, ɣ, ɢ] occur only in pharyngeal words, and the velars [ŋ x ɡ] only in non-pharyngeal words. The only exception is ɡ, which may occur in morpheme-final position in pharyngeal words and may contrast with ɢ” (ibid., 55).

The behavior with respect to pharyngeal harmony of the voiced dorsal consonant that appears in GZA calls for further comment. Svantesson et al. state that “when a suffix beginning with a vowel is added to a stem ending in a vowel, an epenthetic consonant is added to avoid hiatus. This consonant is ɡ in non-pharyngeal and ɢ in pharyngeal words.

When it occurs before *i*, however, it is *g* in pharyngeal words as well, even though the combination *gi* is possible” (55). In their analysis, “velars have the specification [velar] and uvulars [velar, pharyngeal]. The feature [velar] is redundant for the Halh vowels, and it is possible to specify the consonants as well without referring to it, so that velars are unmarked consonants without any place feature, and uvulars are specified as [pharyngeal]. If consonant epenthesis consists of the addition of a consonant without place features, the velar appears under this analysis, and it becomes uvular by the spreading of [pharyngeal] in pharyngeal words” (ibid., 55). In this analysis a special rule (not provided by Svantesson et al.) would be required to get the epenthetic dorsal consonant to surface as velar [g]/[ɣ] rather than uvular *[ɢ]/[ʁ] before /i/. Because in their analysis /i/ is underlyingly unspecified for all place features (cf. (4)), it should not be able to spread [pharyngeal] (or indeed any other place feature) to a preceding epenthetic consonant. This consonant should then, by virtue of being unspecified for place features itself, be able to “become uvular by the spreading of [pharyngeal] in pharyngeal words” as above.

2 SYNCHRONIC DISTRIBUTION OF DORSALS AND GZA

With these preliminaries in mind, let us now focus more closely on the synchronic characterization of GZA. These alternations between a dorsal consonant and zero are traditionally seen by Mongolists as the result of a process that inserts the phoneme /g/ after a stem ending in a long vowel or diphthong followed by a suffix beginning with a long vowel, in order to avoid vowel hiatus (e.g., Poppe 1955, Riialand & Djamouri 1984, Svantesson et al. 2005, Janhunen 2012). As Beffa & Hamayon put it, “si la base se termine en voyelle longue ou diphtongue, il y a apparition d’un /g/ prothétique devant un suffixe en voyelle longue” [if the base ends in a long vowel or diphthong, prothetic /g/ appears before a long-vowel suffix] (1975:43).

In this traditional analysis the Ablative suffix, for example, consists of a long low vowel followed by /s/:

(10) ABLATIVE /-EEs/ (IN TRADITIONAL TRANSCRIPTION)

	NOMINATIVE	ABLATIVE	GLOSS
a.	nom	nomoos	‘book’
b.	xoino	xoinoos	‘north’
c.	odoo	odoo[g]oos	‘now’
d.	noxoi	noxoi[g]oos	‘dog’

When the Ablative suffix *-/EEs/* is added to a stem ending in a consonant or a short vowel it surfaces unchanged, modulo (in traditional terms) [BACK] and [ROUND] harmony. Stem-final short vowels delete before the long vowel of the suffix, as in *xoinoos* (10b).

However, the traditional characterization does not take into account how the phonological system of modern Mongolian works. Specifically, its vowel inventory and harmony system are organized in terms of [ATR]⁸ rather than [BACK] oppositions, and it has undergone a diachronic realignment of vowel length (to which we return in the next section), whereby in non-initial syllables short vowels delete and long vowels become short. More accurate representations for the forms in (10) are therefore as in (11):

⁸ Or [pharyngeal] for Svantesson et al. 2005, as we saw in section 1.

(11) ABLATIVE /-Es/ (UPDATED WITH PHONETICALLY ACCURATE TRANSCRIPTIONS)

	NOMINATIVE	ABLATIVE	GLOSS
a.	н᠋ᠣᠮ	н᠋ᠣᠮ᠋ᠰ	‘book’
b.	χ᠋ᠳᠡᠨ	χ᠋ᠳᠡᠨ᠋ᠰ	‘north’
c.	᠋ᠲ᠋ᠤ	᠋ᠲ᠋ᠤ[᠋ᠢ]᠋ᠰ	‘now’
d.	᠋ᠨ᠋ᠴ᠋ᠣ(᠋ᠢ)	᠋ᠨ᠋ᠴ᠋ᠣ(᠋ᠢ)[᠋ᠢ]᠋ᠰ	‘dog’

Reflecting the phonological facts of the modern language allows us to make sense of the epenthesis process in a simple fashion: when a vowel-initial suffix is added to a vowel-final stem, /g/ is inserted to avoid hiatus (Svantesson et al. 2005:55).

The surface manifestations of this /g/ phoneme are rather complicated, as we quickly reviewed in Section 1. Svantesson et al. (2005:55) state that the epenthetic /g/ surfaces as a velar stop in non-pharyngeal harmonic spans and as uvular [ɢ] in pharyngeal spans. This appears to be true in word-initial and word-final positions, as in the form *цэрэр* [tsi'rik^h] ‘soldier’, which is produced with a velar stop in a non-pharyngeal span.

Intervocalic /g/ may also surface as a stop, e.g. in [pæxguiger] ‘without being’ and the name *Khaltmaagiin* [χalt'magiŋ]. However, Stuart & Haltod (1957) note that /g/ becomes a voiced dorso-velar lenis fricative [ɣ] intervocalically (cf. Janhunen 2012:52) or when adjacent to the liquids /l/ and /r/. Our native speaker consultant also spirantizes under certain conditions in this context, though (as one expects from Svantesson et al.’s (2005) description of the harmony system) the /g/ surfaces as a uvular in pharyngeal spans, as in *зарас* /tsags/ [tsaɣəs] ‘fish’ and *болгож* [pɔɣ'ɣɔtʃ] ‘be.CAUS.CNVB’. One also finds the stop allophone after liquids in some contexts, e.g. *суулгах* [sɔ:ɣɣɑχ] ‘install.INF’, *хөдөлгөөн* [χɔdɔɣ'gɔŋ] ‘motion’, and *өргөн* [ɯr'gɔŋ]⁹.

⁹ Forms and pronunciations accessed at www.forvo.com, 27 March 2019.

Svantesson et al. (2005) and Janhunen (2012) do not discuss the allophony of /g/ in other potentially relevant environments, namely C_V and V_C. The materials available to us suggest that /g/ can surface as a stop or fricative in the C_V context, as in *харцгай* [ħɑɯts'gɛ:] 'hawk', *хашгирах* [ħæʃɣə'reχ] 'scream-INF', *Монгол* [mɔŋgɔɮ] 'Mongol', *дасгал* [tas'gɔɮ] 'exercise', *битгий* [pit^h'xi:] 'not', *мөнгөн* [mɔŋ'gɔŋ] 'silver'¹⁰. In the V_C context underlying /g/ can also surface as a stop or fricative, as in *гагнуурчин* [gɑŋ'nɔɯɾtʃɪŋ] 'welder', *удирдагч* [ʊdir'dɛχtʃ] 'leader', *бодогдох* [pɔdɔg'dɔχ] 'think-INF', *зөөгч* [zo:χtʃ] 'provider', *эмэгтэй* [iməχ'tej] 'woman', *сэтгүүл* [sit'gu:ɮ] 'magazine'¹¹. The precise conditions under which /g/ surfaces as a stop vs. a fricative in these contexts require further research.

The allophonic distribution of the phoneme /g/ can be summarized as follows:

(12) ALLOPHONES OF /g/ IN MODERN MONGOLIC LANGUAGES (MODIFIED AND AUGMENTED FROM JANHUNEN 2012:52)

SPAN	#_	V_V	C_V	V_C	_ {C, #}
[+ATR]	g	ɣ, ɯ	g, x	ɣ, x	g, k
[-ATR]	g	ɣ, ɣ̣	g, ɣ̣	g, ɣ, χ	g, q

When we consider the origins of GZA it may be worth bearing in mind that most or all of the modern Mongolic languages spirantize /g/ intervocalically, and this may preserve the state of affairs that existed in Early Mongolic. It is also worth mentioning at this point that Mongolian does not possess a separate voiced dorsal continuant phoneme /ɣ/ or /ɣ̣/; all surface tokens of [ɣ] and [ɣ̣] are assigned to the phoneme /g/. Thus, when we speak of

¹⁰ Forms and pronunciations accessed at www.forvo.com, 27 March 2019.

¹¹ Forms and pronunciations accessed at www.forvo.com, 27 March 2019.

GZA we refer to the *phoneme* /g/, which in GZA situations is typically realized as a dorsal fricative or approximant by virtue of being intervocalic.

Returning to the distribution of GZA, it appears to be completely general in Mongolian, surfacing with all known vowel-initial suffixes, of which we have been able to identify the 23 shown below in (13) for Khalkha.

(13) KHALKHA SUFFIXES SHOWING GZA

-(G)EE imperfective	-(G)EEr instrumental
-(G)UUI causative	-(G)EE reflexive, possessive
-(G)EErai 2pers prescriptive/fut imperative	-(G)UUI/r agentive
-(G)EEc/t 2pers precative	-(G)EEs ablative
-(G)UUr/l comitative	-(G)EEd approximative
-(G)EEsai 3pers desiderative	-(G)UUr superessive, directive, prolative
-(G)EEd perfective gerund/converb	-(G)EEEx causative
-(G)UUshtai ambivalent non-finite necessitative ppl/converb	-(G)EEd distributive (for numerals)
-(G)UUt disjunct terminative concomitant converb	-(g)iiig accusative
-(G)UU(dza)i 3pers dubitative	-(G)EEguyd dative negative ppl
-(g)iiish present imperative	-(g)ii(n) genitive
	-(G)EE(n) deverbal noun

As Staroverov (2014:280) puts it, “dorsal epenthesis is not morphologically restricted.” He gives examples of GZA after nominal and verbal stems and after derivational suffixes, and the suffixes that participate in GZA can be derivational or inflectional.

The one exceptional suffix, as pointed out by Svantesson et al. (2005:75), is the infinitive or future participle, which surfaces (in traditional transliteration) as -x after vowels and -əx after consonants. In its phonological behaviour, this suffix contrasts with nominalizing and verbalizing suffixes that also take the form -x, but which never surface with a schwa, as in /aaw-iŋ-x/ *aawinx* ‘what belongs to father’ (father-GEN-NOMINALIZER). The future participle suffix could be represented as /-əx/, but this would constitute the only

occurrence of schwa in an underlying representation in the language. It would also necessitate making an exception to the GZA process such that forms like *nee* ‘to open’ do not surface as **neegex* rather than the attested *neex*.

Another apparent exception involves loanwords with what appear to be short vowels, such as *pizza*. On the basis of native alternations like *xoino* ‘north’ and its ablative *xoinoos* (4b), we might expect the final orthographic <a> of <pizza> not to be pronounced, and for this word to have a paradigm with nominative *pizz* and ablative **pizzaas*. This does happen with some loans, such as *America* with nominative *Amerik* and ablative *Amerikaas*. Other loans, however, such as *radio*, *chimpanzee*, *Congo*, *Obama*, and *pizza*, retain their final vowel and select the *g*-initial allomorph of the suffixes in (13). In (14) we provide a translation of a Mongolian Pizza Hut advertisement¹² that demonstrates this pattern.

(14)	дуртай	пиццагаа	ундсэн	унээр	нь
	durtai	pitstsa-gaa	ündsen	ün-eer	n’
	‘tʰrhta:	pi:tse:’ʁa:	’untsu	u’ner	un
	favorite	pizza-POSS/REFL	base	price-INSTR	DEF
	‘enjoy your favorite pizza at the base price’				

Our informant produces this sentence with a full final vowel in *pizza*, rather than a reduced one; the orthography just happens to preserve the spelling of the source language. Some archaic words show this effect as well, such as the name of Togtoa, one of the tribal leaders conquered by Chinggis Khan in *The Secret History of the Mongols*. This name has the ablative form *Togtoa-gaas* in the Khalkha translation of the book (Perlee 1958).

¹² Accessed at <https://www.facebook.com/PizzaHutMongolia> on May 1, 2018.

As mentioned earlier, one also finds GZA with Chinese loans ending in syllabic consonants in varieties that possess these, such as Khorchin Mongolian, spoken in northeast Inner Mongolia. The speaker of Khorchin consulted by Puthuval (2013) has essentially the same system of GZA as Khalkha speakers do, but by virtue of this variety possessing Chinese loans with the syllabic retroflex fricative [ʒ], it is revealed that consonantal nuclei select the /g/-initial variant of following morphemes as well, as in [tʃaʊʒz:-ga:r] ‘supermarket-ABL.’

Finally, GZA does not occur in non-derived contexts, contrary to what Karlsson (2005) and some others imply. This is true not only for loans such as *xaos* ‘chaos’ and *teorem* ‘theorem’ but also for native forms such as the aforementioned name *Togtoa* (which is not pronounced **Togtoga*).

We can summarize the synchronic behaviour of GZA as follows:

(15) Synchronic behaviour of GZA

- a. The phoneme /g/ can appear, without morphological restriction, whenever morpheme concatenation would otherwise be expected to produce a sequence of a syllable Nucleus followed by another Nucleus. The first Nucleus can be a vowel (which is normally written long but not always, especially in loanwords), a diphthong, or a syllabic consonant. The second Nucleus invariably contains a full vowel that is written as a double vowel. The second vowel is never a diphthong, but this is probably because Mongolian has no diphthong-initial suffixes (though there are suffixes that contain non-initial diphthongs, e.g. possessive -tai).
- b. GZA is word-bound; it does not appear across word boundaries or with clitics, such as the enclitic question marker -UU, which instead inserts [j] when attached to a vowel-final word.
- c. The /g/ appears in hiatus configurations regardless of whether the stem is native or borrowed.

- d. The lone apparent exception is the infinitive suffix *-əx*, which does not attach directly to vowel-final stems as we would expect if it were underlyingly */x/*, and does not trigger appearance of */g/* after vowel-final stems as we would expect if it were underlyingly vowel-initial.

As mentioned in Section 1, Svantesson et al. treat GZA as the product of a synchronic rule that inserts between two vowels a consonant unspecified for place features. This feeds the redundancy rule in (9), which inserts the feature [velar] in segments lacking an oral place of articulation, as well as the rule of pharyngeal harmony, which spreads [pharyngeal] to this segment (when it does not immediately precede an */i/*) in pharyngeal harmonic spans.

A putative advantage of Svantesson et al.'s analysis is that the seemingly unexpected [velar] feature is not arbitrary; it is argued to follow from [velar] being the default place of articulation in Mongolian, because its occurrence is predictable in both consonants and vowels. The power of this argument lies in the coupling of consonantal place of articulation to vowel place; if one considers consonants on their own in isolation from vowels, it is typically possible (in the absence of evidence from transparency, neutralization, epenthesis, etc.) to make equally valid arguments for any of the places of consonant articulation as the default, with the others being lexically specified. But if the default for consonantal place of articulation is tied to the default in vowels, then by virtue of the fact that all vowels are dorsal cross-linguistically (Flynn 2012) we should expect it to be common cross-linguistically for epenthetic consonants to be dorsal as well, which is not the case (Vaux and Samuels 2017). A further concern with Svantesson et al.'s analysis is that it leaves unexplained the question of why the epenthetic consonant changes from *y* to *g* in the history of Mongolian, precisely after the development of intervocalic *g* deletion, as we shall see in the next section.

3 DIACHRONIC DEVELOPMENT OF GZA

Having established the synchronic distribution of GZA, we can now discuss how these alternations may have arisen diachronically. We believe that the periodization of the history of Mongolian by Nicholas Poppe (1955, 1959, 1964) contains the key to the origins of GZA. According to Poppe, there were four main stages in the development of Modern Mongolian from Ancient Mongolian, the latter being a language very close to what is reflected in texts written in the Uyghur Mongolian script in the 13th century.

3.1 FROM PROTO-MONGOLIC TO KHALKHA

Some relevant phonological developments in the history of Modern Mongolian are summarized in (16), illustrated with the toponym *Ulaanbaatar* and the given name *Battulga*.

(16) SUMMARY OF PHONOLOGICAL DEVELOPMENTS FROM PROTO-MONGOLIC TO KHALKHA

a.	Proto-Mongolic or Ancient Mongolian		*ulagan ‘red’	bagatur ‘hero’	batu-tulga ‘solid hearth’
b.	Preclassical Written Mon- golian	Intervocalic spirantiza- tion	ulayan	bayatur	--
c.	Common Mon- golic	ɣ-deletion	ulaan	baatur	--
d.		V ₁ V ₁ merger	ula:n	ba:tur	--
e.	Mongolian, Buriat, Oirad, Dagur	Deletion of short V in non-initial syllables	--	ba:tr	bat-tulg
f.		Reanalysis of V: in non- initial syllables as short	ulan	--	--
g.		V epenthesis	--	ba:tər	bat-tuləɣ
h.	Khalkha	Fricativization	uɮan	--	bat-tuɮəɣ
			[ʊɮan]	[pa: ^h tər]	[pa ^h təɮəɣ]

The first stage, which Poppe calls Ancient Mongolian, is characterized by the existence of intervocalic voiced velar consonants, *ɣ and *g, the former appearing in [BACK] contexts such as *ayula* ‘mountain’ and the latter in [FRONT] contexts such as *temegen* ‘camel.’ Poppe confusingly uses the symbol ɣ to denote a voiced uvular stop, IPA [ɣ]. His main reason for assuming that *g* and *ɣ* were stops rather than fricatives at this point seems to have been the existence of early loans from Mongolian into Turkic and Tungusic languages where they surface as stops, even though the languages in question also possessed the corresponding fricatives. This can be seen in the word for camel being borrowed by

Evenki as *t̪m̪e̪ge̪ẽ* and the word for goat (by hypothesis [imagan] in Ancient Mongolian) being borrowed by Barguzin Evenki as *imagan*. Poppe also seems to have taken the fact that Uyghur Mongolian script renders the voiced uvular with the Uyghur symbol for *q* rather than its symbol for *ɣ* as evidence that a stop rather than a fricative was being borrowed. The consensus view among scholars of the family holds that Proto-Mongolic had no length contrast in vowels, but developed one by the time of the breakup of Common Mongolic (16d), thanks in large part to the loss of intervocalic **g* and **ɣ* under certain conditions (16c). Two examples of this can be seen in the name of the capital *Ulaanbaatar*, which is preserved in the preclassical written form *Ulayan Bayatur*.

The next stage involved the spirantization of intervocalic **g* and **ɣ* (i.e. *g*) (Poppe 1960:41,46). Many scholars believe that loans from this period can be identified in Chagatay and Persian (e.g., Nagy 1997), such as the word for ‘snow and wind storm’ *boruqa(n)*, which appears to have been borrowed both at the spirantization stage as *boravan* and at the next stage, where the spirants deleted altogether, in this case giving *borān*.

Mongolian and several other languages in the family subsequently deleted short vowels in non-initial syllables (16e), which led to a reanalysis of original long vowels in those syllables as short (16f). A process of vowel epenthesis then inserted new short vowels where required by the phonotactics of the language (16g). These were sometimes in the same location as original short vowels, as in *Baatar*, but other times not, as in *Battulga*, which orthographically still reflects stage (16a) but now has an epenthetic vowel before the *<g>*.¹³ This stage, according to Poppe, appears to have been reached by the mid-13th century and involved gradual disappearance of **g* and **ɣ* and the resultant identical vowels in hiatus contracting into a single long vowel. This stage also characterizes Middle

¹³ Some Mongolic languages, specifically Khamnigan, Mongghul, and Ordos, have GZA but did not undergo the realignment of the vowel length system described here. They seem to require the traditional analysis of GZA as occurring between long vowels, rather than the simpler account of GZA between vowels proposed by Svantesson et al. (2005). We set this issue aside but note that a number of languages have consonant epenthesis specifically between long vowels, including Gokana (Lombardi 2002), Gondi (Subrahmanyam 1968 apud Srinivas 2010:68), Greenlandic (Kirchner 1995), Guajiro (Mansen & Mansen 1984), Hausa (Halle & Vergnaud 1980), Old Khotanese (Hitch 2016), Plains Cree (1973), and Western Ojibwe (Valentine 1994).

Mongolian, of which *The Secret History of the Mongols* is the most famous representative. Poppe maintains that the intervocalic fricatives disappeared entirely at this stage; if the two vowels brought together in this way were identical they merged into a long vowel as in *temē* ‘camel,’ but non-identical vowels remained distinct, as in *aula* ‘mountain.’ During this period, Ilkhanid Mongolian word lists began to appear in Armenian, Persian, and Arabic contexts. For example, in 1241 the Armenian monk Kirakos Gandzakets‘i produced a list of 50 Mongolian words that he had encountered following the Mongol Invasion, which included *t^haman/t^hamun* ‘camel’ and *iman* ‘goat’, both displaying loss of the original intervocalic dorsal consonant. This stage is preserved in the geographically peripheral modern languages Moghol, Santa, and Dagur.

It is important to note at this point that both of the two main systems used to write Mongolian are highly archaizing. The Uyghur Mongolian script used in Inner Mongolia largely reflects stage (16a), and the Cyrillic script used in the state of Mongolia reflects a mix of stages (16c) through (16e). Because both orthographies predate stage (16f), one will generally see Mongolian forms written with illusory short and long vowels, except in the work of Svantesson and his associates. In the present article we preserve traditional length-based notation in situations where non-shortening languages are included or when a stage prior to (16f) is being discussed.

The final innovation¹⁴ in producing the forms in table (16) is that the Khalkha dialect has fricativized its /l/ phoneme in all positions, as can be seen in both the words for ‘red’ and ‘hearth’ in (16h), as well as in the name of the Khalkha dialect, which is pronounced [χalʒχ]. In the languages that progressed to the fourth stage, the remaining vowel sequences merged into long vowels as well.

Many researchers other than Poppe believe, though, that while the western Mongolian of the Ilkhanid state may have completely deleted the reflexes of intervocalic *g/g by the

¹⁴ We do not include the laryngeal features of orthographic singleton and geminate stops here, as they are not germane to our discussion and are not necessarily innovations.

third stage, back in the homeland, Middle Mongolian maintained a consonant in this position; we return to this issue later in this section. While there are some reasons to believe that this may be true, it is clear that by the time of the breakup of Common Mongolic there was no such consonant left intervocalically, as none of the modern languages preserve a consonant in this position.

The lenition of intervocalic voiced dorsals created paradigmatic alternations that can be seen in Middle Mongolian, as with ‘officer’, the singular of which is *nojanlig* in *The Secret History*, alternating with the plural *nojanli’ud*,¹⁵ with lenition of the *g* intervocalically. With originally /g/-initial suffixes such as the causative and instrumental there is an interesting inversion: in Middle Mongolian they have /g/ after *consonant*-final stems and zero after *vowel*-final stems, but in Modern Mongolian they show /g/ after *vowel*-final stems and zero after *consonant*-final stems. Cleaves (1982:277) highlights different instrumental forms of ‘archer’, *učuma’ar* and *učumayar*, which suggest that there was synchronic variation in the presence or absence of intervocalic /g/ in Middle Mongolian. This, together, with paradigmatic alternations, could have provided a trigger for reanalysis by learners at the inflection point where GZA in the modern sense first appeared. That is to say, this appears to be the crucial point at which GZA developed. Up to Poppe’s third stage, Mongolian did not generally allow vowel hiatus word-internally; when morpheme concatenation produced a string of two vowels in Preclassical Written Mongolian, a [j] was typically inserted, so that for example the accusative was *-i* after *consonant*-final stems but *-yi* after *vowel*-final stems (Poppe 1964:75). The paradigmatic alternations resulting from this epenthesis were preserved in Middle Mongolian, so again for example, the genitive *-in* added to the name *Tamacha* produced *Tamacha-yin*.

¹⁵ Mongolists represent the mysterious intervocalic reflex of original *g with an apostrophe.

3.2 OUR PROPOSAL : GZA IS REANALYSIS OF DELETION AS EPENTHESIS

We suggest that, at a certain point in time, some learners were exposed both to outputs of Stage 3 with intervocalic /g/ insertion and to /g/-ful outputs produced by Stage 2 speakers without the deletion rule, and/or to speakers with variable deletion. This is what Bermúdez-Otero (2020) calls “localized bifurcation”, where an innovation is undertaken by some speakers within a community but not others. We suggest that some learners at this stage hypothesized that intervocalic /g/ was, in Vennemann’s (1972) words, a “hiatus breaker” rather than part of the words to which it historically belonged. The new rule of /g/-insertion would then have generated non-etymological instances of /g/, as in the ablative suffix *-Es*. The Ancient and Middle Mongolian ancestor of this suffix was *-ača* and invariably surfaced in vowel-initial form; in Modern Mongolian, *-Es* surfaces with initial /g/ when attached to vowel-final stems, as we have seen.

Subsequently, in what is essentially the modern system, we suggest that one or more speakers postulated that the rule of /g/-insertion was restricted to derived environments. In the theories of Lexical Phonology (Kiparsky 1982) and Stratal Optimality Theory (Bermúdez-Otero 1999, Kiparsky 2000), this is an automatic consequence of a process entering the lexical phonology, which is arguably where one would locate /g/-insertion. However, we contend that the original process of intervocalic /g/ lenition, which in traditional terms is post-lexical as it has no exceptions and applies across word boundaries, remains active in the post-lexical phonology throughout all of the stages just reviewed. This is reminiscent of Bermúdez-Otero’s version of “rule scattering”, in which derivatives of an originally low-level process can move into higher levels of the phonological component (e.g., the lexical stratum) while leaving the original in place.

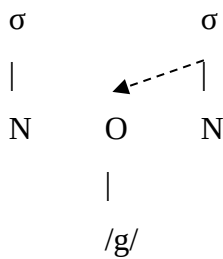
To summarize, we propose that Mongolic intervocalic /g/-insertion arose from an original process of /g/-deletion via reanalysis. This sort of development has many parallels cross-linguistically, including with *γ* in many dialects of Modern Greek studied by Newton (1972), as well as with *r* in English (see e.g. Vaux & Samuels 2017).

Following (8c), the resultant synchronic process of /g/-insertion in Khalkha Mongolian can be formulated in rule-based terms as in (17).

(17) /g/-insertion in Khalkha

a. *prose formulation*: insert /g/ between two immediately adjacent Nuclei spanning a morpheme boundary within a Prosodic Word.

b. *non-linear formulation*:



condition: subject to the Derived Environment Constraint

If our proposal is correct, it has implications for the identity of the mysterious intervocalic consonant represented as \dagger in Written Mongolian, which in Ancient and Middle Mongolian has variously been proposed to represent **h* (Svantesson et al. 2005:121), **ħ* (Miller 2002, Hill 2009), **x* (Janhunen 1999, 2003), **G* (Poppe 1964), **ɣ* (Doerfer 1963), **ɛ* (Shiratori 1929, Hattori 1939, Kobayashi 1954, Street 1957, Miller 2002), **ʕ* (Poppe 1951), or \emptyset (Pelliot 1925; Poppe for Middle Mongolian). If the mystery consonant were *h*, *x*, or *ʕ*, hypercorrection should have inserted these respectively; we would then be left with no explanation for the development of /g/-insertion. If the Written Mongolian and *hP'ags-pa*¹⁶ symbols in question were mere markers of hiatus, as Pelliot suggested, we again cannot explain the rise of /g/-insertion. If the mysterious intervocalic consonants were allophones of /g/, on the other hand, it makes sense that the phoneme /g/ would be chosen for insertion.

¹⁶ *hP'ags-pa* script bears the name of its inventor, a Tibetan monk, who developed it in the late 13th century at the behest of Qublai Khan (Shen 2015). It was in use throughout the Yuan dynasty (~100 years).

4 COMPETING ACCOUNTS OF GZA

GZA has emerged at the forefront of the controversy over C epenthesis (see, e.g., Żygis 2010, de Lacy and Kingston 2013, Uffmann 2014, Morley 2015, Staroverov 2016), since epenthetic dorsals are unexpected on the basis of cross-linguistic markedness. In most Optimality Theoretic (OT) approaches, an epenthetic segment is inherently unfaithful and must therefore be relatively unmarked to emerge. However, [dorsal] is considered to be quite marked as a C-place (see, e.g., Lombardi 2002, de Lacy 2006), so the rare cases of epenthetic dorsal Cs in the Mongolic languages have been met with some scepticism (e.g., de Lacy & Kingston 2013; Staroverov 2014, 2016). Some scholars have proposed that GZA is not the product of a synchronic phonological process, but rather involves suppletion (de Lacy & Kingston 2013, Staroverov 2016). Others have suggested that /g/ is in fact expected as an epenthetic C in Mongolian (Staroverov 2014). In this section we discuss each of these proposals in turn, beginning with the possibility that GZA could be analysed as deletion.

4.1 DELETION

An account of GZA in terms of deletion of stem-final /g/ is precluded by the phonological facts of the language. As an example, consider a deletion analysis of the alternation between the nominative [xu:] ‘boy’ and the instrumental [xu:ger]. One would posit a stem /xu:g/ and suffix /-Er/, or alternatively a stem /xu:/ and suffix /-gEr/, plus a rule that deletes /g/ in some appropriate context. In the case where the /g/ is taken to be stem-final, finding such a context does not seem to be possible, given that (i) dorsals are permitted word-finally in Mongolian, as in [pag] ‘team’; (ii) dorsals are specifically permitted word-finally after long vowels, as in [za:g] ‘border’ and [ɕ:g] ‘may s/he/it drink’; and (iii) dorsals do not normally delete after other Cs, as in /bos-g-Ex/ [pɔsgəχ] ‘stand-CAUS-INF’ (Svantesson et al. 2005), and when /g/ appears in a derived -gC# sequence, it triggers

vowel epenthesis, as in /udz-g/ [udzək] ‘may s/he see.’ Some of the same evidence rules out the /g/ being suffix-initial: if we were to maintain such an analysis, we would need a rule that deletes /g/ after C to obtain the correct forms for C-final stems, but the presence of forms such as /bos-g-Ex/ [pɔsɡəχ] ‘stand-CAUS-INF’ shows that /g/ does not in fact delete after C, across a morpheme boundary or otherwise. We conclude that GZA is not obviously amenable to a deletion analysis.

4.2 ALLOMORPHY

There are at least 23 morphemes that participate in GZA in Khalkha (recall (13)); it applies with both derivational and inflectional suffixes, and there is only one exception in the whole affix system of the language. Attributing GZA to allomorphy in the Khalkha scenario would effectively be treating the fact that at least 23 morphemes undergo exactly the same alternation as a massive coincidence involving the vast majority of the language’s morphemes.

It may be difficult to rule out a suppletion account of Khalkha entirely,¹⁷ though it finds very little support. Once one admits allomorphy as a possible account of this type of pattern, the phonological theory no longer makes predictions about the range of possible epenthetic consonants: if an “impossible” C-∅ alternation is observed, it can simply be treated as allomorphy, and the phonological theory’s prediction becomes unfalsifiable (see also Odden 2019:35 on this point).

4.3 SPLITTING

Staroverov (2014) presents an account of GZA in terms of “splitting”, which he proposes as an alternative to C epenthesis more generally. In such an account, markedness plays no

¹⁷ This is in part due to the word-boundedness of the phenomenon. In languages with C epenthesis across words, like English /r/-insertion, more definitive arguments against a morphological account can be made; see e.g. Vaux & Samuels (2017).

role in the selection of the output C (in this case, the various allophones of /g/). Rather than being inserted, the hiatus-breaking C “splits” from a neighbouring input vowel, and the identity of output C is driven by IO faithfulness to the neighbouring segments. This theory makes strong predictions regarding the occurrence of epenthetic Cs, since “[t]he inserted [C] will always be featurally the closest available to the input [Vs].... All [Cs] which are featurally closer to the same [V] must be blocked in the same language” (Staroverov 2014:36).¹⁸

Splitting theory requires a number of unusual assumptions within Optimality Theory (OT) with Correspondence (McCarthy & Prince 1995, 1999). Most crucially, it is stipulated that GEN does not allow insertion into syllable margins (Staroverov 2014:24), thus making DEP-C redundant since it can never be violated. This elimination of C epenthesis by fiat is not rationalized in any way, which is particularly unsatisfying given that true V epenthesis is still permitted. As such, splitting theory violates “freedom of analysis,” or the notion that GEN “applies all linguistic operations freely, optionally, and sometimes repeatedly” (McCarthy 2007:264). If C epenthesis is somehow not a “linguistic operation,” again, we are in need of an explanation for this striking asymmetry between Vs and Cs. McCarthy (ibid.) specifically notes in this regard that “complicating GEN with limits on epenthesis is unnecessary, since EVAL puts limits on epenthesis anyway.” However, this is the core assumption upon which splitting theory rests.

Splitting is taken to transform an input segment, say /i₁/, into multiple corresponding output segments, e.g. [j₁i₁] (Staroverov 2014:27ff). This violates INTEGRITY, and except for homorganic vocalic glides,¹⁹ also violates various IDENT-F constraints. In exchange, violations of markedness constraints such as ONSET or FINAL-C are reduced. The splitting

¹⁸ Feature-closeness is defined as follows (Staroverov 2014:67): “Given three segments, α, β, γ such that β differs from α in all and only the values of features from the set $\Theta = \{F_1 \dots F_n\}$, and γ differs from α in all and only the values of features from the set $\Pi = \{F_1 \dots F_m\}$, [γ] is featurally closer to [α] than [β] is iff $\Pi \subset \Theta$.”

¹⁹ The emergence of vocalic glides and laryngeals (the latter proposed to be [-CONS, +SON] approximants) is taken to represent V epenthesis, not splitting. Consonantal glides and laryngeals (Cs with Glottal place) cannot be epenthetic unless a language lacks dorsal Cs entirely, since otherwise those Cs would be featurally closer to the Vs by virtue of their shared [DORSAL] feature. Note that, in this system, the definition of Onset cannot refer to [+CONS].

operation that produces faux-epenthetic Cs is taken to be both binary and local; the output correspondents produced by splitting must be only two in number, and must be adjacent to one another (Staroverov 2014:29). However, Staroverov (2014:398ff) later argues that the splitting operation that produces “echo” V faux-epenthesis must be *non-local*, as it produces the mapping /V_iCCV_j/ → [V_iCV_iCV_j]. He claims that the operation of splitting a C into a nuclear position is unattested, and suggests that it may be ruled out by GEN; this entails that splitting of Vs into nuclei is *always non-local*. He adds, rather circularly, that this may be “why true insertion may be available with nuclei but not with margins” (Staroverov 2014:399). None of these V-C asymmetries, which must be universal as part of GEN, are explained.

In order to account for Mongolian GZA specifically, a particular analysis of the Mongolian feature inventory must be assumed, such that allophones of /g/ are able to emerge as the closest featural matches to the input Vs from which they split (Staroverov 2014:269ff). Vs are taken to be [+VOICE, DORSAL], and all glides in the language are assumed to be [+CONS]; epenthesis of vocalic glides is prevented by highly ranked *MARGIN/V. Splitting of input vowels to produce [g, ɣ]²⁰ is achieved via the ranking of IDENT constraints in (18); for a more complete ranking, see Staroverov 2014:288). No other Cs share [+VOICE, DORSAL] with vowels, as there are no other non-nasal voiced dorsals in the language. Thus, the dorsals that emerge are the closest in featural specification to the input vowels.

(18) Khalkha constraint ranking (Staroverov 2014:285)

IDENT-[PLACE], IDENT-[NASAL] >> IDENT-[CONS], IDENT-[SONORANT] >> IDENT-tongue position (e.g. [HIGH])

²⁰ Or [ɣ, ʁ]; he remains agnostic as to the exact specification of these Cs.

While this account appears to generate Khalkha GZA successfully, it requires accepting a restriction on GEN, namely that C epenthesis is not an available operation, and other asymmetries between consonants and vowels that await justification or explanation. We also show how splitting is not successful in accounting for a more complex pattern involving both dorsals and [j] in Dagur in Section 5.2. Given these issues and the problems with potential accounts in terms of deletion and allomorphy described in the previous subsection, we conclude that Khalkha GZA is most insightfully described as a case of C epenthesis.

5 EXTENSIONS TO RELATED LANGUAGES

Although the focus of the present work is Khalkha Mongolian, it is illuminating to compare the Khalkha case to that of related languages that also exhibit GZA. A more complete treatment of these languages is beyond the scope of this article, but here we briefly outline accounts of Buriat and Dagur GZA here because they illustrate the difficulties that suppletion and splitting accounts face when they are extended to GZA in these languages.

5.1 BURIAT

It has been proposed by de Lacy (2006) and de Lacy & Kingston (2013) that Buriat GZA constitutes an example of morphological suppletion. They provide two arguments in favor of this analysis. First, they claim that Buriat GZA is highly morphologically restricted, occurring with only three morphemes (the instrumental, the genitive, and the reflexive possessive). Staroverov (2016) extends this list to ten morphemes. The number of participating morphemes therefore raises suspicions, as Morley (2015) notes, and as we have also noted above for Khalkha²¹.

²¹ Morley (2015) provides a number of arguments that Buriat provides a learner with robust evidence for epenthesis, which we will not recap here.

The second argument for a suppletion account of Buriat is that the environments in which the /g/ appears are not the same across the three participating suffixes, and further that the surface realizations of at least the possessive suffix are rather distinct: *-ai* after consonants, *-gai* after long vowels, *-n* after final [i:] and diphthongs, and *-iin* after short vowels. Interestingly, the genitive behaves in a very similar fashion in Khalkha, which Odden (2019) summarizes as follows:

- (19) Realizations of /-in/ genitive suffix in Khalkha (modified from Odden 2019:37)
- a. Final /n/ ([ŋ]) deletes if the stem ends with /n/; cf. [nɔjɔŋ] ‘Mr.’, genitive [nɔjɔn-i]
 - b. After anything ending in orthographic <й> (e.g., so-called “long i” and diphthongs), the /i/ of the suffix deletes, as it also does in the accusative /-ig/; cf. [daʒai] ‘ocean’, genitive [daʒai-ŋ].
 - c. Dorsal-initial form occurs after vowel-final stems, with the above exception; cf. [sana] ‘thought’, genitive [sanagiŋ].

The phonological similarities between the forms in (19) are obvious, as are the phonological processes required to derive them, so these alternations do not require a suppletion analysis *prima facie*. However, from our perspective there is no problem in principle with suppletion co-existing with consonant epenthesis, so it would not automatically constitute evidence against our proposal if a small number of morphemes with exceptional behaviour exist amidst the landscape of a more general phonological process in which the majority of morphemes participate.

A third argument against an epenthetic account of GZA in Buriat comes from Staroverov (2016), who contends on the basis of data from nine Buriat speakers in a nonce suffixation task that GZA is not productive in this language, and must therefore be morphological rather than phonological. He suggests that GZA may be “represented as a property of affixes (either independently or generally for all of them.” If GZA is an individual

property (realized in Staroverov’s account as a floating feature²²) of 10+ morphemes in Buriat, this is a massive coincidence and missed generalization. It is unclear what a “general” GZA property of this class of affixes might be, if not a phonological rule.

Moreover, the results of Staroverov’s nonce suffixation task are puzzling and suggest to us that it lacked ecological validity. He asked speakers to produce forms with a nonce “augmentative” suffix of the form /-E:bE:/. Of the nine tested speakers, two predominantly inserted /r/ at the morpheme boundary, one predominantly inserted /l/, one predominantly inserted /g/, and one predominantly inserted /b/; the remainder employed a vowel deletion strategy. There are no processes of /b/, /r/, or /l/ insertion in Buriat, so whatever these four speakers hypothesized, it does not reflect their native phonology. However, as Staroverov notes, many of the training and filler items in the experiment ended in /r/ or /l/, which may explain the three speakers’ invention of such an epenthetic C. The /b/ insertion could reflect a copy of the consonant in the nonce suffix. Although the majority of speakers did epenthesize some C in the V_V: context, the results do not favor any particular analysis, but instead suggest that the speakers were biased by statistical regularities in the training/filler materials, rather than performing in a naturalistic manner. Moreover, the premise upon which the experiment rests is itself dubious: non-application of a phonological process to a novel suffix does not entail that the process itself does not exist (Pierrehumbert 2006); conversely, an irregular morphological process can be extended by analogy, as in the innovative English irregular past tense forms *dive* ~ *dove* and *sneak* ~ *snuck*. We conclude that, at best, Staroverov’s results suggest that speakers of Buriat prefer to avoid hiatus. This may be an interesting result for independent reasons, but says little about GZA in Buriat. We know of no such experiment that has been conducted with Khalkha speakers, but if such a study were carefully constructed, the results could be illuminative.

²² We also note that Staroverov’s (2016) account crucially relies on vowels being truly bimoraic due to the ranking MAX-BIMOR >> DEP, because in order for the floating feature to surface, a root node needs to be inserted, and that repair can only be preferred over deletion if MAX-BIMOR is highly ranked. This assumption about the vowel system appears to be incorrect for reasons reviewed earlier.

5.2 DAGUR

The splitting analysis described in Section 4.3 runs into problems with GZA in the closely related Mongolic language Dagur. Dagur has epenthesis of /g/ in the verbal system but /j/ in the nominal declension, as in (20) below from Nugteren (2011). Note that the glide is not homorganic, but invariant.²³

(20) Dagur epenthesis (Tsumagari 2003)

a.	akaa-EEs	‘older brother-abl’	→	akaayaas
b.	shiree-EEs	‘table-abl’	→	shireeyees
c.	tulie-EEs	‘firewood-abl’	→	tulieyees
d.	coloo-EEs	‘stone-abl’	→	colooyaas
e.	oo-EEcing	‘one who drinks-part.ag’	→	oogaacing

Staroverov (2014:60-61, 94-96) makes a number of specific predictions regarding glide epenthesis, as shown in (21):

(21) Predictions of the Splitting theory for glide epenthesis in non-high vowel contexts (slightly modified from Staroverov 2014:96)

- a. Glide epenthesis next to any non-high vowel violates IDENT-[high]. Therefore if glide insertion is extended to non-high vowels, the epenthesis-motivating markedness constraint (e.g. ONSET) must dominate IDENT-[high].
- b. For high and mid vowels one of the inserted glides is more faithful than the other. Consequently, unless some markedness constraint (e.g. *ji/wu) has a blocking effect, glide epenthesis next to high and mid vowels will always be homorganic.

²³ Uyghur, another language with non-homorganic [j] epenthesis, poses similar difficulties for a splitting account; see Vaux & Samuels (2017) for discussion in the context of markedness-based accounts of consonant epenthesis.

- c. Homorganic glide epenthesis next to mid vowels is more faithful than glide epenthesis next to low vowels. Therefore while languages that insert glides next to high and mid vowels are expected, there should be no languages which insert glides next to high and low (but not mid) vowels.
- d. For low vowels, none of the glides is more faithful than the other, and therefore we expect to find both [j] and [w] epenthesized in this context.

First, Dagur shows non-homorganic glide insertion next to non-low vowels, contra (21b). Second, Staroverov follows Levi (2004, 2008) in positing that glides can be either consonantal or vocalic. Let us for the sake of argument assume that Dagur [j] in (20) is consonantal, a position defended by Tsumagari (2003), in which case it is specified as Coronal place whereas all vowels are Dorsal (Staroverov 2014:271). Since the glide is not homorganic in this case, it incurs multiple IDENT violations (see e.g. Staroverov 2014:92). Moreover, it does not share Dorsal place with the vowels, so it should be precluded from generation via splitting given that the language has dorsal Cs. On the other hand, we could posit that the [j] is vocalic. It would then share Dorsal place with Vs, and indeed would be featurally identical with /i/, thus blocking the appearance of any [+CONS] segment via splitting in the same environment (Staroverov 2014:72ff)—but this prediction does not hold, since we see /g/ appearing in the same environment in the verbal system. Thus, the appearance of [j] in the nominal declension must be attributed to some mechanism other than splitting, presumably allomorphy rather than epenthesis, since Staroverov (2014:399) does not allow epenthesis in syllable margins. This is an undesirable analysis because it results in two very different explanations for two extremely similar processes in the same language, both of them morphologically restricted to similar degrees.

CONCLUSION: GZA IS CONSONANT EPENTHESIS

In the present work we described Khalkha Mongolian GZA from both diachronic and synchronic perspectives with the aim of documenting its historical development and providing an insightful analysis of the process as it occurs synchronically. GZA appears to have arisen from reanalysis of the lenition and eventual loss of intervocalic **g*, which took place prior to the breakup of Common Mongolic. Subsequently, several Mongolic languages underwent a major realignment of the vowel system. Understanding the outcomes of this realignment, which is not reflected in the orthographic systems used to write the modern languages, is crucial for properly characterising the environment in which GZA occurs. It is also important to note that GZA reflects alternations between a *phoneme* /*g*/ and zero. This phoneme surfaces intervocalically as a spirant in modern Mongolic languages; recall (12). Our account also sheds light on a long-standing question in Mongolian historical phonology, namely the identity of a controversial Written Mongolian character and its hPags-pa counterpart, which we have proposed represented allophones of /*g*/.

With a description of the phenomenon in hand, we established that the synchronic GZA process should not be characterized as /*g*/-deletion, though it arose from the aftermath of such a process historically. Numerous other cases of *C~∅* alternations with similar histories have been documented; see, e.g., Blevins (2008) and Morley (2012). We have described the shortcomings of describing GZA in terms of allomorphy as well as theoretical and empirical problems with treating GZA in Khalkha and Dagur as splitting rather than insertion. On this basis we conclude that GZA represents a case of dorsal epenthesis. Vaux & Samuels (2017) provide an overview of why this is unexpected in theories that consider epenthesis to produce ‘emergence of the unmarked.’

Synchronically, GZA in Khalkha Mongolian can be captured with a traditional rule-based account in the spirit of Lexical Phonology. We propose specifically that insertion of /*g*/ occurs between two nuclei in derived environments, i.e., when affixation creates

hiatus. This only happens between orthographically “long” Vs because “short” Vs are not yet present when the /g/-epenthesis rule applies, as they are themselves epenthesised later in the derivation. The /g/-epenthesis is followed by [pharyngeal] spreading. The historical /g/-deletion rule is no longer synchronically active, though /g/-lenition is.

We conclude that any descriptively adequate phonological theory must be able to account for the Khalkha pattern of dorsal epenthesis. Since both markedness-based and splitting-based OT accounts face difficulties with GZA and other patterns of its type, these patterns may require a return to a constraint-based approach without the fixed markedness hierarchies that have been proposed, or a rule-based account such as the one presented here.

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DISCUSSION WITH PAUL DE LACY

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COMMENTS

Building on Svantesson et al. (2005) and Staroverov (2014), Samuels & Vaux (the above article) (hereafter SV) identifies observations about Halh speakers, called ‘/g/-epenthesis’.²⁴ SV makes three claims: (1) there is a rule-based theory that accounts for the observations, but (2) “markedness-based ... O[ptimality]T[heoretic]” theories and (3) “splitting-based OT” theories “face difficulties” in accounting for the observations.

I will not discuss all phonological theories that mention ‘markedness’ here because their formal implementations and empirical predictions vary greatly. I will instead focus on two theories that SV discuss: de Lacy (2006)’s theory (deL) will represent ‘markedness-based’ OT theories (because it’s the one I know best), and Staroverov (2014)’s theory (S14) will be the ‘splitting-based’ OT theory (the only splitting theory I know of).

1. Markedness-Based Theories. SV cite deL as an example of a ‘markedness-based’ theory.

In deL’s theory, Halh “/g/-epenthesis” cannot involve epenthesis of /g/. SV’s ‘/g/’ refers to a phonological segment in a derivationally intermediate form. deL’s framework is classical Optimality Theory, and there are no computationally accessible derivationally intermediate forms – there is only the input and output.

²⁴ Svantesson et al. (2005:xvii) identify their subjects’ language as “Standard Mongolian, the Halh (Khalkha) dialect as spoken in Ulaanbaatar, the capital of the Republic of Mongolia”. They generally refer to it as “Halh”, as does Staroverov (2014), so I will call it ‘Halh’ here. For why I refer to ‘Halh speakers’ rather than ‘[the language] Halh’, see de Lacy (2009).

So, what is epenthesized in terms of deL's theory? The Halh speakers phonological outputs have the dorsal glides [ɤ]/[ɥ], with velar/uvular place determined by adjacent vowels' [ATR] values. For deL, then, the issue is how to generate epenthetic dorsal glides [ɤ]/[ɥ], not the epenthetic dorsal stop [g] (which doesn't occur in the epenthesis environment in the output).

In deL's theory, there are a set of constraints on major Place of Articulation: *dors, *{dors,lab}, *{dors,lab,cor}, *{cors,lab,cor,glottal} (deL §2.3.2.2). These constraints raise a number of questions. In constraints outranking epenthesis formal terms. Phonological complexity fails. Primary reasons for epenthesis - coupled Every constraint is violated by [dorsal], so how could dorsals ever be epenthetic? In fact, the constraints favor glottals, so shouldn't the epenthetic consonant always be glottal? Moreover, deL has constraints on margin sonority that favor oral stop onsets over everything else, with glides being worst. So, shouldn't the Halh epenthetic consonant be the glottal stop [ʔ]? And if dorsal glides are the most marked segment possible, won't they be an impossible epenthetic segment?

deL (ch.3) addresses these points. The answer reduces to the observation that there are other conflicting constraints.

For example, there are constraints against the high-sonority glottals, so [ʔ], [h], and [ɦ] can be eliminated as contenders (deL §3.2.3).

There are also constraints that favor assimilation. For example, if manner-assimilation constraints outrank PoA constraints, epenthetic approximants win (de L§3.2.4). Manner assimilation eliminates oral stops, fricatives, and nasals as epenthetic contenders.

Recall that glottals are eliminated by sonority constraints, so why don't Halh speakers generate an epenthetic coronal approximant, since coronal is the next least marked PoA?

The problem with coronal approximants is that they come with extra baggage (deL§3.2.4). For example, the alveolar approximant [ɹ] is rhotic, and rhoticity can be avoided due to other markedness hierarchies. Halh speakers have no coronal approximant (different speakers have [r], [r] and a rhotic fricative – Svantesson et al. 2005:20).

So, apart from constraints, incidental properties of coronal approximants can push us further up the PoA markedness hierarchy: sonority constraints eliminate glottals, coronal approximants are out for auxiliary reasons (e.g. rhoticity, laterality), and so we arrive at the more marked PoAs: labial and dorsal (see deL§3.2.4.3 for more detailed discussion).

Now that we are left with only non-rhotic approximants, we can ask why Halh speakers epenthesize [ɤ/ʉ] and not the other options available to them: i.e. [w wj j].

There are a few different analytical options here, depending on one's feature theory. Staroverov (2014) proposes that [w j] are consonantal while [ɤ/ʉ] are vocalic, so the latter agree with vowel features better than the former – I refer the reader to that extensive discussion. Another option is to observe that the epenthetic consonants must agree in [ATR] with the surrounding vowels (a condition also found with fricatives and nasal stops). If [ATR] is a dependent of a back feature (e.g. [dorsal] or [pharyngeal]), then having an [ATR] specification would force a segment to also be back. Epenthetic dorsality would be a side-effect of ATR assimilation (see Hall 2007§13.6).

A further option is inspired by Danis (2017)'s theory of complex PoA. [w] is labio-dorsal and [j] is corono-dorsal (Hall 1997). In contrast, [ɤ/ʉ] has just one major PoA – [dorsal]. With the PoA constraints, [ɤ/ʉ] is the 'best' in terms of the PoA constraints because it incurs a proper subset of violations of the place-complex [j] and [w]. So, [ɤ/ʉ] is the winner.²⁵

²⁵ A possible problem with this approach is that some speakers might have a labial glide rather than a labio-velar. Svantesson et al. (2005§2.5) say that “[w] ... is sometimes described as a bilabial fricative [β] ; it is, however, a “glide (approximant) rather than a fricative”. Unfortunately, there is so little information that I must leave determination of the phonological features of glide-[β] (in those speakers who have it) and its relationship to the dorsal glides for future research.

(1) Epenthesizing dorsal approximants, after Danis (2017).

/e-e/	AGREE (approx)	*ONS \geq stop	*DORSAL	*DORS,LAB	*DORS,LAB, COR
(a) ete	*!				*
(b) eme	*!	*		*	*
(c) exe	*!	*	*	*	*
(d) eʉe		*	*	*	*
(d) eje		*	*	*	* *!
(d) ewe		*	*	* *!	* *

So is it surprising that Halh has an epenthetic dorsal glide? Yes, if we focus solely on the PoA constraints. However, it's a methodological error to focus on computational subparts – a single set of constraints in OT, or a single group of rules in SPE. Asking about the capabilities of the phonological module requires system-wide evaluation. In OT, for example, it's essential to look at all the constraints before we make claims about what a particular theory of CON can and can't do.

But if deL's theory can generate epenthetic dorsal approximants, can it generate absolutely anything? To answer that question, we have to look at all of the other constraints. As deL (§3.2.4) points out, glides are rather special because there is no coronal approximant that doesn't carry additional featural baggage. If we focus on oral stops, then the constraints deL mentions would be unable to produce epenthetic [k], for example.

So, do Halh speakers actually produce 'marked' epenthetic consonants? Yes, if you focus on the PoA constraints. No, if you focus on the system – in Halh, [ɣ/ʉ] are the best epenthetic segments in the context of vowels, so in this system-wide sense they are least 'marked'.

For examples of other cases of epenthetic consonants with relatively highly marked PoA, see deL (§3.2.4.3).

2. Splitting-based Theories. Staroverov (2014) (S14) proposes that underlying vowels can split into two output segments. The result of such splitting looks like consonant ‘epenthesis’: e.g. /i₁a/ - [i₁j₁a].

In my opinion, the import of S14’s theory is highly under-appreciated. OT theories with Correspondence already have splitting, so showing that splitting can produce alternations that look like ‘epenthesis’ should give us serious pause. In essence, S14 proposes that the split consonant is largely faithful to its underlying vowel features in Halh, so explaining why it ends up as a glide. S14 provides a detailed analysis of the Halh case, so I refer the reader to it.

Here, I note that while SV criticize S14’s theory, they conclude their discussion with the comment: “this account [S14] appears to generate [Halh ‘epenthesis’] successfully”. I agree.

If S14 actually works for Halh, then what is SV’s criticism? It seems to be that it “requir[es] accepting a restriction on GEN, namely that C epenthesis is not an available operation, and other asymmetries between consonants and vowels that await justification or explanation.” However, every theory places restrictions on its computation and representation, so I believe SV’s criticism is essentially that S14’s theory has axioms – an observation true of every theory. The real justification for a theory is that it works, and as SV conclude, S14’s theory works for Halh.

SV do also claim that S14 can’t generate Dagur’s epenthesis. However, the description of Dagur is very short, and does not address the crucial issues of generality and productivity. More importantly, SV do not demonstrate that S14’s theory fails to generate Dagur epenthesis – doing so would require a proof set within the theory.

3. SV’s Theory. There is another component to SV’s argument: they claim to have a theory set within a Lexical Phonology framework that can generate the Halh alternations. It is presented as contrasting with ‘markedness-based’ theories, but what this means in formal terms is not defined.

A central part of SV's theory is rule (17) – /g/ insertion at vowel hiatus at morpheme boundaries. I believe that insertion of /g/ (and not [ɣ/ɥ]) is necessary within SV's framework because of computational restrictions at the lexical level – non-contrastive segments are not allowed, and so the allophonic [ɣ/ɥ] are not available. Later post-lexical (allophonic) rules must spirantize the /g/ and assimilate to ATR to produce [ɣ/ɥ].

There is one interesting difference between the SV and deL/S14 theories. Underlying /g/ spirantizes to [ɣ/ɥ] intervocalically. In SV's theory, /g/-spirantization and epenthesis produce the same output ([ɣ/ɥ]) because epenthesis inserts a /g/. In contrast, for deL and S14, epenthesis and /g/-spirantization act on different input elements: epenthesis on \emptyset , and /g/-spirantization on /g/. So, for deL and S14, it seems to be pure luck that both epenthesis and /g/ spirantization produce the same output segment. However, the same markedness constraints that act on epenthetic segments also act on underlying /g/, and so it is actually not surprising that they end up at a similar point.

Interestingly, lexical /g/ and the epenthetic segment don't end up at exactly the same point. Svantesson et al. (2005:29) notes that underlying velars generally agree in ATR with surrounding vowels. However, there is one exception: in onset position morphemefinally, [g] and [ɣ] contrast: e.g. [pag-as] 'team-RFL', [pag-ɣg] 'team-ACC' cf. [pag-as] 'small-RFL', [pag ɣg] 'small-ACC'.²⁶ This is exactly the environment in which epenthetic consonants appear; however, epenthetic consonants do agree in ATR. So, the question for SV's theory is why epenthetic /g/ undergoes ATR in this environment while underlying /g/ does not. In the deL and S14 theory, there is a straightforward reason: faithfulness constraints protect underlying /g/ and /g/ from assimilating, but they don't protect epenthetic consonants. As is usual with epenthetic segments, the epenthetic consonant shows the action of a phonological process that is blocked in underlying segments.

²⁶ These forms are intermediate forms, cited from S05:29. As output forms they would be [paɥ-as] vs. [paɣ-as], and so on.

Conclusions. SV assumes that deL’s theory can’t generate epenthetic dorsals. There is a good reason for this assumption: in the table of possible epenthetic consonants in de Lacy (2006:81), no dorsal is marked as potentially epenthetic – not even [ɥ]. (In fact, Anderson 2016:10 makes exactly the same assumption as SV, referring to deL and Halh).

However, the deL theory can generate epenthetic dorsal glides, as we’ve seen. So, SV’s error was in trusting that deL had figured out the predictions of the deL theory correctly.²⁷ The moral of the story? Don’t trust, verify.

What does ‘verify’ mean? There are two ways to show that a theory doesn’t work. One is to show that it is internally inconsistent – i.e. incoherent. The other is to show that it fails to generate what it claims to generate.

SV doesn’t show that S14’s theory is internally inconsistent, or show that it fails to generate the Halh speakers’ alternations. In fact, SV concludes that S14’s theory generates “successfully”. For ‘markedness-based’ theories, SV does not pick a specific theory and prove that it fails. For example, SV does not show that the deL theory necessitates a ranking contradiction in generating the Halh speakers’ alternations. In short, to prove that a theory fails, it’s necessary to present a proof that it fails. And of course, that proof must be set within the theory.

As examples of arguments against deL that employ such proofs, I recommend S14, Danis (2017), and Shih (2018). All these authors present rather difficult – perhaps insurmountable – problems for a variety of aspects of the deL theory, and all present proofs by demonstrating that the deL theory cannot generate specific input→output mappings.

In short, it’s likely that SV have the beginnings of a rule-based theory that adequately generates the Halh ‘epenthesis’ observations. However, it doesn’t then follow, nor have they proven, that ‘markedness-based’ and ‘splitting-based’ theories fail.

²⁷ To be fair, deL might have made assumptions about glide features that precluded [ɥ] epenthesis (e.g. assuming that [w] only has [labial] PoA) (Personally, it’s too long ago for me to remember). More adequate theories of glide features (e.g. see S14) necessarily change the predictions.

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DISCUSSION JOAQUIM BRANDÃO DE CARVALHO
(UNIVERSITÉ PARIS 8)

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COMMENTS

This paper argues for the existence of true velar epenthesis in modern Khalkha Mongolian, which would affect a number of verbal suffixes (listed in (13)). This epenthesis is shown to result from reanalysis of an earlier rule of intervocalic /g/-deletion.

On the whole, the argumentation is convincing. However, the reader may still have some doubts on two topics. The first concerns the rejection of allomorphy and of a suppletion-based account (pp. 354 and following). Two of the minor remarks below (marked with an asterisk) concern this point. In particular, the proposed reanalysis seems to imply that not only is /g/ inserted between vowels, but also that the velar is deleted after consonant historically. As there seems to be no constraint banning *VCgV, such a reorganization of the allomorphs is likely to point towards a morphological phenomenon instead of epenthesis.

The second topic is about velars. The reviewer did not read Vaux & Samuels 2017. Do the authors take it for granted that dorsal epenthesis is (highly) marked? Do they back /g/-epenthesis in Mongolian despite its markedness? It is not clear what are the "difficulties" met by the approaches that "have attempted to limit the range" of possible epenthetic consonants (p. 329). Are they empirical or theory-related? Or do the authors believe that there is no such limit? In any event, typological evidence is largely ambiguous on that matter: if coronals are the favorite unmarked consonants according to most phonologists that worked on place (un)specification, some have also claimed that velars are or may be placeless: see for example Trigo 1988, Avery & Rice 1989, Kaye, Lowenstamm &

Vergnaud 1990, Harris 1990, van der Hulst 1991, 1994, Rice 1996, Clements 2001 and Carvalho 2013. I think that this should be recalled in order to assess the "phonological cost" of the assumed epenthesis.

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