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The Signs TA and DA in Old Hittite: Evidence for a Phonetic Difference

Abstract

In this article it will be argued that in Old Hittite the signs TA and DA are not used interchangeably, as is commonly believed, but in fact represented different sounds. The sign TA represents the value [ta], with a voiceless [t], whereas the sign DA can represent either the value [t$^{?}$a], with a glottalized [t$^{?}$], or the value [da], with a voiced [d], depending on the environment. The values of these signs thus perfectly match their values in the Old Babylonian texts from Alalaḫ, in which TA represents *ta* (= [ta]) and DA can represent both *ṭa* (= [t$^{?}$a]) and *da* (= [da]).

Keywords: Hittite, phonology, cuneiform signs, Indo-European

The cuneiform syllabary that was taken over by the Hittites from their North Syrian neighbours[1] possesses in its *CV* series separate signs to distinguish voiceless from voiced stops, e.g. TA vs. DA, KA vs. GA, KI vs. GI, etc. Yet, already in the beginning of Hittite studies it was noticed that many Hittite words are sometimes spelled with one member of such pairs, and sometimes with the other.[2] For instance, the word for 'they eat' is sometimes spelled *a-ta-an-zi*, with the sign TA, and sometimes *a-da-an-zi*, with the sign DA; the verb 'to open up' is sometimes spelled *ki-nu-*, with the sign KI, and sometimes *gi-nu-*, with the sign GI; etc. In the Hittitological literature it is therefore generally stated that in spelling the choice between the signs for the voiceless stop and the signs for the voiced stop is random, and that the use of a specific sign in a given word has no bearing whatsoever on the phonology of the stop it denotes.[3]

In Kloekhorst 2010, I opposed this view, however, arguing that in word-initial position the signs for the voiceless stops (TA, KA, KI, etc.) represent phonologically different sounds from those represented by the signs for the voiced stops (DA, GA, GI, etc.). This of course begs the question whether also in word-internal position such a distinction is present.

[1] Especially the ductus as found in Old Babylonian texts from Alalaḫ (Tell Açana, level VII) resembles the typical Hittite ductus best, cf. Rüster / Neu (1989: 15).

[2] Cf. e.g. Weidner (1917: 13–14).

[3] Cf. e.g. Melchert (1994: 13–14); Kimball (1999: 89–90); Kloekhorst (2008: 21); Hoffner / Melchert (2008: 16); Patri (2009: 89).

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In the following pages I will try to answer this question for the sign pair TA/DA.[4] Since the phonology of Hittite changes through time, also with regard to its stops,[5] I will in this article focus on the Old Hittite stage only: if there originally was a distinction between the signs TA and DA, we would expect this distinction to be represented best in Old Hittite texts. I have therefore compiled a corpus of all Old Hittite texts (i.e. texts that are written in the Old Script (OS)),[6] in which I have looked for significant distribution patterns between the two signs.

Statistics

If we count the total number of times that in Old Hittite texts the signs TA and DA occur in word-internal position, we arrive at the following numbers:

	TA	DA
number of occurrences	542×	261×
percentage	67.5 %	32.5 %

If it is indeed true that in spelling the choice between the signs for a voiceless stop and the sign for a voiced stop is in principle random, we would expect that the overall ratio of the occurrences of the sign TA to the sign DA, namely 67.5 % to 32.5 %, would be more or less the same in all kinds of different environments in which these signs can be found. In order to check if this is indeed the case, I have divided the environments in which these signs occur into three large groups:

(a) the environment in which the signs stand in a postvocalic position: °*V-ta*(-) and °*V-da*(-).
(b) the environment in which the signs spell intervocalic geminates: (-)*Vt-ta*(-) and (-)*Vd-da*(-).
(c) the environment in which the signs stand in a postconsonantal position: (-)*VC-ta*(-) and (-)*VC-da*(-).

If we count the number of occurrences of the signs TA and DA in these environments, we arrive at the following numbers:

	environment (a)		environment (b)		environment (c)	
	°*V-ta*(-)	°*V-da*(-)	(-)*Vt-ta*(-)	(-)*Vd-da*(-)	(-)*VC-ta*(-)	(-)*VC-da*(-)
number of occurrences	64×	99×	233×	11×	245×	151×
percentage	39.3 %	60.7 %	95.5 %	4.5 %	61.9 %	38.1 %

[4] I intend to treat the other pairs of this kind (TI/DI, TU/DU, KA/GA, KI/GI, etc.) on other occasions.
[5] Cf. Kloekhorst (2010: 208–209, 216–217).
[6] In this corpus I have included all texts that in Hetkonk are dated as 'ah.'.

We see that the ratio of the occurrences of TA to the occurrences of DA is rather different for each of these environments. Especially the numbers for (-)*Vt-ta*(-) vs. (-)*Vd-da*(-) stand out: the ratio in this environment (95.5 % : 4.5 %) is strikingly different from the overall ratio (67.5 % : 32.5 %). I will therefore first treat this environment.

(-)*Vt-ta*(-) vs. (-)*Vd-da*(-)

As we have seen in the table above, in Old Hittite texts the sequence (-)*Vt-ta*(-) occurs 233 times whereas the sequence (-)*Vd-da*(-) occurs only 11 times. Since the spelling with the sign DA is apparently the exception, we should have a closer look at the forms in which this spelling occurs. The forms in question are the following:

LÚ.MEŠ*a-ku-ud-da*[-…] (StBoT 25.16 rev.? 16 (OS))
pád-da-aḫ-ḫi (KBo 17.5 ii 2 (OS))
[*p*]*ád-da-ni* (StBoT 25.4 iii 39 (OS))
pád-da-a-ni (StBoT 25.4 iii 41 (OS))
[*p*]*ád-da-ni-i* (StBoT 25.3 iv 21 (OS))
GIŠ*pád-da-*[*ni*] (StBoT 25.137 iii 10 (OS))
GIŠ*pád-da-r=a-a=š-ša-an* (StBoT 25.137 iii 11 (OS))
píd-da-a-i (KBo 17.43 i 16, StBoT 12+ i 1 (OS))
ud-d[*a*?-]*a*?*-ar* (KBo 3.22 obv. 33 (OS))
zi-pád-da-ni (StBoT 25.13 i 27 (OS))

It is remarkable that five of these belong to a single lemma, namely *paddar / paddan-* 'basket'. It therefore seems worthwhile to look closer at this word.

paddar / paddan- 'basket': Apart from the five attestations that are spelled with the sign DA (nom.sg. *pád-da-r*°, dat.-loc.sg. *pád-da-ni*, *pád-da-a-ni*, [*p*]*ád-da-ni-i* and *pád-da-*[*ni*]), this word also occurs in Old Hittite texts four times spelled with the sign TA: nom.-acc.sg. *pát-ta-ar* (KBo 17.6 iii 16 (OS), StBoT 25.4 iii 24 (OS)), instr.(?) *pa-at-ta-ni*[*-it*] (KBo 25.122 ii 3 (OS)), *pa-at-ta*[*-ni-it*] (KBo 25.122 ii 7 (OS)).[7] The ratio of the use of the sign TA to DA in this word is therefore 4 : 5 = 44 % : 56 %. This ratio is so different from the general ratio between (-)*Vt-ta*(-) and (-)*Vd-da*(-) (95.5 % : 4.5 %), that I can only conclude that the use of the sign DA in the word for 'basket' must have been deliberate, which means that it apparently denotes a specific linguistic feature that was relevant enough to note down. Etymologically, this word is usually thought to have been derived from the root **peth$_2$-* 'broad', which points to a reconstruction **péth$_2$-r*, **pth$_2$-én-*.[8]

[7] Another attestation is spelled with the sign TAR, nom.-acc.sg. *pa-at-tar* (StBoT 25.137 i 7 (OS)), and is therefore irrelevant for our present discussion.

[8] Thus e.g. Schindler (1975: 5) and Rieken (1999: 298), who reconstruct an acrostatic paradigm, **póth$_2$-r*, **péth$_2$-n-*, however. Since I expect that a preform **póth$_2$-r* would have yielded Hitt. ***pāttar*, with a long /ā/, I assume that the nom.-acc.sg. form must instead have been **péth$_2$-r*, and that the **e* in the root

It is striking that in this word the sign DA is used to represent an etymological cluster consisting of a dental stop + laryngeal, since this is exactly the condition for the use of the sign DA in word-initial position as well. As I argued in Kloekhorst 2010, in word-initial position the sign DA represents the syllable [tˀa], with a glottalized [tˀ] that is the outcome of a PIE cluster consisting of a dental stop and a laryngeal, **TH-*, namely in words like *da-a-i* 'he places' < **d*^{h}*h*$_{1}$*óiei* and *da-an-zi* 'they take' < **dh*$_{3}$*énti*.[9] Such a value of DA is not as surprising as it at first sight may seem, since in the Old Babylonian texts from Alalaḫ (Tell Açana, level VII), the ductus of which resembles the typical Hittite ductus best and which may therefore be regarded as the best representatives of the North Syrian scribal tradition from which the Hittite one was taken over,[10] the sign DA can, apart from being used in the value *da* = [da], also be used in the value *ṭa*,[11] i.e. with an 'emphatic' dental stop, which in fact was a glottalized [tˀ], (cf. Kouwenberg 2003: 81–82). It therefore is attractive to assume that also in the word for 'basket' the presence of a PIE cluster **-TH-* correlates with its use of the sign DA.

In order to test this hypothesis, we must look at the etymology of the other words that contain the sequence (-)*Vd-da*(-): do they also reflect a cluster **-TH-*? Most of them do:

LÚ.MEŠ*a-ku-ud-da*[-…]: The interpretation of this form is not fully clear. It is often interpreted as belonging with the word LÚ*akuttara-*, denoting a certain priest in Hattic rituals, which is usually reconstructed as **h*$_{1}$*g*^{wh}*-tro-* 'drinker'.[12] If LÚ.MEŠ*a-ku-ud-da*[-…] indeed belongs here and reflects **h*$_{1}$*g*^{wh}*-tro-*, it would mean that in this word the spelling (-)*Vd-da*(-) does not represent an earlier cluster **-TH-*. Yet, since in that case the dental stop would in fact not have been in intervocalic position, we may exclude this word from the present discussion.

pád-da-aḫ-ḫi: This word is the 1sg.pres.act. form of the verb *padd*(*a*)-*i* 'to dig', of which no other attestations in Old Hittite texts are found. The root of this verb is generally reconstructed as **b*^{h}*od*^{h}*h*$_{2/3}$*-*.[13] The laryngeal was first postulated by Melchert (1984: 26[55]) in order to explain the presence of the geminate *-dd-* in Hittite vis-à-vis the **d*^{h} as found in the other IE languages (Lat. *fodiō* 'to pierce, to dig', OCS *bodǫ* 'to stab', Lith. *bedù* 'to dig'), and has since then been generally accepted (cf. e.g. LIV^{2}: 66).

was coloured to a short *a* because of the following cluster **-tH-* (see Melchert 2008: 369–373 for this development). If this is correct, we can safely reconstruct this word as proterodynamic, **péth*$_{2}$*-r*, **pth*$_{2}$*-én-* (cf. the several dat.-loc.sg. forms with plene spelling of the suffix syllable, *pád-da-a-ni*, which points to suffixal accentuation). This reconstruction would independently confirm the presence of the **h*$_{2}$, because it is needed to explain the colouring of the **e* of the suffix syllable to Hitt. *a*.

9 Cf. Kloekhorst (2010: 202–207).

10 Cf. Rüster / Neu (1989: 15), van den Hout (2012).

11 For the use of the sign DA in the value *ṭa* in Alalaḫ Akkadian, cf. Kloekhorst 2010: 235. The fact that in Akkadian texts written in Ḫattuša the syllable /ṭa/, besides being normally spelled with the sign DA, is also commonly spelled with the sign TA, which is then transliterated as *ṭá* (cf. Durham 1976: 276), is a separate issue that deserves its own treatment.

12 E.g. Puhvel HED 1/2: 266.

13 Cf. Kloekhorst (2008: 654–655).

píd-da-a-i: This word is the 3sg.pres.act. form of the verb *piddai-^{i} / pitti-* 'to run, to race, to flee'. Within the Old Hittite corpus, no forms of this verb spelled (-)*Vt-ta*(-) are found. On the basis of a semantic connection with the PIE verbal root **peth$_1$-* 'to fall' or **peth$_2$-* 'to fly' (cf. LIV^2: 477 and 479, respectively), this verb can be reconstructed as **pth$_{1/2}$-oi-* (cf. Kloekhorst 2008: 655–658 for a treatment).

ud-d[*a*$^{?}$-]*a*$^{?}$*-ar*: This word is the nom.-acc.pl. form of the noun *uttar / uddan-* 'word, thing', which in Old Hittite texts occurs once spelled *ut-ta-a-ar* (StBoT 25.54 ii 5 (OS)) as well. In Kloekhorst (2008: 932–933), it was argued that one should reconstruct *uttar / uddan-* as **uéth$_2$-r / *uth$_2$-én-*, in which **ueth$_2$-* is the verbal root that in LIV^2: 694 is glossed as "sagen" and reconstructed as such on the basis of Lat. *vetō* 'to prohibit' and MWe. *dy-wed-* 'to say'. The presence of the **h$_2$* is confirmed by the fact that the **e* of the suffix syllable in the oblique cases of the Hittite word has been coloured to *a*.

zi-pád-da-ni: This word, which indicates a certain measure unit, occurs in Old Hittite texts spelled *zi-pát-ta-ni* (KBo 17.43 iv 7 (OS), KBo 22.1 obv. 11 (OS)) as well. It has no good etymology.

We can conclude that in all forms containing the sequence (-)*Vd-da*(-) that have a good etymology (*paddar / paddan-*, *paddaḫḫi*, *piddāi*, *uddār*), the geminate *-dd-* reflects a PIE cluster **-TH-*.

This contrasts with the etymology of the words that are consistently spelled with the sequence (-)*Vt-ta*(-): in these, the *-tt-* always reflects a PIE plain **-t-*, as exemplified by the following forms:[14]

ar-ma-ni-i̯a-at-ta 'he becomes ill'	< **h$_1$rmnioto*
ḫa-an-da-a-(e-)et-ta 'it fits'	< **°ieto*
ḫa-at-ta-an-ta 'intelligent'	< **h$_2$etent-*
i-e-et-ta 'he goes'	< **h$_1$ieto*
i-i̯a-at-ta 'he goes'	< **h$_1$ioto*
kat-ta(-an) 'below, down'	< **k̑m̥to(m)*
ki-iš-ta-an-zi-at-ta-at 'he suffered from famine'	< **°ioto°*
ki-it-ta 'he lies'	< **k̑eito*
ku-ut-ta-aš 'wall (gen.sg.)'	< **g̑^{h}eutos*
lu-uk-kat-ta 'the next morning'	< **leukoto*
nu-u=t-ta 'and to you'	< **nu=tuo*
še-ep-pí-it-ta-aš 'grain (gen.sg.)'	< **sepitos*
^{d}*Ši-i-u̯a-at-ta-aš* 'sun-deity (gen.sg.)'	< **dieuotos*
ú-e-et-ta[*-an-da-an-ni*] 'period of a year (dat.-loc.sg.)'	< **uetent-*

We must conclude that consistent spelling with the sign TA in the sequence (-)*Vt-ta*(-) correlates with an etymological **-t-*, whereas spelling with the sign DA, (-)*Vd-da*(-), correlates with an etymological cluster **-TH-*. I therefore assume that, just as in word-initial position, the DA in the sequence (-)*Vd-da*(-) should in fact be read as *ṭa*, i.e. as represent-

[14] Cf. Kloekhorst (2008: *s.vv.*) for etymological treatments of these words.

ing the syllable [tˀa], with a glottalized dental stop, [tˀ], the glottalic element of which is a direct reflex of the PIE laryngeal. Note that in words belonging to the second category, spelling with the sign DA is not fully consistent: in its best attested representative, namely the word *paddar / paddan-* 'basket', 56 % of the attestations are spelled with DA, whereas 44 % of the attestations are spelled with TA.

This new interpretation of the spelling (-)*Vd-da*(-) demands that we adapt our view of the phonological details of the development of the verb *padd*(*a*)- < PIE *$*b^hod^hh_2$-*. As far as I am aware, there are three competing views on the exact details of its prehistory. Melchert (1994: 76) argues that the *$*d^h$*, which, according to him, in the prehistory of Hittite was a voiced stop, underwent devoicing by assimilation to the *$*h_2$*, which in his view is a voiceless [ħ] (Melchert 1994: 47). After this development, the laryngeal was dropped (like in all postconsonantal positions), and the resulting /t/ is in Hittite spelled with a geminate stop. Phonetically this scenario can be schematized as follows: PIE *$*b^hod^hh_2$-* > pre-PAnat. *[bodħ-] > *[botħ-] > PAnat. *[bot-] > Hitt. [pat-], spelled *padd-*. As an alternative scenario, Melchert (1994: 76–77) entertains the possibility that in the cluster *$*d^hh_2$* the laryngeal assimilated to the stop, the result of which was a geminated voiced stop, /dd/: PIE *$*b^hod^hh_2$-* > pre-PAnat. *[bodħ-] > PAnat. *[bodd-] > Hitt. [padd-], spelled *padd-*. A third scenario was provided by myself: since in my view the PIE voiced (aspirated) stops had in pre-Proto-Anatolian times already developed into short voiceless stops (so *$*d^{(h)}$* = *[t], as opposed to PIE voiceless stops, which in pre-Proto-Anatolian had developed into long voiceless stops, so *$*t$* = *[tː] or, noted differently, *[tt]),[15] I argued in Kloekhorst (2008: 66) that the development of clusters of the type *$*-D^{(h)}H-$* to a geminate spelled stop is a matter of assimilation: the laryngeal is assimilated to the preceding short voiceless stop, which is lengthened to a long voiceless stop, and therewith merges with the outcome of PIE voiceless stops, which in Hittite are spelled as geminates. In this case, the development would have been: PIE *$*b^hod^hh_2$-* > PAnat. *[potˀ-] > Hitt. [patː-] = [patt-], spelled *padd-*.

None of these scenarios can be correct, however, since all three assume that the result of PIE *$*-d^hH-$* is identical to the result of PIE *$*-t-$*, whereas we have now seen that this is not the case: the two preforms yield different results in Hittite. Instead, the cluster *$*-d^hH-$* (*$*b^hod^hh_2V$° > *padda-*) rather yields the same result as the cluster *$*-tH-$* (*$*péth_2-r$*, *$*pth_2én-$* > *paddar*, *paddan-*, *$*pth_{1/2}-ói-$* > *piddai-* and *$*uth_2ór$* > *uddār*). Moreover, all three scenarios assume the total loss of the laryngeal, whereas we have now seen that the Old Hittite spelling with the sign DA = *ṭa* = [tˀa] rather indicates the synchronic presence of a glottalic element following the dental stop that must be the direct reflex of the laryngeal.

Combining these insights, I want to propose a new scenario for the phonological development of the cluster *$*-d^hH-$*. We know that in the prehistory of Hittite in certain environments a contact-induced fortition took place: e.g. *$*h_1g^{wh}ské/ó-$* > Hitt. *akkuške/a-* /əkʷské/á-/ 'to drink (imperf.)', in which PIE *$*g^{wh}$*, which normally should have yielded Hitt. lenis /gʷ/ = [kʷ], has instead yielded Hitt. fortis /kʷ/ = [kʷː] because of contact with a following *s*. Note that this is not a matter of assimilation: the *$*s$* is retained as such; it is only the preceding consonant that has been lengthened. I now propose that in the

[15] Cf. Kloekhorst (2008: 21–25).

cluster *-d^hH-, the *d^h, which in pre-Hittite times was a lenis voiceless stop, *[t], underwent a similar contact-induced fortition and was lengthened to [tː] = [tt]. This means that PIE *$b^hod^hh_2$-V°, through a pre-Hittite stage *[potʔV°], underwent lengthening to *[potːʔV-] = *[pottʔV-], which developed into Old Hittite [patːʔV°] = [pattʔV°], spelled *pád-da-* = *páṭ-ṭa-* = '*pát-tʔa-*'. In clusters of the shape *-*tH*-, the **t* was a long *[tː] = *[tt] from the outset, which means that the development of e.g. *uth$_2$ór*, through a stage *[utːʔór] = *[uttʔór], to OH [utːʔár] = [uttʔár], spelled *ud-da-a-ar* = *uṭ-ṭa-a-ar* = '*ut-tʔa-a-ar*', is fully straightforward.

Now that we have determined that in the sequence (-)*Vd-da*(-) the sign DA has a specific phonetic value that differs from the sign TA in the sequence (-)*Vt-ta*(-), we may assume that this is the case in the other environments as well.

(-)*VC-ta*(-) vs. (-)*VC-da*(-)

As we have seen, in Old Hittite texts the sequence (-)*VC-ta*(-) occurs 245 times (not including (-)*Vt-ta*(-)) and the sequence (-)*VC-da*(-) occurs 151 times (not including (-)*Vd-da*(-)), giving a ratio of 245 : 151 = 61.9 % : 38.1 %. This ratio more or less resembles the overall ratio of the use of TA to DA (67.5 % : 32.5 %), so one could argue that apparently in the postconsonantal position the signs TA and DA are used interchangeably. Yet, upon closer scrutiny this turns out not to be the case.

If we count the number of occurrences of TA and DA after specific consonants, we arrive at the following table:

	ḫ	*k*	*l*	*m*	*n*	*p*	*r*	*š*
TA	2	9	1	–	73	2	21	137
DA	–	–	1	–	148	–	2	–

We see that the use of the signs TA and DA does not randomly interchange at all: in many environments only the sign TA occurs. The only consonants after which the signs TA and DA are both attested are *l*, *n* and *r*. Note, however, that the three words that contain the sequences (-)*Vl-da*(-) and (-)*Vr-da*(-) are personal and geographical names (^{m}*Zi-kal-da-aš-ša* (KUB 36.107, 7 (OS)), ^{URU}*Kar-d*[*a-ba-ḫ*°] (StBoT 25.13 i 17 (OS)) and ^{URU}*Kar-da-ba-ḫ*[*u-u-me-né-eš*] (KBo 20.3 ii 3 (OS)), and therefore can be left out of the present discussion. This effectively means that in genuine Hittite words the sign DA appears in no other postconsonantal position than after *n*. It may therefore be worthwhile to look at this position in more detail.

°*n-ta*(-) vs. °*n-da*(-)

If we take a look at the list of words from Old Hittite texts containing the sequences °*n-ta*(-) and °*n-da*(-), we immediately notice that there are a number of words that occur spelled both with the sequence °*n-ta*(-) and with °*n-da*(-). For instance, the word for 'they

sit (down)' is spelled *e-ša-an-ta* (7×)[16] as well as *e-ša-an-da* (3×);[17] the word for 'they stand' is spelled *a-ra-an-ta-ri* (1×)[18] as well as *a-ra-an-da*(*-ri*) (3×);[19] the word for 'opposite' is spelled *me-e-na-aḫ-ḫa-an-ta* (3×)[20] as well as *me-e-na-aḫ-ḫa-an-da* (5×);[21] etc. In these words the signs TA and DA therefore seem to randomly interchange. Yet, this does not hold for all words. For instance, the word for 'into' occurs 54 times, and is in all instances spelled *an-da*, with the sign DA, and never ***an-ta*.[22] The same goes for the word 'inside', which occurs twelve times, always spelled *an-da-an*, with the sign DA, and never ***an-ta-an*. The large numbers of attestations of these words clearly speak against a coincidence: the consistent spelling with the sign DA must have been a deliberate choice by the scribes.

An opposite situation may be visible in the word for 'they libate'. It occurs five times,[23] and is always spelled *ši-pa-an-ta-an-zi*, with the sign TA, and never ***ši-pa-an-da-an-zi*.[24]

We therefore seem to be dealing with a threeway opposition:

(1) some words are spelled both with TA and with DA.
(2) some words are spelled with TA only.
(3) some words are spelled with DA only.

In order to establish what phonetic distinction may underly this three-way opposition, we first need to look at the uses after *n* of the signs TU/DU and TI/DI[25].

[16] *e-ša-an-ta* (KBo 25.58 ii 5 (OS), KUB 54.50 i 5 (OS), StBoT 25.54 i 32 (fr.), ii 7, iii 10 (OS), StBoT 25.56 iii 16 (OS)).

[17] *e-ša-an-da* (KBo 25.24 obv.? 11 (fr.) (OS), StBoT 12 i 19 (OS), StBoT 25.19 obv. 6 (OS)).

[18] *a-ra-an-ta-ri* (KBo 40.200 l.col. 7 (OS)).

[19] *a-ra-an-da* (KBo 20.23 rev. 4 (OS), StBoT 12 i 6 (OS)), [*a-*]*ra-an-da-ri* (KBo 17.6 ii 15 (OS)).

[20] *me-e-na-aḫ-ḫa-an-ta* (KBo 20.11 + KBo 8.85 ii 3 (fr.), iii 2 (OS), KBo 20.25 + KBo 20.19 i 12 (fr.) (OS)).

[21] *me-e-na-aḫ-ḫa-an-da* (KBo 3.22 rev. 53 (OS), KUB 26.35:7 (OS), KUB 33.59 iii 10 (OS), StBoT 25.3 ii 40 (OS), StBoT 25.4 ii 48 (OS)).

[22] Neu (1980: 145) cites a form '*an-ta*' for KBo 25.69 ii 5 (OS). Although the handcopy of this text indeed shows a form  = *an-ta*, the photo of this text, available through Hetkonk, shows that the form in fact is  = *an-ša*, with a sign ŠA () instead of TA (). I will therefore leave this form out of consideration.

[23] *ši-pa-an-ta-an-zi* (StBoT 25.54 iii 1 (fr.), 9 (fr.) (OS), StBoT 25.56 i 14 (OS), KBo 25.58 ii 4, 7 (fr.) (OS)).

[24] Neu (1980: 130) cites a form '*š*]*i-pa-an-da-an-zi*' for KBo 25.58 rev. 5 (OS), with the remark that this reading is uncertain. And indeed, if we look at the handcopy of this text, we see that the form in question is rather damaged:  . I will therefore leave this form out of consideration.

[25] Although in principle the sign DI can be read as *de* and thus can function as the voiced counterpart to the sign TE, forming a pair TE/'DE', the Hittites practically never used this value of the sign DI. The only word in the entire Old Hittite corpus in which the sign DI is used in the value *de* at all is [*ḫ*]*a-an-de-zu-um-ni* (StBoT 25.4 i 16 (OS)) (note that the sequence °*n-te*(-) is in Old Hittite texts well attested, namely 46 times). This virtually complete absence of the use of the sign DI in the value *de* in the Old Hittite corpus can to my mind be directly linked with the full absence of the use of the sign DI in the value *de* in the Old Babylonian texts from Alalaḫ (Kloekhorst 2010: 238). I therefore will leave the pair TE/'DE' out of the present discussion.

°*n-tu*(-) vs. °*n-du*(-)

In the case of the pair TU/DU, we find that in Old Hittite texts the sign TU occurs after *n* 43 times, whereas DU occurs in that position 21 times. Some words show spellings both with TU and with DU. For instance, the word for 'they must be' is spelled *a-ša-an-tu* (4×)[26] as well as *a-ša-an-du* (3×)[27]. Another example may be the word for 'human being', which occurs in my corpus of Old Hittite texts twice spelled as *an-du-uḫ-š*°,[28] with the sign DU, and in the possibly Old Hittite text KUB 36.105 (OH/OS or MS) once as *an-tu-u̯a-aḫ-ḫa*[-*aš*],[29] with the sign TU.

Yet, there are also words that are consistently spelled with one of the signs only. For instance, the word for 'libation (vessel)' is in Old Hittite texts consistently spelled *iš-pa-an-tu*(-*uz*)-*zi*(-), with the sign TU (11×),[30] and never ****iš-pa-an-du*(-*uz*)-*zi*(-). The same goes for its derivative *išpantuzziia̯šar* 'libation vessel', which is always spelled *iš-pa-an-tu-uz-zi*(-*i̯a*)-*aš-š*°, with the sign TU (13×),[31] and never ****iš-pa-an-du-uz-zi*(-*i̯a*)-*aš-š*°. The consistent use of TU in these words cannot be due to chance: they are both attested often enough to exclude an accidental absence of spellings with the sign DU. By contrast, the word for 'mortality' is consistently spelled *ta/da*-(*a*-)*an-du-ki-iš-n*°, with the sign DU (16×),[32] and never ****ta/da*-(*a*-)*an-tu-ki-iš-n*°. This word, too, is attested too often to ascribe the absence of spellings with TU to chance.

We therefore must distinguish three groups:

(1) words that are spelled both with TU and with DU.
(2) words that are spelled with TU only.
(3) words that are spelled with DU only.

This three-way opposition precisely matches the opposition as found for °*n-ta*(-) vs. °*n-da*(-).

[26] *a-ša-an-tu* (KUB 36.107, 6 (OS), StBoT 25.3 iii 7 (OS), StBoT 25.4 iii 2, 7 (OS)).
[27] *a-ša-an-du* (KUB 12.43, 5, 7 (OS), StBoT 25.3 iii 2 (fr.) (OS)).
[28] Gen.sg. *an-du-uḫ-ša-aš* (StBoT 25.3 i 23 (OS), StBoT 25.4 i 18 (OS)).
[29] Nom.sg. *an-tu-u̯a-aḫ-ḫa*[-*aš*] (KUB 36.105, 12 (OH/OS or MS)).
[30] Nom.-acc.sg. *iš-pa-an-tu-uz-zi* (KBo 17.59 + KBo 25.99 rev. 2 (OS), KBo 30.25 i 26 (OS), StBoT 25.3 ii 43, iv 23 (OS), StBoT 25.4 ii 51, iv 20 (OS)), ^{DUG}*iš-pa-an-tu-uz-zi* (IBoT 2.121 obv. 13 (OS)), gen.sg. *iš-pa-an-tu-uz-zi-aš* (KBo 25.112 ii 9 (OS)), nom.pl. [*iš-pa-a*]*n-tu-uz-zi-e-eš* (KBo 34.6 i 6 (OS)), broken ^{GEŠTIN}*iš-pa-an-t*[*u-uz-zi(-)*] (KBo 25.5, 2 (OS)), *iš-pa-an-t*[*u-uz-zi(-)*] (HHT 73 i 5 (OS)).
[31] Nom.-acc.sg. *iš-pa-an-tu-zi-aš-šar* (KBo 17.18 ii 9 (fr.) (OS), KBo 17.43 i 8 (OS), KUB 43.30 ii 8, 12, 20 (fr.) (OS)), *iš-pa-an-tu-uz-zi-aš-šar* (KBo 17.50 rev.? 2 (fr.) (OS), KBo 25.147 rev.? 3 (OS)), *iš-pa-an-tu-uz-zi-i̯a-aš-šar* (KUB 32.28 ii? 10 (fr.) (OS), KUB 43.28 ii? 8, iii? 4 (fr.), 6 (fr.) (OS)), acc.sg. [*iš-pa-a*]*n-tu-zi-aš-ša-ra-an* (KUB 43.30 ii 21 (OS)), acc.pl. *iš-pa-an-tu-zi-aš-ša-ru-uš* (KUB 43.30 ii 6 (OS)).
[32] Dat.-loc.sg. *ta-an-du-ki-iš-ni* (KUB 31.143a + VBoT 124 ii 10, iii 12 (fr.), 17 (fr.), 21 (OS), KUB 43.27 i 10 (fr.), iv 2 (fr.), 7 (OS)), *da-an-du-ki-iš-ni* (KBo 25.112 ii 18, iii 6 (OS), KBo 25.115, 4 (fr.) (OS), KUB 8.41 ii 2, 5, 8, 11, 19 (fr.), iii 14 (OS)), *da-a-an-du*[-*ki-iš-ni*] (KBo 57.76 obv.? 3 (OS)).

°*n-ti*(-) vs. °*n-di*(-)

In the case of the pair TI/DI, we find that in Old Hittite texts the sign TI occurs after *n* 67 times, whereas DI occurs in that position only 7 times. All words that are spelled with DI also occur with a spelling with TI: *ḫa-an-di* 'opposite, against' (attested thus 3 times)[33] is also spelled *ḫa-an-ti* (2×);[34] *iš-pa-an-di* 'at night' (attested thus 3 times)[35] is also spelled *iš-pa-an-ti* (5×);[36] [*ša-š*]*a-ạn-dị-i=š-ši* 'to his concubine' (attested thus once)[37] is also spelled *ša-ša-an-ti-i=š-ši* (1×)[38]. These forms therefore seem to show that TI and DI are interchangeable. Yet, the opposite situation is not true: not all words that are spelled with TI occur with DI as well. In a number of cases this need not be relevant. For instance, the word *ḫūmanti* 'all, every (dat.-loc.sg.)', which is only attested as *ḫu-u-ma-an-ti*, with the sign TI, occurs a mere three times,[39] so that the absence of attestations with the sign DI could easily be due to chance.

There is one word, however, for which such a reasoning does not hold. The word for 'he libates' occurs in Old Hittite texts 36 times, all of which are spelled with the sign TI (*ši-pa-a-an-ti* (10×),[40] *ši-pa-an-ti* (14×),[41] *iš-pa-a-an-ti* (1×),[42] *iš-pa-an-ti* (11×)[43], whereas not a single attestation with the sign DI can be found.[44] The number of attestations with TI is too large for the absence of attestations with DI to be coincidental. Another word that is spelled with the sign TI only is 'palace', which always occurs as $^{(É)}$*ḫa-le-en-ti-u-*, with the sign TI (6×),[45] and never as **$^{(É)}$*ḫa-le-en-di-u-*.

[33] *ḫa-an-di* (IBoT 2.121 rev. 17 (OS), KBo 25.37 rev. 8 (OS), KBo 25.38, 7 (OS)).

[34] *ḫa-an-ti* (KBo 6.2 ii 8 (OS), KBo 17.30 ii 6 (OS)).

[35] *iš-pa-an-di* (KBo 3.22 obv. 6, 16, rev. 47 (OS)).

[36] *iš-pa-an-ti* (KBo 17.6 iii 12 (OS), KUB 43.26 iv 18 (OS), StBoT 25.3 iii 29 (OS), StBoT 25.4 iii 29, 45 (OS)).

[37] [*ša-š*]*a-ạn-dị-i=š-ši* (VBoT 124 rev. 10 (OS)).

[38] *ša-ša-an-ti-i=š-ši* (KUB 8.41 ii 7 (OS)).

[39] *ḫu-u-ma-an-ti* (KBo 6.2 ii 59 (fr.), iii 22 (OS), KBo 17.22 iii 3 (fr.) (OS)).

[40] *ši-pa-a-an-ti* (KBo 17.11 iv 4, 14 (OS), KBo 25.51 i 6 (fr.) (OS), KUB 43.28 iii 9 (OS), StBoT 25.52 i 6 (fr.), 14 (fr.), ii 11 (OS), StBoT 25.127 + StBoT 25.147 ii 27, iii 24, 25 (OS)).

[41] *ši-pa-an-ti* (HHT 73 i 6 (OS), KBo 17.43 i 9 (OS), KBo 25.29 iii 6 (fr.) (OS), KBo 25.36 ii 8 (fr.), iii 14 (OS), KBo 25.51 i 4, i 19 (fr.) (OS), KUB 28.75 ii 20 (OS), KUB 43.30 ii 10, 11, 14, 15 (OS), KUB 60.41 iii 5 (OS), StBoT 25.61 iii 9 (OS)).

[42] *iš-pa-a-an-t*[*i*] (KBo 25.44, 2 (OS)).

[43] *iš-pa-an-ti* (KBo 7.41 l.col. 6 (OS), KBo 17.59 + KBo 25.99 rev. 3 (OS), KBo 20.11 ii 5 (fr.), 6, iii 5 (fr.) (OS), KBo 20.19 + KBo 20.25 i 6 (2×), 7, 8 (fr.) (OS), KBo 25.88, 21 (fr.) (OS), StBoT 25.4 iii 52 (fr.) (OS)).

[44] Note that the form *iš-pa-an-di*, spelled with the sign DI, represents a different word, namely 'at night': cf. footnote 35.

[45] Nom.-acc.sg. $^{(É)}$*ḫa-le-en-ti-u* (KBo 17.28 l.col. 11 (OS), KBo 25.51 + KBo 30.31 i 17 (fr.) (OS), KBo 25.92 r.col. 6 (OS), StBoT 12+ i 24 (fr.), 35 (fr.), 46 (OS)), abl. [^{É}*ḫ*]*a-le-en-ti-u*[*-a*]*z* (StBoT 12+ i 33 (OS)).

We can distinguish two groups:

1. words that are spelled both with TI and with DI
2. words that are spelled with TI only.

On the basis of our findings for TA/DA and for TU/DU, we may expect to find a third group, namely consisting of words that are spelled with DI only, but such a group has not surfaced in the language material represented by the Old Hittite texts.

Three-way distinction

Combining our findings regarding the pairs TA/DA, TU/DU and TI/DI, we must distinguish three groups of words:

(1) words that are spelled both with *t* and with *d*: *arant/da*(*ri*), *ašant/du*, *ešant/da*, *ḫant/di*, *išpant/di*, *mēnaḫḫant/da*, *šašant/di*.
(2) words that are spelled with *t* only: *ḫalentiu-*, *išpă̆nti*, *išpantuzzi-*, *išpantuzi̯aššar*, *šipantanzi*, *šipă̆nti*.
(3) words that are spelled with *d* only: *anda*, *andan*, *t/dandukišn-*.

We should ask ourselves to what extent we are allowed to combine the groups of TA/DA, TU/DU and TI/DI: does, for instance, the consistent spelling with the sign TI in *išpă̆nti* have any connection with the consistent spelling with the sign TU in *išpantuzzi-*? To my mind, it does: it is remarkable that all forms derived from the verbal root *šipă̆nt- / išpă̆nt-* 'to libate' that are attested in Old Hittite texts belong to group (2): they are always spelled with a *t*-sign regardless of whether this *t* is followed by *a*, *u* or *i*. I regard this fact as an important indication that we can indeed combine the material of the pairs TA/DA, TU/DU and TI/DI.

Phonetic/phonological interpretation

Whenever we find a complementary distribution in spelling, the default assumption should be that this distribution reflects a phonetic/phonological opposition. In order to determine what opposition we are dealing with in this case, I will first look at the etymology of the words belonging to these three groups. In the following overview, I give the commonly accepted reconstructions of the words that have a good IE etymology.[46]

Group 1:

ant/du(*u̯a*)*ḫḫ*(*a*)*š-*	< **h*$_1$(*e*)*nd*^{h}*u*(*e*)*h*$_2$(*e*)*s-*
arant/da(*ri*)	< **h*$_3$*rénto*(*ri*)
ašant/du	< **h*$_1$*séntu*
ešant/da	< **h*$_1$*éh*$_1$*s*(*e*)*nto*
ḫant/di	< **h*$_2$*énti*
išpant/di	< **k*^{w}*spénti*

[46] Cf. Kloekhorst (2008: *s.vv.*) for etymological treatments of these words.

mēnaḫḫant/da	< *…-$h_2$ento[47]
šašant/di	< *ssénti

Group 2:

išpantuzzi-	< *spnduti-
išpantuzziia̯šar	< *spnduti-
šipantanzi	< *spndénti
šipă̆nti/išpă̆nti	< *spóndei

Group 3:

anda	< *h_1(e)ndo
andan	< *h_1(e)ndom

We see that all words of Group 1 reflect either the PIE cluster *-*nt*- or the cluster *-*nd*^{h}-, and that they thus contrast with the words of Group 2, which all reflect the PIE cluster *-*nd*-. Yet, also the two words of Group 3 that are of IE origin are commonly reconstructed with the cluster *-*nd*-. This situation is puzzling. If it is indeed true that the words of Group 2 contain a cluster that is etymologically identical to the cluster that is present in the words of Group 3, we would expect that synchronically in Old Hittite the two clusters would be phonologically identical as well, and that they consequently would have been spelled the same way. Instead, we find a totally opposite spelling: consistent use of the sign TA in Group 2 vs. consistent use of the sign DA in Group 3. To my mind, this absolute distribution can only mean that the clusters of the two groups were phonologically distinct, and that, as a consequence, these clusters cannot reflect one and the same PIE cluster. Put differently, the consistent difference in spelling between the two groups forces me to assume that the reconstruction of one of these groups is incorrect: the reconstruction *-*nd*- cannot be correct for both groups.

In the words of Group 2, which are all derived from the verbal root *išpă̆nt- / šipă̆nt-* 'to libate', the dental stop is part of that root, which on the basis of Gr. σπένδω 'to libate' and Lat. *spondeō* 'to pledge' can securely be reconstructed as **spend*-, with a **d*. It is therefore impossible to reconstruct these words otherwise than as containing a cluster *-*nd*-.

In the words of Group 3, *anda* 'into' and *andan* 'inside', the dental stop is part of a suffix that enlarges the basic root **$h_1$en*- 'in'. Although the words that are usually regarded to be

[47] This reconstruction is based on the view that *mēnaḫḫant/da* must be seen as an old compound of *mēna*- 'face' + *ḫant*- 'face, forehead' < **$h_2$ent*- (cf. Kloekhorst 2008: 576). In 2010, Nikolaev argued that the word is instead a compound consisting of the all.sg. form of 'face', **men-eh*$_2$, and the adverb *anda* 'into'. I find this etymology unlikely. First, the etymology demands that the univerbation of these two elements must have taken place at the time that word-final *-*eh*$_2$ had not yet developed into *-*ā*, i.e. in pre-Proto-Anatolian times already. This is to my mind hardly credible. Second, this etymology demands that the Hitt. all.sg. ending -*a* goes back to PIE *-*eh*$_2$, which to my mind is not the case: in Kloekhorst (2008: 161), I argued that it reflects *-*o*. Third, this etymology does not explain why *mēnaḫḫant/da* shows spellings both with TA and with DA, whereas *anda* is spelled with the sign DA only. I therefore reject Nikolaev's reconstruction, and maintain that the second element of *mēnaḫḫant/da* is a form of *ḫant*- 'forehead' < **$h_2$ent*-.

their closest cognates, Gr. ἔνδον 'inside' and OLat. *endo* 'into', indeed reflect *h_1(e)n-do(m)*, with a suffix containing a **d*, this reconstruction need not in my view be the only possibility for Hitt. *anda(n)*. For instance, Skt. *antar* and Lat. *inter* 'within, inside' < **$h_1$en-ter* reflect a formation in which the suffix contains a **t*, whereas e.g. Skt. *kúha* and OCS *kъde* 'where' < PIE **k^wu-d^he*[48] prove the presence of locatival suffixes containing a **d^h*. I therefore will in the following propose that the words of Group 2 reflect **-nd-*, whereas the words in Group 3 do not reflect **-nd-*, but rather a different cluster.

It is now time to discuss the synchronic phonological interpretation of each of the three groups.

Group 1

In the words of Group 1, the cluster *-nT-* is spelled with both *t*-signs and *d*-signs and reflects both the PIE cluster **-nt-* and the cluster **-nd^h-*, which in the course of the development of Hittite apparently have merged. As I have already mentioned above, the normal outcome of PIE **t* in Hittite is a long (geminate) voiceless stop, [t:], whereas the normal outcome of PIE **d^h* is a short voiceless stop, [t]. It is therefore quite understandable that the PIE clusters **-nt-* and **-nd^h-*, through a pre-Hittite stage *[-nt:-] and *[-nt-], have merged: apparently the length of *[t:] was lost after *n*. Yet, the resulting cluster is in Hittite not consistently spelled with *t*-signs, which indicates that it cannot have phonetically been [-nt-]. Instead, the use of the *d*-signs must be interpreted as signalling another pronunciation. Since the use of the *d*-signs can in this case hardly represent the presence of a glottalized [t^ʔ] (there simply is no reason to assume the presence of a glottalic element behind the dental in any of these words), we have to look at another possible phonetic interpretation. Since in Akkadian the *d*-signs cannot only be read with an emphatic stop, [t^ʔ], but also with a voiced stop, [d],[49] I assume that in this case the *d*-signs represent the presence of this latter sound. It is typologically common that nasals have a voicing effect on following voiceless stops, and it therefore seems attractive to assume that PIE **-nt-* and **-nd^h-*, through a pre-Hittite stage *[-nt-], yielded Hitt. [-nd-], with a voiced stop [d].[50]

Group 2

In the words of Group 2, the cluster *-nT-* is consistently spelled with *t*-signs (never with *d*-signs) and reflects PIE **-nd-*. The deliberate absence of *d*-signs in the spelling of these clusters indicates that their dental stops were neither glottalized nor voiced. Instead, we must assume that they were plainly voiceless, [t].

[48] A reconstruction **k^wud^{h}h$_1$e* is possible as well, cf. below.

[49] Cf. Kloekhorst (2010: 232–235) for a treatment of the spelling of the phoneme /d/ in Alalaḫ Akkadian.

[50] The fact that this [d] was not consistently spelled with the *d*-signs is probably due to the fact that, as will be argued below, the [d] that occurs in intervocalic position was only allophonically realised as a voiced stop.

The question now is: why would PIE *-*nd*- yield Hitt. [-nt-], whereas PIE *-*nt*- and *-*nd*^{h}- yielded Hitt. [-nd-]? The solution to this question lies in one's interpretation of the phonetic properties of PIE *-*d*. As I have already stated above, in word-internal position the Hittite lenis stops, which are the outcomes of the PIE voiced (*-*b*, *-*d*, etc.) and voiced aspirated (*-*b*^{h}, *-*d*^{h}, etc.) stops, are synchronically voiceless short stops ([p], [t], etc.). Moreover, in Kloekhorst (2012: 258–259),[51] I have pointed out that the outcomes of the PIE voiced stops, but not PIE voiced aspirated stops, have in Hittite and Luwian certain effects on preceding vowels that indicate that at the Proto-Anatolian level these consonants must have been pre-glottalized. This means that we can assume that the Proto-Anatolian outcome of the PIE voiced stops must have been pre-glottalized voiceless short stops: *[ˀp], *[ˀt], etc. In the case of the PIE cluster *-*nd*-, we therefore have to assume a PAnat. prestage *[-nˀt-].

The effect that the glottalic element of the pre-glottalized consontants *[ˀp], *[ˀt], etc., had on a preceding vowel is comparable to the effect that *h_1 had on a preceding vowel: both cause lengthening of that vowel. We may therefore hypothesize that also in the cluster *[-nˀt-] the glottalic element has an effect on its neighbouring sounds that is comparable to the effects of *h_1 in similar clusters. It is therefore interesting to see that in clusters consisting of a nasal, a *h_1 and a sibilant, the laryngeal prevented assimilation of its neighbouring sounds. For instance, although the PIE cluster *-*ns*- yielded Hitt. -*šš*- (e.g. **dénsu*- > *daššu*- 'strong, powerful'), with full assimilation of the nasal to the sibilant, the PIE cluster *-*nh$_1$s*- yielded Hitt. -*nz*- (e.g. **génh$_1$su*- > *genzu*- 'lap, abdomen'), with preservation of the nasal. Apparently, the *h_1 blocked the assimilation. Similarly, although PIE *-*ms*- yielded Hitt. -*šš*- (e.g. **h$_2$émsu*- > *ḫaššu*- 'king'), with full assimilation of the nasal to the sibilant, the cluster *-*mh$_1$s*- yielded Hitt. -*nš*- (e.g. **h$_2$ómh$_1$sei* > *ānši* 'he wipes'), with preservation of the nasal. We therefore may assume that, just as *h_1 in the clusters *-*nh$_1$s*- and *-*mh$_1$s*- prevented assimilation of the nasal to the sibilant, the glottalic element of *[ˀt] in the cluster *[-nˀt-] prevented voice assimilation of the dental to the preceding nasal, so that the voiceless stop could remain voiceless. To my mind, this is the most straightforward way to explain Hitt. [-nt-] from PIE *-*nd*-.

Group 3

In the words of Group 3, the cluster -*nT*- is consistently spelled with *d*-signs (never with *t*-signs). As we have seen, it is not fully clear what the etymology of this cluster is. The only two words of IE origin that contain it, *anda* 'into' and *andan* 'inside', are usually reconstructed and as **h$_1$(e)ndo* as **h$_1$(e)ndom*, respectively, with a cluster *-*nd*-. However, these reconstructions with *-*nd*- conflict with the fact that in the words of Group 2 the cluster *-*nd*- yielded Old Hittite [-nt-], with consistent spelling with *t*-signs. I therefore assume that this reconstruction of *anda* and *andan* cannot be correct. Moreover, since PIE *-*nt*- and *-*nd*^{h}- yielded Old Hittite [-nd-], which is spelled both with *t*-signs and with *d*-signs, the cluster -*nd*- in *anda* and *andan*, which is consistently spelled with *d*-signs, cannot reflect

[51] Cf. also Kloekhorst (forthcoming, § 2.5.3 and § 3.5.2).

these clusters either. I therefore propose that their clusters reflect PIE *-*nTH*-, i.e. a cluster in which the dental stop is followed by a laryngeal, and that the sign DA, with which they are consistently spelled, should in fact be read as *ṭa* and represents the presence of a glottalized stop: [-nt^{ʔ}-] (or perhaps [-nd^{ʔ}-]?). If this is correct, we may assume that the latter part of *anda* and *andan* may etymologically be compared with Gr. -θα (as in ἔνθα 'there') ~ Skt. *-ha* (as in *ihá* 'here') < *-*d^{h}h$_2$e*,[52] or with Skt. *-ha* (as in *kúha* 'where') ~ OCS *-de* (as in *kъde* 'where') < *-*d^{h}h$_1$e*.[53]

°*V-ta*(-) vs. °*V-da*(-)

As we have seen, in Old Hittite texts the sequence °*V-ta*(-) occurs 64 times whereas the sequence °*V-da*(-) occurs 99 times, yielding a ratio of TA to DA of 64 : 99 = 39.3 % : 60.7 %. In most words that contain this sequence, the two signs are used interchangeably: they show spellings both with TA and with DA. For instance, the word for 'they eat' is spelled *a-ta-an-zi* (2×)[54] as well as *a-da-an-zi* (5×);[55] The word $^{\text{NINDA}}$*u̯a-ga*(-*a*)-*ta-aš* (attested thus 7 times),[56] a type of bread, is spelled $^{\text{NINDA}}$*u̯a-ga-a-da-aš* (3×)[57] as well; the word for 'evil' is spelled *i-ta-a-l*° (2×)[58] as well as *i-da-a-l*° (5×);[59] etc. In fact, there is not a single well attested word that shows an exclusive spelling either with TA or with DA.[60] This does not necessarily mean that the use of the sign DA has no significant function at all. In our treatment of the cluster *-*nT*-, we have seen that the group of words that show spellings both with TA and with DA contain the sound [d], which contrasts with the group of words that is

[52] Cf. Rix (1992: 189) for this reconstruction.

[53] E.g. **k^{w}ud^{h}h$_1$e* 'where' may be analysed as **k^{w}u-d^{h}h$_1$-e*, i.e. a compound containing the verbal root **d^{h}eh$_1$-* 'to place', comparable to e.g. Slav. **podъ* 'floor, bottom' < **h$_2$po-d^{h}h$_1$-o-*, which contains the root **d^{h}eh$_1$-* as well (p.c. A.M. Lubotsky).

[54] *a-ta-an-zi* (StBoT 25.54 iii 11 (fr.), 13 (OS)).

[55] *a-da-an-zi* (Bo 6594 rev. 4 (OS), KBo 13.175 rev. 7 (OS), KBo 16.72 r.col. 3 (fr.) (OS), KBo 16.73, 3 (OS), StBoT 25.56 iii 17 (fr.) (OS)).

[56] $^{\text{NINDA}}$*u̯a-ga-a-ta-aš* (Bo 3123 i 4 (fr.), 5 (fr.) (OS), StBoT 25.75 i 8 (OS), KBo 25.79 i 8 (OS)), $^{\text{NINDA}}$*u̯a-ga-ta-aš* (StBoT 25.12 ii 11, iii 17 (OS), StBoT 25.13 iv 6 (OS)).

[57] $^{\text{NINDA}}$*u̯a-ga-a-da-aš* (KBo 20.8 iv 3 (OS)), $^{\text{NINDA}}$*u̯a-ga-da-a-aš* (KBo 25.79 i 7 (OS)), $^{\text{NINDA}}$*u̯a-ga-da-aš* (StBoT 25.19 obv. 12 (OS)).

[58] Dat.-loc.sg. *i-ta-a-la-ú-i* (KBo 25.103 rev. 3 (OS)), derived verb *i-ta*[*-a-la-u-e-eš-š*°] (KBo 6.2 iii 7 (OS)).

[59] Nom.-acc.sg. *i-da-a-lu* (KBo 8.42 rev. 10 (OS), StBoT 25.3 ii 4, iii 11, iv 2 (OS), StBoT 25.4 iii 11 (OS)).

[60] The only word that seems to show a consistent spelling is the verb *uda-^{i}* 'to bring (here)', a univerbation of the preverb *ŭ-* 'hither' and the verb *dā-^{i}* 'to take', which in Old Hittite texts occurs 31 times spelled *ú-da*(-), but never ***ú-ta(-)*. Yet, to my mind this verb cannot be separated from *pēda-^{i}* 'to bring (away)', which is a univerbation of the preverb *pĕ-* 'thither' and the verb *dā-^{i}* 'to take'. Since this latter verb is spelled with both signs (it is attested in Old Hittite texts 30× as *pé*(-*e*)-*da*(-), and 14× as *pé*(-*e*)-*ta*(-)), I am inclined to assume that its dental stop must be of the same quality as that of *adanzi/atanzi*, *u̯agādaš/u̯agātaš*, etc., which means that the dental stop of *uda-^{i}* must have had this quality as well. I do not want to exclude the possibility, however, that in these words the use of the sign DA in the sequence °*V-da*(-) represents the presence of a short glottalized stop, [-Vt^{ʔ}a-], which then must have been taken over from the base verb *dā-^{i}/d-* 'to take', which had the shape [t^{ʔ}(ā)-]; cf. Kloekhorst (2010: 205–207).

spelled with the sign TA only, which contain the sound [t]. I therefore assume that in the case of *-VTa*(-), the spelling both with TA and with DA indicates the presence of a voiced stop, [d], too. As I have stated above as well, to my mind the basic form of the lenis dental stop (which is the outcome of PIE **d* and **d^h* and of **t* when standing in a leniting position) is a short voiceless stop, [t]. Yet, it seems unproblematic to me to assume that in intervocalic position this sound was allophonically voiced to [d]. The fact that the voicing was non-contrastive explains why the voicing was not systematically indicated in spelling.

Conclusions

In Old Hittite texts, the signs TA and DA occur in word-internal position in such specific distributional patterns that we cannot conclude but that they must have represented different sounds. The exact interpretation of the phonetic distinction differs per environment. In the case of intervocalic geminates, the spelling (-)*Vt-ta*(-) represents the presence of a voiceless geminate stop, [-tt-], which is the outcome of PIE **-t-*, whereas the spelling (-)*Vd-da*(-) represents the presence of a glottalized geminate stop, [-tt^{ʔ}-], the outcome of the PIE cluster **-TH-*. After an *n*, consistent use of the sign TA, °*n-ta*(-), represents the presence of a cluster containing a voiceless stop, [-nt-], the outcome of PIE **-nd-* (through earlier **[-n^{ʔ}t-]); consistent use of the sign DA, °*n-da*(-), represents the presence of a cluster containing a glottalized stop, [-nt^{ʔ}-], the outcome of PIE **-nTH-*; whereas interchange between the signs TA and DA, °*n-ta/da*(-), represents the presence of a cluster containing a voiced stop, [-nd-], the outcome of PIE **-nt-* and **-nd^h-*. In the case of intervocalic singletons, the interchange between TA and DA, °*V-ta/da*(-), represents the presence of a voiced stop, [-d-], the outcome of PIE intervocalic **d* and **d^h* and of **t* when standing in leniting position.

The fact that the sign DA can be used in two different values, namely as [t^{ʔ}a], with a glottalized stop, and as [da], with a voiced stop, and thus differs from the sign TA, which is used in the value [ta], with a voiceless stop, perfectly fits the use of the sign DA as both *ṭa* (= [t^{ʔ}a]) and *da* (= [da]) and of the sign TA as *ta* (= [ta]) as attested in the Old Babylonian texts from Alalaḫ. The Hittite values of these signs can therefore be seen as a direct continuation of their values in Alalaḫ Akkadian.

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