Synchronic morphological parsing and suffixal productivity in the Hittite adjective: Considerations on some illustrative examples[*]

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Abstract: The purpose of this article is to analyse some Hittite adjectives, to discuss the different options concerning their morphological parsing – and, if available, their etymology – and to clarify the issues behind the productivity of some specific suffixes.

Keywords: Hittite, derivational morphology, morphological productivity, adjective, Proto-Indo-European, etymology

0. Premise

The purpose of this contribution is to analyse, from the perspective of morphological parsability – disregarding any diachronic consideration – some Hittite adjective formations of problematic interpretation, for which it does not seem possible to perform a parsing that clearly isolates the derivational morphemes and precisely defines the class membership of the base from which they derive.[1] The analysis presented here takes into account the functionalist theoretical framework of Natural Morphology (cf. Mayerthaler 1980, Dressler et al.

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[1] For the controversy between the morpheme-based ("parsability") and the word-based ("non-parsability") approach see, e.g., Hill (2020: e52), Audring & Masini (2019: 15-16), Haspelmath & Sims (2010: 40-53), Bybee (1995: 426, fn. 1; 1985: 127-129), etc. However, according to recent psycholinguistic studies (cf. Hill 2020: e53 for the bibliographical references), speakers would be capable both to process morphologically complex forms as a whole and to parse inflectional forms into smaller units (cf., among others, Burani & Thornton 2003).

1987, Kilani-Schoch 1988, Bybee 1995, Dressler 2000, etc.), which, within the *continuum* between derivation and lexicon – whose boundaries are notoriously blurred – focuses on words that, although characterised by a semi-transparent internal structure and analysable through diachronic processes, can synchronically be considered as stored in the speaker's lexicon when the diagrammatic relationship between semantic and morphological motivation has been lost. As is well known, current debates in linguistic theory highlight a fundamental opposition regarding how speakers process inflectional forms. One school of thought, characterised by a morpheme-based approach, suggests that an individual's mental dictionary largely comprises morphemic elements and the combinatory principles that enable them to construct inflected forms (cf., e.g., Bruening 2018). In contrast, another perspective (cf., e.g., Blevins 2016) – commonly described as word-based – holds that speakers store entire words in their memory and rely on these word sets as templates whenever a particular form is not directly accessible. However, the present study aims to address several problematic cases concerning morphological parsability in Hittite adjectives and to discuss various interpretative options without necessarily taking a stance on either theoretical perspective. As will be shown below, this neutrality does not preclude the possibility of situating certain words at the boundaries, or elsewhere, within the *continuum* between derivation and lexicon. In the present article, the term primary (adjective) reflects a broader problem: it is used non only referring to the general meaning of 'simple', 'underived' (i.e., mono-morphemic, apart from its ending), but also – as we will see later – to words exhibiting the structure *root + suffix + ending* (where the root is not attested). In both cases, reference is made to adjectives that are stored in the lexicon as 'primary words' because they cannot be formed via synchronically productive rules (albeit showing some traces of internal structure).

After a brief overview of adjective formation in Hittite (§ 1) and a discussion about synchronic morphological parsing of complex words (§ 2), the article will examine several noteworthy specific formations. The following paragraphs will therefore focus, respectively, on the problematic suffix *-ena-/-ina-* (§ 2.1), in order to determine whether it attaches to a coherent class of nouns and in which cases it is actually segmentable within a word; on some underived *-i-* and *-u-*stem adjectives (§ 2.2); and, finally, on certain formations in *-ant-* (§ 2.3) and in *-want-* (§ 2.4), both well attested in Hittite.

1. Adjective formation in Hittite

As is well known,[2] Hittite adjectives can be underived, in which case they mostly end in *-a* (cf. *arawa-* 'free', *kappi-* 'small, little', *nakkī-* 'heavy, difficult', *nēwa-* 'new', *tepu-* 'small, little', etc.), or derived, formed through the addition of one or more derivational suffixes. Loanwords are usually included in the category of underived adjectives,

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[2] EHS: 160ff., Berman (1972), Hoffner & Melchert (2008: 51ff.), Francia & Pisaniello (2019: 26). The most comprehensive study of how Hittite nominal stems are formed is found in EHS. Additional insightful analyses of specific stem categories can be found in the works of Weitenberg (1984) and Rieken (1999).

because they are not characterised by Hittite derivational suffixes (Hoffner & Melchert 2024: 86).

Among the main suffixes that form Hittite adjectives, the following can be mentioned (cf. Hoffner & Melchert 2008: 54 ff.): -*ala*-, which forms adjectives from nouns (cf. *liššiyala*- 'pertaining to liver' < *lišši*- 'liver' etc.) or from adverbs (cfr. *tuwala*- 'far' < *tuwa* 'at distant' etc.); -*alla*- and -*alli*-[3], which form denominal adjectives (cfr. *annalla*- 'maternal' < *anna*- 'mother', *attalla*- 'paternal' < *atta*- 'father' etc.); -*ašša/i*-, which forms denominal adjectives denoting appurtenance (cf. ^URU*Tarḫuntašša*- '(city) of *Tarḫunta*' etc.); -*iya*-, which forms denominal and deadverbial adjectives (cf. *išpantiya*- 'nocturnal' < *išpant*- 'night' etc.); -*ili*-, which forms adjectives from different bases (cf. *karuili*- 'previous, past' < *karū* 'previously, in the past', *tarḫuili*- 'strong, powerful' < *tarḫu*- 'prevail, conquer' etc.); -*want*-, which forms possessive adjectives from nouns (cf. *ešḫarwant*- 'bloodstained' < *ešḫar*- 'blood', *pittuliyawant*- 'anxious' < *pittuliya*- 'fear, tension' etc.) and from verbs (*armaḫḫuwant*- 'pregnant' < *armaḫḫ*- 'make pregnant' etc.)[4]; and, finally, -*zzi(ya)*- which forms adjectives from locative adverbs (cf. *appezzi(ya)*- 'last, most recent' < *āppa* 'behind, after,' etc.). The situation concerning the suffix -(*a*)*nt*- is complex; from a purely synchronic perspective, it can be considered as a multifunctional suffix.[5] It forms denominal possessive adjectives (such as *perunant*- 'rocky' < *peruna*- 'rock,' *irmanant*- 'ill, suffering from a disease' < *irman* 'disease,' etc.) and has an individualising function (cf. *ḫamešḫant*- 'the (next) spring' < *ḫamešḫa*- 'spring,' etc.), as well as an "empty" function, because forms characterised by this suffix show no semantic difference compared to those without it (cf. *ikuna*- and *ikunant*- 'cold,' *gaena*- and *gaenant*- 'relative,' *ḫappina*- and *ḫappinant*- 'rich,' *dannara*- and *dannarant*- 'empty, smooth,' etc.). [6]

Other strategies for adjective formation (although adjectival attestations are less frequent than nominal or verbal ones) include reduplication (cf. *walliwalli(ya)*- 'fast (?), strong (?)' < *walli*- 'glory, pride,' [7] etc.) and compounding (cf. *dāyuga*- 'of two years,' constructed on *dā- < *dwoyo- 'two' – cf. *dān* 'for the second time' – and *yuga*- 'year/season,' cf. Hoffner & Melchert, 2008: 153; EHS: 116ff.).

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[3] Cf. Melchert (2005: 455-456) for the discussion on "*i*-mutation".

[4] On -*want*-, cf. Oettinger (1988, 2022), Frotscher (2013, 2017), Maier (2013), and Rieken & Sasseville (2014).

[5] Cf. Hoffner & Melchert (2008: 55 fn.10). See also Hoffner & Melchert (2008: 55, note 10). For more detail, refer to Frotscher's doctoral thesis (2013), which, in addition to exploring various properties (as will be discussed further), distinguishes denominal adjectives (e.g., *laḫlaḫḫimant*- 'excited' < *laḫlaḫ(ḫ)ima*- 'excitement'), denominal nouns (e.g., *ḫuḫḫant*- 'grandfather' < *ḫuḫḫa*- id.), and deadjectival formations (e.g., *antarant*- 'blue' < *antara*- id.).

[6] In these specific cases, the -(*a*)*nt*- suffix is traditionally considered semantically empty, because forms bearing it exhibit no difference in meaning relative to those without it. Regarding the (poly)functionality of -(*a*)*nt*-, see Dardano (2010), Frotscher (2013), Melchert (2017a), Rieken (2017), and Goedegebuure (2018).

[7] Hittite *walliwalli(ya)*- 'impetuous, stormy, strong' is probably related to *walli*- 'glory, pride,' although the formation is not entirely clear: the noun only appears in the genitive singular *walliyaš pedan* 'place of glory' (HEG W-Z: 260).

2. Synchronic morphological parsing of complex words and etymology

There are numerous discussions regarding the evaluation of the typological category of the adjective[8] in the Indo-European stage, as a lexical class separate from that of the noun, from which the former supposedly differs by virtue of a richer and more productive gender inflection (a contextual category for adjectives and an inherent one for nouns, where the former is mostly a derivational category relative to the latter). Participles themselves do not constitute a separate class but are often understood as deverbal adjectives. Moreover, a closely related aspect to the evaluation of adjectival typology – but which will not be addressed explicitly in this contribution – is the debate on the Caland system and its suffixes (*-u-, *-ro-, *-mo-, *-nt- and, perhaps, *-i-).[9] In the case of Hittite, a language in which its functioning is relatively straightforward, reference may be made to Hoffner & Melchert (2024: 85ff.), who note the difference between the suffixation process by addition (from *išpant-* 'libate, pour' → *išpant-uzzi-* 'libation' → *išpant-uzzi-aššar* 'libation vessel', etc.) and by substitution, which is mainly found when the base is an adjective (*park-u-* 'high', *parg-ašti-* 'height', *park-nu-* 'to elevate', *park-ešš-* 'to become high', etc.) and which reveals traces of the more general Indo-European Caland system.

From a synchronic perspective, however, suffixation by addition was likely the regular model for Hittite speakers. In contrast, suffixation by substitution was perceived as synchronically irregular (Hoffner & Melchert 2024: 85). This would explain suffixed formations such as *ḫatku-* 'narrow' > *ḫatku-ešš-* 'to become narrow,' *uktūri-* 'durable' > *uktūri(y)-aḫḫ-* 'to make durable,' *nakkī-* 'important' > *nakki(y)-atar* 'importance, dignity,' *mayant-* 'young' > *maya(n)d-atar* 'youth' and *mayant-aḫḫ-* 'to make young.' More generally, the typological aspect of the debate on the root has interesting consequences for the reconstruction of Indo-European. The two derivational systems are not mutually exclusive (cf. Alfieri 2023: 262), insofar as not all derived formations are better explained within one scenario rather than the other, and the debate among scholars remains open. Likewise, discussions on the origin of the Indo-European adjective tend to proceed in two opposite directions: some authors argue that quality values were encoded as nouns in the lexicon (and that consequently, in the Indo--European stage, nouns and adjectives belonged to a single lexical class; see, among others, Balles 2006 and 2008); others have suggested that Indo-European adjectives manifested

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[8] Cf., among others, Comrie (1997: 101ff.), Szemerényi (1985: 191ff.), Meier-Brügger (2002: 292ff.). For a recent account of the adjective as a word class see Beck (2023), and for an overview of the adjective from a typological perpective cf. Dixon (2004).

[9] The literature on this issue is vast. For the main discussions see Risch (1974: 65-112), Meissner (1998, 2006), Meier-Brügger (2002: 292ff.), Stüber (2002), Rau (2009: 67-75), Dell'Oro (2015), Oettinger (2017), Alfieri (2023) and see Dardano (2007) for an analysis of the Hittite material. For a summary of the issue, especially regarding the morphemes that, over time, have been added to the list of the more traditional Caland suffixes, see Bichlmeier (2015: 258), according to whom the suffix *-e/ont- "is probably not identical to the suffix of the active participles in PIE *-e/ont-/-n̥t-". The question of the identity of these suffixes is still being disputed (cf. Lowe 2014). For the controversial state of *-i-adjectives, cf. the bibliography quoted in in Alfieri & Pozza (2024), in particular Nussbaum (1976, 2014), Tronci (2000), Bozzone (2016), Grestenberger (2013, 2014, 2017), Lundquist & Yates (2018: 2115), and Höfler (2022).

a verbal orientation (they would be deverbal formations, participles, etc.) rather than a nominal one (e.g., Alfieri 2009 and Bozzone 2016).

Despite some previous works having addressed the relationship between the Caland system and Hittite (notably Dardano 2007, see also § 2.3), the morphological decomposition method used to discuss the cases presented in this study and the proposed analysis of certain forms as "primary" or "derived," follows the principle[10] according to which morphologically segmentable complex words are those formed on attested bases through word-formation rules that are fully transparent both semantically and formally. Derivatives that do not meet these criteria – although possessing some internal structure – are instead considered as stored in the lexicon (consider adjectives representing fossilisations of ancient participles, such as Italian *lucente* 'bright' < Latin *lucens* < *lucēre* 'brighten', which cannot be synchronically derived from an existing verbal base, even though the formation of active participles in -V*nte* is a productive rule in Italian, cf. Bozzone 2016).[11] Therefore, semi-transparent formations that, while analysable diachronically, cannot be segmented by applying derivational rules, will be regarded as lexicalised elements (cf. Bauer 2001: 27, 43)[12] and as underived, thus "primary" formations ("simple words are the hard core of storage," cf. Mayerthaler 1987: 46) not subject to further morphological parsing by the speaker. The frequency with which a given form is attested is also, as is well known, an additional factor that can potentially transform originally derived words into independent lexical items (cf. Bybee 1985: 133; 1995: 429). However, it should be recalled that when dealing with a *corpus*-language such as Hittite, it is virtually impossible to assess token frequency on the basis of the available textual record.

Usually (based on a more general systematisation criterion), derivatives characterised by the same suffix are grouped in reference grammars (cf. Hoffner & Melchert 2008 and 2024), regardless of whether they result from productive rules. Nonetheless (cf. Alfieri & Pozza 2024: 154), in line with contemporary morphological research, considering adjectives to be lexicalised when rules cannot synchronically process their structure avoids the necessity to postulate unattested words (a reconstruction which is, however, entirely relevant from a diachronic viewpoint) and to deduce the word-class status based solely on the suffix type. In Hittite, most suffixes are not exclusively affixed to a single type of base (cf. Hoffner & Melchert, 2008: 54 ff., 2024: 88 ff.).

[10] Cf. Mayerthaler (1980), Dressler *et al.* (1987), Bybee (1995), in addition to the references quoted in footnote 12.

[11] See also examples such as Italian *fantasista* < *fantasia*, *animalista* < *animale*, or English *murderer* < *murder*, *worker* < *work* compared to *ametista, pista, spider, hammer*, etc. A similar method of composition relies on the notion of productivity (Bauer 2001, 2005), which can only be indirectly assessed in ancient languages. On affix productivity in closed corpus languages, see also Panagl (1982). For productivity and diachrony, see Sandell (2015).

[12] For more on lexicalisation processes of adjectives in different ancient Indo-European languages and general theoretical aspects of part-of-speech analysis from a typological and comparative perspective, see numerous works by L. Alfieri (especially Alfieri 2014, 2016, 2021), recently cited in Alfieri & Pozza (2024). On factors triggering lexical storage of derived words cf. Dressler et al. (1987), Bertram et al. (2000), Aronoff & Anshen (2001), Bell & Schäfer (2016). See also Lipka (1994).

For example, the suffix -(*a*)*nt*- attaches to verbal bases (*akkant*- 'dead' < *akk*- 'to die'), to nouns (*irmanant*- 'ill, suffering from a disease' < *irman*- 'disease'), and to adjectives (*ikuna*- and *ikunant*- 'cold') – indeed, it is not always easy to establish a clear boundary between denominal formations in -(*a*)*nt*- and participles – and the suffix -*want*- attaches both to nominal bases (*ešḫar-want*- 'bloodstained' < *ešḫar*- 'blood') and to verbs (*kartimmiya-want*- 'angry' < *kartimmiya*- 'to be angry').[13]

Moreover, Hittite is a language that had profound contacts (starting with its mixed graphic system, both logographic and phonographic) with other languages of the Ancient Near East, not only those of the Indo-European family.[14] This characteristic complicates the analysis of derivational affixes, whose nature and existence are not always easy to establish, as will be discussed in § 2.1). Furthermore, it cannot be excluded that unattested forms in Hittite might have been present in lost or still undiscovered texts, just as related forms may be documented in other Anatolian languages. However, even if a base form is documented in another Anatolian language, this alone is insufficient to hypothesise its (potential) presence in Hittite. When considering synchronic productivity, it is essential to keep in mind that the reconstruction of a base form that generated a (attested) derived form can be performed from a diachronic perspective – reconstructing a proto-form not necessarily attested – but this does not always synchronically clarify the word-formation processes. Therefore, as will be explicitly observed later, it may lead to assessing the lexeme as an indivisible element. Finally, it should be emphasized that the attested Hittite corpus may not fully capture the polysemy of either base or derived lexemes. In other words, without access to the complete semantic range of the items in question, it is impossible to determine whether a given derivational relationship was genuinely affected by semantic drift.

Essentially, from a historical perspective (see §§ 2.3 and 2.4), it is legitimate to analyse adjectives such as **idālu*- 'bad, evil' and *le/iliwant*- 'fast, winged, urgent' respectively as derivatives in -*u*- and in -*want*- (or in -*ant*-) from bases such as **idāl*- (< **edwal*-, cf. Cun.Luw. *ādduwāl*(*i*)- id.) and **le/ili*- (or **le/iliw*(*a*)-) (cf. EDHIL: 421, 525; HED E/I: 493, L: 84-85; HEG A-K: 443, L-M: 58). However, the bases marked with an asterisk are reconstructed and not (yet) attested, which leads to them being considered as non-existent, and consequently the formations in some way connected to such bases being classified as primary, despite their potential analysability diachronically.

Consider, for example, *iyatnuwant*- 'luxuriant', probably derived[15] from the oblique stem of a fossilised verbal noun, *iyatar*, indicating 'growth', 'fertility' (especially vegetal) + the suffix -*want*- (or participle from **iyatnu*-, cf. EHS: 568, albeit with doubts) and

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[13] Furthermore, within nominal morphology, consider the suffixes -*att*-, -*eššar*-, and -*ima*-, which attach both to verbs and adjectives, or the suffix -*ātar*, which can attach to nouns, verbs, and adjectives (for -*ātar* and -*eššar* see, recently, Pozza & Fagiolo 2023 with the bibliography therein). For a precise classification of clearly denominal or deverbal forms (in -*ant*-/-*want*-), see Frotscher (2013: 39 ff.).

[14] See, among others, Alfieri & Pozza (2024) and the bibliography therein, especially the numerous works by P. Dardano on this topic, beginning with Dardano (2011).

[15] Cf. Watkins (1979: 282), who interprets *iyatar* as an abstract denoting 'movable wealth', literally 'that which goes, that which moves' (contra, HED E/I: 348-349; 352). For a different interpretation, see the discussion in Rieken (1999: 254ff.).

iyatniyant- 'cultivated', 'growing' (an adjective in *-nt-* from a base with an extension in *-na-/-niya-* or a participle of an unattested denominal **iyatniya-*, cf. EHS: 101; 568, HEG A-K: 348, HW² I: 32), showing clear correlation with *iya-* 'to walk', in the specific sense of 'to grow'. However, as noted by Puhvel (HED E/I: 352), the synchronic relation with ("the living paradigm of") *iya-* does not occur, due to the lack of assimilation of *-tn-* into *-nn-* as expected in the oblique cases of verbal nouns in *-atar* (genitive **iyatnaš*, instead of the expected ***iyannaš*).[16] In addition to the problem of lack of assimilation, *iyatar* is frequently attested without the final vibrant, as observed by Starke (1990: 473) and Rieken (1999: 255), which makes the connection with *iya-* less obvious. Furthermore, the attestation (old Hittite in middle script) of the singular genitive *iyataš* would support the hypothesis (EDHIL: 380) that *iyata-* represented the base for *iyatar* and not simply that the former was a variant lacking /r/.[17]

The relationship between *iyatar* and *iya-*, essentially, can be etymologically founded. From a synchronic perspective, the association between the two forms based on the productivity of the suffix of verbal abstracts is impossible, leading to the consideration of *iyatar* as a primary noun endowed with a semi-transparent internal structure.

2.1. The case of the suffix *-ena-/-ina-*

Some lexical items may lend themselves to more than one interpretation depending on the criterion adopted for morphological segmentation: consider, for instance, the case of the obscure suffix *-ena-/-ina-*,[18] whose presence is not always easily identified in some Hittite words (as discussed in Pozza 2023). Additionally, a considerable number of forms ending in *-ena-/-ina-* (cf. Jie 1994: 14-15) lack etymology, partly because their meaning cannot be inferred from context and thus remains too obscure to be assessed. Many of these lemmas are not even recorded in the main dictionaries. This formative element seems to be present in words such as *alwanzena-* 'enchanted', *araḫzena-* 'foreigner', *ḫerina-* (a word used in connection with the term for 'fire'), *kapina-* 'thread', ᴳᴵˢ*karpina-* 'a (type of) tree', ᴸᵁ́*kireštenna-* 'priest', *lappina-* 'firestarter, wick, tinderbox', *lappina-*⁽ˢᴬᴿ⁾, a phytonym indicating 'a (type of) garden plant', etc. Other entries are attested, perhaps segmentable differently, with a suffix of the type *-šīna-/-šēna-*, which, according to Melchert's opinion (2002), would represent "covert compounds" rather than derivatives ending in *-ena-/-ina-*.

In the case of ⁽ᴳᴵˢ⁾*kalmišina-/kalmišana-* 'burning log', for example, if one follows Melchert's interpretation, it would be a "hidden" compound in *-šīna-/-šēna-* (cf. Pozza 2023 for the problems connected with graphic variants with *-a-* vocalism). Despite the lack of sufficient etymological evidence, that *kalwišina-*⁽ˢᴬᴿ⁾ 'edible plant or vegetable' possibly could be interpreted as a "hidden" compound of the type **kalwi + šīna-/šēna-*. There are

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[16] This led Starke (1990: 473 ff.) to suggest a Luwian origin for the form.

[17] According to Rieken (1999: 256), an original **h₁iy-è(h₂)-teh₂* should be postulated, whose final [-ā́da] was interpreted by speakers as a variant of [**ā́dar] lacking /r/ (see the text for full discussion).

[18] This suffix does not appear listed by Hoffner & Melchert (2008: 53ff. and 2024: 87ff.) among the main suffixes forming derived stems from nouns and adjectives.

cases such as *parḫuena-/parḫuina-* (one of the most frequently cited ingredients of magical material in Hittite ritual texts), whose formal and semantic interpretation is far from straightforward: 'oats' according to Francia (2020); 'a sweet beverage or vegetable product' according to Kronasser (EHS: 183); 'fermentation matter of cereals', 'material for beer production' according to Puhvel (HED PA: 122ff.); 'a type of grain' according to Tischler (HEG P: 457). Puhvel (2009, 2011: 72; HED PA: 122) considers it a lexeme of Indo-European origin, linking it to Greek φρείατα, Latin *ferv(e)ō* 'to boil', ferment 'yeast, malt liquor', Old English *brēowan* 'beer' (< *$bhér-E_2$-, *$bhr-éE_2$-(w-)* 'to pant, boil, ferment', *$bhr(e)Hwr/n$-* 'rising, fermentation', genitive *$bhr̥Hwén(o)s$*)[19]: the meaning to be attributed to the word should therefore be 'fermentation beverage'. The prehistoric genitive of *parḫuena-/parḫuina-*, *$bhr̥Hwéns$* (realised as *parḫuenaš*), to which Puhvel assigns the value of '(beverage) of fermentation', would need to be reinterpreted as *parḫuena-* in the manner of [(LÚ)]*kururaš* '(man) of hostility' > [LÚ]*kurura-* 'enemy' (see Yakubovich 2006) and *paḫḫuenaš* '(attack of) fire', genitive of *paḫḫur* 'fire'. Conversely, Francia (2020), who discusses all the passages in which the word is documented, considers that *parḫuena-/parḫuina-* would not indicate a beverage but rather oats (which can also be used to produce beer), characterised by calming properties that act both on the nervous system and the gastrointestinal tract (*ibid.*: 136). Therefore, it is impossible to clearly identify a verbal root from which it could derive (in cases like these, according to Puhvel, 2009: 77, one would be dealing with "hidden Anatolian derivates of otherwise common primary verbal roots"). As illustrated by the discussion, there is no certainty regarding the meaning conveyed by the lemma (still under debate) or whether it might be a word of Indo-European origin.

Among the words ending in *-ena-/-ina-*, some have obscure meanings and unknown or uncertain etymology (cf. [(LÚ)]*ḫamina-/ḫamena-, ḫarmina-*, etc.), and others very likely represent loanwords (adapted from the replica language, cf. *ḫerina-* 'cedar wood; oven', possibly from Sumerian EREN 'cedar' → Akkadian *erēnu* 'wooden instrument'; *kulina-*, probably a Hurrian attribute referring to Ishtar; *kurupšini-*/[(LÚ)]*kurupzina-* qualifier of material/shape of rhyta, perhaps related to Akkadian *kupuršin(nu)m*, a qualifier of the word for 'gold'), and still others, of probable Indo-European origin, interpretable as deverbal formations (cf. Gusmani 1978, Puhvel 2009) formed by adding the Indo-European suffix *-ĭno-*[20] (possibly [GIŠ]*karpina-* 'a (type of) tree' < *(s)kerp-* and *lappina-* 'wick' < *leh_2p-*).

From these brief observations, one can clearly understand how complex it is to reason about the possible productivity of the suffix *-ena-/-ina-*, whose status and origin remain uncertain. The scarcity of attestations (together with the fact that many lemmas ending in *-ena-/-ina-* are, in fact, *hapax legomena*) and the strongly multilingual context in which the Hittite language is documented pose problems when providing general remarks regarding derivational morphology. The issue is further complicated, as shown, by the absence of a credible derivational base and a more than uncertain etymology.

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[19] With *E_2 Puhvel (HED A: x) means "[a] voiced e-coloring laryngeal, Hittite ḫ-, -ḫ-".

[20] Or *-eyno-? Or *-i(H)n(e)h₂-? For the details, cf. Pozza (2023).

2.2. The case of *-i-* and *-u-* adjectives

In Hittite, as in other ancient Indo-European languages, *-i-* and *-u*-adjectives are quite common. The suffix *-i-* is not productive (cf. Hoffner & Melchert, 2008: 54 ff.),[21] and the high frequency of *-i*-nouns and adjectives is due to numerous loanwords from Hurrian formations in *-i-* (cf. Berman 1972: 9). Primary (underived) adjectives in *-i* include words such as *kappi-* 'small', *nakkī-* 'heavy; difficult', etc. Among the underived *-u*-adjectives are words like *idālu-* 'bad, evil', *tepu-* 'small', *panku-* 'whole', etc.

It is not always easy to determine the relationship between a given adjective in *-i-* or *-u-* and its possible base form, whether verbal or nominal, when the latter is not attested in the available documentation. Likewise, it is not entirely obvious whether the adjective should be considered prior to the correlated verb or *vice versa*, as in the case of Hitt. *šuu-* 'full' (cf. Alfieri & Pozza 2024: 162-163). Berman (1972: 188–189), Watkins (1975: 378), and Weitenberg (1984: 136), for instance, argue that *šuu-* derives from the verb *šuwa(i)-* 'to fill, to be full' by means of the addition of a suffix *-u-*. However, the prevailing view is that the verb should be interpreted as de-adjectival (HEG Š²: 1128; 1219: "sicherlich denominativum"; EDHIL: 797). If this latter proposal is accepted, *šuu-* should be regarded as a primary adjective,[22] even though, diachronically, it can be traced back to the (verbal) root *sew-(H)-* 'to fill' (HED ŠE/ŠI/ŠU: 134; LIV²: 539, s.v. *seu̯h₃-* 'to be/become full', "nur anatolisch").

A similar situation is found with *daššu-* 'strong; heavy; difficult' (possibly connected – cf. Kellogg 1925: 28 – with Gr. δασύς 'dense, thick' and Lat. *dēnsus* 'dense', or – cf. Juret 1941: 51 – with Skr. *dáṁsas* 'miraculous power'). It may represent a *-u-* deverbal adjective from *dašš-* (as argued by Kloekhorst, EDHIL: 854), although the base *dašš-* is not itself attested (the causative *daššanu-* 'to fortify' is documented, however, parallelling *tepnu-* 'to diminish', from *tepu-* 'small, little', itself derived from a non-attested base *tep-*). Alternatively, because no base form is documented, *daššu-* could be regarded as a primary adjective. Further evidence that the scarcity of documentation in Hittite sometimes prevents us from making clear-cut decisions about whether a given form is derived from its base is provided by *šarku-* 'eminent, illustrious, powerful'. Its derivation from the verbal base *šark-* 'to ascend, rise' (at present only attested in the iterative *šarkiške/a-* 'to be good', EDHIL: 734) is taken for granted by Gusmani (1968: 94). However, as noted by Kloekhorst (EDHIL: 734), the meaning 'to ascend' attributed to the base *šark-* in such an authoritative source as the CHD (Š: 268) ultimately rests (as acknowledged by the editors themselves) solely on the presumed connection with the adjective *šarku-* and on its semantic nuance associated with the concept of 'height', despite the absence of contexts in which the verbal meaning is incontrovertible.

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[21] For the so-called "-*i*-mutation" of Luwian see in particular Oettinger (1987), Starke (1990), and Rieken (1994, 1999, 2005).

[22] The form *šuwant-* should be interpreted, according to Oettinger (1979: 296), as an ancient *-nt-* extension of *šuu-*, later reanalysed as the participle of *šuwa(i)-* 'to fill'.

In the same way, from a formal perspective, the adjective *kappi-* 'small' can be considered either as a primary adjective, or as formed from a verb such as *kapp(ai)-* 'to diminish, reduce' (EDHIL: 439; HED K: 62), which, however, is only inferred from the participle *kappant-* 'small'. Moreover, as mentioned earlier, the suffix *-i-*is not generally productive in Hittite. One may therefore argue, with Hoffner & Melchert (2008: 52–53), that both the adjective *kappi-* and the formation *kappant-* are preserved in the lexicon as primary words, being ultimately derived diachronically from the unattested root *kapp-* (on *kappant-* cf. also Dardano 2007: 13-14). In turn, the formation *kappant-* lends itself to a further interpretation, namely that of Frotscher, who considers it de-adjectival.

> Die Bildung *kappắnt-* 'klein' ← *kappi-* / *kappaͧ-* spricht in der Tat dafür. Es findet sich nämlich kein Verb **kappae-ͩ* 'verkleinern', wozu dieses Ptz. sein könnte. Stattdessen ist es einfacher *kappānt-* aus **kapp-aͧ-ant-* ← *kappi-* / *kappaͧ-* 'klein' herzuleiten und als denominale *-(a)nt-*-Bildung zu werten (Frotscher 2013: 40).

However, as also emphasised by Frotscher, unlike the *-u-*ablaut stems (which exhibit derivations such as *idalawant-* ← the stem *idalaw-* from *idālu-*), for the *-i-* ablaut stems there do not seem to be documented derived formations from the *-ay-* stem (and thus, potentially, *-aiͧ-ant-* > *-ānt-*) that could support this hypothesis: *šuppiiͧant-* ← *šuppi-* 'pure', which appears to go against the trend, is a non-ablaut *-i-* stem and therefore not conclusive. Frotscher (*ibid.*: 163) does not exclude verbal derivation, thereby illustrating the objective difficulty in taking a definitive stance on the matter.

A similar case is that of *ḫarki-* 'white, bright', which appears to be associated with a verb attested with different orthographic variants:[23] *ḫar-ki-eš-zi* (KBo 2 i 44-45), *ḫar-ki-e-eš-zi* (KUB 15.39 + 12.59 ii 16), *ḫar-ki-i-eš-zi* (dupl. KBo 39.8 + iii 4), and *ḫar-ki-i-iš-zi* (KUB 27.67 ii 28). These spellings allow for readings such as *ḫark(i)ešš-* (HED Ḫ: 170), *ḫarkiyešš-* (EDHIL 307), and *ḫarkešš-* (HEG A-K: 177); the meaning is the same ('to become white'), but the synchronic morphological interpretation of each form differs: *ḫarkiyešš-* is a denominal verb derived from *ḫarki-*, parallel to *tepaw-ešš-* from *tepu-* (de-adjectival verbs are constructed on different ablaut grades); *ḫarkešš-* is a case of suffix substitution derivation based on *ḫarki-*, parallel to *tepnu-* from *tepu-*; and *ḫark(i)ešš-* would be compatible with both perspectives. However, based on graphic considerations of the variants, it is more likely that the spelling <-ki-i-> alludes to the denominal *ḫarkiyešš-* and that the suffix therefore followed (and did not replace) the /i/ of the adjectival stem. This would exclude a suffix substitution derivation, which, as shown (cf. § 2), involves a diachronic etymological interpretation but does not imply morphological productivity synchronically. Furthermore, there are no attested *-i-*adjectives built on athematic verbal bases through derivation by addition and, consequently, *ḫarki-* can be interpreted as a primary adjective without internal structure.[24]

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[23] Much has been written on *scriptio plena*. We refer especially to Kloekhorst (2014).

[24] The relationship between graphic considerations of the variants and morphological productivity may not immediately reveal a clear causal connection. Nevertheless, the reading deemed most appropriate appears to reflect a derivation by addition (rather than substitution) from the simple adjective.

2.3. The case of *ḫūmant-* 'each, all, entire, *ḫappina(nt)-* 'rich', *ḫaršallant-* 'angry, furious'

The suffix -(*a*)*nt*- conveys more than one function in Hittite (cf. § 1, as well as Hoffner & Melchert 2008: 55-56; 2024: 89-90): it forms participles (*miyant-* 'in bloom' < *mai-/mi-* 'to grow, to prosper'); denominal possessive adjectives (*perunant-* 'rocky' < *peruna-* 'rock'); has an "individualising" function (*ḫamešḫant-* 'the (upcoming) spring' < *ḫamešḫa-* 'spring'), alternates – without semantic variation – with forms that lack it (*irmala-/irmalant-* 'sick'); and, in some cases, reflects the addition of -*t*- to a stem in -(*a*)*n*- (as in *išpant-* 'night' compared, for example, to Av. *xšapan*).[25]

Among the examples of lexemes that exhibit traces of internal structure without it being possible to demonstrate that they result from productive word-formation rules – especially because none of the hypothetical base forms of these derivations are attested as such (hence the presence of the asterisk) – are the cases[26] of *ḫūmant-* 'each, all, entire' and *ḫappina(nt)-* 'rich' (on primary adjectives in *-*nt*- in Anatolian, the important study by Dardano 2007 is of notable relevance). Even in this case, the bases *ḫū(m)-* and *ḫāpp(in)-* are not documented[27], or at least not with the required value, as in the case of *ḫāpp-*, which, from a purely synchronic point of view, means 'to unite, to attach (used impersonally or in the middle voice), to manage, to work'.

Therefore, the meaning 'to abound, to be rich,' which is the prerequisite to justify a derivative *ḫappina(nt)-* 'rich,' can be ascribed to *ḫāpp-* only on etymological grounds (that is, if the connection with Sanskrit *ápnas-* 'possessions,' Latin *ops* 'wealth' is accepted), but from a purely synchronic perspective, none of these meanings can serve as the basis for constructing an adjective with the value 'rich'.[28] That *ḫappina(nt)-* could be correlated with *ḫāppar-/ḫāppir-* 'trade, business', based on an original heteroclitic "Proto-Hittite" form such

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[25] See Dardano (2010: 6), who states that «the presence of the same suffix in both participles, more properly defined as verbal adjectives, and in primary adjectives should not be surprising», when compared with the historical continuations of the suffixes *-lo-*, *-no-*, and *-to-*; «the common denominator is the use of a deverbal derivational suffix (originally from roots, only later deverbal) also in denominal formations» (*ibid.*: 7). Consider, for example, *ḫattant-* 'intelligent, sharp', which, as noted by Dardano (2007: 17, note 61), is recorded as an autonomous lexeme by Puhvel (HED Ḫ: 260-263), separately from the participle *ḫattant-*, from < *ḫat*(*t*)-, *ḫatta-* 'to pierce, to strike', with the meaning 'pierced, struck'.

[26] On *ḫappina(nt)-* and *ḫūmant-* see the discussions in HW² (Ḫ: 231-232, ḪE-ḪU: 712ff.).

[27] Clearly, the unattested forms in Hittite texts could appear in other lost texts, or related forms might be found in other Anatolian languages. For the dissimilation of /w/ to /m/ before /u/ (in the case of postulating a suffix -*want*- on the base *ḫū-*, as an alternative to -*ant*- on the base *ḫūm-*), see Melchert (1994: 109; 127). For this matter, also consult HEG (Ḫ: 381).

[28] Laroche (1963: 72) translates an occurrence of the verb as "avoir en abondance" (*takkuš-maš UL-ma ḫapzi ta natta ḫazzianzi* "mais s'ils sont dans le dénuement [lett. 's'il n'y a pas pour eux abondance'], on abat un porc", KBo 11.34 i 5). This translation is rejected by more recent studies: Neu (1968: 45, fn. 1; 1974: 83) translates "wenn es sich ihnen aber nicht fügt, stechen sie (es) nicht ab" ["but if it does not fit them, they do not stab (it)"]; Puhvel (HED Ḫ: 251) translates "but if it does not work out for them, they do not stick [it]", and the entire etymology is rejected by Kronasser, who considers *ḫappina-* "ohne nachweisbares Grundwort" ["without an attested base word"] (EHS: 182). See also HW² Ḫ: 196, s.v. *ḫap(p)-* 'sich fügen': "kein Zusammenhang besteht mit *ḫappina(nt)-* 'reich', *ḫappar-* und *ḫappira-* 'Stadt (Dorf)'".

as *ḫapḗr/*ḫapén-, is the view of Oettinger (1979: 353, 1981: 149),[29] but, even in this case, the etymological hypothesis does not change the fact that, from a synchronic point of view, it is a primary adjective.

That ḫūmant-, for example, could – according to Kimball (2007: 201 ff.) – represent the participle of an athematic compound verb of the type *h_2u-h_1em-/*h_2u-h_1m-, where *h_2u- 'together' would constitute the preverbal element and *h_1em- 'to take' the root (hence the meaning 'taken together' for the participle ḫūmant-), certainly cannot be ruled out (also supported by Frotscher 2013: 143, albeit with different arguments), from the point of view of a possible etymological interpretation. However, synchronically, deciding on the type of base represented by *ḫum- solely based on its occurrence with the suffix -ant- is equally (if not more) questionable than considering ḫūmant- as stored in the lexicon. "Errstarrte Bildung" also for Frotscher (ivi: 144), exited early and subsequently became isolated from the participial system.

Semitransparent words that – although marked by some internal structuring – cannot be traced back to others through derivational rules can thus be considered "lexicalised"[30], because they are stored in the lexicon: ḫappina(nt)- 'rich', ḫūmant- 'each, all', and tepu- 'small', for example, cannot be traced back to any attested Hittite base and are therefore preserved in the lexicon, even though they exhibit the suffixes -(a)nt- and -u-. The suffixes -u- and -(a)nt- are "real" morphemes in words like ḫuišu- 'alive' < ḫuiš- 'to live' and karšant- 'cut' < karš- 'to cut', but they are "quasi-morphemes" in tepu- and ḫappina(nt)-, thus semi-frozen morphemes formally identifiable but not productive functionally (Aronoff 1976: 11), similar to the sequences -u- and -(a)nt- in idālu- and ḫūmant-.[31]

The complexity of the univocal classification of certain forms has been the subject of study by Dardano, who, in the already cited 2007 article (ibid.: 16-17), mentioned some entries of ambiguous interpretation, including enant- 'tamed' and parrant-, of uncertain meaning, used in reference to straw, for which the classification tends to oscillate between participle and adjective. Dardano notes that the former is lemmatised as enant- by Puhvel (HED E/I: 271) – who traces it back to a (unattested) root en- < *ain- 'to agree' – which Tischler (HEG A-K: 106) derives from annanu- 'to instruct, to teach' (of unclear etymology), and it is not classified explicitly by HW² (E: 37). For parrant-, more complex in semantic reconstruction, dictionaries (CHD P: 135, HEG P: 441) fluctuate between classifying it as adjective or participle, leaving the question open. The same applies to other forms discussed by Dardano, among which are tatrant- 'pointed, sharp; aggressive' and paprant- 'impure', for

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[29] Cf. also Rieken (1999: 315).

[30] Cf. Bauer (2001: 27): "[…] we can note that while lexicalisation as discussed just above is a process which affects individual words diachronically, the result is that at any synchronic moment different words will be at different stages of lexicalisation, the diachronic process being reflected in the synchronic status of individual words."

[31] Another example illustrating the difficulty in choosing between a verbal or nominal derivation is that of išḫaškant- 'bloodstained', which could be a participle from *ešḫar-šk- with *-ršk- > *-šk- (cf. the hapax eš-ḫa-ri-eš-ki-it-du in EHS: 456, 491, 506 and HEG A-K: 115), or a syncopated participle of the iterative verb ešḫaneški- derived from *ešḫaniya- 'to blood': *ešḫan(i)škant- > ešḫaškant-/išḫaškant- (HED E/I: 309). Both verbs, however (although their base forms are reconstructed but unattested), can be traced back to the noun ešḫar 'blood'. See also the discussion in EDHIL: 258-260.

which no base verb is documented, only the corresponding causative formation (*tatraḫḫ-* 'to incite, provoke', *papraḫḫ-* 'to make impure'). Dardano (2007: 22) concludes that most of the -(*a*)*nt-* formations in Hittite, unlike the corresponding ones in other Indo-European languages, should be considered as verbal adjectives (primary, root-based), and therefore belong to the realm of derivational morphology, not inflectional (as participles do). It is essential to observe that the choice to consider an adjective as primary, not directly traceable to an unattested verbal form synchronically, does not relate as much to its evaluation in light of the Caland system, and thus to whether a form (if root-based and not deverbal) can fit into the system. What is under discussion here – following Dardano's line of reasoning – is that, in the absence of an attested base, assumed solely on the formal structure of the derivative and the (diachronic) reconstruction of its etymological basis, a derived lexeme, although morphologically transparent in its internal structure, should be considered as primary in the speaker's lexicon (that is, in their competence).

Finally, the case of *ḫaršallant-* 'angry, furious' is noted, perhaps a participle of an unattested (denominal?) **ḫaršal*(*l*)*a*(*i*)- (HED H: 186, HW² Ḫ: 341) or (HED H: 186) a denominal derivative in -*nt*- from a **ḫaršalla-* (the relation to *ḫaršar/ḫaršan-* 'head' should not be excluded but only diachronically, as a result of dissimilation from an original **ḫaršan-ant-*?). "Ohne Grundwort" in Kronasser's opinion (EHS: 266). Tischler (HEG A-K: 183) cites the possible derivation from the verb *ḫarš-* 'to tear, to break'. Nevertheless, even in this case, as emphasised by Kronasser (EHS: 266), "wenn jedoch Grundwörter fehlen, läßt sich oft nicht einmal die ursprüngliche Wortart mit einiger Sicherheit feststellen, da Partizipia zu Nomina und Adjektiva zu Substantiva werden können". A primary formation, therefore, even if endowed with a semi-transparent internal structure.

2.4. The case of *armawuant-* 'pregnant', *ešḫarwant-* 'bloodstained; blood-coloured', *ḫuišwant-* 'alive', *innara/uwant-* 'vigorous, strong', *le/iliwant-* 'quick, winged, urgent', *mišriwant-* 'luminous, brilliant'

Let us now examine some cases of formations in -*want*-, a suffix which, as has been seen (§ 1), attaches to both nouns and verbs. Even in this case, determining whether the formation is nominal or verbal is not straightforward, and it cannot be excluded, in the absence of the derivational base, that it was a primary lexeme stored in the lexicon (see also § 1 and fn. 12). Fundamental to the analysis and evaluation of the suffix -*want*- are the monograph by Maier (2013) and Frotscher's doctoral thesis (2013: 41 ff.), in which the latter classifies the deverbal formations (participles) and the nominal constructs in -*want*-, categories between which it is not always easy to draw a clear distinction, especially when both verbal and nominal bases are present. The merit of this study lies in the extensive discussion (see also below) of the substitutional suffixation process based on the derivational model of the type -*ant*- ~ -*aḫḫ*-, -*ātar*-, -*ē*-, -*ēšš*- (exemplary, from this point of view, is the final schematisation, *ibid.*: 344-353).

Of difficult resolution, for example, is the case of *armawant-* 'pregnant', deverbal from *armai-* 'to be pregnant' (HED A: 157), as well as potentially nominal (EHS: 266), derived from *arma-* 'moon; month' (documented only in the Sumerogram ᵈEN.ZU, ITU(KAM), and

the Akkadogram ᵈSÎN), or from *arma-* 'pregnancy' (HEG A-K: 62). In Maier's view (2013: 20-21), in addition to the deverbal hypothesis (which would have first presupposed derivation from the genitive *armawaš* of the unattested verbal noun *armawar*), a derivation from the *-aw-* stem of a *armu-* could also be outlined. In this case, however, in the absence of attestation of the base noun, it seems preferable to lean toward the first hypothesis (also supported by Frotscher 2013: 89-90, 99).

The adjective *ešḫarwant-* 'bloodstained, blood-coloured',[32] again, can be interpreted as a denominal in *-want-* derived from *ešḫar-* 'blood', but at the same time it may represent the participle of a *išḫarwai-*, itself a denominal verb built on the unattested noun *išḫaru-* 'bloody-ness', connected to *ešḫar-* 'blood'. The first option is based on actually documented data. It therefore appears preferable, because the verbal base *išḫarwai-* and the noun *išḫaru-*[33] are unattested (Oettinger 1988: 284, Hoffner & Melchert 2008: 61). For a more detailed discussion of the various proposals, see Otten & Souček (1969: 53), HEG (A-K: 115), Rieken (1999: 483 ff.), Maier (2013: 61-63).

Furthermore, *ḫuišwant-* 'living, alive' could be interpreted[34] as a deverbal adjective in *-want-* from *ḫuiš-* 'to live', as an extension in *-nt-* of *ḫuišu-* 'alive', or as a participle in *-(a)nt-* built on *ḫuišwai-* 'to be alive', a denominal verb derived from *huišu-* 'fresh, raw', which in turn is a deverbal adjective built on the verbal base *ḫuiš-* 'to live' (cf. EHS: 267, HEG A-K: 268).

A helpful device to orientate oneself toward the participial interpretation is to evaluate the position relative to the possible noun to which it refers, because participles follow the noun in all uses in Hittite. In contrast, adjectives tend to precede the noun in attributive function and follow it in predicative function (Francia 2001). However, these are tendencies, not strict rules, and attributive adjectives in -want- can quite freely precede or follow the noun (Hoffner & Melchert 2008: 272). Therefore, distinguishing and thus choosing between the function of a predicate and that of an adjective can be difficult, especially in cases of an adjectival predicate without a copula.[35] The proposal of Frotscher (2013: 136, 202-204) and Maier (2013: 47) is that this is a participle in *-ant-* (of the stative verb *ḫuišwai-* 'to be alive') functioning adjectivally, with the syntactic behaviour of an adjective (attributive, predicative, substantivised, and – albeit rarely – even adverbial).[36] Regarding the participles of stative verbs, Frotscher (2013: 203) observes that "the participle expresses a state that has

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[32] Cf. for example (KBo 17.1 i 24-25) *weššanda=ma išḫarwantuš TÚGḪI.A-uš* "they wear blood-red garments" (HED E/I: 311). On *ešḫarwant-* and *ešḫarnuwant-* cf. Frotscher (2013: 41).

[33] "On the basis of *išḫarwant-*, however, the stem *išḫaru-* received some productivity, resulting in forms such as *ēšḫarwaḫḫ-*, *išḫarwieške/a-* […], and *išḫarwīl*" (EDHIL: 260).

[34] See the various hypotheses proposed in the synthesis of Maier (2013: 45-47).

[35] Consider the case, discussed in Alfieri & Pozza (2024): *ḫalkiaš ḫaršar išḫiy-and-[a]* [Z]ÍZᴴᴵ·ᴬ-*ašš=[a] ḫaršar išḫiy-and-a* (KBo 17.1 iv 19-20, Otten & Souček 1969: 37 'die 'Köpfe' von Gerste (sind) (zusammen-) gebunden, und die 'Köpfe' von Spelt (sind) (zusammen) gebunden'). Otten & Souček translate *išḫiyant-* as '(are) bound' (the text lacks the copula). The passage, however, can be interpreted either as "the barley ears are bound together" or "the barley ears bound together."

[36] For example, for the participle *ašant-* in the adjectival value of 'true' (in attributive and predicative function), see the detailed analysis by Cotticelli-Kurras (1991: 158 ff.).

become a property, whereas the finite form does not express a property, but only the state. The participle is therefore an adjective".

If, on the other hand, the base form of adjectives in -(*a*)*nt*- or -*want*- is not attested, it would be appropriate, according to the same principle, to consider these adjectives as non-derived, albeit endowed with a semi-transparent internal structure. Indeed, although the formation of adjectives from nouns is fairly productive in Hittite, in many cases the nominal bases from which certain adjectives might appear to be derived are not attested: in addition to the examples already mentioned, this is the case of words such as *innara/uwant*- 'vigorous, strong', *le/iliwant*- 'fast',[37] *mišriwant*- 'bright, shining', respectively from the unattested **innaru/a-*, **le/ili-*, and **mišri-*. From a strictly synchronic point of view, we should consider them primary formations, despite their later attestation in other derived forms such as *mišriwaḫḫ*- 'to make bright, brilliant', *mišriwatar* 'brightness', *mišriwešš*- 'to become bright', *leliwaḫḫ*- 'to hurry', *in(n)ara(wa)ḫḫ*- 'to strengthen', *innarawawar* 'strength', *innarawešš*- 'to become strong', etc.

As for *innarawant*-, for example, Weitenberg (1984: 189) reconstructs the base **innaru-*, while Frotscher (2013: 54), underlying that "**innaru-* is, however, not attested as such", states that "instead, *innarau̯ant*- is a -*u̯ant*-adjective derived from **innara-*, as it appears in the adverb (< Nom.-Acc.Pl.n.) *innarā* 'intentionally, diligently'". The same view had been expressed some time earlier by Melchert (1984: 80), who also suggested that the verbal derivatives *innarawešš*- and *innarawatar* were formed on a base **innarawa-* extracted from *innarawant*-, following the model of pairs like *pittalwa-/pittalwant*-, etc. Finally, it is also worth mentioning Maier's (2013: 56-59) detailed synthesis, according to which one could reconstruct an abstract nominal base **innara-*, built on **innar-* (according to Hrozný 1917, **innara-* could represent the outcome of a compound such as **h₁en-h₂nor-* 'endowed with internal vigor'; *contra*, EDHIL: 387).

Etymologically, then, **mišri-* 'glitter' in *mišriwant*- can be traced back to **miš-* 'to sparkle' (< **meys-* 'to shine') plus the suffix -*ri*- (Hoffner & Melchert 2008: 59; 2024: 93). Nevertheless, the etymology is uncertain (EDHIL: 582). From a morphological standpoint, according to the same authors (2024: 90), "*mišriwant*- was reinterpreted as *mišriwa-ant*- like *pittalwant*- and -*ant*- was deleted in the formation of *mišriw-aḫḫ*- 'to make splendid, perfect'". According to Neumann (1962: 155), *mišriwatar* and *mišriwešš*- would instead derive respectively, "mit stärker Syncope" from **mišri-want-*(*a*)*tar* and **mišri-want-eš*. Forms like *mišri-want*- would then have been reinterpreted as *mišriw-ant*- before -*ant*- was deleted in the formation of verbs such as *mišriwaḫḫ*- 'to make splendid, perfect', following an extension of the substitution pattern found in -*i*- and *u*-stems, and -(*a*)*nt*- (although suffixation by addition, as already noted, should have been the regular pattern in Hittite; cf. *ḫatku*- 'tight' > *ḫatku-ešš*- 'to become tight', etc.). Along the same lines (elision of °-(*a*)*nt*-) see Oettinger (1979: 241). Kronasser (EHS: 401), opposed to the hypothesis proposed by Neumann (cf. above), does not exclude the reconstruction of a base **mišriwa-* and motivates

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[37] For a thorough interpretation of the entry, see Frotscher (2013: 83-84), who does not exclude a verbal derivation from **lelai-i/*leli-*, with the presumed meaning 'to move quickly' (for the issues related to the originally transitive semantics of the verb, I refer directly to Frotscher's work). See also Maier (2013: 94-95).

the derivation of *mišriwešš-* from *mišriwant-* on the basis of a proportional analogy of the type *idalawant- : idalawešš- = mišriwant-* : x. All these hypotheses, although plausible, do not resolve the problem of the unattested synchronic base (*mišri-*? *mišriwa-*?).[38]

That speakers may have carried out false segmentations of the forms in -*want-*, following the obsolescence of the original bases *le/ili*, *mišri-*, and *innaru/a-* (the latter, in the -*a*-stem, inferred from the adverb *innarā*, but never attested autonomously as a noun), and that consequently they originated the above-mentioned verbal forms from bases such as *mišriw-*, *innaraw-*, and *leliw-* (cf. *supra*) is certainly a plausible hypothesis. However, the fact that a nominal base is not (any longer) documented autonomously but only indirectly through multiple derivatives does not allow us to classify such formations – at a synchronic level – as denominal, but rather as already lexicalised forms. Additionally, false segmentations or back-formations, which generalise a model of morphological relation, are at best semi-productive sporadic processes.[39]

Even in cases such as those just mentioned, essentially, despite formations with a (semi)-transparent internal structure, we would be dealing, from a synchronic perspective, with "primary" adjectives. Frotscher (2013: 54 ff.), however, considering the verbal derivatives of the forms discussed above as formed through suffix substitution – following the ideas previously proposed by Neumann (1962: 154-155), Oettinger (1979: 240 ff.) and Hoffner & Melchert (2008: 51; 2024: 85) – argues that the base for their formation was not a noun (which, as we have seen, is not attested), but that the derivational formation model started precisely from the stem in -*want-*, according to a derivational pathway that originated from the substitution of the participial suffix with that of the factitive verbs, from which (-)*ant-* → (-)*aḫḫ-*, (-)*ešš-*, etc.

Regarding the factitive formations in -*ešš-*, Frotscher envisions two developmental models, as in the case of an adjective like *parkui-/pargaw-* 'pure', which shows a dual outcome in the factitive derivatives: the form *pargaw-ēšš-* would derive from the (unattested) adjective in -(*a*)*nt-* *pargaw-ant-* (fully consistent with what was previously observed for the factitives in -*aḫḫ-*), whereas *parku-ēšš-* would have as its base the adjectival stem without the -*i*-extension. As can be seen, the perspective adopted by Frotscher, while entirely reasonable, differs (though not contradicts) the line pursued here: postulating a historical origin of *pargaw-ēšš-* from a hypothetical **pargawant-* is a valid diachronic-reconstructive operation, but in fact it does not conflict with the idea that both factitive formations derive from the simple adjectival base and that, for speakers, the productive model was not **pargawant-* → *pargaw-ēšš-*, but rather *pargaw-* → *pargaw-ēšš-*.

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[38] More recently, see the detailed discussion in Maier (2013: 104-106). See also Frotscher (2013: 54-55, 348). Cf. Tischler (HEG L-M: 217) and Puhvel (HED M: 164) for further bibliographical references.

[39] Cf., among others, Matthews (1991: 69).

3. Final remarks

As has been observed, when attempting a synchronic morphological segmentation of certain Hittite adjectives containing productive suffixes, it is not always possible to identify the base form (verbal, nominal, or adjectival) from which the derivative should come. Consequently, this does not allow confirmation that a given suffix attaches exclusively or predominantly to a specific type of base (precisely because it is not attested). Indeed, derived Hittite adjectives can be classified as denominal (e.g., *genzuwala-* 'kind-hearted, merciful' < *genzu-* 'mercy'), deadjectival (e.g., *appezzi(ya)-* 'posterior, subsequent' < *āppa* 'behind, after'), deverbal (cf. participles like *kariyant-* 'covered' < *kariya-* 'to cover', or forms like *parku-* 'high' < *park(iya)-* 'to increase, elevate, (make) grow', *tarḫuili-* 'strong, powerful' < *tarḫu-* 'to prevail, conquer'), deadjectival with extended suffixes (cf. forms in -(*a*)*nt-* like *dannarant-* 'empty, smooth' compared to *dannara-* id., or *arawanni-* 'free' compared to *arawa-* id.), as well as lexicalised compounds (cf. above, *dāyuga-* 'of two years') or of heterogeneous nature (*kurur* 'hostile, enemy'),[40] *šanezzi-/šanizzi-* 'pleasant, excellent, valuable[41] etc.).

Hoffner & Melchert (2008: 52; 2024: 86) clarify that nominal or adjectival formations in Hittite, for which it is not possible to identify a base form of derivation (regardless of their status in the pre-Hittite phase), should be considered as underived: therefore, in such cases, from a methodological point of view, these forms should be regarded as lexemes stored in the lexical competence of speakers as unitary lexemes (even though their internal structure is transparent and it is possible, diachronically, to decompose their constituents). Consider the case of *šuppišduwara-* 'brilliant,' perhaps derived from *šuppi-* 'pure, purified' + **išduwara-*, an unattested verbal noun, in turn derived from *išduwa-* 'to be manifest, to be revealed' (Neu 1970: 69), but whose connection with *šuppi-* remains somewhat uncertain (cf. EDHIL: 791). In fact, the semantic connection between the two composing elements of the compound is problematic (cf. Melchert 2017b: 179).[42]

It is also evident, as already mentioned, that the lack of attestation of a base form, in the case of a language such as Hittite, can be accidental, and therefore, the evaluation of a form as "primary" with respect to the typology of synchronic segmentation offered solely by the documented forms is not the most correct solution. However, wishing to distinguish between forms objectively derived from attested bases and forms whose synchronic derivation is uncertain (also in light of, as seen, the non-unique attachment of a derivational morpheme to a specific base), the approach taken in the examination presented here has been to opt for classifications that, as objectively as possible, are founded on the currently available data.

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[40] On its (secondary) adjectival value, cf. Hoffner & Melchert (2008: 61, 117), EDHIL: 496, HED K: 278, HEG A-K: 665 and, most of all, Neu (1979).

[41] Perhaps derived from *šani-* 'the same' + suff. *-ezzi(ya)-*? (EDHIL: 723). According to Berman (1972: 201), obscure formation.

[42] "The evidence of the Hurro-Hittite Bilingual shows that *šuppištuwar-ant-* is another possessive adjective in *-ant-*, 'possessing bosses, protuberances, appliqués' from the noun *šuppištuwara/i-* 'boss, protuberance, appliqué' (also spelled once *išpištuwarāš* at KUB 42.64 Vo 2). We are dealing with a derivative of the PIE root **spei-* referring to various pointed objects: cf. English 'spit' or 'spire'" (Melchert 2017b: 179).

As already noted by Gusmani (1968: 95 ff.), sometimes in Hittite the possible relation to a verbal base is no longer demonstrable, because the base formation has been lost or has become unrecognisable, even if documented as a root formation in other historical Indo-European languages: this is the case of *panku-* 'all, entire,' which diacritically can be traced back to PIE **bhenĝh-* (cf. Sanskrit *baṃbhayate* 'strengthens, increases', *bahú-* 'much, wide', gr. παχύς 'thick'), but whose Hittite verbal base is absent.

The same observation applies to *tepu-* 'few, scarce', an *-u-*adjective whose base, **tep-*, is not documented. The derived verb *tepnu-* could represent the extended *-nu-* form of the base (unattested) verb underlying the adjective *tepu-*, or it could be a deadjectival verb derived from *tepu-*. This ambiguity means that the parallel with Sanskrit *dabhnóti* 'damages', where the verbal base is attested, should not be given much importance (Gusmani 1968: 96). The productive derivational processes in the synchronic domain should thus be distinguished from etymological analysis. Kronasser (EHS: 418-419) had already questioned the distinction between etymological and synchronic analysis when discussing the concept of root in Hittite. Morphological productivity types (cf. Bauer 2001: 25) correspond to quantitative, qualitative, synchronic, or diachronic criteria: some are based on existing words, others on potential words. This recalls the idea that, in the speaker's perception, "the less morphotactically transparent, the more storage" (Mayerthaler 1987: 45). It is clear that the use of Hittite dictionaries and the various etymological proposals presented from time to time represent an essential source for a more complete evaluation of problematic lexemes, also to avoid confusing general reflections on the cognitive aspect of speaker behaviour with those derived from a rigorous diachronic investigation.

The same observation was made starting from the more general groupings – in the reference grammars – of derivatives presenting the same suffix, regardless of whether they are the result of productive rules, from which some less obviously classifiable forms were extrapolated. As seen, for example, *ḫappina*(*nt*)- 'rich' (cf. *supra*) is usually considered an *-(a)nt-*derivative,[43] *idālu-* 'bad, evil' as an adjective in *-u-, dāyuga-* 'of two years' as a compound (built on **dā-* < PIE **dwoyo-* 'two' – cf. the adverb *dān* 'for the second time' – although **dā-* is not attested in the expected form, because no synchronic rule predicts the deletion of *-n-* from *dān*)[44] etc.

Such situations are more easily framed within a scale (cf. especially Bybee 1985: 81ff. and Mayerthaler 1987: 46) whose extremes are represented respectively by complete storage

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[43] Probably, as indicated in Hoffner & Melchert (2024: 90), "the synonymy of the *-a-* stem and *-ant-* stem in cases like *marša-/maršant-* and *pittalwa/pittalwant-* 'plain' and instances where only the longer variant survived (e.g., *marlant-* 'foolish' to **marla-*) permitted speakers to reanalyze derivatives of the base adjective as belonging to the *-ant-* stem, leading to *ḫappinant-* 'rich' > *ḫappin-aḫḫ-* 'to make rich' and *ḫappin-ešš-* 'to become rich'". In Oettinger's opinion (1981: 148) *ḫappina-* should be interpreted as a back-formation on the more frequently attested *ḫappinant-*. On the semantics of *ḫappina-, ḫappinant-* cf. Cotticelli-Kurras (1998).

[44] It is also true that in many languages the forms of lexemes entering into compounds do not have autonomy outside the compound, which does not imply that such compounds are not formed by productive rules nor that those forms depend on rules applying only in the context of the compound. However, synchronically, the relation between the adverb (including ordinal numeral, cf. HEG T1: 89) *dān* and the first member of the compound *dā-* is not documented in other formations, just as the cardinal numeral *dā*, deduced (since Hrozný 1917) precisely from *dāyuga*, is not (yet) attested.

and complete processing through rules, a *continuum* along which there exist possible morphological spaces occupying an intermediate zone, outlining "compromise pockets" corresponding to morphological structures that are partially stored and partially processed (because they are less transparent morphosemantically and morphotactically). Thus, adjectives like *ḫupigawant-* 'veiled' (← *ḫupiga-* 'veil' + *-want-*) or *išpantiya-* 'nocturnal' (← *išpant-* 'night' + *-iya-*) can be considered as clearly rule-processed and are placed at one end of the categorial *continuum*, while forms such as *ḫuelpi-* 'fresh, young' or *pittalwa-* 'simple, pure', which are certainly primary, lie at the opposite end as they are undoubtedly stored in the lexicon. The "compromise pockets" could contain cases like the already mentioned *alwanze/ina-* 'magical, practicing witchcraft', *ḫappina*(*nt*)- 'rich', *ḫūmant-* 'every, all', *mišriwant-* 'brilliant' etc., whose derivational morphemes are semi-frozen (cf. § 2.4) and whose bases (***alwanza-*, ***kalwi-*, ***ḫappin-*, ***ḫūm-* and ***mišri-*), not synchronically attested, are not immediately identifiable and uniquely associable with a specific part of speech. It is undoubtedly true that diachronic analysis can prove decisive in most of the problematic cases mentioned so far, mainly because Hittite data, unlike those of other historical Indo-European languages, are in some ways more complex, both due to the fragmentary attestation of some forms, due to phenomena linked to linguistic interference and the multilingual – also graphical – geographical context, and due to the difficulty that is encountered more than once even in reading – and thus in the consequent morphological evaluation – of a specific (and sometimes unique)[45] attestation, etc.

Therefore, evaluating data from both synchronic and diachronic perspectives is all the more critical. Consider the well-known example in Italian of *giornalaio* ('newspaper seller') vs. *beccaio* ('seller of goat meat' → 'butcher'): the former follows an Italian derivational rule (*giornale* 'newspaper' + *-aio-*), while the latter has the same suffix only in a diachronic view, as it continues Latin *beccarius* 'butcher' but cannot be traced back to Italian *becco* (which has an entirely different meaning, 'beak'). The analysis for Hittite is less evident because the documentation does not allow for such a clear distinction, but this does not mean one should be unaware of it. Nonetheless, what has been attempted here is a synchronic morphological overview of some formations, first to assess their "distance" from lexicalisation or derivation, categories whose boundaries are notoriously blurred.[46] The analysis, conducted on a sample of individual derivational types in the formation of adjectives, provides a substantial methodological indication of the necessity of careful case-by-case examination, to avoid generalisations that would flatten different chronological levels (Indo-European derivation, Proto-Hittite derivation, Hittite derivation with rules operating in the speaker's competence).

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[45] For the relationship between *hapax legomena* and productivity in ancient languages, cf. Sandell (2015: 34-35).

[46] Refer to the bibliography cited in footnotes 10, 11 and 12 and *passim* in the work. For the quantitative results related to the Hittite language (which seems to present a higher percentage of primary adjectival structures alongside a large number of participial formations or those secondarily derived from verbal roots), see Alfieri & Pozza (2024) and the specific theoretical typological framework discussed therein.

References

Alfieri, L. 2009. La categoria dell'aggettivo in vedico. *Archivio Glottologico Italiano* 94(1). 3-41.

Alfieri L. 2014. *Qualifying modifier encoding and adjectival typology*. in Simone, R. & Masini, F. (eds.), *Word classes: Nature, typology and representations*, 119-139. Amsterdam – Philadelphia: John Benjamins.

Alfieri L. 2016. The typological definition of the (apparently historical) notion of root. *Archivio Glottologico Italiano* 102(1). 129-169.

Alfieri, L. 2020. The lexicalization of the adjective as an innovative feature in the Indo-European family. *Poznań Studies in Contemporary Linguistics* 56(3). 379-412.

Alfieri, L. 2021. *Parts of speech comparative concepts and Indo-European linguistics*. In Alfieri, L. & Arcodia, G. F. & Ramat, P. (eds.), *Linguistic categories, language description and linguistic typology*, 313-366. Amsterdam – Philadelphia: John Benjamins.

Alfieri L. 2023. Review of: Malzahn, M. & Fellner, H. A. & Illés, Th-S. (eds.). 2022*. Zurück zur Wurzel: Struktur, Funktion und Semantik der Wurzel im Indogermanischen: Akten der 15. Fachtagung der Indogermanischen Gesellschaft von 13. bis 16. September 2016 im Wien, Reichert, Wiesbaden*. *Ricerche Linguistiche* 1. 245-272.

Alfieri, L. & Pozza, M. 2024. The Hittite adjective in comparative perspective. *Archivio Glottologico Italiano* 109(2). 137-198.

Aronoff, M. 1976. *Word-formation in generative grammar*. Cambridge (MA): MIT Press.

Aronoff, M. & Anshen, F. 2001. *Morphology and the lexicon: Lexicalization and productivity*. In Spencer, A. & Zwicky, A. M. (eds.), *The Oxford handbook of morphology*, 237-247. Oxford: Blackwell.

Audring, J. & Masini, F. 2019. Introduction: Theory and theories in morphology. In Audring, J. & Masini, F. (eds.), *The Oxford handbook of morphological theory*, 1-16. Oxford – New York: Oxford University Press.

Balles I. 2006. *Die altindische Cvi-Konstruktion: Form, Funktion, Ursprung*. Bremen: Hempen.

Balles I. 2008. *The Old Indic* cvi-*construction, the Caland system, and the PIE adjective*. In Rasmussen, J. E. & Olander, Th. (eds.), *Internal reconstruction in Indo-European: Results, methods, and problems*: *Section Papers from the XVI International Conference on Historical Linguistics, University of Copenhagen, 11th-15th August 2003,* 1-15. Copenhagen: Museum Tusculanum.

Bauer L. 2001. *Morphological productivity*. Cambridge: Cambridge University Press.

Bauer L. 2005. *Theories on productivity*. In Štekauer, P. & Rochelle, L. (eds.), *Handbook of word-formation*, 315-334. Dordrecht: Springer.

Beck, D. 2023. Adjectives. In van Lier, E. (ed.), *The Oxford handbook of word classes*, 365-382. Oxford – New York: Oxford University Press.

Bell, M. J. & Schäfer, M. 2016. Modelling semantic transparency. *Morphology* 26. 157-199.

Berman, H. 1972. *The stem formation of Hittite nouns and adjectives*. Chicago: University of Chicago. (Doctoral dissertation.)

Bertram, R. & Schreuder, R. & Baayen, R. H. 2000. The balance of storage and computation in morphological processing: The role of word formation type, affixal homonymy and productivity. *Journal of Experimental Psychology: Learning, Memory and Cognition* 26(2). 489-511.

Bichlmeier, H. 2015. *Caland system and Greek*. In Giannakis, G. (ed.), *Encyclopedia of Ancient Greek language and linguistics*, 256-260. Leiden – Boston: Brill.

Blevins, J. 2016. *Word and paradigm morphology*. Oxford: Oxford University Press.

Bozzone, C. 2016. The origin of the Caland system and the typology of adjectives. *Indo-European Linguistics* 4. 15-52.

Bruening, B. 2018. The lexicalist hypothesis: Both wrong and superfluous. *Language* 94(1). 1-42.

Burani, C. & Thornton, A. M. 2003. The interplay of root, suffix and whole-word frequency in processing derived words. In Baayen, H. & Schreuder, R. (eds.), *Morphological structure in language processing*, 157-208. Berlin: De Gruyter.

Bybee, J. 1985. *Morphology: A study of the relation between meaning and form*. Amsterdam – Philadelphia: Benjamins.

Bybee, J. 1995. Regular morphology and the lexicon. *Language and Cognitive Processes* 10(5). 425-455.

CHD = Güterbock, H. G. & Hoffner, H. A. Jr. & van den Hout, Th. P. J. (eds.). 1980. *The Hittite dictionary of the Oriental Institute of the University of Chicago*. Chicago: The Oriental Institute of the University of Chicago.

Comrie, B. 1997. *La famiglia linguistica indoeuropea: Prospettive genetiche e tipologiche*. In Giacalone Ramat, A. & Ramat, P. (eds.), *Le lingue indoeuropee*, 95-122. Bologna: Il Mulino.

Cotticelli-Kurras, P. 1991. *Das hethitische Verbum 'sein'. Syntaktische Untersuchungen* (Texte der Hethiter 18). Heidelberg: Winter.

Cotticelli-Kurras, P. 1998. *Eine lexikalische Untersuchung, Annelies Kammenhuber gewidmet*. In *III. Uluslararası Hititoloji Kongresi Bildirileri: Acts of the IIIrd International Congress of Hittitology, Çorum 16-22 September 1996*, 109-118. Ankara: Uyum Ajans.

Dardano, P. 2007. *In margine al sistema di Caland: Su alcuni aggettivi primari in *-.nt- dell'anatolico*. In Groddek D. & Zorman, M. (eds.), *Tabularia Hethaeorum: Hethitologische Beiträge Silvin Košak zum 65. Geburtstag*, 221-246. Wiesbaden: Harrassowitz.

Dardano, P. 2010. *Zur anatolischen Morphosyntax: Das Suffix -(a)nt- und seine Bildungen.* In Hazirlaya, Y. & Süel, A. (eds.), *Acts of the VIIth International Congress of Hittitology, Çorum, August 25-31, 2008*, 73-188. Ankara: Çorum Valiliği.

Dardano, P. 2011. *Mehrsprachigkeit im hethitischen Reich: Die Beziehungen zwischen dem Hethitischen und dem Akkadischen*. In Boschung, D. & Riehl, C. M. (eds.), *Historische Mehrsprachigkeit: Workshop des Zentrums für Antike Kulturen des Mittelmeerraums und des Zentrums Sprachenvielfalt und Mehrsprachigkeit an der Universität Köln, 4.-5. Juli 2008*, 47-59. Aachen: Shaker Verlag.

Dell'Oro, F. 2015. *Leggi, sistemi e leghe suffissali "di Caland": Storia della questione "Caland" come problema teorico della linguistica indoeuropea*. Innsbruck: Institut für Sprachen und Literaturen der Universität.

Dixon, R. M. W. 2004. *Adjective classes in typological perspective*. In Dixon, R. M. W. & Aikhenvald, A. Y. (eds.), *Adjective classes: A cross-linguistic typology*, 2-49. Oxford: Oxford University Press.

Dressler, W. U. 2000. *Naturalness*. In Boji, G. & Lehmann, Ch. & Mugdan, J. (eds.), *Morphology* I, 288-296. Berlin – New York: de Gruyter.

Dressler W. U. & Mayerthaler, W. & Panagl, O. & Wurzel, W. U. (eds.). 1987. *Leitmotifs in natural morphology*. Amsterdam – Philadelphia: John Benjamins.

EDHIL = Kloekhorst, A. 2008. *Etymological dictionary of the Hittite inherited lexicon*. Leiden – Boston: Brill.

EHS = Kronasser, H. 1966. *Etymologie der hethitischen Sprache*. Wiesbaden: Harrassowitz.

Francia, R. 2001. La posizione degli aggettivi qualificativi nella frase ittita. In Carruba, O. & Meid, W. (eds.), *Anatolisch und Indogermanisch: Akten des Kolloquiums der Indogermanischen Gesellschaft Pavia, 22./25. September 1998*, 81-91. Innsbruck: Institut für Sprachwissenschaft.

Francia, R. 2020. Hitt. parḫuena-: "oats"? *Oriens Antiquus* 2. 131-139.

Francia, R. & Pisaniello, V. 2019. *La lingua degli Ittiti*. Milano: Hoepli.

Frotscher, M. 2013. *Das hethitische -ant- Partizip und seine indogermanischen Grundlagen: Semantik, Morphologie, Syntax*. Versona: Università degli Studi di Verona. (Doctoral dissertation.)

Frotscher, M. 2017. Review of Maier, M. G. 2013. *Hethitisch °want- und Verwan(d)tes: Untersuchungen zur Vertretung des indogermanischen Possessivsuffixes *-went- in den anatolischen Sprachen* (Dresdner Beiträge zur Hethitologie 42), Wiesbaden, Harrassowitz. *Wiener Zeitschrift für die Kunde des Morgenlandes* 107. 387-392.

Goedegebuure, P. 2018. *The packagers -ant- and -a-, and the origin of split-ergativity in Hittite (and Lycian)*. In Goldstein, D. M. & Jamison, S. W. & Vine, B. (eds.), *Proceedings of the 29th Annual UCLA Indo-European Conference*, 77-115. Bremen, Hempen.

Grestenberger, L. 2013. The Indo-Iranian cákri-type. *Journal of the American Oriental Society* 133(2). 269-93.

Grestenberger, L. 2014. *Zur Funktion des Nominalsuffixes *-i- im Vedischen und Urindogermanischen*. In Oettinger, N. & Steer, T. (eds.), *Das Nomen im Indogermanischen: Morphologie, Substantiv versus Adjektiv, Kollektivum: Akten der Abeitstagung der Indogermanischen Gesellschaft vom 14. bis 16. September 2011 in Erlangen*, 88-102. Wiesbaden: Reichert.

Grestenberger, L. 2017. *On *-i- substantivization in Vedic compounds*. In Hansen, B. S. S. & Hyllested, A. & Jørgensen, A. R. & Kroonen, G. & Larsson, J. H. & Whitehead, B. N. & Olander, T. & Søborg, T. M. (eds.), *Usque ad radices: Indo-European studies in honour of Birgit Anette Olsen*, 193-206. Copenhagen: Museum Tusculanum Press.

Gusmani, R. 1968. *Il Lessico ittito*. Napoli: Libreria Scientifica.

Gusmani, R. 1978. Ittito ḫappina- e greco ΑΠΤΩ. *Incontri Linguistici* 4(2). 242-243.

Haspelmath, M. & Sims, A. 2010. *Understanding morphology*. 2nd edn. London: Hodder Education.

HED = Puhvel, J. 1984-. *Hittite etymological dictionary*. Berlin – New York: de Gruyter.

HEG = Tischler, J. 1983-. *Hethitisches Etymologisches Glossar*. Innsbruck: Institut für Sprachwissenschaft der Universität Innsbruck.

Hill, E. 2020. Analogy in inflectional change: Modification or whole-word replacement? *Language* 96(1). e38-e58.

Höfler, S. 2022. Ein Potpurri aus 'süß' und 'schleimig': "Calandwurzeln", Wortbildung, Etymologie und Co. In Malzahn, M. & Fellner, H. A. & Illés, T.-S. (eds.), *Zurück zur Wurzel: Struktur, Funktion und Semantik der Wurzel im Indogermanischen: Akten der 15. Fachtagung der Indogermanischen Gesellschaft von 13. bis 16. September 2016 im Wien*, 71-82. Wiesbaden: Reichert.

Hoffner, H. A. Jr. & Melchert, C. H. 2008. *A grammar of the Hittite language*. Winona Lake: Eisenbrauns.

Hoffner, H. A. Jr. & Melchert C. H. 2024. *A grammar of the Hittite language*. 2nd edn. University Park, Pennsylvania: Eisenbrauns.

Hrozný, B. 1917. *Die Sprache der Hethiter*. Wiesbaden: Harrassowitz.

HW² = Friedrich J. & Kammenhuber, A. & Hoffmann, I. 1975-. *Hethitisches Wörterbuch*. Heidelberg: Winter.

Jie, J. 1994. *A complete retrograde glossary of the Hittite language*. Istanbul: Nederlands Historisch-Archaeologisch Instituut.

Juret, A. 1941. Esquisse d'une vocabulaire étymologique de la langue hittite. *Revue Hittite et Asianique* 6(42). 33-66.

KBo = *Keilschrifttexte aus Boghazköy*, 1916-. Leipzig – Berlin: Hinrichs-Gebr. Mann Verlag.

Kellogg, R. J. 1925. *Studies in Hittite and Indo-European philology.* I. *Some new Indo-European coincidences in Hittite*: Ottawa (KS): Ottawa University.

Kilani-Schoch, M. 1988. *Introduction à la morphologie naturelle*. Bern: Peter Lang.

Kimball, S. E. 2007. *Hittite ḫūmant- 'all, entire, each'*. In Nussbaum, A. (ed.), *Verba Docenti: Studies in historical and Indo-European linguistics presented to Jay H. Jasanoff by students, colleagues, and friends*, 201-212. Ann Arbor: Beech Stave.

Kloekhorst, A. 2014. *Accent in Hitttite: A study in plene spelling, consonant gradation, clitics, and metrics* (Studien zu den Boğazköy-Texten 56). Wiesbaden: Harrassowitz.

KUB = *Keilschrifturkunden aus Boghazköy*. 1921-1990. Berlin: Akademie Verlag.

Laroche, E. 1963. Comparaison du louvite et du lycien. *Bulletin de la Société de Linguistique de Paris* 58. 58-80.

Lipka, L. 1994. *Lexicalization and institutionalization*. In Asher, R. E. (ed.), *The encyclopedia of language and linguistics*, vol. 4, 2164-2167. Oxford: Pergamon.

LIV² = Rix, H. & Kümmel, M. & Zehnder T. & Lipp, R. & Schirmer, B. (eds.) 2001. *Lexikon der indogermanischen Verben: Die Wurzeln und ihren Primärstammbildungen*. 2nd edn. Wiesbaden: Reichert.

Lowe, J. J. 2014. Indo-European Caland adjectives in *-nt-* and participles in Sanskrit. *Historische Sprachforschung* 127(1). 166-195.

Lundquist, J. & Yates, A. D. 2018. *The morphology of Proto-Indo-European*. In Klein, J. & Joseph, B. & Fritz, M. (eds.), *Handbook of comparative and historical Indo-European linguistics*, 2079-2195. Berlin – Boston: de Gruyter.

Maier, M. G. 2013. *Hethitisch °want- und Verwan(d)tes: Untersuchungen zur Vertretung des indogermanischen Possessivsuffixes *-went- in den anatolischen Sprachen* (Dresdner Beiträge zur Hethitologie 42). Wiesbaden: Harrassowitz.

Matthews, P. H. 1991. *Morphology*. 2nd edn. Cambridge: Cambridge University Press.

Mayerthaler, W. 1980. *Morphologische Natürlichkeit*. Wiesbaden: Akademische Verlagsgesellschaft Athenaion.

Mayerthaler, W. 1987. *System-independent morphological naturalness*. In Dressler, W. U. & Mayerthaler, W. & Panagl, O. & Wurzel, W. U. (eds.), *Leitmotifs in natural morphology*, 25-58. Amsterdam – Philadelphia: John Benjamins.

Meier-Brügger, M. 2002. *Indogermanische Sprachwissenschaft*. 8th edn. Berlin – New York: de Gruyter.

Meissner, T. 1998. *Das "Calandsche Gesetz" und das Griechische – nach 100 Jahren*. In Meid, W. (ed.), *Sprache und Kultur der Indogermanen: Akten der X. Fachtagung der Indogermanischen Gesellschaft Innsbruck, 22.--28. September 1996*, 237-254. Innsbruck: Innsbrucker Beiträge zur Sprachwissenschaft.

Meissner, T. 2006. *S-stem nouns and adjectives in Greek: A diachronic study in word-formation*. Oxford: Oxford University Press.

Melchert, C. H. 1984. Review of J. J. S. Weitenberg, *Die hethitischen U-Stämme,* Amsterdam, 1984. *Kratylos* 29. 79-82.

Melchert, C. H. 1994. *Anatolian historical phonology*. Amsterdam – Atlanta: Rodopi.

Melchert, C. H. 2002. Covert possessive compounds in Hittite and Luvian. In Cavoto, F. (ed.) *The linguist's linguist: A collection of papers in honour of Alexis Manaster Ramer*, 297-302. München: Lincom.

Melchert, C. H. 2005. *The problem of Luvian influence on Hittite*. In Meiser, G. & Hackstein, O. (eds.), *Sprachkontakt und Sprachwandel: Akten der XI. Fachtagung der Indogermanischen Gesellschaft. 17.-23. September 2000, Halle an der Saale*, 445-460. Wiesbaden: Harrassowitz.

Melchert, C. H. 2017a. *The source(s) of Indo-European participles in *-e/ont-*. In Le Feuvre, C. & Petit, D. & Pinault G.-J. (eds.), *Verbal adjectives and participles in Indo-European languages*, 217-220. Bremen: Hempen.

Melchert, C. H. 2017b. Review of M. G. Maier, *Hethitisch °want- und Verwan(d)tes: Untersuchungen zur Vertretung des indogermanischen Possessivsuffixes *-went- in den anatolischen Sprachen* (Dresdner Beiträge zur Hethitologie 42), Wiesbaden, Harrassowitz. *Journal of the American Oriental Society* 137(1). 178-179.

Neu, E. 1968. *Interpretation der hethitischen mediopassiven Verbalformen* (Studien zu den Boğazköy-Texten 5). Wiesbaden: Harrassowitz.

Neu, E. 1970. *Ein althethitisches Gewitterritual* (Studien zu den Boğazköy-Texten 12). Wiesbaden: Harrassowitz.

Neu, E. 1974. *Der Anitta Text* (Studien zu den Boğazköy-Texten 18). Wiesbaden: Harrassowitz.

Neu, E. 1979. *Hethitisch* kurur *und* taksul *in syntaktischer Sicht*. In Carruba, O. (ed.), *Studia Mediterranea Piero Meriggi dicata I*, 407-427. Pavia: Aurora.

Neumann, G. 1962. Bemerkungen zur hethitischen Morphologie: Die Verba auf -*eš*-. *Innsbrucker Beiträge zur Kulturwissenschaft* 15. 153-157.

NIL = Wodtko, D. S. & Irslinger, B. & Schneider, C. (eds.). 2008. *Nomina im Indogermanischen Lexikon*: Heidelberg: Winter.

Nussbaum, A. J. 1976. *Caland's "law" and the Caland system*. Harvard University. (Doctoral dissertation.)

Nussbaum, A. J. 2014. *Feminine, abstract, collective, neuter plural: Some remarks on each* (expanded handout), In Neri S. & Schuhmann R. (eds.), *Studies on the collective and feminine in Indo-European from a diachronic and typological perspective*, 273-306. Leiden – Boston: Brill.

Oettinger, N. 1979. *Die Stammbildung des hethitischen Verbums*. Nürnberg: Carl.

Oettinger, N. 1981. Hethitisch *ganenant*- 'gebeugt, durstig': Ein Beitrag zur Heteroklisie. *Münchener Studien zur Sprachwissenschaft* 40. 43-153.

Oettinger, N. 1987. Bemerkungen zur anatolischen i-Motion und Genusfrage. *Zeitschrift für vergleichende Sprachforschung* 100(1). 35-43.

Oettinger, N. 1988. *Hethitisch* -want-. In Neu, E. & Rüster, C. (eds.), *Documentum Asiae Minoris Antiquae: Festschrift für Einrich Otten zum 75. Geburtstag*, 273-286. Wiesbaden: Harrassowitz.

Oettinger, N. 2017. *Der Ursprung des indogermanisches Caland-System und die *-nt-Stämme*. In Le Feuvre, C. & Petit D. & Pinault, G.-J. (eds.), *Verbal adjectives and participles in Indo-European languages: Proceedings of the Conference of the Society for Indo-European Studies (Indogermanische Gesellschaft), Paris, 24th to 26th September 2014*, 267-275. Bremen: Hempen.

Oettinger, N. 2022. *Die Herkunft von indogermaisch* "-u̯ent-". In Malzahn, M. & Fellner, H. A. & Illés, T.-S. (eds.), *Zurück zur Wurzel: Struktur, Funktion und Semantik der Wurzel im Indogermanischen. Akten der 15. Fachtagung der Indogermanischen Gesellschaft von 13. bis 16. September 2016 im Wien*, 225-234. Wiesbaden: Reichert.

Otten, H. & Souček, V. 1969. *Ein althethitisches Ritual für das Königspaar* (Studien zu den Boğazköy-Texten 8). Wiesbaden: Harrassowitz.

Panagl, O. 1982, Produktivität der Wortbildung von Corpussprachen: Möglichkeiten und Grenze der Heuristik, *Folia Linguistica* 16. 225-239.

Pozza, M. 2023. An overview of the Hittite suffix -*ena-/-ina*-: A preliminary assessment. *Rivista degli Studi Orientali* 96(2-3-4). 227-242.

Pozza, M. & Fagiolo, V. 2023. Fragments of scribal bilingualism in lexical lists: The choice of verbal nouns in -*war (-mar)* versus nouns in -*(ā)tar* and -*eššar*. *News from the lands of the Hittites – Scientific Journal for Anatolian Research* 7. 173-193. (*Proceedings of the conference Languages and Cultures in Contact in the Ancient Mediterranean, Verona 11-12 May 2023*, ed. Giusfredi, F. & Martínez Rodríguez, E. & Matessi, A. & Merlin, S. & Pisaniello, V.).

Puhvel, J. 2009. Covert Indo-European verbal roots in Anatolian, *AJNES Aramazd Armenian Journal of Near-Eastern Studies* 4(2). 77-84.

Puhvel, J. 2011. Elliptic genitives and hypostatic nouns in Hittite. *Aramazd Armenian Journal of Near-Eastern Studies* 6(2). 68-72.

Rau, J. 2009. *Indo-European nominal morphology: The decads and the Caland system*. Innsbruck: Institut für Sprachen und Literaturen der Universität.

Rieken, E. 1994. Der Wechsel -*a*-/-*i*- in der Stammbildung des hethitischen Nomens. *Historische Sprachforschung* 107. 42-53.

Rieken, E. 1999. *Untersuchungen zur nominalen Stammbildung des Hetitische*n (Studien zu den Boğazköy-Texten 44). Wiesbaden: Harrassowitz.

Rieken, E. 2005. Neues zum Ursprung der anatolischen i-Mutation. *Historische Sprachforschung* 118. 48-74.

Rieken, E. 2017. *Das hethitische Partizip: Zur Schnittstelle von Syntax und Semantics*. In Le Feuvre, C. & Petit, D. & Pinault, G.-J. (eds.), *Verbal adjectives and participles in Indo-European languages*, 391-403. Bremen: Hempen.

Rieken, E. & Sasseville, D. 2014. *Social status as a semantic category in Anatolian: The case of PIE* *-wo-. In Melchert, C. H. & Rieken, E. & Steer, T. (eds.), *Munus amicitiae Norbert Oettinger a collegis et amicis dicatum*, 302-314. Ann Arbor: Beech Stave.

Risch, E. 1974. *Die Wortbildung der homerischen Sprache*. 2nd edn. Berlin: de Gruyter.

Sandell, R. P. 2015. *Productivity in historical linguistics: Computational perspectives on word-formation in Ancient Greek and Sanskrit*. University of California. (Doctoral dissertation.)

Starke, F. 1990. *Untersuchung zur Stambildung des keilschrift-luwischen Nomens* (Studien zu den Boğazköy--Texten 31). Wiesbaden: Harrassowitz.

Stüber, K. 2002. *Die primären* s-*Stämme des Indogermanischen*. Wiesbaden: Reichert.

Szemerényi, O. 1985. *Introduzione alla linguistica indoeuropea*. Milano: Unicopli. (Translation of *Einführung in die vergleichende Sprachwissenschft*, 1970, Darmstadt: Wissenschaftliche Buchgesellschaft.)

Tronci, L. 2000. Eredità indoeuropea e innovazione nel greco omerico: L'elemento -ι° come «marca» caratterizzante di primi membri di composto. *Studi e Saggi Linguistici* 38. 275-311.

Watkins, C. 1975. *Die Vertretung der Laryngale in gewissen morphologischen Kategorien in den indogermanischen Sprachen Anatoliens*. In Rix, H. (ed.), *Flexion und Wortbildung: Akten der V. Fachtagung der Indogermanischen Gesellschaft, Regensburg, 9.-14. September 1973*, 358-378. Wiesbaden: Reichert.

Watkins, C. 1979. NAM.RA GUD UDU *in Hittite: Indo-European poetic language and the folk taxonomy of wealth*. In Neu, E. & Meid, W. (eds.), *Hethitisch und Indogermanisch: Vergleichende Studien zur historischen Grammatik und zur dialektographischen Stellung der indogermanischen Sprachgruppe Altkleinasiens*, 269-287. Innsbruck: Innsbrucker Beiträge zur Sprachwissenschaft.

Weitenberg, J. S. 1984. *Die hethitischen U-Stämme*. Amsterdam: Rodopi.

Yakubovich, I. 2006. The free-standing genitive and hypostasis in Hittite. *Journal of Near Eastern Studies* 65. 39-50.