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# Anatolian evidence suggests that the Indo-European laryngeals $*h_2$ and $*h_3$ were uvular stops

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## Abstract

In this article it will be argued that the Indo-European laryngeals  $*h_2$  and  $*h_3$ , which recently have been identified as uvular fricatives, were in fact uvular stops in Proto-Indo-Anatolian. Also in the Proto-Anatolian and Proto-Luwic stages these sounds probably were stops, not fricatives.

## Keywords

Indo-European – laryngeals – phonological change – Indo-Anatolian

## 1 Background

It is well-known that the Indo-European laryngeals  $*h_2$  and  $*h_3$  have in some environments survived in Hittite and Luwian as consonants that are spelled with the graphemes  $\hbar$  (in the cuneiform script) and  $h$  (in the hieroglyphic script).<sup>1</sup> Although in handbooks it was usually stated that the exact phonetic interpretation of these graphemes is unclear,<sup>2</sup> in recent years a consensus seems to have formed that they represent uvular fricatives (Kümmel 2007:

- <sup>1</sup> Although there is no full consensus on the question exactly in which environments  $*h_2$  and  $*h_3$  were retained as  $\hbar$  and  $h$ : especially the outcome of  $*h_3$  in Anatolian is debated (e.g. Kloekhorst 2006). Nevertheless, for the remainder of this article it is not crucial in which environments  $*h_2$  and  $*h_3$  yielded  $\hbar$  and  $h$ , only that they sometimes did.
- <sup>2</sup> E.g. Melchert 1994: 22; Hoffner & Melchert 2008: 38.

331; Simon 2014; Weiss 2016), an interpretation that is based on the way in which Hittite and Luwian lexemes containing these sounds (especially personal names) are rendered in other languages of the Ancient Near East; I refer to the works mentioned for the details.<sup>3</sup>

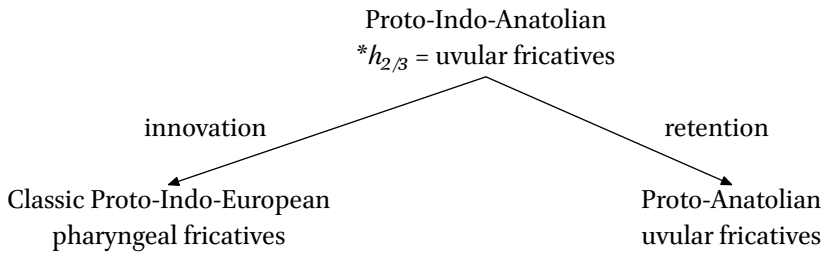
From a comparative perspective, this uvular interpretation of the outcomes of  $*h_2$  and  $*h_3$  in Anatolian is interesting, since it is quite generally assumed that at the Proto-Indo-European stage these sounds were rather pharyngeal fricatives.<sup>4</sup> Weiss therefore cogently states that “[i]f the Anatolian reflexes [of  $*h_2$  and  $*h_3$ ] were uvulars, then odds are that the second and third PIE laryngeals were themselves uvulars, because directionality favors the development from uvulars to pharyngeal (Aramaic, Hebrew (eventually), Dathina) over the opposite development [...]. We can have our cake and eat it too if we suppose that Nuclear Proto-Indo-European underwent a uvular-to-pharyngeal shift” (Weiss 2016: 337).

In other words, Weiss assumes that in the original mother language the laryngeals  $*h_2$  and  $*h_3$  were uvular fricatives, a situation that was retained as such in Anatolian, whereas all non-Anatolian languages underwent a common innovation, namely a shift from uvular fricatives to pharyngeal fricatives. In this way, Weiss’ scenario forms an argument in favor of the Indo-Anatolian<sup>5</sup> hypothesis, which states that Anatolian was the first branch to have split off from the mother language. In the case of  $*h_2$  and  $*h_3$ , we can schematize this relationship as follows (note that the language stages that Weiss called “PIE” and “Nuclear Proto-Indo-European”, respectively, are here rather called “Proto-Indo-Anatolian” and “Classic Proto-Indo-European”):

3 According to Weiss (2016: 335, 337), the fact that Luwian  $h$  is in Neo-Assyrian sometimes rendered as  $q$  (e.g. Neo-Ass.  $Q(a)ue/i$  = Luw.  $Hija\dot{u}a$  and Neo-Ass.  $Qalparunda$  = Luw.  $Halparuntija$ ) indicates that “in some dialect” of Luwian the uvular fricative  $[\chi]$  was hardened to a uvular stop  $[q]$ , which was then written in Neo-Assyrian with  $q$ . However, Simon (2014: 887) has cogently argued that the geographic and chronological distribution of these names with  $q$  for Luw.  $h$  indicates that they were probably transmitted to Neo-Assyrian via Aramaic: in Aramaic, no  $[\chi]$  existed, so that the Luwian  $h = [\chi]$  was substituted by its plosive variant  $[q]$ . This attractive analysis makes it unnecessary to follow Weiss’ assumption that in some (undefined) dialect(s) of Luwian, a hardening of  $*[\chi]$  to  $[q]$  has taken place, which is a typologically difficult development anyway (see also section 3.1, below).

4 E.g. Beekes 1995: 148; Tichy 2000: 31 (with hesitation); Fortson 2004: 58; Weiss 2009: 50.

5 Although often called the ‘Indo-Hittite hypothesis’, using the term originally coined by Sturtevant (1933: 30), a better term to describe the theory that the Anatolian branch split off from the mother language is the ‘Indo-Anatolian hypothesis’. From now on I will therefore use this term, and use the name ‘Proto-Indo-Anatolian’ for the mother language from which both Proto-Anatolian and Classic Proto-Indo-European descend.



In this article, I will go into more details regarding the phonetic value of the outcomes of  $*h_2$  and  $*h_3$  in the Anatolian languages, and will argue that for Proto-Anatolian (and Proto-Indo-Anatolian) we should not reconstruct them as uvular fricatives, but rather as uvular stops.

## 2 The outcome of $*h_2$ and $*h_3$ in Lycian and Carian

Although in Cuneiform Luwian and Hieroglyphic Luwian the outcomes of  $*h_2$  and  $*h_3$  are rendered with an *ḫ* (in cuneiform) and an *h* (in hieroglyphic), which, following the arguments of Kümmel (2007: 331), Simon (2014), and Weiss (2016), represent uvular fricatives, the value of their corresponding sounds in the two other relatively well known Luwic languages, Lycian and Carian, are different.

### 2.1 Lycian

In Lycian, we find four consonants that are generally regarded to reflect a consonantal outcome of  $*h_2$  and/or  $*h_3$ , namely  $\chi$ , *k*, *g*, and *q*.

Lyc.  $\chi$ : This is the sound corresponding to Hitt./Luw. word-initial *ḫ*- (Lyc. *ḫñtawat(i)*- ‘king’ ~ CLuw. *ḫantaḫat(i)*- ‘id.’ <  $*h_2ent$ -; Lyc. *ḫba(i)*- ‘to irrigate’ ~ Hitt. *ḫapae*- ‘id.’ <  $*h_2eb^ho$ -) and word-internal fortis *-ḫḫ*- (Lyc. *-ḫa* (1sg.pret.act.) ~ CLuw. *-ḫḫa*, Hitt. *-ḫḫun* ‘id.’ <  $*-h_2e$ ). It thus is the regular outcome of PIA  $*h_2$  when unlenited.

Synchronically, Lyc.  $\chi$  is generally assumed to represent a voiceless velar stop [k] (which after nasals was allophonically voiced, [g]): cf. the following personal names which are attested both in the Lycian and in the Greek alphabet: Lyc. *Xudara* > Gr. Κοδάρης; Lyc. *Xuwata* > Gr. Κοατα; Lyc. *Xñtabura* > Gr. Κενδαβόρα; Lyc. *Idāḫre* > Gr. Ιδαγρος.<sup>6</sup>

<sup>6</sup> Melchert 1994: 282; Van den Hout 1995: 138; Kloekhorst 2008a: 125.

Lyc. *k*: It is usually claimed that also *k* corresponds to Luw. fortis *-h̥-*, which would best be seen in Lyc. *tike* ‘anyone’ ~ CLuw. *kuiš̥ha* ‘id.’ (= *kuiš̥* + *=h̥ha*) < *\*k<sup>w</sup>is=h<sub>3</sub>e*.<sup>7</sup> This equation has recently been challenged by Sideltsev & Yakubovich 2016, however.

Synchronically, Lyc. *k* probably represents a voiceless palatal stop [c] (or, allophonically, [j] after nasals): cf. Lyc. *Krbbe[s]e* > Gr. Θ[ε][ρ]βεσιος; Lyc. *Kizzapr̥n̥na* ~ *Zisapr̥n̥na* < Pers. *\*Ciçafarnā*; Lyc. *Krupsse* > Gr. Θρυψις; Lyc. *Tikeukēpre* > Gr. Τιτευσεμβρα.<sup>8</sup> So, if the equation between Lyc. *tike* and CLuw. *kuiš̥ha* can be upheld (but cf. the criticism by Sideltsev & Yakubovich 2016; personally, I am still undecided on this point), we would have to assume that *k* = [c] is the outcome of pre-Lyc. *\*χ* = [k] when standing in a fronting environment (i.e. *=ke* [=cæ] ‘and’ < *\*=χe* *\*[=kæ]* < PAnat. *\*=Ho*). This would mean that Lyc. *k* would have been of a relatively recent origin, and we can therefore leave it out of consideration for the remainder of this article.

Lyc. *g*: This sound corresponds to Luw. intervocalic lenis *-h̥-*: cf. Lyc. *χuga-* ‘grandfather’ ~ CLuw. *hū̥ha-* ‘id.’ < *\*h<sub>2</sub>éuh<sub>2</sub>-eh<sub>2</sub>-*; Lyc. *agā* ‘I did’ ~ CLuw. *aḥa* ‘id.’ < *\*-h<sub>2</sub>e* (with lenition).

Synchronically, Lyc. *g* is generally seen as a velar fricative. It is usually interpreted as a voiced consonant, [ɣ], although I myself have argued that its basic value may be voiceless, /x/, and that it was only allophonically voiced in intervocalic position (see more on this below, in section 8.2).<sup>9</sup>

Lyc. *q*: The interpretation of *q* has been a matter of debate, but nowadays it seems generally accepted that it is the regular cognate of Hitt./Luw. *-h̥hu-*, the outcome of the PIA cluster *\*-h<sub>2</sub>u-* (and possibly also *\*-h<sub>3</sub>u-*<sup>10</sup>), e.g. Lyc. *trqqñt-* ‘Storm God’ ~ CLuw. *tarḥunt-* ‘id.’, Hitt. *tarḥuuant-* (ptc. of *tarḥu-* ‘to conquer’) < *\*trh<sub>2</sub>u(e)nt-*.<sup>11</sup>

Synchronically, it must have been a voiceless labiovelar stop [k<sup>w</sup>] (which after nasals was allophonically voiced, [g<sup>w</sup>]), cf. Lyc. *Qñtu-rahe/i-* > Gr. Κονδορασις.

7 E.g. Melchert 1994: 285, 306; Kloekhorst 2013: 145. Note that Lyc. *=ke* ~ CLuw. *=h̥ha* is sometimes rather reconstructed as *\*=h<sub>2</sub>o* (e.g. Melchert 1994: 235), but this is in principle irrelevant for the present discussion: the intermediate PAnat. stage would in both cases have been *\*=Ho*.

8 Kloekhorst 2008a: 125.

9 Cf. Kloekhorst 2008a: 125–126. Note that in that article, I indicated the phonetic value of Lyc. *g* as “[χ]”, as if a uvular fricative, but in fact I meant [x], a velar fricative.

11 Kloekhorst 2006[2008]: 97–101; Kloekhorst 2008a: 125; now also accepted by e.g. Melchert 2011: 129; Melchert fthc.

We may thus conclude that the regular cognate of Hitt./Luw. fortis *-h<sub>2</sub>* is in Lycian a voiceless velar stop [k] (or [kʷ] when followed by \**u*), and that the cognate of Hitt./Luw. lenis *-h* is a velar fricative [χ] (which may be a voiced allophone of an underlying voiceless fricative /x/).

## 2.2 *Carian*

Our knowledge of the phonology of Carian is much less advanced than that of Lycian, but nevertheless, also for Carian some facts are known regarding the outcome of PIE \**h*<sub>2</sub> and/or \**h*<sub>3</sub>.

Car. *k*: It seems now rather generally accepted that Car. *k* is the outcome of \**h*<sub>2</sub> and \**h*<sub>3</sub> in at least word-initial position (Car. *kδou-* ‘king(?)’ ~ CLuw. *hanta<sub>2</sub>uat(i)-* ‘id.’ < \**h*<sub>2</sub>*ent-*; but cf. also the Carian gloss *κόν* ‘sheep’ (Adiego 2007: 455) ~ CLuw. *hā<sub>2</sub>ua/i-* ‘id.’ < \**h*<sub>3</sub>*eu-i-*).<sup>12</sup>

Synchronically, there can be no doubt that Car. *k* represents a voiceless velar stop.<sup>13</sup>

Car. *q*: Also this sound reflects \**h*<sub>2</sub>: it is the outcome of the sequence \**-h<sub>2</sub>u-* in Car. *trq(u)δ-* ‘Storm God’ ~ CLuw. *tar<sub>2</sub>hunt-* ‘id.’, Hitt. *tar<sub>2</sub>hu<sub>2</sub>ant-* (ptc. of *tar<sub>2</sub>hu-* ‘to conquer’) < \**trh<sub>2</sub>u(e)nt-*.

There is debate on the exact phonetic interpretation of Car. *q*: Adiego (2007: 244) assumes that it had the value of a uvular stop, [q] (thus also Simon 2011: 539 f. and Brosch 2016: 9–10), whereas I myself have rather proposed a labiovelar stop [kʷ] (Kloekhorst 2008a: 138).<sup>14</sup>

Whatever be the exact value of Car. *q*, it is clear that Car. *k* was a voiceless velar stop [k], which seems to be the regular outcome of PIA word-initial \**h*<sub>2/3</sub>. It thus matches Lyc. *χ*, which is a voiceless velar stop [k], as well.

## 3 Reconstructing the Proto-Luwic value of \**h*<sub>2</sub>

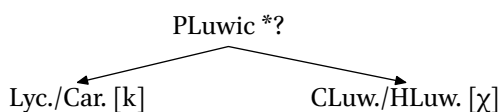
Within the Luwic sub-branch, we thus find two different outcomes of PIA \**h*<sub>2</sub>: a voiceless uvular fricative [χ] in Cuneiform Luwian and Hieroglyphic Luwian, and a voiceless velar stop [k] in Lycian and Carian (in the coming paragraphs I

<sup>12</sup> Adiego 2007: 260; Kloekhorst 2008a: 145; Simon 2011; Brosch 2016.

<sup>13</sup> Adiego 2007: 243; Kloekhorst 2008a: 138; Simon 2011: 538; Brosch 2016: 8.

<sup>14</sup> Especially the possibility that the Car. enclitic morpheme =*q* means ‘and’ and reflects PIA \**=k<sup>w</sup>e* (Kloekhorst 2008a: 140–141) would point into the direction of a labiovelar stop rather than a uvular stop.

will only focus on the unlenited outcome of  $*h_2$ ; the value of its lenited counterpart will be discussed in section 8; and cf. section 9 for a more detailed discussion of  $*h_3$ ). This raises the question what one should reconstruct for Proto-Luwic:



In theory, there are three options.

### 3.1 Option 1: *PLuwic* $*[\chi]$

The first option is that the Proto-Luwic value of  $*h_2$  was the same as in the Luwian languages, namely  $*[\chi]$ . This implies that we have to assume a development of *PLuwic*  $*[\chi] > \text{Lyc./Car. [k]}$ , i.e. a “hardening” of a fricative to a stop and a subsequent fronting of the uvular to the velar place of articulation (or first a fronting of uvular  $*[\chi]$  to velar  $*[x]$  with subsequent hardening to  $[k]$ ). This development is not self-evident, however, since the hardening of a velar / uvular fricative to a stop is a cross-linguistically rare phenomenon. In his book on the typology of consonantal change, Kümmel (2007: 147–148) remarks that an unconditioned hardening of fricatives is almost exclusively attested for the dental-interdental place of articulation. In the case of velar and uvular fricatives, Kümmel (2007: 148) states that a hardening of a fricative to a plosive articulation is usually conditioned (“teilweise auf den Anlaut oder andere Positionen beschränkt”), and that “eine Entwicklung zur Aspirata häufiger [ist]”. And indeed, of the examples of hardening of velar / uvular fricatives that Kümmel cites (2007: 148), in most cases they develop into an aspirated velar stop  $[k^h]$ . In the case of Lycian and Carian, however, the velar stops were clearly unaspirated: if they would have been aspirated, they should have been rendered in Greek with the aspirated velar stop  $\chi$   $[k^h]$ , which they never are. Therefore, the languages in which a velar / uvular fricative develops into an aspirated  $[k^h]$  cannot be used as an argument in favor of postulating a *PLuwic*  $*[\chi]$  that would have undergone a hardening into Lyc./Car.  $[k]$ . The only examples of a hardening of a velar / uvular fricative to an unaspirated stop cited by Kümmel (2007: 148) are either conditioned<sup>15</sup> (and thus cannot be used as a

15 The development of “ $x > k / \_R$ ” in Upper Sorbian and Central Lower Sorbian, and the development of “ $x > k / \_ \#$ ” in Polish dialects (Lesser Polish).

parallel for PLuwic \*[χ] to [k], which seems to have been unconditioned), or are dubious.<sup>16</sup>

All in all, assuming an unconditioned hardening of a PLuwic uvular fricative [χ] to a velar stop in Lycian and Carian does not seem to be supported by cross-linguistic evidence.

Of course, one could argue that Lycian and Carian have undergone a heavy substratum influence that eliminated fricatives in general, and thus did cause a hardening of \*[χ] to [k]. However, this would be contradicted by the fact that synchronically in Lycian we do find fricatives, like labial *b* = [β] (or [ϕ]), dental *d* = [ð] (or [θ]), but also velar *g* = [ɣ] (or [x]), which is the outcome of the lenis variant of PIA \**h*<sub>2</sub> (perhaps Carian had fricatives too, but their status and origins are much less clear). So there definitely never was a general hardening of fricatives in the prehistory of Lycian (and probably neither in Carian), which means that postulating a development of \*[χ] > Lyc./Car. [k] on the basis of heavy substratum influence is not satisfactory either.

### 3.2 Option 2: PLuwic \*[k]

The second option is to assume that the PLuwic value of \**h*<sub>2</sub> was the same as in Lycian and Carian, namely \*[k]. This implies that we would have to assume a development of PLuwic \*[k] > CLuw./HLuw. [χ]. This is impossible, however, since we know that the PLuwic \*[k] that was inherited from Proto-Anatolian (the outcome of the PIA plain velar stop \**k*), yielded a [k] in the Luwian languages: PIA \**kers*- > PANat. \**kars*- > PLuw. \*[kars-] > CLuw. *karš*- 'to cut'. If we would assume that Luw. [χ] derives from a \*[k], we should expect that also PANat. \**k* through PLuw. \**k* would have yielded Luw. [χ], and that, for instance, 'to cut' would have been \*\**hkarš*-.

### 3.3 Option 3: PLuwic \*[q]

Since the PLuwic value of \**h*<sub>2</sub> can hardly have been identical to its value in the Luwian languages, [χ], and can certainly not have been identical to its value in Lycian and Carian, [k], it is best to assume that it was a sound different from both outcomes. I therefore want to propose that it in fact was a voiceless uvular stop, \*[q]. This means that for Lycian and Carian we would have to

16 The development “?\*x > k / \_” as cited for Proto-Baltic is regarded by Kümmel himself as dubious (cf. the question mark). The development of “x > k / \_” as cited for Montenegrin (with reference to Popović 1960: 436), is in fact not unconditioned, but rather an auslaut phenomenon (cf. Ivić 1958: 213) [I would like to thank Tijmen Pronk for discussing these examples with me]. The only other unconditioned hardening cited by Kümmel is “\*χ > \*q / \_” in Lycian and Carian, i.e. the development that is under review here.

assume a shift in the place of articulation, namely a fronting of a uvular stop to a velar stop,  $*[q] > [k]$  (thus causing a merger with the outcome of PANat.  $*k$ ), and for the Luwian languages that it underwent a shift in the manner of articulation, namely from a stop to a fricative,  $*[q] > [\chi]$ . Both developments are cross-linguistically well attested: the development  $*[q] > [k]$  is for instance found in Turkish, whereas  $*[q] > [\chi]$  is known from several other Turkic languages,<sup>17</sup> as well as, for instance, from several West Caucasian languages.<sup>18</sup>

Of the three options discussed it is clear that, from a typological point of view, this third one is the most attractive one.

#### 4 Reconstructing the Proto-Anatolian and Proto-Indo-Anatolian value of $*h_2$

If in Proto-Luwic the outcome of  $*h_2$  was indeed a voiceless uvular stop  $*[q]$ , we may ask ourselves if this has consequences for the reconstruction of this sound for Proto-Anatolian. To my mind, it certainly does: if we compare Proto-Luwic  $*[q]$  to Hitt.  $[\chi]$ , the same considerations apply as was discussed in section 3: a ‘hardening’ from a uvular fricative  $*[\chi]$  to a uvular stop  $*[q]$  is typologically difficult, whereas a fricativization of  $*[q]$  to  $[\chi]$  has good parallels. It therefore is more attractive to reconstruct for Proto-Anatolian a stop  $*[q]$  than a fricative.

Of course, the same story then goes for our reconstruction of Proto-Indo-Anatolian: if we have a Proto-Anatolian uvular stop  $*[q]$  besides the Classic PIE pharyngeal fricatives ( $*[ħ]$  or  $*[ʕ]$ ), it is more attractive to assume that Proto-Indo-Anatolian had a uvular stop,  $*[q]$ .

#### 5 Additional arguments

Thus far, the argumentation has been typological. However, in order to make a definite case in favor of interpreting  $*h_2$  as a uvular stop at the Proto-Luwic, Proto-Anatolian, and Proto-Indo-Anatolian levels, we need other types of arguments as well. At this moment, I can think of three such arguments in favor of this interpretation.

17 Cf. Johanson 1998: 99–100.

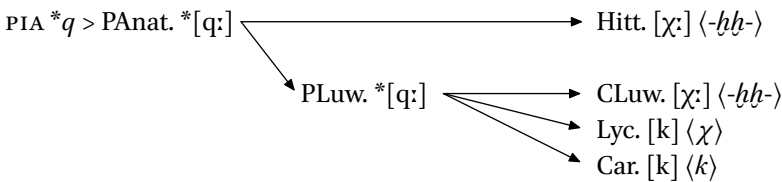
18 E.g. in the Abkhaz dialects Bzyp, Abzhywa, Ahchypsy, and Sadz (Chirikba 1996: 60–61).

### 5.1 *Argument 1: the fortis character of \*h<sub>2</sub>*

The regular outcome of intervocalic \*h<sub>2</sub> in Hittite and in CLuwian is spelled as a geminate, i.e. fortis, -hh-, e.g. \*péh<sub>2</sub>ur > Hitt. pahhur ‘fire’, \*-h<sub>2</sub>e > CLuw. -hha (1sg.pret.act. ending). Although the exact phonetic interpretation of geminate spelling of consonants in Hittite and CLuwian has been a matter of debate, nowadays consensus seems to have it that, at least at the synchronic level, these consonants were long.<sup>19</sup> In other words, an intervocalic \*h<sub>2</sub> yielded in these languages a long voiceless uvular fricative [χ:] (\*péh<sub>2</sub>ur > Hitt. pahhur [páχ:or], \*-h<sub>2</sub>e > CLuw. -hha [-χ:a]). This development contrasts with the outcome of \*s in Hittite and CLuwian. The regular outcome of this consonant in intervocalic position is a single spelled, i.e. lenis, -š-, which was a short consonant: e.g. \*néb<sup>hes</sup>es > Hitt. nēpišas [népisaš] ‘of heaven’; \*h<sub>1</sub>ésēr > Hitt. ešer [ʔéser] ‘they were’; \*h<sub>1</sub>séntu > Hitt. ašandu /əsántu/, CLuw. ašandu /əsántu/ ‘they must be’.

If we would assign to \*h<sub>2</sub> the value of a voiceless uvular fricative for the Proto-Anatolian or Proto-Indo-Anatolian stage, it would be difficult to understand why this would yield a long, fortis consonant in Hittite and CLuwian, whereas the other fricative, \*s, which was voiceless as well, yielded a short, lenis consonant. As far as I am aware, this problem has never been properly addressed, let alone solved. I now want to argue that the difference in outcome between \*h<sub>2</sub> and \*s can be explained by assuming that \*h<sub>2</sub> originally was a voiceless stop, \*q. In this way, we could compare its outcome as a fortis consonant in Hittite to the outcome of the other voiceless stops of PIA, which in Proto-Anatolian and in Hittite and CLuwian yielded long, fortis consonants as well, e.g. PIA \*t > PANat. \*[t:] > Hitt./CLuw. [t:], spelled -tt-, etc.

In other words, we can now set up the following developments, in which the outcome of \*h<sub>2</sub> = \*q as a geminate spelled -hh- in Hittite and CLuwian can be explained.



Recently, I have argued that also at the PIA level the consonants that are traditionally called ‘voiceless stops’ were in fact long stops, e.g. PIA \*p = \*[p:],

19 Melchert 1994: 13–21; Kloekhorst 2008b: 21–25; Kloekhorst 2014: 21–22, 544–546; Kloekhorst 2016: 213–217; Melchert 2017: §1.88.

PIA  $*t = [t]$ , etc. (Kloekhorst 2016). This would then imply that  $*h_2$  at this level was a long stop as well,  $*[q]$ . However, this interpretation of the Proto-Indo-Anatolian stop system is not relevant for the present argument: also if one adheres to the traditional reconstruction (PIA  $*t$  being a short voiceless stop  $*[t]$ , that only in Anatolian was lengthened to  $*[t:]$ , etc.), the fact that  $*h_2$  yielded a fortis consonant in Hittite is better explained if  $*h_2$  were a stop than if it were a fricative.

### 5.2 *Argument 2: the outcome of $*sh_2$ -*

Word-initial clusters of the shape  $*sh_2V$ - receive a prothetic vowel in Hittite and yield  $išhV$ - (e.g.  $išhai$ - ‘to bind’ <  $*sh_2oi$ -). A similar development can be found in word-initial clusters of the shape  $*sTV$ - (in which  $T$  = any stop):  $iškār$ - ‘to sting’ <  $*skór$ -;  $išpānt$ - ‘to libate’ <  $*spond$ -;  $ištu$ - ‘to be announced’ <  $*stu$ -; etc. This development differs from the outcome of word-initial clusters of the shape  $*sRV$ - (in which  $R$  = any resonant); here no prothetic vowel develops:  $šalik$ - / $slik$ - ‘to touch’ <  $*sleiğ$ -;  $šamen$ - / $smen$ - ‘to pass by’ <  $*smen$ -;  $šarā$  / $srā$ / ‘upwards’ <  $*sró$ ; etc.

One could in principle explain the development of  $*sh_2V$ - to Hitt.  $išhV$ - by stating that in this environment fricatives were treated as stops. This may be contradicted, however, by the development of  $*ssénti$  > Hitt.  $šašanzi$  ‘they sleep’ (only if this development may be viewed as regular, which admittedly is quite uncertain).

It may therefore be easier to explain the development of  $*sh_2V$ - to Hitt.  $išhV$ - by assuming that  $*h_2$  originally was a stop. This would mean that  $*sh_2V$ - was  $*sqV$ -, which yielded PANat.  $*[sq:V]$ . This cluster then first developed a prothetic vowel (like all clusters of the shape  $*sTV$ -), yielding pre-Hitt.  $*[isq:V]$ , after which the uvular stop underwent fricativization, resulting in Hitt.  $[isχ:V]$ , spelled  $išhV$ -.

### 5.3 *Argument 3: $Ahhiiayā$ vs. $ʾAχaioi$*

It is nowadays generally accepted that the Hittite toponym  $Ahhiiayā$  refers to Mycenaean Greece, and that this name is related to the Greek term  $ʾAχaioi$  ‘Achaeans’.<sup>20</sup> However, the equation between Hitt.  $Ahhiiayā$  and Gr.  $ʾAχaioi$  is phonetically not fully straightforward, since Hitt.  $-hh-$   $[χ]$  is rather distinct from Gr.  $χ$   $[k^h]$ . Why was Gr.  $ʾAχaioi$  <  $*Aχaiʔoi$   $*[ak^haiw]$  not rendered in Hittite with  $-kk-$ , i.e.  $**Akkiiayā$ ?

<sup>20</sup> E.g. Beckman, Bryce & Cline 2011: 4.

The equation between *Aḥḥiiaūā* and Ἀχαιοί becomes easier if Hitt. *-ḥḥ-* derives from an earlier \*[q:]. We could then assume that *Aḥḥiiaūā* goes back to an earlier form \*[aq:iaw-], which is much closer to the Greek stem \*[ak<sup>h</sup>aiw-].

## 6 A counter-argument

Next to these additional arguments in favor of assuming that \*h<sub>2</sub> was a uvular stop at the Proto-Indo-Anatolian, Proto-Anatolian and Proto-Luwic level (of which I am aware that the former one is clearly stronger than the latter two), I can think of one possible argument against this postulation. We would have to assume that within the Anatolian language family a development of \*[q:] > [χ:] took place in two separate branches independently, namely in pre-Hittite (PAnat. \*[q:] > Hitt. [χ:]) and in pre-Luwian (PLuwic. \*[q:] > CLuw./HLuw. [χ:]). However, as we have seen above as well, this would match the situation in the Turkic language family, in which a fricativization of *q* to *χ* has taken place in several branches independently as well (e.g. Tuvan, Khalaj, cf. Johanson 1998: 99–100).<sup>21</sup> To my mind, this counter-argument therefore does not outweigh the arguments in favor of postulating that \*h<sub>2</sub> was a uvular stop rather than a fricative.

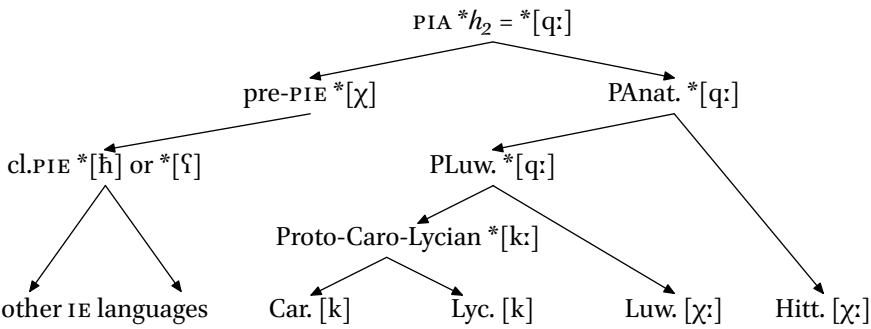
## 7 Conclusions regarding \*h<sub>2</sub>

We have seen that, typologically, it is difficult to understand how Lycian and Carian [k] could have been the outcome of \*h<sub>2</sub> if the latter sound originally was a uvular fricative. Instead, Lyc./Car. [k] is much better explained from a uvular stop, which can also account for the uvular fricative as found in Hittite and Luwian. Moreover, there are additional arguments to be given in favour of such a reconstruction, especially the fact that \*h<sub>2</sub> yields a fortis (long) consonant in Hittite and CLuwian.

All in all, I want to propose the following values for \*h<sub>2</sub> in the different language stages:<sup>22</sup>

21 Moreover, another branch in which the development of \*q to \*χ must then have taken place is Classic Proto-Indo-European, where \*χ subsequently developed into a pharyngeal fricative (see also section 1).

22 Note that Kümmel 2007: 318–327 argues that the Proto-Indo-European so-called plain velars (\*k, etc.) may in fact have been uvular stops (\*[q], etc.), which, if correct, would be contradictive to the idea presented here. However, Kümmel's argument is largely based on



8      The lenis variant of *\*h*<sub>2</sub> in Anatolian

As is well known, Proto-Anatolian knew several lenition rules, according to which original fortis consonants were lenited in certain intervocalic positions, namely (1) after a long accented vowel, and (2) when standing in between two unaccented vowels in a posttonic position.<sup>23</sup> Also *\*h*<sub>2</sub> was subject to these lenition rules: the lenited variant of *\*h*<sub>2</sub> is in Hittite and CLuwian spelled as a single *-h-*, and in Lycian as *g* (its value in Carian is not yet clear). The question now is: what was the exact phonetic value of these sounds, and what can we reconstruct for their Proto-Anatolian stage?

In his article on the phonetic value of the Luwian laryngeals, Simon gives a convenient table in which all values of the renderings of these consonants in neighbouring languages are given (Simon 2014: 886). A part of this table is reproduced here (with minor adaptations):

	<i>h-</i> , <i>-hh-</i>	<i>-h-</i>	≠
Aramaic	[h]	[ʕ]	[ʔ], [h], ⟨q⟩
Egyptian	[χ]	[g]	[q], [h], [ʕ], [ʔ], [h]
Ugaritic	⟨h⟩ (= [x] or [χ])	⟨ġ⟩ (= [ɣ] or [ʁ])	⟨q⟩, [h], [ʕ], [ʔ], [h]

his, to my mind unconvincing, attempt to interpret the PIE palatovelars (*\*k̑*, etc.) as plain velars (*\*[k]*, etc.) instead of as palatalized velars (*\*[kʲ]*, etc.).

23 Eichner 1973: 79, 100<sup>86</sup>; Morpurgo Davies 1982/83; Kloekhorst 2014: 547–566. Underlyingly, the two lenition rules can be reinterpreted as a single rule, *\*ṽ(... )VCCV > ṽ(... )VCV*, cf. Adiego 2001; Kloekhorst 2006[2008]: 133–134; Kloekhorst 2014: 586.

As we see, the renderings of word-initial *h*- and word-internal fortis *-hh-* are taken together here (first column), because they usually are the same. They moreover contrast with the rendering of word-internal lenis *-h-*, which is therefore given separately (second column). In the third column, Simon lists the other post-velar phonemes of the respective languages, which were not used to render the Luwian laryngeals, and which therefore can be used as an argument for determining what kind of value they did *not* have.

Despite his very clear presentation of these data, Simon's discussion of the material is less lucid, containing several incomprehensible steps (some of which even contradict his own findings!). This leads him to state that the distinction between Luw. fortis *-hh-* and lenis *-h-* must have been one between a fricative and a stop, and he therefore assumes that Luw. fortis *-hh-* was a voiceless uvular fricative [χ], whereas lenis *-h-* was a voiceless uvular stop [q] (Simon 2014: 888). This is quite impossible, however: the only language in which lenis *-h-* is rendered as a stop is Egyptian, where we find a [g], even though this language would have a [q] at its disposal to render the value of *-h-* if this really were a [q]. The fact that in Egyptian not [q], but [g] is used instead, rather indicates that Hitt./Luw. lenis *-h-* *cannot* have been a [q].

The one feature that Aramaic, Egyptian and Ugaritic share in their rendering of Luw. lenis *-h-* is voice: in Aramaic we find a voiced pharyngeal fricative [ʕ], in Egyptian a voiced velar stop [g], and in Ugaritic a voiced fricative that was either velar, [ɣ], or uvular, [ʁ]. It therefore seems fully cogent that lenis *-h-* was a voiced sound. Since fortis *-hh-* by all means must have been a voiceless uvular fricative [χ], it is only logical that lenis *-h-* was its voiced counterpart: a voiced uvular fricative [ʁ]. The fact that in Egyptian this sound was rendered as a voiced velar stop can then be explained by the fact that this language did not have a voiced uvular fricative at its disposal.<sup>24</sup>

24 Simon explicitly denies the possibility that lenis *-h-* could have been a voiced fricative, but his reasoning is flawed. He first claims that if the distinction between fortis *-hh-* and lenis *-h-* were one in voice, we would have to assume either a pair [x] vs. [ɣ] (velar fricatives) or a pair [h] vs. [ʕ] (pharyngeal fricatives). It is unclear to me, however, why he does not mention the possibility that the pair was one of uvular fricatives, [χ] vs. [ʁ]. Moreover, Simon then states that the possibility that we are dealing with a pair of voiceless vs. voiced fricatives “aber durch die klaren assyrischen und aramäischen Belege mit ⟨q⟩ widerlegt [wird], das, obwohl genau unbekannt ist, bestimmt keinen Frikativ darstellt”. However, the ⟨q⟩ that is sometimes found in Assyrian and Aramaic renderings of Hittite and Luwian names is in fact used to denote fortis *-hh-* and not its lenis variant *-h-*. Moreover, Simon himself has convincingly argued that this ⟨q⟩ must have been a (Sam’alic) Aramaic substitution of Hitt./Luw. [χ] (a sound that Aramaic itself did not possess), and that the names containing this ⟨q⟩ were then taken over in Assyrian from this variety of Aramaic (Simon 2014: 887–888; cf. also footnote 3 above). Therefore, the use of a ⟨q⟩ in Assyrian and Aramaic for

### 8.1 *Voice or length?*

This is not the whole story, however. As we have seen above, in both Luwian and Hittite, the fortis *-ḫḫ-* was in fact a *long* voiceless uvular fricative, [χ:]. The question thus arises: to what extent is this length relevant for the phonemic distinction between fortis *-ḫḫ-* = [χ:] and lenis *-ḫ-* = [ɣ]?

An answer may be provided by the following observation. The name of the Luwian Storm God *tarḫunt-* is in Egyptian attested as *trgt-*, with the voiced stop [g], and in Ugaritic as *trġ(n)d-*, with the grapheme *ġ* that either represents a voiced velar fricative [ɣ] or a voiced uvular fricative [ʁ].<sup>25</sup> Nevertheless, there can be no doubt that the *ḫ* in this form was fortis: the corresponding form in Hittite is spelled *tar-uḫ-ḫa-an-t*<sup>o</sup>, with geminate *-ḫḫ-*, and also Lyc. *trqqñt-* and Car. *trqδ-* clearly point to an original fortis consonant (albeit its labialized variant, from *\*h<sub>2</sub>u*). Apparently, fortis [χ:] could allophonically be voiced when standing next to a resonant. This implies that voice was not the underlying phonemic difference between fortis [χ:] and lenis [ɣ]: it must have been length instead. I therefore assume that in Luwian and, by extension, in Hittite the phonemic values of fortis *-ḫḫ-* and lenis *-ḫ-* were /χ:/ and /ɣ/, respectively, albeit that in intervocalic position the latter was allophonically voiced, [ʁ], and that also the former could be allophonically voiced when standing next to resonants, [ʁ:].

### 8.2 *The value of Lycian g*

A similar reasoning goes for the value of the outcome of the lenis variant of *\*h<sub>2</sub>* in Lycian. Although the sign with which this sound is written, *g*, is graphically identical to the Greek sign γ, which represents a voiced velar stop [g] (just as its labial and dental counterparts *b* and *d* are graphically identical to Greek β = [b] and δ = [d], respectively), it is generally not seen as representing a voiced stop, but rather as a voiced fricative, [ɣ] (likewise *b* = [β] and *d* = [ð]).<sup>26</sup> This is based on the observation that voiced stops are in Lycian usually rather spelled with the signs for voiceless stops with a preceding nasalization: e.g. *ñtarijeus* = Δαρείος and *idāχre* = Ἰδαίρος. In my opinion, this observation has another implication, namely that voice may not have been a phonemic feature: if fortis χ = [k] could allophonically be a voiced stop [g], then the phonemic distinction with its lenis counterpart *g* was possibly not determined by voice. This means

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rendering Hitt./Luw. fortis *-ḫḫ-* has no bearing on the phonetics of the Hitt./Luw. lenis *-ḫ-*, and thus does not preclude that the latter was a fricative, too.

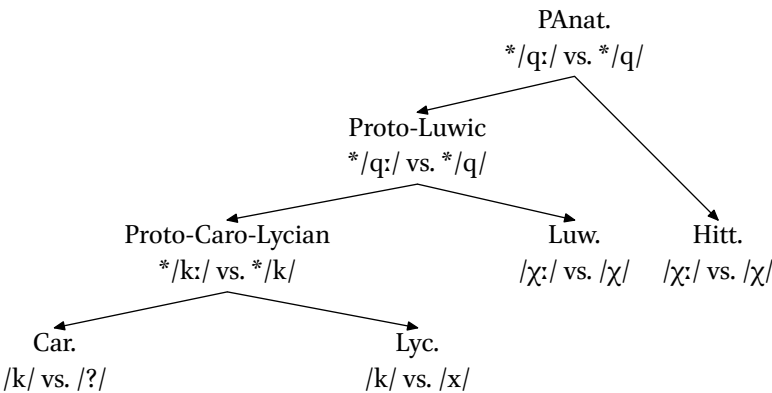
25 Cf. Simon 2014: 877 and 878 for these forms, with references.

26 E.g. Melchert 1994: 40, with references.

that the voice quality of *g* may have been allophonic as well, leaving open the possibility that its basic value was a voiceless velar fricative /x/.<sup>27</sup> Nevertheless, the fact that this sound is spelled with the sign *g*, which is equivalent to Greek γ, indicates that it was often voiced. Such allophonic voicing would be very likely in intervocalic position and probably also when the consonant is adjacent to resonants.

8.3 The outcome of lenited \*h<sub>2</sub>: conclusions

Although both the Hittite and Luwian value of the outcome of lenited \*h<sub>2</sub>, which was /χ/ (with an allophonic voiced variant [ɣ]), and its Lycian counterpart [y] (which may be an allophonic variant of an underlying voiceless /x/) were fricatives, I do not think that it is likely that their Proto-Anatolian predecessor was a fricative as well. In Lycian, the other fricatives, *b* and *d*, go back to lenis stops, and it therefore seems attractive to me that Lyc. *g* goes back to a stop as well. All in all, I reconstruct for both the fortis and the lenis outcome of \*h<sub>2</sub> in the Anatolian branch the following values (all of which could in certain environments be allophonically voiced):



9 The phonetics of \*h<sub>3</sub>

It is generally assumed that \*h<sub>2</sub> and \*h<sub>3</sub> were phonetically close, but the exact relationship between the two sounds is unclear. Some scholars assume that \*h<sub>3</sub>

<sup>27</sup> Thus already Kloekhorst 2008a: 125.

is the labialized variant of  $*h_2$ ,<sup>28</sup> some think that  $*h_3$  is the voiced / lenis variant of  $*h_2$ ,<sup>29</sup> and others postulate both differences.<sup>30</sup>

The idea that  $*h_3$  may have been the labialized variant of  $*h_2$  is of course based on the fact that  $*h_3$  generally has an *o*-colouring effect on a neighbouring  $*e$  (i.e. backing and rounding), whereas  $*h_2$  has an *a*-colouring effect on a neighbouring  $*e$  (i.e. backing and lowering, but not rounding). This is by all means certainly a cogent argument.

The idea that  $*h_3$  may have been the voiced / lenis variant of  $*h_2$  is based on several considerations, which I will treat one by one:

1. The reduplicated present to the verbal root  $*peh_3$ - ‘to drink’ must be reconstructed as  $*pi-bh_3-e/o-$ , with a  $*b$ : Skt. *píbati*, Lat. *bibō* (with assimilation of initial  $*p$ - to *b*-), Arm. *əmpəṃ* <  $*pimb$ - (with secondary nasal-infix), OIr. *-ib*, *ebait*. Structurally, we would expect this reduplicated present to rather have been  $*pi-ph_3-e/o-$ , however, with a  $*p$  (structure  $*C_1i-C_1C_2-e/o-$ ). It is therefore generally assumed that a change of  $*ph_3$ - to  $*bh_3$ - has taken place, which would then indicate that  $*h_3$  was a voiced consonant, since this development can then be viewed as due to voice assimilation. Since  $*h_2$  does not cause voicing, but in some branches instead causes aspiration (e.g.  $-th_2e$  > Skt. *-tha* (2sg.perf.ending)), it is assumed that  $*h_3$  thus was the voiced variant of  $*h_2$ .

There are a few odd things, however. First, there is not a single other good example in which a voicing because of  $*h_3$  would have taken place. For instance, the other verbal root of a structure  $*Teh_3$ -, viz.  $*keh_3$ - ‘to sharpen’, does not show any voicing at all (e.g. Skt. 3pl.pres. *śísanti* <  $*ki-kh_3-enti$ , ptc.midd. *śísāna*- <  $*ki-kh_3-mh_1no$ -, ta-ptc. *śita*- <  $*kh_3to$ -). Second, the voicing effect of  $*h_3$  would have taken place in Proto-Indo-European already (that is, at least the stage from which Indo-Iranian, Italo-Celtic and Armenian derive). This contrasts with the aspirating effect of  $*h_2$ , which is found only in Indic, Armenian and Slavic, and thus may have been a *satəm*-development only.<sup>31</sup>

According to Kortlandt (e.g. 1996: 53), we should therefore postulate an alternative scenario to explain the presence of  $*b$  in  $*pi-bh_3-e/o-$ . In his view, the original root actually was  $*beh_3$ - (with a reduplicated present

28 E.g.  $*[\zeta]$  vs.  $*[\zeta^w]$  (Beekes 1995: 148).

29 E.g.  $*[h]$  vs.  $*[\zeta]$  (Fortson 2004: 58; Tichy 2000: 31); or  $*[\chi]$  vs.  $*[\varepsilon]$  (Tichy 2000: 31).

30 E.g.  $*[x]$  vs.  $*[\zeta^w]$  (Rasmussen 1999: 77);  $*[h]$  vs.  $*[\zeta^w]$  (Weiss 2009: 50); or  $*[\chi]$  vs.  $*[\varepsilon^w]$  (Tichy 2000: 31).

31 It is debated whether Greek shows aspiration because of  $*h_2$ , cf. the discussion in De Decker 2011.

\**bi-bh<sub>3</sub>-e/o-*), in which, in pre-PIE times, \**b* (originally a glottalized stop) in word-initial position lost its glottalic feature and merged with \**p-*. This would then explain why in all forms of the verb we find word-initial \**p-*, but not in word-internal position in the reduplicated present \**pihb<sub>3</sub>e/o-*. If this scenario is correct,<sup>32</sup> \**bh<sub>3</sub>-* would have been the original cluster and would not derive from earlier \**ph<sub>3</sub>-* through voice assimilation. This then removes the necessity for \**h<sub>3</sub>* to have been a voiced consonant.

2. The outcome of word-initial \**h<sub>3</sub>-* in Anatolian is debated, and one can find different opinions in the literature, especially on the outcome of \**h<sub>3</sub>-* in Lycian. For instance, it has been claimed that in Lycian \**h<sub>3</sub>-* is lost, as would be clear from the following two examples:<sup>33</sup> *epirije-* “to sell” and *epenētijatte* “acts as a salesman”, both from \**h<sub>3</sub>ep-*.<sup>34</sup> Interestingly, the corresponding Hittite forms have an initial *h-* (*happiriē/a-* and \**happinantijahh-* < \**h<sub>3</sub>ep-*). This differs from the outcome of \**h<sub>2</sub>-* in Lycian, which was *χ-* (e.g. *χñtawā-* ‘rule’ < \**h<sub>2</sub>ent-*), and which corresponds to Hitt. *h-* as well (e.g. Hitt. *hant-* < \**h<sub>2</sub>ent-*). According to Melchert (1994: 55), we therefore have to assume two different outcomes for \**h<sub>3</sub>-* and \**h<sub>2</sub>-* in Proto-Anatolian. Since \**h<sub>3</sub>-* was lost in Lycian, but \**h<sub>2</sub>-* was retained as a consonant, he states that \**h<sub>3</sub>-* had yielded in Proto-Anatolian a phoneme that he notes down as \*/h/, and which was the lenis variant of \**h<sub>2</sub>-*, which yielded PAnat. \*/H/. In Melchert’s view, the main phonetic distinction between the two was that \*/H/ < \**h<sub>2</sub>-* was voiceless, whereas \*/h/ < \**h<sub>3</sub>-* was voiced (an assumption based on the idea that \**h<sub>3</sub>* was a voiced consonant in PIE, cf. 1994: 47).

However, both examples in favor of loss of word-initial \**h<sub>3</sub>-* in Lycian are unconvincing: *epirije-* probably does not mean ‘to sell’ at all, and therefore

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- 32 Note that the “*b*-gap” is a generally recognized constraint for Proto-Indo-European, and that such a constraint can only be explained by a pre-PIE development of \**b* into a different sound (thus already Pedersen 1951: 10–16). However, the *b*-gap is not complete: we do find \**b* in word-internal position in e.g. \**h<sub>2</sub>eb-l-* ‘apple’, \**g<sup>h</sup>rebH-(?)* ‘to grab’, \**lembH-* ‘to hang down limply’, \**seib-* ‘let flow’, \**steib-* ‘to make stiff’, and \**uremb-* ‘to turn’ (although the reconstruction of some of these verbal roots may be debated). It therefore stands to reason to assume that the sound law that caused the rarity of \**b* in Proto-Indo-European was a conditioned one. In that sense, Kortlandt’s postulation of a pre-PIE soundlaw of word-initial \**b-* > \**p-* and thus explaining \**pi-bh<sub>3</sub>-e/o-* from earlier \**bi-bh<sub>3</sub>-e/o-*, is perfectly in line with more general considerations and is not as *ad hoc* as it at first sight may seem.
  - 33 A third alleged example, Lyc. *ētre/i-* ‘lower’ < \**h<sub>3</sub>nd<sup>h</sup>ero-* ~ Hitt. *hantiyāra-* “niedrig” as adduced by Oettinger (2001: 84–86) has in the meantime been withdrawn (Oettinger 2007). See Kloekhorst 2006: 103 for criticism on this example.
  - 34 Kimball 1987; Melchert 1989: 43.

does not need to be cognate to Hitt. *ḥappiriye/a-*;<sup>35</sup> and the translation and interpretation of *epenētijatte* is seemingly based on etymological considerations only, and therefore cannot be used as an argument.<sup>36</sup> Instead, I have argued elsewhere (Kloekhorst 2006: 102–103) that initial *\*h<sub>3</sub>-* rather seems to have yielded *χ-* in Lycian (*χawa-* ‘sheep’ < *\*h<sub>3</sub>ew-* and *χerēi* ‘name of a dynasty’ < *\*h<sub>3</sub>er-on-*). If correct, this would mean that in word-initial position, *\*h<sub>3</sub>-* in principle merged with the outcome of *\*h<sub>2</sub>-*, and that for Proto-Anatolian no distinction between the outcomes of initial *\*h<sub>2</sub>-* and *\*h<sub>3</sub>-* needs to be assumed.

3. Melchert (2011) argues that the Hittite verb *lāḥu-i* ‘to pour’ should not be reconstructed as deriving from a stem *\*leh<sub>2</sub>u-*, as was usually done,<sup>37</sup> but rather contains a root *\*leh<sub>3</sub>u-*, which is identical to the root *\*leuh<sub>3</sub>-* (with laryngeal metathesis) as attested in Gr. *λᾰέω, λούω*, Lat. *lavō* ‘to wash’. Thus far, such a reconstruction was impossible, since it was generally assumed that, in Hittite, *\*h<sub>3</sub>* was lost in intervocalic position, cf. e.g. *\*dóh<sub>3</sub>-ei* > *dāi* ‘he takes’. However, Melchert, accepting my proposal that the sequence *\*-h<sub>2</sub>u-* yielded a Proto-Anatolian unitary ‘labiolaryngeal’,<sup>38</sup> argues that also the sequence *\*-h<sub>3</sub>u-* may have yielded such a ‘labiolaryngeal’ (2011: 129). Since in *lāḥu-i* we find single spelling of the *-ḥ-*, Melchert assumes that the outcome of *\*-h<sub>3</sub>u-* was in fact a lenis labiolaryngeal “*\*γ<sup>w</sup>/\*ʕ<sup>w</sup>”*, which thus contrasts with the fortis labiolaryngeal that is the result of *\*-h<sub>2</sub>u-* (for which Melchert assumes a value “*\*h<sup>w</sup>/\*x<sup>w</sup>”*). The etymology of *\*lāḥu-i* as reflecting the root *\*leh<sub>3</sub>u-* may then be used as an additional argument in favor of viewing *\*h<sub>3</sub>* as the lenis variant of *\*h<sub>2</sub>*.

Although I accept Melchert’s proposal to derive Hitt. *lāḥu-i* from *\*leh<sub>3</sub>u-*, in which the retention of *\*h<sub>3</sub>* as a consonant is due to an earlier development of the sequence *\*-h<sub>3</sub>u-* into a monophonemic ‘labiolaryngeal’, I do not think that his conclusion that this ‘labiolaryngeal’ was always lenis is justified. As I have extensively argued elsewhere,<sup>39</sup> there are clear indications that P1A short accented *\*ó* had in Proto-Anatolian become a long vowel, *\*/ō/*, which, just as other long accented vowels, caused lenition of a following intervocalic fortis consonant. This rule can, amongst others, explain the class of *ḥi*-verbs in which the 3sg.pres.act. form shows a lenis stem-final consonant (e.g. *āki* ‘he dies’, *ḥāši* ‘she gives birth’), whereas

35 Rasmussen 1992: 56–59.

36 Kloekhorst 2006: 102.

37 Cf. e.g. Kloekhorst 2008b: 511–513.

38 Kloekhorst 2006[2008]: 97–101; Kloekhorst 2008a: 125.

39 Kloekhorst 2006[2008]: 132; Kloekhorst 2014: 553–559.

in the other forms of the paradigm the stem-final consonant is fortis (*akkanzi* ‘they die’, *ḥaššanzi* ‘they give birth’). Especially cases in which the stem-final consonant is *-ḥ(h)-* (*nāḥi* / *naḥḥanzi* ‘to fear’, *zāḥi* / *zaḥḥanzi* ‘to hit, to beat’) are telling: this *\*-ḥ(h)-* can only reflect *\*-h<sub>2</sub>-*, which normally yields a fortis consonant intervocalically. There is therefore simply no other option than that in the preforms of 3sg.pres.act. *\*nóh<sub>2</sub>ei* and *\*tióh<sub>2</sub>ei* it was the *\*ó* that caused the lenition (through PANat. *\*/ó/*). Although in his 2011-article, Melchert calls this analysis of these verbs “entirely ad hoc” (2011: 128),<sup>40</sup> already a year later, in 2012, he has to admit that *nāḥi*, etc. can only be explained by a lenition because of the preceding *\*ó* (2012: 177–179).<sup>41</sup>

The recognition that *\*ó* has a leniting effect on following fortis consonants, opens up the possibility that also the lenis character of *-ḥ-* in *lāḥu-<sup>i</sup>* is the result of lenition, since this form reflects *\*lóh<sub>3</sub>u-ei*. It therefore cannot be used anymore as an argument that *\*h<sub>3</sub>* must be a lenis consonant. We see that none of the three arguments in favor of viewing *\*h<sub>3</sub>* as the lenis variant of *\*h<sub>2</sub>* is compelling: alternative scenarios can be provided to explain the state of affairs.

To my mind, there are however two arguments to be given that would indicate that *\*h<sub>3</sub>* is, just as *\*h<sub>2</sub>*, originally a fortis consonant.

1. Besides the verb *lāḥu-<sup>i</sup>* ‘to pour’, which shows a single spelled *-ḥ-*, Hittite knows the lexemes *laḥḥu-* ‘a vessel’ and *laḥḥura-* ‘offering table’, which both show geminate spelling of the *-ḥḥ-*.<sup>42</sup> Especially *laḥḥu-* ‘a vessel’ is semantically close to *lāḥu-<sup>i</sup>*, but also *laḥḥura-* ‘offering table’ may be connected to it, cf. the following context (KUB 9.31 ii 8–9):

(8) *n=a-at=ša-an* <sup>GIŠ</sup>*la-aḥ-ḥu-ri šu-uḥ-ḥa-i nu me-na-aḥ-ḥa-an-da*  
 (9) *GEŠTIN la-aḥ-ḥu-u-ṽa-i*

‘He scatters them (broken pieces of thick-bread) on the *laḥḥura-* and pours wine over (them)’.

40 Referring to Kimball 1999: 397, who, too, explained cases like *nāḥi* and *zāḥi* as due to a lenition caused by *\*ó*, although assuming that this lenition only affected *\*h<sub>2</sub>*. In my view, it affects all fortis consonants.

41 Although, like Kimball (see preceding footnote), assuming that this lenition affects *\*h<sub>2</sub>* only.

42 The noun *\*laḥḥuēšsar* / *laḥḥuēšn-* that I cite in Kloekhorst 2008b: 512–513 as another example of a derivative of *lāḥu-<sup>i</sup>* with a geminate spelled *-ḥḥ-*, probably does not exist, cf. Melchert 2011: 127<sup>2</sup>.

Moreover, *lahhura-* is occasionally spelled *lāhu-*, which can only be explained as due to influence from *lāhu-*<sup>i</sup>, indicating that, at least synchronically, the Hittites saw a connection between the two lexemes. Vice versa, *lāhu-*<sup>i</sup> does in NH texts occasionally occur spelled *lahhu-* (like in the context cited), which must be due to influence by *lahhura-*.

On the basis of these considerations I had proposed already earlier on (Kloekhorst 2008b: 513–514, at the time of which I still reconstructed a stem *\*leh<sub>2</sub>u-* with *\*h<sub>2</sub>*) that the stems *lahhu-* (in *lahhu-* ‘a vessel’ and *lahhura-* ‘offering table’) and *lāhu-* (in *lāhu-*<sup>i</sup> ‘to pour’) are etymologically related to each other, and that the former one goes back to an *e*-grade stem *\*léh<sub>2</sub>u-*, whereas the latter reflects the *o*-grade stem *\*lóh<sub>2</sub>u-*, in which the accented *\*ó* (through PAnat. long *\*ó*) causes lenition. Taking Melchert’s attractive connection to Gr. λῶεω, λούω, Lat. *lavō* ‘to wash’ < *\*leuh<sub>3</sub>-* < *\*leh<sub>3</sub>u-* (Melchert 2011) into account, we should now reconstruct these stems as follows: *lahhu-* < *\*léh<sub>3</sub>u-*, and *lāhu-* < *\*lóh<sub>3</sub>u-*. The consequence of this is that the normal, unlenited intervocalic outcome of *\*h<sub>3</sub>* in this environment was a fortis consonant, and that we thus must assume that *\*h<sub>3</sub>* originally was fortis as well.<sup>43</sup>

2. According to LIV<sup>2</sup>: 679, the Hittite verb *ṣalḥ-zi* ‘to hit, to strike’ can be connected to, amongst others, Gr. ἐάλῶν ‘was killed’, which points to a root *\*uelh<sub>3</sub>-* (with Gr. ἐάλῶν < *\*h<sub>1</sub>e-ulh<sub>3</sub>-eh<sub>1</sub>-*). This was followed by myself (Kloekhorst 2008: 946) and Melchert (2011: 129), who explicitly cites this verb as an example in which word-medial *\*h<sub>3</sub>* was retained as a conso-

43 An anonymous reviewer objects to this argumentation, for two reasons. First, in his/her view, “there is no chance at all that the two words [*lahhura-* and *lāhu-*<sup>i</sup>] are related”. To my mind, an etymological connection between these words is certainly possible, however, cf. the context cited. Second, (s)he states that “[t]he noun *lahhuš-* surely is derived from ‘to pour’, but shows merely the well-known prehistoric devoicing before *\*s* seen in *akkuške-*” (note that the reviewer cites the stem of the word for ‘vessel’ as “*lahhuš-*”, implying an interpretation as a (neuter?) *-uš*-stem, whereas CHD L: 13 cites the stem as a common gender *u*-stem *lahhu-*, interpreting the attested form *la-ah<sub>1</sub>-hu-uš* as a nom.sg. form in *-š*). However, the geminate found in *akkuške/a-* (imperf. of *eku-zi* / *aku-* ‘to drink’) is *not* the result of devoicing before *\*s*. If this were true, we would expect a “devoicing” in 2sg.pres. *ekušši*, 3sg.pret. *ekuzzi*, 2pl.pres. *ekutteni*, 2sg.pret. *ekutta*, 3sg.pret. *ekutta*, 3sg.imp. *ekuddu*, etc., as well. All these forms show that there was no such thing as a “prehistoric devoicing” of *\*g<sup>w(h)</sup>* before whatever original voiceless consonant at all. The geminate as found in *akkuške/a-* < *\*h<sub>1</sub>g<sup>wh</sup>-ske/o-* is due to a specific fortition of *\*g<sup>wh</sup>* before the cluster *\*sk*. Therefore, the value of *lahhu-* ‘a vessel’ (nom.sg. *lahhuš*) simply cannot be dismissed: its semantic connection to *lāhu-*<sup>i</sup> is beyond any doubt, and its geminate *-hh-* cannot be explained as due to the *-š* (whether this *š* is part of the stem or forms the nom.sg.c. ending). This form therefore *proves* that the lenis *-h-* in *lāhu-*<sup>i</sup> goes back to an original fortis *-hh-*, which means that *\*h<sub>3</sub>* originally was a fortis consonant.

nant. Interestingly, this verb often shows geminate spelling of the *h*: part. *ṽa-al-aḥ-ḥa-an-t*<sup>o</sup>, verbal noun *ṽa-al-aḥ-ḥu-ṽa-ar*, inf.I *ṽa-al-aḥ-ḥu-ṽa-an-zi*, imperf. *ṽa-al-aḥ-ḥi-iš-ke/a-*, imperf. *ṽa-al-aḥ-ḥa-an-na/i-*.<sup>44</sup> There can therefore be no doubt that this consonant is fortis, /ualχ:/, which implies that \*h<sub>3</sub> originally was a fortis consonant.

On the basis of these arguments, we may conclude that \*h<sub>3</sub> originally was a fortis consonant. If this is correct, it means that both \*h<sub>2</sub> and \*h<sub>3</sub> originally were fortis consonants, and that the distinction between the two therefore cannot have been that the one was the lenis variant of the other.<sup>45</sup> Instead, we then have to assume that the distinction between \*h<sub>2</sub> and \*h<sub>3</sub> was some other feature, and it therefore is attractive to assume that the latter was the labialized variant of the former. Since we have above determined that it is likely that, in Proto-Indo-Anatolian, \*h<sub>2</sub> was a long uvular stop \*/q:/, we may assume that at that stage \*h<sub>3</sub> was a long labialized uvular stop \*/q<sup>w</sup>:. An extra argument in favor of this view is that we can now explain why, in Anatolian, word-internal \*h<sub>3</sub> was only retained when it stood before a \*ṽ: in this position the labialization of \*h<sub>3</sub> = \*/q<sup>w</sup>:/ was neutralized, causing it to merge with its non-labialized counterpart \*h<sub>2</sub> = \*/q:/.

We thus can set up a relative chronology of the development of \*h<sub>2</sub> and \*h<sub>3</sub> in Anatolian (exemplified by Hittite and Lycian):

PIA	pre-PAnat.	PAnat.	Hitt.	Lyc.
*h <sub>2</sub> e- = */q:e-/	> */q:a-/	> */q:a-/	> ḥa- /χ:a-/	χα- /ka-/
*h <sub>3</sub> e- = */q <sup>w</sup> :e-/	> */q:o-/ <sup>46</sup>	> */q:o-/	> ḥā- /χ:ā-/	χε- /ke-/
*Vh <sub>2</sub> ṽV- = */Vq:wV/	> */Vq:wV/	> */Vq <sup>w</sup> :V/	> VḥḥuV /Vχ <sup>w</sup> :V/	VqV /Vk <sup>w</sup> V/
*Vh <sub>3</sub> ṽV- = */Vq <sup>w</sup> :wV/	> */Vq:wV/	> */Vq <sup>w</sup> :V/	> VḥḥuV /Vχ <sup>w</sup> :V/	unatt.
*ṽh <sub>2</sub> ṽV- = */ṽq:wV/	> */ṽq:wV/	> */ṽq <sup>w</sup> :V/	> VḥuV /ṽχ <sup>w</sup> :V/	unatt.
*ṽh <sub>3</sub> ṽV- = */ṽq <sup>w</sup> :wV/	> */ṽq:wV/	> */ṽq <sup>w</sup> :V/	> VḥuV /ṽχ <sup>w</sup> :V/	unatt.

44 Cf. Kloekhorst 2008: 945–946.

45 If correct, it means that the reduplicated present \*pi-bh<sub>3</sub>-e/o- should be explained as proposed by Kortlandt, namely that it reflects an earlier \*bi-bh<sub>3</sub>-e/o- and that the root for ‘to drink’ in fact was \*beh<sub>3</sub>-, originally.

46 I assume that the phonologization of the colouring of \*e to \*o when adjacent to \*h<sub>3</sub> caused the loss of the labialization, which results in the merger of \*h<sub>2</sub> and \*h<sub>3</sub>.

The fact that in intervocalic position,  $*h_3$  seems to have been lost in Anatolian (e.g.  $*dóh_3ei > \text{Hitt. } dāi$  ‘he takes’), means that this consonant was in this environment probably lenited at an earlier stage. The fact that  $*h_2$  yields a consonantal outcome in this environment (e.g.  $*nóh_2ei > nāhi$ ), however, shows that  $*h_2$  and  $*h_3$  did not develop in a parallel fashion. This should not surprise us too much. From other languages we know that labialized consonants can be lenited earlier than their non-labialized counterpart. Compare, for instance, the fact that PIE  $*(g^l)$  yields Lat.  $g-$ , whereas its labialized counterpart  $*g^w-$  > Lat.  $ɣ-$ , with loss of its buccal part. We may therefore assume that also  $*h_3 = */q^w:/$  was in some environments lenited earlier than its non-labialized counterpart  $*h_2 = */q:/$ , which would yield a relative chronology along the following lines (with pre-PAnat. (1) representing the stage before colouring of adjacent vowels, and pre-PAnat. (2) the stage after colouring):

PIA	pre-PAnat.(1)	pre-PAnat.(2)	PAnat.	Hitt.
$*Vh_2V = */Vq:V/$	$> *[Vq:V]$	$> *[Vq:V]$	$> */Vq:V/$	$> Vh_2V \text{ } /Vχ:V/$
$*Vh_3V = */Vq^w:V/$	$> *[Vχ^w:V]$	$> *[Vh:V]$	$> */VʔV/$	$> VV \text{ or } \bar{V}$

A similar development may also be envisaged for other environments in which  $*h_3$  did not yield a consonant in Hittite, but was ultimately lost, e.g.  $*Vh_3c$ . But in this environment also  $*h_2$  was ultimately lost, and we may therefore assume a similar development:

PIA	pre-PAnat.(1)	pre-PAnat.(2)	PAnat.	Hitt.	Lyc.
$*eh_2c = */eq:C/$	$> *[eχ:C]$	$> *[aħ:C]$	$> */āC/$	$> āC$	$aC$
$*eh_3c = */eq^w:C/$	$> *[eχ^w:C]$	$> *[oħ:C]$	$> */ōC/$	$> āC$	$eC$

Moreover, to my mind it is quite possible that in these environments these first lenitions ( $*/q:/ > *[χ:]$  and  $*/q^w:/ > *[χ^w:]$ ) had taken place in Proto-Indo-Anatolian already, and that at that moment in time, both  $*h_2$  and  $*h_3$  had two allophones, namely  $*[q:]$  and  $*[χ:]$ , and  $*[q^w:]$  and  $*[χ^w:]$ , respectively. In fact, such an assumption is necessary anyway since the phonotactic behaviour of some PIA roots containing laryngeals demand that these were fricatives rather than stops. For instance, as was argued by Schindler (1975: 265–266),

the distribution within neuter *s*-stems between nom.-acc.sg. forms of the type \*CéCH-*s* (e.g. \*kréuh<sub>2</sub>-*s*) and of the type \*CéC-*os* (e.g. \*men-*os*) << \*CeC-*s* is best explained by assuming that in \*CéCH-*s* the laryngeals could already be syllabified at a pre-PIA level, which precluded the replacement of the suffix \*-*s* by its syllabic allomorph \*-*os*.<sup>47</sup> For \*h<sub>2</sub> and \*h<sub>3</sub> this implies that in this environment they had already early on undergone an allophonic fricativization to \*[χ:] and \*[χʷ:], respectively.

## 10 Conclusions

We may conclude that Anatolian provides several arguments that indicate that \*h<sub>2</sub> was a long voiceless uvular stop \*[q:] at the Proto-Indo-Anatolian level, as well as at the Proto-Anatolian and Proto-Luwic stages, having retained its stop quality into the Luwic languages Lycian and Carian, where (in some environments) it yielded a velar stop [k] (or a labiovelar stop [kʷ] when originally standing before \*u). In the case of \*h<sub>3</sub>, arguments can be given that this consonant was the labialized counterpart of \*h<sub>2</sub>, i.e. \*[qʷ:].

Although \*[q:] and \*[qʷ:] were the basic values of \*h<sub>2</sub> and \*h<sub>3</sub>, it is likely that already in PIA they had in some environments allophonically become fricativized to \*[χ:] and \*[χʷ:], respectively. It remains a task for the future to determine the exact details for the distribution between the plosive and fricative allophones of these two phonemes, but we may assume that in environments where Lycian and Carian show [k] (or [kʷ] when originally before \*-u-), the PIA renderings of \*h<sub>2</sub> and \*h<sub>3</sub> must have been \*[q:] and \*[qʷ:], respectively.

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<sup>47</sup> Cf. Litscher 2007 for a different view.

## References

- Adiego, Ignacio J. 2001. Lenición y acento en protoanatolio. In: Onofrio Carruba & Wolfgang Meid (eds.), *Anatolisch und Indogermanisch. Akten des Kolloquiums der Indogermanischen Gesellschaft, Pavia 1998*, 11–18. Innsbruck: Innsbrucker Beiträge zur Sprachwissenschaft.
- Adiego, Ignacio J. 2007. *The Carian Language*. Leiden—Boston: Brill.
- Beckman, Gary M., Trevor R. Bryce & Eric H. Cline. 2011. *The Ahhiyawa Texts*. Atlanta: SBL.
- Beekes, Robert S.P. 1995. *Comparative Indo-European Linguistics. An introduction*. Amsterdam—Philadelphia: John Benjamins.
- Brosch, Cyril. 2016. Zur Vertretung der Laryngale im Karischen. In: Henning Marquardt, Silvio Reichmuth, José Virgilio García Trabazo (eds.), *Anatolica et Indogermanica. Studia linguistica in honorem Johannis Tischler septuagenarii dedicata*, 7–12. Innsbruck: Innsbrucker Beiträge zur Sprachwissenschaft.
- Chirikba, Viacheslav A. 1996. *Common West Caucasian: The Reconstruction of its Phonological System and Parts of its Lexicon and Morphology*. Leiden: CNWS.
- De Decker, Filip. 2011. Evidence for laryngeal aspiration in Greek? Part 1: The “recent” evidence. *Indogermanische Forschungen* 116, 87–109.
- Eichner, Heiner. 1973. Die Etymologie von heth. *mehur*. *Münchener Studien zur Sprachwissenschaft* 31, 53–107.
- Fortson IV, Benjamin W. 2004. *Indo-European Language and Culture. An Introduction*. Oxford: Blackwell.
- Hoffner, Harry A. & H. Craig Melchert. 2008. *A Grammar of the Hittite Language* (2 vols.). Winona Lake: Eisenbrauns.
- Hout, Theo P.J. van den. 1995. Lycian consonantal orthography and some of its consequences for Lycian phonology. In: Theo P.J. van den Hout & Johan de Roos (eds.), *Studio Historiae Ardens, Ancient Near Eastern Studies Presented to Philo H.J. Houwink ten Cate on the Occasion of his 65th Birthday*, 105–141. Istanbul: Nederlands Historisch-Archeologisch Instituut.
- Ivić, Pavle. 1958. *Die Serbokroatischen Dialekte: ihre Struktur und Entwicklung*. The Hague: Mouton.
- Johanson, Lars. 1998. The history of Turkic. In: Lars Johanson & Éva Á. Csató (eds.), *The Turkic Languages*, 81–125. London—New York: Routledge.
- Kimball, Sara E. 1987. \*H<sub>3</sub> in Anatolian. In: George Cardona & Norman H. Zide (eds.), *Festschrift for Henry Hoenigswald, On the Occasion of his Seventieth Birthday*, 185–192. Tübingen: Narr.
- Kimball, Sara E. 1999. *Hittite Historical Phonology*. Innsbruck: Innsbrucker Beiträge zur Sprachwissenschaft.
- Kloekhorst, Alwin. 2006. Initial Laryngeals in Anatolian. *Historische Sprachforschung* 119, 77–108.

- Kloekhorst, Alwin. 2006[2008]. Čop's Law in Luwian revisited, *Die Sprache* 46, 131–136.
- Kloekhorst, Alwin. 2008a. Studies in Lycian and Carian phonology and morphology. *Kadmos* 47, 117–146.
- Kloekhorst, Alwin. 2008b. *Etymological Dictionary of the Hittite Inherited Lexicon*. Leiden—Boston: Brill.
- Kloekhorst, Alwin. 2013. Likijskij jazyk. In: Yuri B. Koryakov & Andrej A. Kibrik (eds.), *Jazyki Mira: Reliktovyje Indoevropejskie Jazyki Perednej i Central'noj Azii*, 131–154. Moscow, Academia.
- Kloekhorst, Alwin. 2014. *Accent in Hittite: A Study in Plene Spelling, Consonant Gradation, Clitics, and Metrics* (= *Studien zu den Boğazköy-Texten* 56). Wiesbaden: Harrassowitz.
- Kloekhorst, Alwin. 2016. The Anatolian stop system and the Indo-Hittite hypothesis. *Indogermanische Forschungen* 121, 213–247.
- Kortlandt, Frederik H.H. 1996. The High German consonant shift. *Amsterdamer Beiträge zur älteren Germanistik* 46, 53–57.
- Kümmel, Martin J. 2007. *Konsonantenwandel*. Wiesbaden: Reichert.
- Litscher, Roland. 2007. *κρέας*, *kravīh* and the original nom.-acc. sg. of the IE s-stem neuters. In: Coulter George et al. (eds.), *Greek and Latin from an Indo-European Perspective* (= *Proceedings of the Cambridge Philological Society, Suppl. Vol. 32*), 107–120. Cambridge: Cambridge Philological Society.
- Melchert, H. Craig. 1989. New Luvo-Lycian isoglosses. *Historische Sprachforschung* 102, 23–45.
- Melchert, H. Craig. 1994. *Anatolian Historical Phonology*. Amsterdam—Atlanta: Rodopi.
- Melchert, H. Craig. 2011. The PIE verb for 'to pour' and medial \*h<sub>3</sub> in Anatolian. In: Stephanie Jamison et al. (eds.), *Proceedings of the 22nd UCLA Indo-European Conference*, 127–132. Bremen: Hempen.
- Melchert, H. Craig. 2012. Hittite *hi*-verbs of the type *-āC<sub>1</sub>i*, *-aC<sub>1</sub>C<sub>1</sub>anzi*. *Indogermanische Forschungen* 117, 173–185.
- Melchert, H. Craig. 2017. Addenda and Corrigenda to Harry A. Hoffner Jr. and H. Craig Melchert, *Grammar of the Hittite Language (GrHL). Reference Grammar*, <http://www.eisenbrauns.com/assets/errata/HOFGRAMMA-AddendaCorrigenda.pdf>.
- Melchert, H. Craig. fthc. Hittite historical phonology after 100 years (and after 20 years). To appear in: Ronald Kim et al. (eds.), *Hrozny and Hittite: The First Hundred Years*, Prague, 11–14 November 2015.
- Morpurgo Davies, Anna. 1982/83. Dentals, rhotacism and verbal endings in the Luwian languages. *Zeitschrift für Vergleichende Sprachwissenschaft* 96, 245–270.
- Oettinger, Norbert. 2001. Varia hethitica. *Historische Sprachforschung* 114, 80–89.
- Oettinger, Norbert. 2007. Nochmals zu Luwisch-Hethitisch *hantiyara-*, *hantiyassa-* und

- summiyara-*. In: Metin Alparslan et al. (eds.), *VITA—Festschrift in Honor of Belkis Dinçol and Ali Dinçol*, 543–547. Istanbul: Ege Yayınları.
- Pedersen, Holger. 1951. *Die gemeinindoeuropäischen und die vorindoeuropäischen Verschlußlaute*. København: Munksgaard.
- Popović, Ivan. 1960. *Geschichte der serbokroatischen Sprache*. Wiesbaden: Harrassowitz.
- Rasmussen, Jens E. 1992. Initial  $h_3$  in Anatolian: A vote for chaos. *Copenhagen Working Papers in Linguistics*, vol. 2, 53–61.
- Rasmussen, Jens E. 1999. *Selected Papers on Indo-European Linguistic: With a Selection on Comparative Eskimo Linguistics*. Copenhagen: Museum Tusculanum.
- Schindler, Jochem. 1975. Zum ablaut der neutralen s-Stämme des Indogermanischen. In: Helmut Rix (ed.), *Flexion und Wortbildung*, 259–267. Wiesbaden: Reichert.
- Sideltsev, Andrej & Ilya Yakubovich. 2016. The origin of Lycian indefinite pronouns and its phonological implications. *Münchener Studien zur Sprachwissenschaft* 70, 75–124.
- Simon, Zsolt. 2011. Die Fortsetzung der Laryngale im Karischen. In: Thomas Krisch & Thomas Lindner (eds.), *Indogermanistik und Linguistik im Dialog. Akten der XIII. Fachtagung der Indogermanischen Gesellschaft vom 21. bis 27. September 2008 in Salzburg*, 538–547. Wiesbaden: Reichert.
- Simon, Zsolt. 2014. Der phonetische Wert der luwischen Laryngale. In: Piotr Taracha (ed.), *Proceedings of the Eighth International Congress of Hittitology. Warsaw, 5–9 September 2011*, 873–895. Warsaw: Agade.
- Sturtevant, Edgar H. 1933. *A Comparative Grammar of the Hittite Language*. Philadelphia: LSA.
- Tichy, Eva. 2000. *Indogermanistisches Grundwissen für Studierende sprachwissenschaftlicher Disziplinen*. Bremen: Hempen.
- Weiss, Michael. 2009. *Outline of the Historical and Comparative Grammar of Latin*. Ann Arbor—New York: Beech Stave.
- Weiss, Michael. 2016. The Proto-Indo-European laryngeals and the name of Cilicia in the Iron Age. In: Andrew M. Byrd, Jessica DeLisi & Mark Wenthe (eds.), *Tavet Tat Satyam. Studies in Honor of Jared S. Klein on the Occasion of His Seventieth Birthday*, 331–340. Ann Arbor—New York: Beech Stave.