The origin of the Hittite ḫi-conjugation

Kloekhorst, A.; Beek, L. van; Kroonen, G.; Peyrot, M.; Pronk, T.

The origin of the Hittite *ḫi*-conjugation[1]

Alwin Kloekhorst

Background

As is well known, the Hittite verbal system knows in its active voice two conjugations, the so-called *mi*- and *ḫi*-conjugations, which mainly differ from each other in the set of endings that they use. The origin of the *mi*-conjugation is quite clear: it is generally connected with the present-aorist system of the other Indo-European languages, with, for instance, the present endings *-mi*, *-ši*, *-zi* directly corresponding to the PIE primary endings $*-mi$, $*-si$, $*-ti$.[2] The origin of the Hittite *ḫi*-conjugation is fiercely debated, however. Several theories regarding its prehistory have been formulated, two of which are nowadays the most prominent ones, namely the "perfect theory" (most extensively formulated by Eichner 1975) and the "h_2e-conjugation theory" (see especially Jasanoff 2003).[3]

Both these theories start with the observation that, from a formal point of view, the Hittite *ḫi*-conjugation has several matches with the PIE perfect as it has traditionally been reconstructed on the basis of the other IE languages. First, there is a match with regard to the endings. The present endings of the *ḫi*-conjugation, 1sg. *-ḫḫi* (in the oldest texts *-ḫḫe*), 2sg. *-tti*, and 3sg. *-i* (in the oldest texts *-e*), are commonly viewed as being identical to the endings of the 'traditional' PIE perfect, to which an $*-i$ has been added: $*-h_2e-i$, $*-th_2e-i$, and $*-e-i$. The corresponding preterite endings, 1sg. *-ḫḫun* and 2sg. *-tta*,[4] are generally viewed as corresponding to the unextended PIE perfect endings $*-h_2e$ and $*-th_2e$, respectively.[5] Also the Hittite 3pl.pret. ending *-er* (which is used in the *mi*-conjugation as well) is commonly equated with the PIE perfect 3pl. ending $*-ēr$. Second, there is a match in stem vocalism: the Hittite *ḫi*-conjugated verbs all show $*o$-grade in their strong stem, which is also the ablaut vowel that is found in the root of the singular forms of the perfect, e.g. 3sg. $*Ce-CóC-e$.

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[1] I thank Lucien van Beek, Michaël Peyrot and Michiel de Vaan for providing valuable feedback on an earlier draft of this article.

[2] Although the exact relationship is not always as straight-forward as it may seem, cf. Kloekhorst fthc. for a discussion of details of the origin of the *mi*-conjugation.

[3] Other theories are the 'thematic theory' (which argues that the *ḫi*-conjugation goes back to the PIH thematic conjugation) and the 'middle theory' (which argues that the *ḫi*-conjugation goes back to the PIH middle). Both theories can easily be dismissed, however. The 'thematic theory' because the PIH thematic inflection has in Hittite rather been transferred to the *mi*-conjugation (cf. the suffixes *-iie/a-^{zi}* < $*-ie/o-$ and *-ške/a-^{zi}* < $*-ske/o-$); and the 'middle theory' because the PIH middle inflection has in Hittite rather been continued as the middle. Cf. Jasanoff 2003: 21-7 for a *Forschungsgeschichte* and critical treatments of these theories.
In his review of Jasanoff 2003, Oettinger (2006) has launched an Indo-Hittite variant of the h_2e-conjugation theory, according to which Proto-Indo-Hittite knew a "Proto-Intensivum", i.e. a present with $*h_2e$-endings, $*o/Ø$-ablaut, simple or full reduplication, and iterative meaning. According to Oettinger, this category was directly taken over into Anatolian, where it was semantically bleached and therefore de-reduplicated (although archaic reduplicated forms were retained to express iterative meaning), and thus yielded the *ḫi*-conjugation. In the prehistory of classic Proto-Indo-European, however, the "Proto-Intensivum" developed into three separate categories, namely (1) the traditional perfect (with a semantic shift from iterative to stative); (2) the reduplicated present of the type $*d^hé-d^hoh_1-ti$ (with transfer to the *mi*-conjugation and loss of iterative meaning); and (3) the intensive of the type $*h_2uér-h_2uórg-ti$ (with transfer to the *mi*-conjugation, but retention of the iterative meaning). Unfortunately, Oettinger does not give many details as to how and why the exact semantic and formal developments would have taken place.

[4] Note, however, that the Hittite 3sg.pret. *-š* cannot be equated with the PIE perfect ending $*-e$, a fact that is acknowledged by both the "perfect theory" and the "h_2e-conjugation theory". Yet, since the Hittite 3sg.pres. ending *-i* (OH *-e*) derives from $*-e-i$, there can be no doubt that pre-Hittite had the ending $*-e$, too. Cf. Kloekhorst 2008: 688, where it is argued that the expected outcome of PIE $*-e$ would have been Hitt. $*-Ø$, and that this is the reason that a secondary ending was introduced.

[5] Assuming that $*-h_2e$ first yielded $*-ḫḫa$, as is attested in the Luwic languages, to which in Hittite the *mi*-conjugation ending *-un* was attached.

Besides these matches between the Hittite ḫi-conjugation and the traditional perfect, there are also several mismatches between the two categories, on both the formal and the semantic side. It is precisely in the explanation of these mismatches that the perfect theory and the h_2e-conjugation theory differ from each other. The perfect theory states that the Hittite ḫi-conjugation derives from the traditional PIE perfect and that the mismatches between the two categories are due to innovations within the prehistory of Anatolian. This contrasts with the h_2e-conjugation theory, which derives the Hittite ḫi-conjugation from a hitherto unrecognized PIE category, the so-called h_2e-conjugation. Just as the mi-conjugation, the h_2e-conjugation would have formed presents and aorists, and the formal resemblance between the h_2e-conjugation and the PIE traditional perfect is explained by assuming that in pre-PIE the perfect was in fact a reduplicated present to h_2e-conjugated aorists (Jasanoff 2003: 168-9).

In this article I will discuss the mismatches between the Hittite ḫi-conjugation and the PIE traditional perfect, and compare how they are accounted for within the two theories. In this way, it will be determined which of the two theories is better at explaining the origin of the ḫi-conjugation. It will turn out that Eichner's perfect theory clearly surpasses Jasanoff's h_2e-conjugation theory, although two points remain in which the perfect theory does not work well either. It will be argued, however, that with two slight adaptations of the perfect theory (one of which with an Indo-Hittite point of view), a full and convincing account of the origin of the ḫi-conjugation can be given.

Mismatch 1: Ablaut
As was mentioned above as well, virtually all Hittite ḫi-conjugated verbs show in their strong stem a reflex of the vowel *o,[6] and they thus correspond to the traditional perfect, which is reconstructed with o-grade in its singular (= strong) stem, too: 3sg. *Ce-CóC-e. In their weak stem, the vast majority of Hittite ḫi-verbs show a reflex of zero grade in their root, e.g. kānk-^{i} / kank- 'to hang (something)' < *ḱónk- / *ḱnk-; arai-^{i} / ari- 'to rise' < *h₃rói- / *h₃ri-; etc. Their *o/∅-ablaut is thus identical to the root ablaut as reconstructed for the traditional perfect: *Ce-CóC-e / *Ce-CC-ér. However, there are also a few Hittite ḫi-verbs that synchronically show an ablaut that rather seems to reflect earlier *o/e, e.g. šākk-^{i} / šekk- 'to know' < *sókh₁- / *sékh₁-. Since this ablaut is unattested in the perfect of the other IE languages, it forms a mismatch between the Hittite ḫi-conjugation and the traditional perfect.

Although the *o/e-ablaut as seen in some ḫi-verbs does not match the ablaut of the traditional perfect, according to Jasanoff (2003: 79-86) it does have a counterpart outside of Anatolian, namely in the ablaut of the so-called molō-presents. These are presents that in some languages show o-grade in their root (e.g. Goth. malan 'to mill' < *molH-) and in others e-grade (e.g. OIr. melid 'to mill' < *melH-) and which therefore had been reconstructed as having radical o/e-ablaut by Meillet (1916).[7] Jasanoff therefore assumes that both the Hittite *o/e-ablauting ḫi-verbs and the non-Anatolian molō-presents go back to a single category, which he calls the "h_2e-conjugation", i.e. a paradigm with radical o/e-ablaut, showing the endings of the perfect, but having a present meaning: 1sg. *mólh₂-h₂e 'I grind' vs. 1pl. *mélh₂-meH 'we grind' (reconstructions according to Jasanoff 2003: 71). Both the Hittite ḫi-verbs showing *o/∅-ablaut and the traditional perfect, which also shows *o/∅-ablaut, would ultimately derive from this category through a massive replacement of the e-grade of the weak stem by zero grade.

Within the perfect theory, the e-grade of the *o/e-ablauting ḫi-verbs is explained as having an analogical origin, usually as having been generalized from originally reduplicated weak stems. For instance, Eichner (1975: 87) states that the *e may originate from forms like *h₁é-h₁r-ēr > ērer 'they arrived', whereas Oettinger (1979: 114) sees *se-sh₂g-eh₁-re > šekker 'they knew' as the most important source for spread of e-grade in these ḫi-verbs.

In a recent discussion of all relevant material, I have endorsed the view that in the majority of these verbs the e-grade is indeed analogical (albeit ultimately taken over from mi-conjugating verbs, and not through a reinterpretation of reduplication syllables) and has replaced an earlier zero-grade, and that in a small group of verbs the seeming e-grade is in fact an epenthetic vowel that arose in original zero-

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[6] The only exception is the class of factitives in -aḫḫ-, which seem to show e-grade in their stem: 3sg.pres.act. °aḫḫi < *-éh₂-ei.
[7] Although Meillet did not make explicit the exact distribution of o-grade and e-grade throughout the paradigm, and assumed that also zero-grade was part of the ablaut of such paradigms.

grade stems (Kloekhorst 2012; 2014). This means that all ḫi-verbs that at the surface seem to show *o/e-ablaut, in fact go back to *o/Ø-ablauting paradigms.

We may therefore conclude that, when it comes to ablaut, there is in fact no mismatch between the Hittite ḫi-conjugation and the traditional perfect after all: all Hittite ḫi-conjugated verbs originally had an ablaut *o/Ø, which is identical to the ablaut of the traditional perfect. As a consequence, an important pillar underneath the formal aspects of the h_2e-conjugation theory has turned out to be non-existent.

Mismatch 2: Reduplication

The classic reconstruction of the perfect category is 3sg. $*C_1e$-$C_1óC_2$-e vs. 3pl. $*C_1e$-C_1C_2-$ér$, i.e. showing a reduplication syllable *Ce- that reduplicates the first consonant of the verbal root, followed by an *e. In Hittite, ḫi-conjugated verbs do not regularly show reduplication, however: their basic structure is *CóC-e / *CC-ér.[8]

In order to explain this mismatch, Eichner (1975: 87) argues that the absence of reduplication in Hittite is the result of a massive removal of reduplication syllables by analogy with verbs like "*$h_3oh_3ók$ / h_3oh_3k" > Hitt. āk(k)-^{i} / akk- 'to die', in which the original reduplication syllable was dissolved into the verbal stem by regular sound law.

Jasanoff (2003: 15-6) is critical about this assumption, however. He remarks that in almost all non-Anatolian languages that have preserved the perfect, the reduplication was quite well maintained. Only in Germanic, reduplication was removed on a large scale, but as Jasanoff rightly remarks "Late Proto-Germanic was spoken [...] a full two thousand years later than Proto-Anatolian [...]; yet even here the tenacity of reduplication in the perfect is shown by the survival of nearly two dozen reduplicating strong verbs in Gothic alone (e.g. letan 'let', pret. lailot [...]). If the ḫi-conjugation in fact grew out of the perfect, it would have to have given up its reduplication with a precocity unmatched in any other IE language" (2003: 16). Jasanoff himself rather explains the mismatch between the Hittite ḫi-conjugation and the traditional perfect by assuming that the ḫi-conjugation reflects an original unreduplicated h_2e-conjugated formation, and that the traditional perfect "originated within PIE as a kind of h_2e-conjugation reduplicated present", derived from h_2e-conjugated root aorists (2003: 169).

I agree with Jasanoff's criticism on the assumption that Hittite massively removed reduplication syllables in a very short amount of time. However, I do not think that the absence of reduplication in the Hittite ḫi-conjugation is very problematic to the perfect theory, since there are arguments to be given that the perfect originally could have been unreduplicated as well.

The first argument is the PIE verb *uóid-e, *uid-ér 'to know', which can be securely reconstructed as having had *o/Ø-ablaut, the endings of the perfect, but no reduplication. Despite the fact that it matches the traditional shape of perfects in only two of the three diagnostic characteristics, *uóid-e is generally seen as an original perfect that is derived from the verbal root *ueid- 'to see, to find'. Its original meaning would have been 'to be in the state of having seen / found', which underwent a specific development into 'to know'. The remarkable absence of reduplication in *uóid-e, *uid-ér has been explained by some scholars as the result of specific phonetic developments. For instance, Szemerényi (1996: 290) states that *uóid-e goes back to an earlier *ue-uóid-e, which "by assimilation led to *wowoid[e] and then, owing to frequent use, to the simplification *woid[e]". Winter (1993: 482-3) rather assumes that the original form of the perfect was *Cé-CoC-e, *C-CC-mé, i.e. with zero-grade in the reduplication syllable in the plural, and states that "[e]ine Interpretation von *uwidmé als *|widmé|" (a sort of reversed Sievers' development) has led to loss of the reduplication in the plural forms. In the singular, original *ue-uoid-e would then analogically have been replaced by "*uwoyde", which was re-analysed as *|woyde|, leading to a loss of reduplication in the entire paradigm. Both explanations require irregular developments or additional assumptions, and are therefore unattractive. Another approach to explain the aberrant shape of *uóid-e, *uid-ér is taken by Jasanoff (2003: 228-33), who argues that this formation is a neologism that was built within PIE. As a starting point he takes the perfect *ue-uóid-e 'has seen/found' (Skt. vivéda, Av. vīuuaēδa), the perfect middle *ue-uid-ór 'is visible, is recognized' (Skt. vividé) and a 'stative-intransitive present' *uid-ór 'is / becomes

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[8] To be sure, there are some ḫi-verbs with reduplication, like lilḫua-^{i} / lilḫui- 'to pour' (< *li-lh₃u-oi-) or ueuakk-^{i} 'to ask' (< *ue-uók-), but in these cases the reduplication syllable probably expresses imperfectivity, and need not be old (cf. Dempsey 2015: 331-3).

visible / recognizable' (not attested as such), which all three would be regularly formed from the root *ueid- 'to see, to find'. He then assumes that the 'stative-intransitive present' *uid-ór undergoes a semantic shift to 'is known' (Skt. *vidé* 'is known'), which would cause the following four-part analogy:

*ue-uid-ór 'is visible, is recognized'   :   *uid-ór 'is known'
*ue-uóid-e 'has seen/found'   :   X   →   X = *uóid-e 'knows'

This scenario is problematic, however, both semantically and chronologically. First, within Jasanoff's analogy, we would rather expect that a newly created *uóid-e would mean 'has known', and not 'knows'. And second, as Jasanoff admits himself, the perfect middle, which is crucial to his scenario, is generally seen as "a more recent creation than the perfect active" (2003: 233).

Instead of trying to explain *uóid-e, *uid-ḗr as an innovation, it seems clear to me that we have to regard it as an archaic formation.[9] Let us, for instance, look at the synchronic situation in Indo-Iranian. Here the root *ueid- not only forms the unreduplicated formation *uóid-e 'knows' (Skt. *véda*, Av. *vaēdā*), but also the reduplicated perfect *ue-uóid-e 'has seen / found' (Skt. *vivéda*, Av. *vīuuaēδa*). It is clear that the reduplicated perfect functions as the synchronically predictable perfect to the verbal root *ueid- 'to see, to find',[10] whereas the unreduplicated formation is unpredictable. Taking Kuryłowicz's Fourth Law of Analogy – which states that whenever an old (non-analogical) form is kept besides a new (analogical) form, it is the analogical form that takes the basic function, whereas the old form is retained in a secondary function – it seems clear that the synchronically unpredictable form *uóid-e 'knows' must be old, and the synchronically predictable form *ue-uóid-e is a newer, analogical creation.[11] We therefore have to accept that at the pre-PIE time that the original perfect to *ueid- was created (which first meant 'to be in the state of having seen / found', but later developed into 'to know') reduplication was not yet obligatory for all perfects.

The second argument that may indicate that originally perfects could be unreduplicated as well, is the fact that the 3pl. ending of the perfect comes in two varieties, namely *-r(s) (Skt. -ur < *-ṛ or *-ṛs, Av. -arə < *-ṛ)[12] and *-ḗr (Lat. -ēre < *-ēr + -i, Hitt. -er < *-ēr). Since *-ēr may go back to pre-PIE *-ers (with Szemerényi's Law)[13] or *-er (with lengthening of *e to *ē before a word-final resonant)[14], the two endings seem to form an original ablauting pair: zero-grade *-r(s) vs. full grade *-er(s). This situation is reminiscent of the 3pl. ending of the present, for which we find both zero-grade and full grade variants, as well: *-nti and *-enti. The distribution between these two present endings is clear: the full grade ending is found in unreduplicated presents (e.g. *h₁s-énti > Skt. *sánti* 'they are') and the zero-grade in reduplicated presents (e.g. *dʰé-dʰh₁-nti > Skt. *dádhati* 'they put'). This may indicate that in the perfect a similar opposition existed, namely unreduplicated *CC-ḗr vs. reduplicated *Cé-CC-r.

Both arguments imply that in pre-PIE times the perfect had both reduplicated and unreduplicated variants. Unfortunately, it cannot be determined what the exact function of the presence or absence of reduplication was, but if we take the use of reduplication in the present-aorist system as a parallel, we may assume that the reduplication added a certain aspectual nuance to the semantics of the basic, unreduplicated formation.

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[9] Thus also Kümmel 2004: 149-50.

[10] With the present *ui-né-d-ti 'finds' (Skt. *vindáti* (with thematization), Av. *vīnasti*) and the aorist *h₁é-uid-e-t 'has found' (Skt. *ávidat*, Av. *vīdaṯ* [inj.]).

[11] This *ue-uóid-e was formed possibly not until pre-PIIr. times. However, according to Jasanoff (2003: 230), also the Lat. perfect *vīdī* 'I saw' reflects the original perfect *ue-uóid- / *ue-uid-, with vīd- < *wiwid- (whereas most scholars assume that Lat. vīd- goes back to an original root aorist stem *ueid-, cf. LIV²: 665-6). Whether *ue-uóid-e was formed in pre-PIIr. times or was present already in PIE (if Lat. vīd- indeed reflects *ui-uid- < *ue-uid-), is irrelevant for the present argument, however: the semantic difference between *ue-uóid-e 'has seen / found' and *uóid-e 'knows' clearly indicates that *uóid-e was the original form and that *ue-uóid-e was a younger, analogical form.

[12] See the discussion in Frotscher 2012: 77-80.

[13] Cf. Jasanoff 1994: 150; 1997: 120.

[14] Cf. Kortlandt 1975: 85, going back to Wackernagel 1896: 66f.

The conclusion that in pre-PIE times the perfect may have had both reduplicated (*Ce-CóC-e) and unreduplicated (*CóC-e) variants is relevant for the prehistory of the Hittite ḫi-conjugation, especially if we take the Indo-Hittite hypothesis into account. Within this hypothesis, which seems to become more and more accepted nowadays,[15] Anatolian is regarded as the first branch to have split off from the mother language, after which the remaining language underwent several innovations before it eventually disperses into the other IE languages. This means that Proto-Anatolian and 'classic' PIE (i.e. the mother language to all IE languages except Anatolian) can be seen as sisters, which both derive from an earlier, 'Proto-Indo-Hittite', mother language.

In order to account for the formal mismatch between the 'traditional' perfect (*Ce-CóC-e) and the Hittite ḫi-conjugation (*CóC-e), I therefore propose that the pre-PIE period in which the perfect had both reduplicated and unreduplicated variants (*Ce-CóC-e as well as *CóC-e) must be equated with the Proto-Indo-Hittite layer. We then have to assume that during the development of Proto-Indo-Hittite into Proto-Anatolian the unreduplicated variant of the perfect was generalized,[16] whereas during the development of Proto-Indo-Hittite into 'classic' Proto-Indo-European it was the reduplicated variant of the perfect that spread, and in the end affected all perfect formations.[17]

If we follow this scenario, we can conclude that, when it comes to reduplication, there is in fact no formal mismatch between the Hittite ḫi-conjugation and the 'traditional' perfect: the Hittite unreduplicated formation *CóC-e, *CC-ér reflects a Proto-Indo-Hittite perfect formation (which in 'classic' Proto-Indo-European has only been retained in the paradigm of *uóid-e / *uid-ér 'to know'), which existed next to the reduplicated formation *Ce-CóC-e, *Cé-CC-r (which in 'classic' Proto-Indo-European was generalized as the default perfect formation).

Mismatch 3: Semantics
The Hittite ḫi-conjugated verbs do not have a specific semantic sphere when compared to the *mi*-verbs. We find transitive ḫi-verbs (e.g. ḫān-^{i} 'to draw (liquids)') as well as intransitive ones (e.g. ḫāt-^{i} 'to dry up'), some of them denoting an activity (e.g. iškār-^{i} 'to stab'), some a process (e.g. āk(k)-^{i} 'to die'), and others a state (e.g. išpai-^{i} 'to be satiated').[18] The PIE perfect, however, is generally reconstructed as having rather specific semantics, namely as denoting a state that is the result of the completion of an action, e.g. *(le-)lóik^w-e 'is absent, is away (because he has left)'. This reconstruction is based on the fact that in the individual daughter languages where the perfect survived, perfects can end up as statives with present tense semantics (which in Greek is the default situation, e.g. λέλοιπεν 'is away' < *le-lóik^w-e), whereas they also can have undergone a semantic shift in which their resultative aspect has ousted their stative semantics, by which they develop into preterites (e.g. Skt. rireca 'has left' < *le-lóik^w-e).

Eichner's explanation of the semantic mismatch
In order to explain this significant mismatch between the ḫi-conjugation and the traditional perfect, Eichner (1975) proposes that the Hittite ḫi-conjugation was created in three consecutive steps, each step causing an influx of a certain group of verbs into the ḫi-conjugation, which in the end causes it to become a semantically heterogeneous category.

The first and second step
Within Eichner's scenario, the first step in the creation of the ḫi-conjugation revolves around perfects that have the original, stative meaning. As his main example Eichner uses the Hittite verb šākk-^{i} 'to know', which, according to him, derives from the root *seh₂g- 'to search, to follow a trace' and originally must have meant "ich bin einer Spur nachgegangen und habe in Erfahrung gebracht" (1975:

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[15] Kloekhorst 2008: 7-11; Oettinger 2013/2014; Melchert fthc. Cf. Rieken 2009 for a more cautious view.

[16] Although it would be interesting to examine to what extent Hittite reduplicated ḫi-verbs could reflect original reduplicated perfects after all. Perhaps this would also shed light on the original semantic distinction between reduplicated and unreduplicated perfects in PIH.

[17] Except *uóid-e 'knows', which by that time was not viewed as a perfect anymore, and was therefore able to resist the generalization.

[18] Cf. Jasanoff 2003: 2.

85).[19] Eichner assumes that, in analogy to the *mi*-conjugation, on the basis of the perfect endings two rows of endings were made, namely a present tense one (consisting of the perfect endings + *-i*: *-h_2e-i*, etc.) and a preterite tense one (consisting of the original perfect endings: *-h_2e*, etc.). In this way the distinction between *šākḫi* 'I know' and *šākḫun* (< *šākḫa*) 'I knew' came into being.

The second step in Eichner's scenario deals with perfects which already in the mother language had undergone a semantic shift to their resultative aspect and therefore functioned as preterites. In Eichner's view, these preterites originally had a *mi*-conjugated counterpart derived from the same verbal root. For instance, the *mi*-conjugated present *$d^h\acute{e}mi$* 'I put / am putting' had two preterites, namely *mi*-conjugated *$d^h\acute{e}n$* (< *$d^h\acute{e}h_1$-m*) 'I put' and the perfecto-preterite *$d^h\acute{a}iha$*, which functioned "vielleicht speziell zur Bezeichnung der Konstatierung vergangener Ereignisse" (1975: 89), so 'I have put'. When the functional differentiation between the two preterites was lost, the perfecto-preterite received a new present besides it, which, in analogy to stative perfects like *šākḫi* < *-h_2e-i* vs. *šākḫun* < *-h_2e*, was characterized by the endings *-h_2e-i*, etc.

Jasanoff is extremely critical of these two steps. With regard to Eichner's first step, namely the assumption that original stative perfects received a present in *-h_2e-i*, etc., besides a preterite in *-h_2e*, etc., Jasanoff remarks that "[i]mplicit in Eichner's account of *šăkk-* is the assumption that prior to the addition of the *hic et nunc* *i*, the supposed perfect *[se-]sóh_2g-h_2e* meant not only 'I know' but also 'I knew', and that the introduction of *i* served to disambiguate the present and the past readings of the primitive form" (2003: 11). According to Jasanoff, "[t]his assumption can be shown to be incorrect [... since] the preterite of the perfect was expressed in late PIE by a securely reconstructible pluperfect, the singular of which was formed by adding the *active* secondary endings *-m*, *-s*, *-t* to the strong (i.e. normally *o*-grade) perfect stem [... e.g.] Ved. 3 sg. perf. *bibhā́ya* 'fears' : plpf. *abibhet* 'feared'; etc." (ibid.). Jasanoff states that this system must have been present in the language stage from which Anatolian derives because "one of the early IE languages that retains a reflex of the pluperfect is Hittite itself. The *ḫi*-verb *wewakk-* 'demand' (3 sg. pres. *wewakki*) forms an irregular 3 sg. pret. *wewakta* in Middle Hittite, suggesting an earlier 3 sg. perf. *$u̯eu̯ók$-e(i)* with 3 sg. plpf. *$u̯eu̯ók$-t*, exactly parallel to the Vedic perfect : pluperfect pair *bibhā́ya* : *abibhet*" (ibid.). He therefore claims that "even if Eichner's derivation of pre-Hitt. 1 sg. *šāk-ḫai* from a stative perfect *[se-]sóh_2g-h_2e + i* were correct, the corresponding preterite would probably not have been *šāk-ḫa* [...] < *[se-]sóh_2g-h_2e*, but *šā(k)k-un* < *[se-]sóh_2g-m̥*" (ibid.).

Jasanoff's criticism on Eichner's account does not hold water, however. First, the Hittite form *u̯eu̯akta*, which according to Jasanoff is "irregular" and therefore must reflect an archaism, is synchronically perfectly normal. Hittite *ḫi*-verbs ending in a *k* originally indeed show the 3sg.pret.act. ending *-š* (e.g. *ākkiš* 'he died' (OH)), but in New Hittite texts this ending was replaced by the corresponding *mi*-ending *-tta* (e.g. *ākta* 'he died' (NH), *šakta* 'he knew' (NH), *ḫamakta* 'he tied' (NH)). The exact moment of replacement of *-š* by *-tta* cannot be established, since good examples of *ḫi*-inflecting verbs ending in *k* (other than *u̯eu̯akk-*) from Middle Hittite texts are lacking.[20] It is therefore perfectly possible that the MH form *u̯eu̯akta* is a trivial replacement of earlier *u̯eu̯akkiš*. There is thus no need to reconstruct it as *ue-uók-t*, and *u̯eu̯akta* cannot therefore be used to claim that the pre-stage of Anatolian must have had the pluperfect category.

Furthermore, Pooth (2009) has recently, and to my mind convincingly, argued that Proto-Indo-European was a non-tensed language, i.e. a language in which tense was not expressed as a separate category (as in e.g. Mandarine Chinese). In his view, the present/aorist-system as it is traditionally reconstructed should be interpreted otherwise. He claims that the primary endings (*-mi*, *-si*, *-ti*, etc.) originally marked progressive aspect (i.e. "ongoing at the time of reference", cf. Bybee & Dahl 1989: 55; Pooth 2009: 397), whereas the secondary endings (*-m*, *-s*, *-t*, etc.) marked non-progressive aspect. The semantic distinction between the two sets of ending thus was not one of tense,

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[19] Nowadays *šākk-^{i}* / *šakk-* is usually derived from the root *sekh_1-* 'to cut', but the basic principle remains the same: the stative meaning 'to know' apparently was viewed as the result of having completed the action 'to cut'.

[20] The one attestation *ag-ga-aš* 'he died' as found on the MH/MS texts VBoT 1, 24 cannot be used as evidence since this text, which is found in Amarna and contains a letter from the Egyptian Pharao to the Hittite king, may have been written by a non-native speaker (cf. the use of the further unknown word *zinnuk*, see Kloekhorst 2008: 1038; Tischler HEG IV: 751-2).

but rather of aspect.[21] According to Pooth, this is the only way in which the non-tensed semantics of the Vedic category injunctive can be explained.[22] As a consequence, the category tense as found in all IE languages must have been the result of a grammaticalization that took place in the separate prehistories of the individual daughter branches. In Anatolian, for instance, the progressive category marked by *-i was reinterpreted as a present / future tense (*"ongoing at the time of reference" > "ongoing at the time of speaking"), pushing the non-progressive (without *-i) into the preterite tense. If Pooth's theory is correct, it would form an extra argument against the assumption that pre-Anatolian must have had pluperfects: the absence of tense in the active category strongly suggests its absence in the perfect category as well.

The implication of these considerations is that the perfect originally was a non-tensed category, and that a form like *[se-]sóh₂g-h₂e[23] originally indeed meant 'I knew', 'I know' or 'I will know' (in all cases as the result of the completion of an action), depending on the context it was used in. It therefore seems perfectly possible to me that when in Anatolian tense was grammaticalized, and in the active the original progressive marker *-i was reinterpreted as a present / future marker, also in the perfect category the *-i was used to mark the present / future tense (*[se-]sógh₂-h₂e-i > šākḫi 'I know / will know'), whereas the unmarked form was pushed into the function of a preterite (*[se-]sógh₂-h₂e > *šākḫa >> šākḫun 'I knew').

The same then goes for perfects for which the resultative semantics had become the prominent meaning. These originally meant 'I have completed action X', 'I am completing action X' or 'I will have completed action X', depending on the context. With the introduction of tense as a category, the suffix *-i could be attached to convey present / future semantics (e.g. *[h₁e-]h₁ór-h₂e-i > Hitt. ārḫi 'I arrive, I will arrive' < *'I am completing the action of arriving / I will have completed the action of arriving'), whereas the unmarked form was pushed into the function of a preterite (*[h₁e-]h₁ór-h₂e > *ārḫa >> ārḫun 'I arrived' < *'I have completed the action of arriving').

Within this scenario, both stative perfects and resultative perfects could have undergone the grammaticalization of tense at the same time. It therefore becomes unnecessary to assume, as Eichner did, that the creation of present forms of resultative perfects was dependent on the creation of a tense distinction in the stative perfects. This is important, since according to Jasanoff "the absence of credible word equations linking [Hittite] stative ḫi-verbs to stative perfects [in the other IE languages] is total" (2003: 13), and he therefore highly doubts whether enough stative perfects creating a tense distinction between presents in *-h₂e-i and preterites in *-h₂e would have existed so as to trigger the analogical creation of presents in *-h₂e-i besides resultative perfects in *-h₂e as well. Personally, I do not find arguments based on the absence of direct word equations very convincing. For instance, within the group of Hittite nominal diphthong stems (stems ending in -au- and -ai-) there is not a single noun that can be directly equated with nouns from any other IE language. Nevertheless, nobody doubts that this class directly reflects the PIE amphidynamic inflection.[24] Therefore, the absence of direct word equations of Hittite stative ḫi-verbs with stative perfects from the other IE languages does not preclude deriving this Hittite class from the PIE stative perfect. Be that as it may, within the group of Hittite resultative ḫi-verbs, there are in fact quite a few that can be directly equated with perfects as attested in the other IE languages: Hitt. ārḫun 'I arrived' < *h₁ór-h₂e ~ Skt. āra 'I have arrived' < *h₁e-h₁ór-h₂e;[25] Hitt. išḫeḫḫun 'I bound' < *sh₂ói-h₂e ~ Skt. siṣāya 'he holds bound' < *se-sh₂ói-e;[26] Hitt. †išpantaḫḫun 'I libated, I sacrificed' < *spónd-h₂e ~ OLat. spespondī 'I pledged' < *spe-spónd-

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[21] Cf. Kloekhorst fthc., where I argue that this system may still be present in some Old Hittite texts.

[22] Cf. also Kiparsky 2005 for an independent analysis of the Vedic injunctive as a non-tensed category, refuting earlier claims of e.g. Hoffmann 1967.

[23] Or, rather, *[se-]sókh₁-h₂e, cf. footnote 19.

[24] E.g. nom. lingaiš, acc. lingain, gen. linkiịaš 'oath' < *h₁lén⁽ǵ⁾ʰ-ōi(-s), *h₁lén⁽ǵ⁾ʰ-oi-m, *h₁lén⁽ǵ⁾ʰ-i-os < *h₁ln⁽ǵ⁾ʰ-i-és, cf. Weitenberg 1979.

[25] Cf. Kümmel 2000: 101-5 for the translation of Skt. āra as "bin gelangen" and cf. LIV²: 238 for this reconstruction. Note that Jasanoff (2003: 13) equates Hitt. ār-ⁱ and Skt. ār- with Gr. ὄρωρε 'has arisen, exists', on the basis of which he states that "the match is purely formal, not semantic". However, Gr. ὄρωρε reflects *h₃e-h₃ór-e, and is therefore derived from *h₃er- 'to rise' (LIV²: 299-300), whereas Hitt. ār-ⁱ and Skt. ār- derive from a different root, namely *h₁er- 'to arrive'.

[26] Lubotsky 2011: 109.

h_2e; Hitt. [†]*garāpḫun* 'I devoured' $< *g^h rób^h - h_2 e$ ~ Skt. *jagrábha* $< *g^h e - g^h rob^h - h_2 e$ 'I have seized'; Hitt. [†]*u̯aršḫun* 'I harvested, I wiped' $< *uórs - h_2 e$ ~ Lat. *-uorrī* 'I swept $< *[ue-]uors - h_2 e$.

All in all, the basic gist of Eichner's account of the first two steps of the creation of the *ḫi*-conjugation (which in fact must be viewed as a single step) is fully cogent, especially if we add the recognition that the perfect originally was a non-tensed category.

Eichner's third step

The next step in the creation of the Hittite *ḫi*-conjugation consists, according to Eichner, of the transfer of originally *mi*-conjugated verbs to the *ḫi*-conjugation (1975: 96-8). The main reasons why some verbs would undergo such a transfer are, according to Eichner, analogical in nature: either some forms of their paradigms were multi-interpretable (e.g. originally *mi*-conjugated $*tr - né - h_2 - m̥$ > Hitt. *tarnaḫḫun* 'I let go', which was reinterpreted as *ḫi*-conjugated *tarna-ḫḫun*); or they contained a stem vocalism that matched the vocalism of the *ḫi*-conjugation (e.g. causative $*log^h éie/o-$ 'to make lie down' > Hitt. *lāk-[i]* 'to knock out (teeth)').[27]

Concerning this step, too, Jasanoff is very critical (2003: 14-5). With regard to *tarnaḫḫ-un* being reinterpreted as *tarna-ḫḫun*, Jasanoff states that this "supposed reinterpretation [...] could only have taken place after the specifically Hittite remodeling of the ending *-*ḫa* to *-(ḫ)ḫun* [whereas] forms like Luv. 3 sg. *ḫallinai* 'hurts' and the possible Palaic 3 sg. *šapawinai* 'purifies'(?) suggest that the *ḫi*-conjugation inflection of the type *tarna-* was a Proto-Anatolian, rather than a purely Hittite, feature" (2003: 15). Although this latter part of Jasanoff's argument may not be decisive,[28] I do agree with him that *tarna-* cannot have been transferred to the *ḫi*-conjugation according to the scenario sketched by Eichner: it has in the meantime become clear that the laryngeal in the root $*terḱH-$ cannot have been $*h_2$ (see below for a different view on the prehistory of *tarna-*).[29]

In the case of verbs that would have been transferred from the *mi*-conjugation to the *ḫi*-conjugation because of their stem vocalism, Jasanoff deems this "incredible" since he "know[s] of no other case in an IE language in which the root vocalism of a morphological class [although Eichner talked about stem vocalism as well, A.K.] was sufficient to trigger a wholesale switch in inflection and stem structure" (2003: 14, with fn. 29). Yet, such cases do in fact exist. For instance, in the category of Greek nasal presents we see that of roots ending in $*h_2$ the outcome is a formation in -νη-/-να- < $*-neh_2- / *-nh_2-$, whereas of roots ending in $*h_1$ and $*h_3$ the expected stems in **-νη-/-νε- < $*-neh_1- / *-nh_1-$ and **-νω-/-νο- < $*-neh_3- / *-nh_3-$ have been transferred to the -νῡ-class (originally consisting of presents formed with the suffix $*-neu- / *-nu-$).[30] In other words, when compared with the nasal infixed verbs of roots in $*h_2$, the nasal infixed verbs of roots in $*h_1$ and $*h_3$ have in Greek undergone a morphological switch solely on the basis of their stem vocalism. Or take the case of PGerm. *skrīban* 'to write' (a loanword from Lat. *scrībere*), which originally was a weak verb (cf. ON *skrifar*, *skrifaði*, *skrifaður*), but which in West Germanic was transferred to the first class of strong verbs: MoGerm. *schreibt*, *schrieb*, *geschrieben*, MoDutch *schrijft*, *schreef*, *geschreven*. In Dutch, this analogical development was subsequently extended to a large group of verbs containing the vowel *-ij-*. Solely on the basis of their root vocalism they were transformed from original weak verbs into strong ones: *prijzen* 'to praise', *kwijten* 'to discharge', *wijzen* 'to point (at)', *lijken* 'to seem', *belijden* 'to profess', etc.[31] On the basis of such examples it is clear that Jasanoff's *a priori* reluctance to accept a transfer from the *mi*-conjugation to the *ḫi*-conjugation on the basis of root / stem vocalism is unfounded.

Moreover, there are in fact many direct word equations (which otherwise are leading in Jasanoff's reasoning) between Hittite *ḫi*-verbs and "*mi*-conjugating" verbs from other IE languages, which substantiate Eichner's claim that stem vocalism was a key factor in transferring originally *mi*-conjugating verbs to the *ḫi*-conjugation.

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[27] Thus also Oettinger 1979: 400-1.

[28] As pointed out by Janasoff himself as well (2003: 15[31]), the interpretation of Luw. *ḫallinai* as a nasal infix verb is dubious. To my mind, this also holds for the Palaic form he cites. These therefore do not form a sufficient reason to state that the *tarna*-inflection must have been present in Proto-Anatolian as well.

[29] Cf. Kloekhorst 2008: 845-7.

[30] Rix 1992: 210.

[31] Van Haeringen 1940: 249-50. I owe this example and reference to Michiel de Vaan.

For instance, the Hittite verb *dā-^i / d-* 'to take' is generally assumed to derive from the verbal root *deh_3-*, which in the other IE languages has the meaning 'to give'. Although perfects derived from this root exist in Indo-Iranian (Skt. *dadau*, GAv. *dadā*), Greek (δέδοται) and Latin (*dedī*), it is usually thought that these perfects are secondary creations (cf. LIV[2]: 106). It therefore is more attractive to assume a relationship with the root aorist *$déh_3$-m* as abundantly attested in the IE languages. This would mean that when original 1sg. *$déh_3$-m* first had yielded *$dóʔ$-m*, it was transferred to the *ḫi*-conjugation because of its *o*-vocalism, yielding *$dóʔ$-Ha*, ultimately giving rise to 1sg.pret. *dāḫḫun* and the secondary pres. *dāḫḫi*. Likewise, *pāš-^i* 'to swallow' may be derived from an old *s*-aorist *$péh_3$-s-m*[32] > *$póʔs$-m*, which because of its *o*-vocalism was transferred to *$póʔs$-Ha* > Hitt. †*pāšḫun*.

A second group of good word equations are *ḫi*-verbs corresponding to causatives of the type *CoC-éie/o-*.[33] The Hitt. verb *lāk-^i* 'to knock out (a tooth)' is within Hittite related to *lag-^āri* 'to fall over; to be felled'. Because of the etymological connection with the verbal root *leg^h-* 'to lie', it is generally assumed that *lāk-^i* originally must have meant 'to make lie flat'. It therefore is semantically identical to causatives like Goth. *lagjan* 'to lay down' and OCS. *-ložiti* 'id.' < *log^h-éie/o-*. Eichner's idea that Hitt. *lāk-^i* is identical to the causative *log^h-éie/o-*, and that it is the *o*-grade in the root that caused the transfer to the *ḫi*-conjugation is therefore extremely attractive. The same goes for the verb *kānk-^i / kank-* 'to hang (trans.)', which is generally connected with the verbal root *$ḱenk$-* 'to hang (intr.)'. In order to explain the semantics of the Hittite verb, it is attractive to assume that it derives from a causative, as is found in e.g. ON *hengja* 'to hang (trans.)' < *$ḱonk$-éie/o-*. Also the verb * u̯āk(k)-^i* 'to bite' would semantically fit this category, since the basic meaning of the verbal root *$ueh_2ǵ$-* seems to have been 'to break (intr.)' (TochA. *wākät* 'broke (intr.)'). The Hittite meaning 'to bite' can therefore be derived from an original causative meaning 'to make (something) break', which would justify an equation with *$uoh_2^{(}ǵ^{)}$-éie/o-*.[34]

A third group of good word equations exists with the so called *molō*-presents. As we have seen above as well, this term is used for verbs that show *o*-grade presents besides *e*- and zero-grade presents (e.g. *$melH$-* 'to grind' with the present formations Lith. *málti*, Goth. *malan* < *$molH$-* vs. OIr. *melid*, OCS *meljǫ* < *$melH$-* vs. Arm. *malem*, MW *malu* < *mlH-*). It was pointed out by Stang (1942: 40-2) that all verbs belonging to this category have semantics like 'to hit', 'to stab', 'to dig' or 'to grind', and thus can be viewed as having an intensive meaning. He therefore proposed that the *o*-grade presents must be compared with the Sanskrit intensive formation of the type *jaṅghanti* 'kills violently' < *$g^{wh}en$-$g^{wh}on$-ti* (*o*-grade assured by the non-palatalization of the preceding *g^{wh}*),[35] whereas the *e*-grade variants reflect the normal athematic present (comparable to Skt. *hánti*, *ghnánti* 'to kill' < *$g^{wh}én$-ti*,

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[32] An *s*-aorist form may be attested in RV 5.29.8, see Narten 1964: 168.

[33] Jasanoff (2003: 14) states that the connection between *ḫi*-verbs and the *CoC-éie/o-*-causative is falsified by the derivation of Hitt. *u̯aššezzi* 'clothes' (with *mi*-conjugation) from the causative *uos-eie/o-* (e.g. Skt. *vāsáya-* 'to clothe'). Yet, this derivation runs into difficulties: the geminate *-šš-* of *u̯aššezzi* cannot be explained from a preform *uos-eie-ti*. See Kloekhorst 2008: 1004-7 for treatment and an alternative etymology.

[34] For scholars who reconstruct the 3sg. primary thematic ending as *-eti*, the development of, for instance, 3sg. *$ḱonkéieti$* to Hitt. *kānki* (virtually from *$ḱónkei$*) may seem quite a stretch. Yet, for those who reconstruct this ending as *-e* (Watkins 1962: 103; Kortlandt 1997: 134; Beekes 1995: 233), a development from *$ḱonkéie$* to *kānki* may be easier to imagine. Yet, since the causative formation *$CoCéie/o$-* contains three full grades, we may view it as a relatively recent composite. Formally, *$CoCeie/o$-* looks like a *-ie/o*-derivative of a stem *$CoCe$*, which is identical in shape to the original, unreduplicated 3sg.perfect form. If we paraphrase the perfect form *$CoCe$* as 'there is a certain state that he has come into', the causative *$CoCe$-ie/o-* may be paraphrased as 'to make that there is a certain state that he has come into' (cf. Hitt. *i̯e/a-^zi* 'to do, to make'). It then becomes attractive to assume that originally the form *$CoCe$* could be used in two constructions, namely one with a dative subject, meaning 'to John there is a certain state that he has come into', and one with an accompanying ablative/instrumental, meaning 'there is a certain state that he has come into, caused by John'. We may then further assume that the former construction was changed into a nominative construction (often intransitive), giving rise to the classical perfect as well as Hittite *ḫi*-conjugated verbs. The latter would then either have been changed into a construction with the *-ie/o*-suffix, yielding the classic causatives of the shape *$CoCéie/o$-*, or was changed into a transitive nominative construction, yielding the Hittite *ḫi*-verbs of the type *kānk-^i*. If this latter step is correct, the form *kānki* can be seen as directly reflecting *$ḱónk$-e*. See Kortlandt 2010a: 375, 377 for a similar derivation of causatives from original perfects. See now also Jasanoff 2015: VIIa-b for a similar view on the original formations used with a form like *$ḱónk$-e*, but with different chronology and consequences.

[35] Cf. Hiersche 1963: 157 for a similar view.

*$g^{wh}n$-énti). This analysis is clearly superior over other interpretations of the *molō*-presents since it explains at once both the formal and the semantic characteristics of these verbs.[36] Within the Hittite *ḫi*-conjugation, there are a few verbs that can be directly equated with *molō*-presents in other IE languages. It is therefore attractive to interpret these as original deredplicated intensives that because of the *o*-grade in their root were transferred to the *ḫi*-conjugation. Examples are: *mall-^{i} / mall-* 'to grind' (~ Lith. *málti* < *$molH$- vs. OIr. *melid* < *$melH$-) and *padda-^{i} / padd-* 'to dig' (~ Lat. *fodiō* 'to dig', OCS *bodǫ* 'to pierce' < *$b^hod^hh_2$- vs. Lith. *bedù* 'to pierce, to dig' < *$b^hed^hh_2$-), and probably *māld-^{i} / mald-* 'to recite, to make a vow' (~ Lith. *maldaũ* 'to ask, to implore', OCS *moljǫ* 'to ask, to pray' < *$mold^h$- vs. Lith. *meldžiù* 'to ask, to pray' < *$meld^h$-). To my mind, also the *ḫi*-conjugated reduplicated imperfective *u̯eu̯akk-^{i}* 'to wish, to ask for' must go back to an original *mi*-conjugated intensive, *$u̯é$-$u̯oḱ$-ti* (besides unreduplicated *$u̯éḱ$-ti* > Hitt. *u̯ēkk-^{zi}* 'to wish, to ask for').[37]

A transfer from the *mi*-conjugation to the *ḫi*-conjugation because of stem vocalism could also explain nasal infixed verbs like *šunna-^{i}* 'to fill' and *tarna-^{i}* 'to let (go)', if these verbal roots had a root final *h_3. They would then show a development of *$°C$-n-$éh_3$-$m(i)$ > *$°Cnóʔ$-$m(i)$, after which a transfer to *$°Cnóʔ$-$ha(i)$ took place, ultimately yielding Hitt. *šunnaḫḫi, šunnaḫḫun* and *tarnaḫḫi, tarnaḫḫun*. Since the color of the laryngeals in these verbs cannot be independently determined, however, this scenario is merely an option. A similar scenario could also explain the imperfective suffix *-šša-^{i} / -šš-*. If this suffix reflects *$-seh_3$-,[38] we may assume that it originally was "*mi*-conjugated", *$-séh_3$-$m(i)$, but that after the coloration of the stem vowel by the adjacent laryngeal to *$-sóʔ$-$m(i)$ it was transferred to the *ḫi*-conjugation, yielding *$-sóʔ$-$ha(i)$ > *-ššaḫḫi, -ššaḫḫun*.

All in all, we may say that Eichner's third step in explaining the semantic mismatch between the Hittite *ḫi*-conjugation and the traditional PIE perfect (which actually is the second step, since Eichner's first and second step in fact form a singe development) is supported by a large number of good word equations, and can therefore be judged as fully cogent as well.

Jasanoff's explanation of the semantic mismatch

In his 2003 description of the *h_2e*-conjugation theory, Jasanoff is not very explicit about how the semantic mismatches between the Hittite *ḫi*-conjugation and the traditional perfect came about. The fact that Hittite *ḫi*-verbs do not have a specific semantic sphere is simply projected back to the PIE *h_2e*-conjugation category that they are thought to reflect. Jasanoff merely remarks that "no special assumptions are made about the original function of the *h_2e*-series" (2003: 59[62]). Also when it comes to the relationship between the specifically stative-resultative semantics of the traditional PIE perfect and the postulated non-specific semantics of the original *h_2e*-conjugation, Jasanoff is rather vague. In his view, besides *h_2e*-conjugated presents, PIE also knew *h_2e*-conjugated aorists of the shape *$CóC$-e, "which properly denoted entry into a state": *$lóg^h$-e 'lay down', *$b^hóud^h$-e 'woke up', *$u̯áǵ$-e 'broke', etc. (2003: 168). He then continues as follows: "[t]he formal relationship of a perfect like *$b^heb^hóud^h$- / *$b^heb^h(é)ud^h$- to an aorist like *$b^hóud^h$- / *$b^héud^h$- is exactly comparable to that of a present like *$d^héd^heh_1$- / *$d^héd^hh_1$- 'put' to an aorist like *$d^héh_1$- / *d^hh_1-. The perfect evidently originated within PIE as a kind of *h_2e*-conjugation reduplicated present, characterized by the same endings and the same ablaut pattern as the *h_2e*-conjugation root aorist on which it was derivationally based" (2003: 169). One therefore expects that these reduplicated presents would have the same meaning as their corresponding aorists ('entry into a state'), but then in the present tense, i.e. 'lies down', 'wakes up', 'breaks', etc. However, as Jasanoff himself points out, these forms do not denote 'entry into a state' but rather 'the state itself': *le-$lóg^h$-e 'lies', *b^he-$b^hóud^h$-e 'is awake', *$u̯e$-$u̯áǵ$-e 'is broken', etc.

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[36] Cf. Kloekhorst 2014: 73-5 for a *Forschungsgeschichte* of the *molō*-presents.
[37] Cf. Oettinger 1992: 229, who compares RV *vaváksi*.
[38] In Kloekhorst 2008: 690, I reconstructed this suffix with *h_1 because "I know no other suffix or ending where *h_3 is found". Moreover, I stated that "[p]ersonally, I would not be surprised if in the future it would turn out that this suffix, *$-soh_1$- / $-sh_1$-, from a pre-PIE point of view has to be regarded identical to the other imperfective suffix, *$-sḱe/o$- (which probably is a thematicization of origin *$-sḱ$-)". Since the *$-sḱe/o$*-suffix should not be reconstructed with a palatovelar *$ḱ$, but rather with a plain velar (Lubotsky 2001), I am now inclined to think that *$-sḱe/o$- may derive from original *$-sk^w$-e/o-, showing the root *sek^w- 'to follow, to accompany' (for delabialisation of labiovelars after *s, cf. Meillet 1894: 294ff.). In view of other alternations between *k^w and *h_3 (e.g. Hitt. =$(i̯)a$ 'and' < *$=h_3e$ ~ *$=k^we$ 'and', cf. Kloekhorst 2008: 378-9), this may be an argument in favor of reconstructing the Hitt. imperfective suffix *-šša-* as *$-seh_3$-.

(2003: 168). In order to account for this unexpected semantic relationship between these aorists and their corresponding presents, Jasanoff plainly states that "[b]y late PIE the synchronic situation had changed; the perfect had evolved into a separate non-eventive category, distinct from *mi-* and *h₂e-*conjugation presents alike" (2003: 169). No account is given of how this would have happened, and no explanation is offered as to why only reduplicated *h₂e*-conjugation presents (= the ancestors to the traditional perfect) would have developed into stative-resultatives, whereas *h₂e*-conjugated root presents (= the ancestors to the Hittite *ḫi*-conjugated presents) remained eventive.[39] This absence of a specific explanation within Jasanoff's 2003 book for the semantic difference between the Hittite *ḫi*-conjugation and the 'traditional' perfect is quite remarkable, especially when taking into account that Jasanoff's main criticism on Eichner's perfect theory (Jasanoff 2003: 7-15) concerns exactly its semantic side!

In recent years, Jasanoff seems to have become aware of the problems regarding his explanation of the semantics of the traditional perfect, and in a 2015 lecture on the question "what happened to the perfect in Hittite?", he tries to remedy them by adapting his 2003 account. He now assumes that "the perfect was not originally a kind of reduplicated present, but a kind of reduplicated *aorist*" (Jasanoff 2015: Va; emphasis his). This would mean that besides the original aorist *b^hóud^h-e* 'woke up' an "intensive aorist" *b^he-b^hóud^h-e* 'woke up thoroughly' existed. Since "[a]ny change-of-state aorist implies the possibility of the state continuing into the present", this latter form would have later on developed the stative meaning 'has thoroughly woken up and is now awake', a development that was grammaticalized for all intensive aorists (ibid.), thus yielding the resultative-stative formation that is called the 'perfect'. Although this is indeed an improvement on his earlier views, it still heavily depends on the postulation of *h₂e*-conjugated aorists like *b^hóud^h-e*, for which there does not seem to be independent evidence.

Comparing the two explanations for the semantic mismatch
When we compare the ways in which the two theories explain the semantic mismatch between the Hittite *ḫi*-conjugation and the 'traditional' perfect, we see that Eichner's perfect theory offers an extensive account that can satisfactorily account for all aspects of the mismatch,[40] whereas Jasanoff in his description of the *h₂e*-conjugation theory offers no clear vision on the origins of the wide semantic ranges that can be found in the *ḫi*-conjugation, and provides an explanation for the semantics of the traditional perfect that relies too heavily on the postulation of a category for which there is no independent evidence.

Conclusions
After having discussed the three main mismatches between the Hittite *ḫi*-conjugation and the PIE 'traditional' perfect, we may conclude that all aspects of the Hittite *ḫi*-conjugation can in essence be accounted for by the theory that it is derived from the PIE perfect (as most extensively described by Eichner 1975). Only two adjustments to the perfect theory need to be made, namely (1) that the perfect originally (i.e. in Proto-Indo-Hittite times) had both a reduplicated (*Ce-CóC-e*) and an unreduplicated form (*CóC-e*, cf. *uóid-e*); and (2) that it was a non-tensed category. With these extra assumptions, which are supported by independent evidence, all formal and semantic mismatches between the Hittite *ḫi*-conjugation and the traditional perfect can be explained.

The most prominent rival account for the origin of the Hittite *ḫi*-conjugation, the *h₂e*-conjugation theory (most extensively described in Jasanoff 2003) turns out to be no match to the perfect theory: it

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[39] Note that within the *h₂e*-conjugation theory both the *h₂e*-conjugation present and the traditional perfect existed side by side in PIE.

[40] Kortlandt (2010b) endorses the perfect theory as well. He points out that in some Slavic languages original stative verbs (that have the same semantics as reconstructed for the PIE perfect) can develop "into regular imperfectives and subsequently into transitive verbs" (2010: 374), and that this offers a model for the semantic side of the development of the PIE perfect into Hittite. He claims that 35 Hittite *ḫi*-verbs can in this way be derived from old perfects. Although I find Kortlandt's line of reasoning attractive, I think that he applies his model too enthusiastically. For instance, in my view, *mall(a)-^{i}* 'to grind' and *padd(a)-^{i}* 'to dig' are on formal grounds better derived from old intensives than from perfects. Likewise, I see *dā-^{i} / d-* 'to take' rather as reflecting an old root aorist instead of going back to a perfect.

gives no good explanation for the semantic mismatch between the *ḫi*-conjugation and the traditional perfect, and, with regard to formal aspects, takes as a starting point a root ablaut scheme that turns out to have been non-existent.

We may therefore conclude that the perfect theory, with the two adjustments as proposed here, is the perfect theory for explaining the origin of the Hittite *ḫi*-conjugation.

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