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Pluractionality in Hittite

A new look at the suffix *-ške/a-*

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Abstract: Hittite features three derivational suffixes, i.e., *-ške/a-*, *-šša-*, and *-anna/i-*, that attach to verbs and are commonly described as expressing a number of imperfective-like functions. So far, the distribution and use of these suffixes has defied a satisfactory explanation. Whereas some scholars argue that they operate within the domain of lexical aspect, others view them as associated with the encoding of grammatical imperfective aspect. In this paper, we focus on the interpretation of *-ške/a-* and argue that a better understanding of the nature of this suffix can be achieved if one frames its description within the typology of pluractional constructions. As we show, the range of polyfunctionality of *-ške/a-* fully complies with the cross-linguistic behavior of pluractional markers. We also provide a tentative diachronic scenario that accounts for the rise of such polyfunctionality out of the original semantic core of the suffix.

Keywords: Hittite, pluractionality, verbal aspect, imperfective, aspect vs. actionality

1 Introduction

The Hittite verbal system notoriously lacks the morphological distinction between perfective and imperfective stems that is common to several ancient Indo-European (IE) languages. In this language, the overt encoding of imperfectivity is partly taken over by a number of derivational suffixes, whose interpretation, in spite of the sizable number of studies devoted in whole or in part to them, remains controversial. Among these, the interpretation of the suffix *-ške/a-* has prompted a lively debate since its first individuation. Whereas some authors view it as a full-fledged marker of imperfective aspect (cf. Cambi 2007), others instead interpret it as a marker of different actional nuances including, among other things, iterativity, habituality, and distributivity (Bechtel 1936; Dressler 1968; Hoffner and Melchert 2008: 317–323).

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In this paper, we aim to reassess previous analyses of *-ške/a-* by grounding its interpretation on recent typological insights on (lexical and grammatical) aspect and verbal number. Drawing from a survey of verbs that take the *-ške/a-* suffix in a selected corpus of Old, Middle, and New Hittite texts, we investigate the semantics of these forms, and show that the suffix is by no means limited to the encoding of imperfectivity as defined by Cambi (2007). Instead, we argue that *-ške/a-* can be better explained in terms of pluractionality, as the different functions associated with this suffix are essentially the ones covered cross-linguistically by pluractional constructions (cf. Mattiola 2019; Newman 1990). Specifically, we investigate to what extent the functions of *-ške/a-* can be arranged in a network that complies with the conceptual space of pluractional constructions elaborated by Mattiola (2017). Finally, by also taking into account comparative evidence from cognate suffixes in other IE languages, we set out to establish the original function of the Hittite suffix and explain the diachronic processes whereby the different functions developed out of its core meaning.

The paper is organized as follows. In Section 2, we provide an overview of the Hittite verbal system and we summarize the debate surrounding the encoding of aspect in this language, with a focus on the suffix *-ške/a-* and its controversial interpretation (Section 2.1). We also argue that differences in assessing the function of this suffix partly depend upon one's understanding of the distinction between lexical and grammatical aspect: we thus elaborate more on the notions of aspect and actionality in Section 2.2. Section 3 offers an introduction to the notion of pluractionality in typological perspective. In Section 4 we present our own analysis of Hittite *-ške/a-*. After an illustration of the possible functions associated with the suffix (Section 4.1), we argue that the behavior of the suffix can be captured in terms of pluractionality: we explore in detail the distribution of the individual functions and possible constraints for their occurrence (Section 4.2.1) and show that the polyfunctionality of the suffix can be described by means of a semantic map (Section 4.2.2). Finally, we take a closer look at the diachrony of *-ške/a-* in Section 4.3.4. Section 5 summarizes the conclusions of our work.

2 The role of aspect in the Hittite verbal system

When it comes to its verbal morphology, Hittite can be largely classified as a synthetic and fusional language (for an overview of the Hittite verbal system see Hoffner and Melchert 2008: chapters 10–14). Finite verbal forms are composed of a root, one or more optional derivational suffixes, and personal endings. The morphological structure of a Hittite verb can be readily exemplified by the form *zīnuškizzi* ‘he makes cross’ in (1):

(1) *zi-nu-ški-zzi*

CROSS-CAUS-IPFV-3SG.PRS

‘He is making (the ox) cross (the river)’

As the form in (1) shows, Hittite finite verbal forms are built on a root that carries the lexical meaning of the verb, in this case *zi-* ‘cross’. The root can optionally be expanded by means of derivational suffixes. The combination of the root with the derivational suffixes constitutes the verbal stem. Hittite features various derivational suffixes with different functions (Hoffner and Melchert 2008: 175–179). Some suffixes attach to adjectives, verbs, and nouns to form new verbs or to indicate valency-related operations. These include e.g., *-nu-* (causative), *-aḫ-* (factive), *-āi-* (denominative), *-ēšš-* (fientive), and *-ē-* (stative/fientive). In addition to these, Hittite also features three so-called “imperfective” suffixes, i.e., *-ške/a-*, *-šša-*, and *-anna/i-* (see below and Section 2.1). These differ from the others in that they express aspectual meanings connected with imperfectivity, and they can only attach to verbal stems, including already derived ones, as shown in (1), in which the suffix *-ške/a-* is stacked upon causative *-nu-*. Finally, inflectional endings attach to the stem and express the following grammatical categories: tense (present, preterit), person (first, second, third), number (singular, plural), mood (indicative, imperative), and voice (active, middle).

Hittite is remarkable among ancient IE languages in that it features a monothematic verbal system, in which all inflected forms of the verb are built on a single stem. This means that in Hittite (and more generally in Anatolian) grammatical aspect is not systematically encoded on a morphological level through the distinction between present (imperfective) and aorist (perfective) stems that is common to other ancient IE languages. Such an aspectual system is best exemplified by Ancient Greek, in which the imperfective present stem, e.g., *λείπ-ō* ‘I leave (PRS)’, is opposed to the perfective aorist stem, e.g., *έ-λίπ-ον* ‘I left (AOR)’ (on the details of the Ancient Greek aspectual system see e.g., Hewson 2014; Napoli 2006; Willi 2018 and references therein).¹

¹ There is no consensus on whether the monothematic verbal system of Anatolian represents the original state of affairs of the proto-language, with the other IE languages innovating in this respect, or whether aspectual distinctions were lost in Anatolian owing to a generalized restructuring of the verbal system (see e.g., Jasanoff 2003 and Coticelli Kurras forthcoming with references; see also Lundquist and Yates 2018: 2158–2159). According to Melchert (1997), isolated stem alternations of the type *karš-* vs. *karšiye/a-* ‘cut’ constitute relic of an older thematic present vs. root aorist distinction, thus suggesting that the two were already established before the split of Anatolian, but the evidence remains rather scanty. Since the discussion of these issues and the reconstruction of the PIE aspectual system lie beyond the scope of the present paper, we do not address them any further here.

The consequence of having such a monothematic verbal system is that “any basic verbal stem in Hittite may be read as perfective or imperfective, provided that its inherent meaning and the context are appropriate” (Hoffner and Melchert 2008: 317). Consider the behavior of the simplex verb *uet*, the preterit of *uwa-* ‘come’, which according to the context can receive a perfective interpretation, as in (2), or an imperfective one, as in (3). To put it differently, aspectual distinctions in Hittite can be encoded by *conversion*, that is, different aspectual interpretations are not necessarily paired with a specific morphological encoding (cf. Croft 2012: 17, 84–92).

- (2) PERFECTIVE
namma=aš *INA* ^{HURSAG}*Zukkuki* *EGIR-pa* ***uet***
 then=3SG.NOM to mountain.Z. back come:PST.3SG
 ‘Then he came back to Mt. Zukkuki’ [KBo 5.6 i 1]
- (3) IMPERFECTIVE
nu *kuitman* ^{m.GIS}*GIDRU-LÚ-iš* *IŠTU* *KUR* ^{URU}*Mizri* *EGIR-pa*
 CONN while H.:NOM from land Egypt back
uet
 come:PST.3SG
 ‘While Hattusaziti was coming back from the land of Egypt’ [KBo 5.6 iii 26]

The lack of a dedicated inflectional exponent for the category of aspect has resulted in (lexical and grammatical) aspect being a relatively understudied topic in Hittite linguistics as compared to the wealth of studies dedicated to the aspectual system of other ancient IE languages (cf. Coticelli Kurras 2015; Inglese forthcoming). Nevertheless, scholars have pointed out how in Hittite different morphosyntactic devices can contribute to the expression of aspectual meanings. In particular, aspectual values can be conveyed by verbal derivational suffixes. Leaving aside those actional suffixes that create stative and change-of-state verbs (i.e., *-ē-* and *-ēšš-*, cf. Hoffner and Melchert 2008: 177–178), the discussion has mostly focused on the three suffixes *-ške/a-*, *-šša-*, and *-anna/i-*, which “synchronically [...] function effectively as suppletive allomorphs of a single morpheme” and are broadly associated with the domain of imperfectivity (see Melchert 1998: 414; see further Hoffner and Melchert 2002 and extensive discussion in Daves 2012 and Pisaniello 2016).²

² Other aspectual meanings, which we do not further discuss in this paper, are expressed by periphrastic constructions with *hark-* ‘have’ and *eš-* ‘be’ plus the *-ant-* participle, which under certain circumstances have been shown to indicate anteriority, i.e., perfect semantics (cf. Coticelli Kurras 2015; Inglese and Luraghi 2020), and by the use of sentence particles and preverbs, such as the use of *=kan* to highlight telicity/perfectivity (Coticelli Kurras 2014; Josephson 2008, 2013).

To conclude this section, in order to ease the comparison between earlier analyses of the suffix (Section 2.1) and the definitions that we adopt for the purpose of this study (see Section 3 and 4), we report in (4) the various functions of the suffix *-ške/a-* and their definitions according to Hoffner and Melchert (2002, 2008).

- (4) A. PROGRESSIVE/DESCRIPTIVE: “An action is described as ongoing (often as setting the scene for another action-so-called ‘backgrounding’)”
 B. DURATIVE “An activity may be understood as continuing over an extended period of time.”
 C. ITERATIVE: “An action is described as repeated, either continually (in immediate succession) or on separate occasions.”
 D. HABITUAL/GNOMIC: “The marked *-ške/a-* stem or equivalents may also express habitual, customary, or characteristic behavior.”
 E. DISTRIBUTIVE: “An action may be performed once each on a series of objects (the action is thus from a certain point of view iterated).”
 F. INCEPTIVE: “In the case of verbs that refer to activities or accomplishments, the *-ške/a-* form or equivalent may focus on the beginning of the activity.”³

2.1 The suffix *-ške/a-*: previous research and open issues

The existence in Hittite of a suffix *-ške/a-* has been pointed out since the beginning of Hittitology (cf. Hronzý 1917; see Oettinger 1979: 315–29 for the morphology).⁴ Ever since its individuation, the puzzling behavior of the suffix has fueled an intensive scholarly debate (see Cambi 2007 for a comprehensive overview of previous scholarship). Several are the issues that the study of this suffix has raised: what are the functions that the suffix performs? Can one single out a core meaning of the suffix as opposed to more secondary and/or marginal ones? Does the suffix operate within the domain of lexical or grammatical aspect?

Before turning to discuss different approaches to the study of *-ške/a-*, we summarize some salient aspects of its distribution. In the first place, it must be stressed that the suffix is optional, since unsuffixed verbal forms can freely occur in contexts in which they have the exact same meaning as *-ške/a-* forms (cf. Daues

³ In this paper, we adopt the term *inceptive* to refer to verbal forms that express the beginning of an event, in order to avoid confusion with the term *inchoative*, since the latter is also widely used with reference to intransitive change-of-state predicates involved in valency alternation of the anti-causative type (see e.g., Haspelmath 1993).

⁴ At least since Melchert (1998), it has become common practice to refer to the suffix as “imper-fective” in reference works (cf. Hoffner and Melchert 2008; Kloekhorst 2008).

2009; Dressler 1968: 84–85).⁵ Since optionality is a key feature of derivation as opposed to inflection, the optional use of the suffix *-ške/a-* easily points to its derivational nature. However, there are contexts in which the occurrence of the suffix is virtually obligatory. These mostly feature

distributive expressions such as UD-*at* UD-*at* ‘day after day’, ITU-*mi* ITU-*mi* ‘month after month’, GE₆-*ti* GE₆-*ti* ‘night after night’, MU-*ti* MU-*ti* ‘year by year’, *lammar lammar* ‘moment by moment’, *uddanī uddanī* ‘word by word’ [...] with 1-*an* 1-*an* ‘one by one’. (Hoffner and Melchert 2008: 320)

Conversely, according to Bechtel (1936: 62) and Cambi (2007: 121–122) *-ške/a-* is incompatible with adverbs meaning ‘X times’. This view is however partly unwarranted: whereas it is clear that the majority of adverbials of the type ‘X times’ occur with simple verbs, a few *-ške/a-* forms do occur in such contexts (see e.g., example (21a) below). Another constraint concerns the lexical aspect of the base verb, inasmuch as the suffix is unavailable to stative verbs (cf. Bechtel 1936; this is interpreted as a case of *neutralization* by Cambi 2007). Finally, suffixed forms of the supine (a non-finite verbal form) are systematically employed in an ingressive construction ‘begin to X’ in combination with the verbs *dai-* ‘put’ and *tiye/a-* ‘step’ (Hoffner and Melchert 2008: 322, 338).

These facts are well known, and they have been used by various scholars in support of different views about the nature of *-ške/a-*. As already pointed out by Cambi (2007), approaches to *-ške/a-* can be roughly divided into three groups: those that view the suffix as marker of actionality, those that view it as mostly aspectual, and those that treat it as belonging to both domains.

The first school of thought regards the suffix *-ške/a-* as affecting the lexical semantics of verbs and as operating on their lexical aspects. Advocates of this view deny a connection with imperfectivity and instead propose that the suffix is predominantly employed to indicate iterativity or distributivity. Individual accounts differ in their details, as is shown by the somewhat diverse terminology adopted by different scholars: ‘iterative-durative’ (Gusmani 1965: 79), ‘iterative’ (Pedersen 1938: 132; Sommer and Ehelolf 1924: 21–22), ‘distributive’ (Neumann 1967: 24), ‘iterative-durative-distributive’ (Friedrich 1960; Rosenkranz 1966), ‘durative-distributive’ (Kammenhuber 1969: 217), ‘iterative-durative-intensive’ (Kronasser 1966). As we discuss below, Dressler’s (1968) account can also be grouped together with actional approaches.

⁵ Philological evidence for the optionality of *-ške/a-* also comes from the transmission of individual texts, where one finds that *-ške/a-* forms may correspond to simple forms in different copies of the same text. Compare as an example *piddānzi* in KBo 19.66+ iv 17 with *piddāeškanzi* in KBo 5.13 iv 9, both copies of the text CTH 68.

This approach, that has recently been labeled the *actional hypothesis* (cf. Cambi 2007), has been argued against by several scholars who instead suggest treating the suffix as a full-fledged marker of imperfective aspect. Under this second view, that has been called *aspectual hypothesis*, the suffix *-ške/a-* is the marked member of a privative opposition, since it can only encode imperfectivity as opposed to base forms, which are neutral with respect to their aspectual interpretation and can have either a perfective or an imperfective reading (Bechtel 1936; Cambi 2007; Puhvel 1991).

The two approaches are not entirely incompatible, and a more nuanced view, called *hybrid hypothesis* by Cambi (2007), has been advocated whereby *-ške/a-* forms operate at the interface between lexical and grammatical aspect, and are associated both with imperfective (progressive, continuous, habitual) and perfective (inceptive) aspect (Hoffner and Melchert 2002, 2008; Melchert 1998).

Among actional approaches, Dressler's (1968) contribution deserves a special mention, as this work stands out for its particularly innovative proposal. Dressler's approach can be considered actional in that he essentially views *-ške/a-* as affecting the verbs' lexical semantics. However, with respect to other actional approaches, Dressler shifts away the focus from the aspect vs. actionality distinction proper, and rather suggests that the suffix can be interpreted as instantiating verbal plurality. Dressler's account is extremely insightful, in that he proposes a new comprehensive model that easily encompasses all detected usages of the suffix in a principled way. Unfortunately, this view has found little echo in recent literature.⁶ We believe that this line of reasoning deserves more attention, as we discuss extensively in Section 4.

In Table 1 we summarize some of the different existing descriptions of *-ške/a-*. The purpose of this table is not to provide a comprehensive comparison between earlier approaches to *-ške/a-*, but merely to highlight that while virtually all authors agree in assigning certain functions to the suffix, e.g., durative and iterative, the status of other functions, e.g., inceptive, remains debatable.

2.2 Approaches to aspect

In Section 2.1, we have seen that most of the scholarly debate concerning *-ške/a-* has revolved around the issue of whether the suffix operates as a marker of either lexical or grammatical aspect. However, these two notions are on turn highly complex and controversial, and different authors adopt at times inconsistent definitions of these in their assessment of the usage of *-ške/a-*. This results in a

⁶ A noteworthy exception is Lundquist and Yates (2018) observation that the Hittite suffix functions as “iterative, habitual, and pluractional”, which is to our knowledge the only mention of pluractionality with reference to *-ške/a-*.

Table 1: Functions of the suffix *-ške/a-*.

Bechtel (1936)	Dressler (1968)	Hoffner and Melchert (2002, 2008)
Durative	Durative	Durative
Customary action	Usitative	Habitual/Gnomic
Progressive/descriptive	–	Progressive/descriptive
Iterative	Iterative	Iterative
Distributive	Distributive	Distributive
Intensive	Intensive	–
–	–	Inceptive

great deal of confusion across different contributions, since it is not always clear that the authors employ terms such as ‘aspect’, ‘imperfective’, ‘iterative’ to refer to the same linguistic notions. An interesting case in point is the status of the notion of ‘iterative’. As a matter of fact, proponents of the *actional hypothesis* argue that *-ške/a-* operates at the level of actionality precisely because it encodes iterativity, which in their view is a typical *Aktionsart*. This assumption is however not trivial, since in other frameworks iterativity is viewed as belonging to the domain of aspect instead (see e.g., Tatevosov 2002: 333). This shows that far from being theory neutral, one’s understanding of the function of *-ške/a-* is heavily dependent upon the underlying theory of aspect.

In the remainder of this section, we briefly survey current approaches to aspect and actionality, in order to ground our own analysis on an explicit and well-defined terminology.

As is well known, aspect constitutes one of the mostly debated components of verbal semantics, and it has sparked the interest of scholars from across all different linguistic traditions.⁷ As pointed out by Sasse (2002), approaches to aspect can be sorted out into two categories: unidimensional and bidimensional. Unidimensional approaches “proceed from the assumption that there is only [...] a single conceptual dimension in terms of which aspectual phenomena [...] can be analyzed and described” (Sasse 2002: 202). By contrast, bidimensional approaches postulate a clear-cut distinction between two dimensions, which are commonly referred to as lexical aspect (also *actionality* or *Aktionsart*) and grammatical aspect respectively (see e.g., Bertinetto 1986; Bertinetto and Delfitto 2000).

Lexical aspect, or actionality, refers to the inherent temporal structure of events (see also Ježek 2016: 121–126). In his seminal work, Vendler (1957) first established the classification of verbs into four classes based on their lexical aspect

⁷ See Bertinetto (1986), Bybee et al. (1994), Sasse (2002), Tatevosov (2002), Croft (2012), and Filip (2012) for comprehensive critical reviews of earlier scholarship on aspect.

Table 2: Actional classes according to Vendler (1957).

	Durative	Dynamic	Homogenous	Example
State	+	–	+	<i>Mary is sad</i>
Activity	+	+	+	<i>The horse runs</i>
Achievement	–	+	–	<i>The vase shattered</i>
Accomplishment	+	+	–	<i>John built the house</i>

(Table 2). Vendler’s classification is based on the features of duration, dynamicity, and homogeneity. This basic taxonomy has been further refined and new sub-types have been proposed, including ‘semelfactives’, e.g., *cough*, and ‘degree verbs’, e.g., *ripen* (see Bertinetto and Civardi 2015; Botne 2003; Croft 2012).

Grammatical aspect, instead, refers to the “ways of viewing the internal temporal constituency of a situation” (Comrie 1976: 3). Therefore, whereas lexical aspect is lexically stored in the verbal meaning, grammatical aspect is in principle independent from verbal semantics, and is a grammatical category that may receive overt morphosyntactic marking in the world’s languages. The most basic aspectual distinction is that between perfectivity and imperfectivity. The former can be broadly conceived as an external view on an event as a whole, whereas the latter implies that the action is viewed from within (cf. Comrie 1976). Readings typically associated with imperfectivity include e.g., habitual and continuative (cf. Bybee et al. 1994).

Bidimensional approaches are thus based on the distinction between lexical and grammatical aspect and view the two as being fully independent from one another. The bidimensional approach has prominently featured in the discussion of aspect in ancient IE languages (see Inglese forthcoming) and, as the various positions summarized in Section 2.1 show, it also underlies most of the debate on the interpretation of Hittite *-ške/a-*. It is not our goal here to challenge the status of bidimensional approaches in general. However, one should keep in mind that bidimensional approaches set out from a number of non-trivial assumptions, chiefly the more or less tacit assumption that there exists a strict distinction between the domains of lexicon and grammar. Notably, the need of such sharp grammar vs. lexicon distinction has been convincingly challenged by frameworks such as Construction Grammar, which propose a gradual continuum from the ‘lexical’ to the ‘grammatical’ pole (cf. Croft 2001; Goldberg 1995). It follows that, in Construction Grammar, a more nuanced understanding of the divide between ‘lexical’ and ‘grammatical’ aspect is required, whereby aspectual notions commonly seen as belonging to either of the two are placed in a single conceptual

domain. In this respect, Construction Grammar pursues an essentially unidimensional approach to aspect.⁸

In the remainder of this paper, we follow Dressler (1968) and pursue a different approach to the description of the behavior of *-ške/a-*. As we argue, there is little point in maintaining a distinction between those functions of *-ške/a-* that are more drawn to either lexical or grammatical aspect, and we propose that all functions can be accounted for in terms of *pluractionality* instead. Under this approach, typical aspectual features such as “continuative” are conceived as belonging to the same conceptual domain as more actional-like ones, such as “iterativity”. In this respect, even though setting out from a different angle, the perspective that we adopt here goes in the direction of Croft’s (2012) unidimensional approach to aspect.

3 Pluractionality: a cross-linguistic perspective

The notion of verbal plurality is relatively recent in the history of linguistic research (see Mattiola 2019: 4–12 for a thorough discussion of earlier scholarship on the topic). In his pioneering work, Dressler (1968), drawing from the comparison of 40 unrelated languages, including Hittite, was among the first scholars to introduce the concept of *verbal plurality*, and to single out the functions typically associated with markers of verbal plurality.

It was only a decade later that the term *pluractionality* was coined by Newman (1980) for the description of Chadic languages. As Newman himself phrases it, pluractionality can be characterized as follows: “the essential semantic characteristic of such verbs [i.e., pluractional verbs] is almost always plurality or multiplicity of the verb’s action” (Newman 1990: 53).

Discussion on the topic has been recently revived by Mattiola (2017, 2019), who provides the first large cross-linguistic investigation of pluractional markers. Mattiola (2019: 164) offers the following definition of the comparative concept of *pluractionality*: “[p]luractionality is defined by a morphological

⁸ Croft (2012) offers an elaborate account of aspect within the framework Construction Grammar and couched in the tenets of cognitive linguistics. Croft combines insights from uni- and bi-dimensional approaches to aspect, and suggests viewing aspect as a cognitive construal operation. In his view, speakers construe the aspectual profile of events combining the verbs’ lexical semantics with the linguistic constructions which they occur in. Building upon Vendler’s classification, Croft identifies at least 11 aspectual construal types, and shows that shifts in a verb’s aspectual construal follow the general constraints on construal operations and are based on cognitive operations such as metonymy and structural schematization. For an application of Croft’s model to Hittite see the discussion in Inglese (forthcoming).

modification of the verb (or a pair of semantically related verbs) that primarily conveys a plurality of situations that involves a repetition through time, space and/or participants.”

Based on a thorough investigation of pluractionality in a variety (and convenience) sample of 246 languages, Mattioli shows that in the languages of the world pluractional markers (PMs) can express a broad range of functions. These can be roughly distinguished into core and additional functions.⁹

Core functions are those functions that specifically characterize PMs as opposed to other morphosyntactic devices (Mattioli 2019: 21). These include the functions listed under (5), along with their definition.

(5) Core functions of PMs

- A. ITERATIVE: “the case in which the situation occurs multiple times, but the repetitions are limited to a single and the same occasion, that is, the situation is repeated more than once within a time frame that is relatively short to be understood as a single occasion. Therefore, the repetitions occur sequentially, one after the other.” (Mattioli 2019: 23)
- B. FREQUENTATIVE: “the case in which the repetitions of a specific situation are performed over multiple occasions, that is, the situation is repeated, but the time that occurs between one repetition and the other is sufficiently long to be understood as different occasions.” (Mattioli 2019: 24)
- C. SPATIAL DISTRIBUTIVE: “[a] repeated situation [...] distributed over different places.” (Mattioli 2019: 25)
- D. PARTICIPANT PLURALITY: “the type of pluractionality that encodes an occasion in which there is a co-presence of plurality of situations and a plurality of entities. In this case, the plurality of situations will be distributed over different participants.” (Mattioli 2019: 26)

Additional functions are those that are frequently associated with PMs, but that are not exclusive to them, as they can also be indicated by other morphosyntactic means (Mattioli 2019: 21). Crucially, these additional functions include a number of functions that traditionally belong to the domain of aspectual meanings proper, such as *continuative* and *habitual*. Additional functions along with their definitions are listed under (6):

⁹ For reasons of space, in what follows we do not provide examples for the functions listed in (5) and (6). The reader is referred to Mattioli (2019) for extensive exemplification. The functions that are relevant for the description of Hittite *-ške/a-* will be more clearly exemplified with Hittite data in Section 4.

(6) Additional functions of PMs

- A. **EVENT-INTERNAL PLURAL**: “a situation which is internally plural because it is composed of several repetitive sub-situations that are reciprocally intertwined (not discrete) and, thus, difficult to distinguish from each other” (Mattiola 2019: 33)
- B. **CONTINUATIVE**: “a single situation that is prolonged during a period of time” (Mattiola 2019: 34)
- C. **HABITUAL**: “it indicates a situation that is repeated customarily, i.e., that is typical of a period of time. [...] In other words, this value means that a situation is repeated; however, its fundamental trait is not the mere repetition over several occasions (like frequentativity), but the typicality of that situation in a more or less precise time frame.” (Mattiola 2019: 31–32)
- D. **GENERIC IMPERFECTIVE**: “a situation that occurs always, and it can be a property or a quality of an entity or a gnomic truth, that is, it is part of the encyclopedic shared knowledge.” (Mattiola 2019: 35)
- E. **INTENSIVE**: “a situation done with a more effort or whose result is augmented with respect to the normal happening of the same situation.” (Mattiola 2019: 36)
- F. **COMPLETE**: “a situation that is performed completely, in its entirety.” (Mattiola 2019: 37)
- G. **EMPHASIS**: “a situation performed with particular emphasis or affectedness” (Mattiola 2019: 38)
- H. **RECIPROCAL**: “a situation that is done by at least two different participants reciprocally” (Mattiola 2019: 39)

According to Mattiola, the polyfunctionality of PMs can effectively be described through the semantic map model (cf. Croft 2001; Georgakopoulos and Polis 2018; Haspelmath 2003). On the basis of a large-scale typological investigation of PMs in the world’s languages, Mattiola builds up a conceptual space of pluractional constructions (Figure 1) onto which the patterns of polyfunctionality of language-specific PMs can be plotted.¹⁰ The conceptual space is built according to the standards of ‘first generation’ or ‘classical’ semantic maps (cf. Auwera 2013). The use of the semantic

¹⁰ The conceptual space in Figure 1 features two functions that we did not discuss in (5) and (6), i.e., singulational and progressive. The reason to do so is linked to the different status these two functions have in the domain of pluractionality, as extensively discussed in Mattiola (2019: 28–30, 44–45, 60). Notably, such a peculiar status is graphically highlighted by means of dotted and dashed lines.

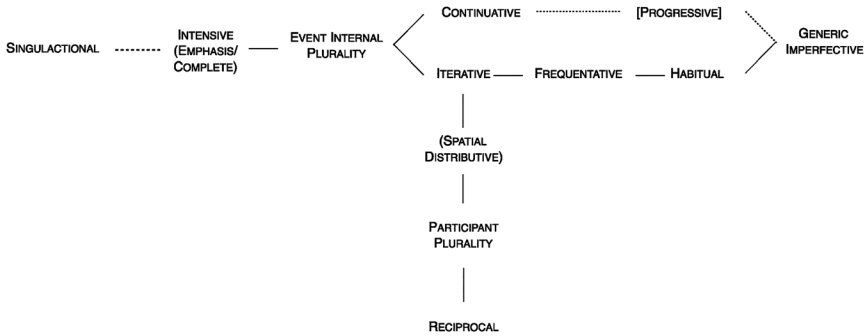


Figure 1: The conceptual space of pluractional constructions (adapted from Mattiola 2017).

map model has the advantage that it allows for the consistent treatment of apparently widely diverse functions within a single framework. Specifically, within this model, there is no need to set up a sharp binary distinction between grammatical and lexical aspect, as both aspectual and actional values are conceived as belonging to the same functional domain (cf. Section 2.2). Mattiola (2017: 129–134) also provides an elaborate account as to how the different functions in Figure 1 relate to one another in terms of functional similarity, and what semantic links there exist between the individual nodes on the map. Even if he does not explicitly mention it, some of these links can also be thought of as providing the diachronic explanation for the extension of a PM from one node on the map to the other (see further Section 4.3).

4 A new approach to Hittite *-ške/a-*

Even a cursory look at the functions of Hittite *-ške/a-* reported in (4) reveals striking similarities with the range of meanings typically associated with PMs illustrated in (5) and (6) above. In this section, we build on Dressler’s (1968) proposal that Hittite *-ške/a-* functions as a marker of verbal plurality and evaluate to what extent the suffix can be described as a full-fledged PM and whether it complies with the conceptual space of pluractionality set up by Mattiola (2017, 2019).

Data for this study consists of a manual collection of fully preserved sentences featuring *-ške/a-* forms from original Old (OH), Middle (MH), and New (NH) texts.¹¹

¹¹ Scholars commonly identify three distinct chronological stages of Hittite, i.e., Old Hittite (OH), Middle Hittite (MH), and New Hittite (NH). Besides being attested on originals, i.e., on manuscripts contemporary to their compositions, Hittite texts dating from the older phases can also be recorded in later copies. Unfortunately, copies are not always reliable as sources of linguistic material. For this reason, we include in our corpus original texts only. See i.e. Goedegebuure (2014) for an overview on

Table 3: Overview of the data.

Dating	Types	Tokens
OH	25	58
MH	47	143
NH	63	205
Total	103	406

Overall, we analyzed 103 verbal lemmata (some of which are attested in more than one language stage) for a total of 406 tokens, as shown in Table 3.¹²

As already observed by Cambi (2007), there appears to be little or no inner-Hittite diachronic variation in the use of the suffix, and this is confirmed by the data from our corpus, as the suffix shows roughly the same distribution across different functions at any language stage. The only significant development is the rise of supine constructions in NH, which in turn leads to a skewed distribution of the inceptive function in NH texts (see Section 4.1).

We classified each occurrence according to the functions of PMs outlined in Section 3. Deciding upon the reading of individual occurrences is admittedly a difficult task, partly because of the inherent polyfunctional nature of the suffix, and partly because of the difficulties of the textual sources.¹³ The classification of individual occurrences rests upon a careful reading of each textual passage. We also compare the behavior of the suffix with corresponding non-derived forms, in order to detect differences in meaning, and we take into account the collocations with temporal adverbs of various sorts (for this methodology see already Sommer and Ehelolf 1924; Bechtel 1936; Bertinetto and Cambi 2006; Cambi 2007). The full

the paleographic and linguistic criteria adopted in the dating of Hittite texts. A full list of the occurrences of *-ške/a-* verbs that we analyzed with their textual sources can be found in the Appendix.

12 We are well aware that these numbers do not cover the entirety of the Hittite corpus, especially as far as the NH sub-corpus is concerned. Nevertheless, we think that the amount of the occurrences analyzed is sufficiently representative of the phenomenon under analysis. Note also that the case studies presented in Mattiola (2019) are based on a comparable size of occurrences (e.g., Akawaio, 220 occurrences of the PM *-pödi*).

13 Needless to say, the analysis presented in this paper inevitably suffers from the well-known limits of working with a ‘corpus language’, i.e., a language that is “no longer anybody’s native language[s] and what we can know of it as [...] a living language is to be traced in the written material still at our disposal” (Cuzzolin and Haverling 2010: 25). Consequently, we can only reach a partial and fragmentary picture (cf. Joseph and Janda 2003: 15–19), and the interpretation of the data is often biased by the linguists’ insights. Keeping these *caveats* in minds, we analyzed each occurrence to the best of our abilities, but were still left with passages whose interpretation remained too uncertain. We left such occurrences out of our analysis.

list of passages analyzed along with their proposed classification can be found in the Appendix.

4.1 Functions of *-ške/a-* as a PM

In this section, we survey the functions of *-ške/a-* that are attested in our corpus and classify them according to the typology of PMs laid out in Section 3.

The first function is the *continuative*, as illustrated in (7).

(7) CONTINUATIVE

<i>takku</i>	LÚ- <i>aš</i>	GU ₄ =ŠU	ÍD- <i>an</i>	<i>zī-nu-ški-zzi</i>
if	man:NOM	ox=3SG.POSS	river:ACC	CROSS-CAUS-IPFV-PRS.3SG
<i>tamaiš=an</i>		šu[<i>wezzi</i>]		
other:NOM=3SG.ACC		push:PRS.3SG		

‘If a man is making his ox cross a river, and another man pushes him off (the ox’s tail)’ [KBo 6.2 ii 30, OH]

In (7), the suffixed verbal form *zīnuškizzi* ‘is making cross’ indicates an ongoing event as seen in its development. The continuative function roughly corresponds to the classic imperfective function according to advocates of the aspectual hypothesis. From a discourse perspective, it is often the case that *-ške/a-* forms “provide a background to the following action” (Josephson 2008: 137). Such a backgrounding function also fits well with the occurrence of several suffixed verbs in a row in narrative texts, as well as in relative clauses (cf. Daues 2009) and in subordinate clauses introduced by *kuitman* ‘while’, as in (8) (cf. Daues 2010; on the semantics of *kuitman* see Inglese 2016: 83), and is more generally compatible with a well-known backgrounding value of imperfective verbal forms (cf. Comrie 1976: 3; see further Caudal 2012 and Carruthers 2012 for extensive references).

(8) [(*nu* ***kuitman*** ^{URU}*Almi*)]*nan* ***wete-ski-t***

CONN	while	A.:ACC	build-IPFV-PST.3SG
------	-------	--------	--------------------

‘And while he was building the town of Almina (he sent Urawanni and Kuwalanzaniti, chief of the shepherds, off to assault the region of Kasula)’ [KUB 31.7 i 3, NH/NS]

From the perspective of aspectual construal, the event denoted by continuative *-ške/a-* verbs is construed as an activity, i.e., as a “durative, unbounded process” (cf. Croft 2012: 60). Depending on the lexical semantics of the predicate, one can

further distinguish between those activities that are incremental, i.e., directed activities, such as *warš-* ‘harvest’ > *warškanzi* ‘they are harvesting (the crops)’, and those that do not depict an incremental process, i.e., undirected activities, such as *šanḥ-* ‘search’ > *šanḥiškit* ‘he was looking (for your death)’.

The second function is the frequentative one. In this case, the suffixed verb indicates an event that takes place on several occasions on a long time frame, as opposed to the simple verbal form that indicates a single event. This use of the suffix is exemplified in (9), in which a frequentative reading is strongly supported by the occurrence of the distributive adverbial expression *MU-ti MU-ti* ‘year after year’:

(9) FREQUENTATIVE

<i>namma</i>	ÉRIN.MEŠ- <i>an</i>	<i>MU-ti</i>	<i>MU-ti</i>	<i>pi-ška-nzi</i>
then	troop:ACC	year:DAT	year:DAT	give-IPFV-PRS.3SG

‘And they will keep providing troops year after year’

[KUB 23.72+ obv. 18, MH]

The frequentative use of *-ške/a-* also includes those cases in which the verbal form is paired with the inhibitive negation *lē*, and the whole construction refers to the interruption of an otherwise iterated event ‘stop ... -ing’ (Hoffner and Melchert 2008: 319–320). This use is exemplified in (10):

(10) <i>n=ašta</i>	<i>ŪL</i>	<i>laḥlahḥi-ški-ši</i>
CONN=PTC	NEG	worry-IPFV-PRS.2SG

‘(My dear brother, keep sending me your greetings) and stop worrying’

[HKM 36 left ed. 2, MH]

Iteratives are similar to frequentatives, but they differ in that the former refers to events that take place multiple times over a short time frame. This usage is exemplified in (11), where the form *ḥukkiškizzi* ‘invokes’ depicts a situation in which the ‘physician’ repeats the invocations several times in a single occasion.

(11) ITERATIVE

<i>nu</i>	^{LÜ} A.ZU	<i>ḥukki-ški-zzi</i>
CONN	physician	invoke-IPFV-PRS.3SG

‘(Then gold-spear-man holds a plated spear, and a physician holds a sistrum. They march together), and the ‘physician’ repeats the invocations’

[IBoT 1.36 ii 46, MH]

(12) HABITUAL

<i>karū</i>	1	MA.NA	KÛ.BABBAR	<i>pi-šk-er</i>	<i>kinuna</i>
formerly	1	mine	silver	give-IPFV-PST.3PL	now
20 GÍN	KÛ.BABBAR	<i>pāi</i>			
20 shekel	silver	give:PRS.3SG			

‘Before they used to give 1 mine of silver, now he gives 20 shekels of silver’

[KBo 6.2 i 10, OH]

Another function that is connected with the notion of repetition of the same event is habituality. What characterizes habituals as opposed to both iteratives and frequentatives is that with habituals the repetition is construed as taking place in a time frame that is typical for the event. As an example of the habitual reading of *-ške/a-*, one may consider the form *pišker* ‘they used to give’ in (12). Notably, in (12) the habitual reading is fully compatible with the occurrence of *karū* ‘formerly’, which indicates that the event typically took place in the past as opposed to the present time, as signaled by *kinuna* ‘now’ (cf. Bertinetto and Cambi 2006).

So far, we have discussed those functions of *-ške/a-* that involve a repetition of the event denoted by the base verb. We now turn to a different function, in which the plurality of the participants involved to the event, rather than the iteration of the event itself, is focused upon. Examples of *-ške/a-* forms occurring in contexts that involve a plurality of participants are given in (13).

(13) PLURALITY OF PARTICIPANTS

a. Plurality of objects

<i>nu</i>	DUMU.MEŠ=ŠU	<i>andan</i>	<i>zikiet</i>
CONN	son(PL)=3SG.POSS	inside	put-IPFV-3SG.PST

‘(She coated baskets with oil) and she placed her sons (one after the other) therein’

[KBo 22.2 obv. 3, OH]

b. Plurality of S subjects (Agent)

<i>mān</i>	LUGAL-waš	<i>peran</i>	<i>šie-ška-nzi</i>
when	king:GEN	in.front.of	shoot-IPFV-PRS.3PL

‘And when they shoot with their bows at the presence of the king (whoever wins, they give him wine to drink’

[KBo 3.34 ii 33, OH/NS]

c. Plurality of S subjects (Patient)

<i>nu=wa</i>	<i>kinun=ma</i>	<i>ammuk</i>	<i>peran</i>	<i>akki-ški-ttari</i>
CONN=QUOT	now=PTC	1SG.DAT	in.front.of	die-IPFV-PRS.3SG.MID

‘But now under my kingdom (lit. in front of me) people die (lit. it dies)’

[KUB 14.10+ i 12, NH]

As the examples in (13) show, the participants whose plurality is highlighted by *-ške/a-* can occur in different syntactic positions. Mattiola (2017: 124) remarks that “the argument that is pluralized [...] tends to be the transitive object and the intransitive subject”. This tendency is fully confirmed by the Hittite data, where most of the instances of plurality of participants concern the direct object, as in (13a). Plurality of intransitive Patient subjects is also well attested, as shown in (13c). By contrast, in our corpus we found only one instance of intransitive subject with an Agent semantic role, as shown in (13b). In line with Mattiola’s prediction, there are no cases of pluralized participants in transitive subject position.

In absence of native speakers’ intuition, it is admittedly not always easy to single out the motivations for the use of *-ške/a-* as a marker of plurality of participants. As a matter of fact, *-ške/a-* forms only occur with a subset of verbs that take plural intransitive subjects/transitive objects, and the latter are also perfectly compatible with simplex verbal forms. It is thus clear that plural number of the S and O participants cannot be the only triggering factor for the occurrence of *-ške/a-*. As a tentative explanation, we would like to suggest that the difference between simple and *-ške/a-* forms is one of construal of the structural schematization type, akin to the *mass* vs. *count* distinction in the nominal domain (Croft and Cruse 2004: 45, 63–64). Specifically, it might be the case that base verbs construe the relevant participants as a homogeneous group/set to which the event denoted by the verb applies uniformly, whereas *-ške/a-* forms construe the participants as constituting a set of distinguishable individual entities, to which the verbal event may not apply uniformly (in place and/or time). Indeed, this is precisely the function that PMs perform in several North-American languages (e.g., Yurok [Algic], Nisga’a [Tsimshian], Central Pomo [Pomoan], among others; see Mithun 1988). Consider the following example from Central Pomo:

- (14) Central Pomo [Pomoan; adapted from Mithun 1988: 225]
- | | | | |
|----|---|-----------------|---------------------|
| a. | [?] <i>aa</i> | <i>múuʔtu</i> | <i>Manááčʔ</i> |
| | I | him | pay.SEM |
| | ‘I paid him’ | | |
| b. | [?] <i>aa</i> | <i>múuʔuyal</i> | <i>Manááčʔ</i> |
| | I | them | pay.SEM |
| | ‘I paid them’ (The crew work received a single check jointly) | | |
| c. | [?] <i>aa</i> | <i>múuʔuyal</i> | <i>manáataayʔaw</i> |
| | I | them | pay.PLAC |
| | ‘I paid them’ (Each worker was paid individually) | | |

In (14a), we have a single event (*manáac̣* ‘pay.SEM’) involving a single O participant (*múuṭu* ‘him’). With a plural O (*múuṭuyal* ‘them’), two options are available. On the one hand, the verb can occur in the singular, as in (14b), thereby construing the situation as a single event (‘The crew work received a single check jointly’). Alternatively, the verb can occur with the PM *-ṭa-*, which triggers a pluractional reading of the verb, whereby the situation is conceived as composed of several individual actions involving each O participant individually (‘Each worker was paid individually.’).

We would like to suggest that Hittite *-ške/a-* may in fact behave similarly to the Central Pomo PM *-ṭa-* as described in Mithun (1988). Let us consider the behavior of the verb *āk-* ‘die’ in (13c) and (15).

- (15) *Û* LÚ^{MES} URU^{LIM} *natta pianzi* *šu=uš*
 CONJ man(PL) city NEG give:PRS.3PL CONN=3PL.ACC
tameššir *š=e* ***akir***
 oppress:PST.3PL CONN=3PL.NOM die:PST.3PL
 ‘And the men of the city do not surrender (them), and they (the king’s army) defeated them (the men of Zalpa) and they died’

[KBo 22.2 rev. 12–13, OH/OS]

The simple form *akir* in (15) refers to a single event, in which all participants are construed as dying in the same place and time as a whole group, as a consequence of the defeat of the city of Zalpa. Conversely, in (13c) the form *akkiškittari* ‘people die (lit. it dies)’ is used to indicate the devastating effect of the plague on the land of Hatti, where people die one after the other in different locations. Clearly, the fact that the participants do not uniformly undergo the event of dying, but rather do so at different times, easily paves the way for a frequentative interpretation of the suffix in contexts such as (13a), whereby repetition of the event instead of plurality of the participants is carried into focus. Similarly, in (13a) and (13b), what is highlighted is the individuality of each participant, which also leads to a sequential interpretation of the verbal event: in (13a) the queen takes of her sons one by one and puts them in the basket one after the other, and similarly, in (13b), the men are involved in a competition, so that each one is shooting to the target on his own, and they are not acting as a group. Based on these reasonings, we suggest that the use of *-ške/a-* might be sensitive to a higher degree of individualization of the event’s participants.

A function that is particularly difficult to individuate is the intensive one. Already Dressler (1968: 188) noted that intensification is difficult to assess in a corpus language. A possible example for the intensive function is the verb *ešši(š)ker* in (16). This form is based on the verb *iya-* ‘make do’ and receives double marking

with both the suffixes *-šša-* and *-ške/a-* (cf. Daues 2012; Pisaniello 2016: 345–346). Based on the context, it can hardly indicate but a single perfective and telic event affecting a single participant. The contribution of the suffix thus lies elsewhere. Whereas the meaning of the simple verb is basically ‘do, make’, the suffixed verb in (16) seemingly display an additional intensive nuance, which highlights the thoroughness with which the event is carried out (see Dardano 1997: 44–45).

(16) INTENSIVE²

š=*an* ē-šši-(š)*k-er*

CONN=3SG.ACC do-IPFV-IPFV-PST.3PL

‘(And then they took him away), they took ‘good care’ of him (so that he died)’

[KBo 3.34 ii 7, OH/NS]

Other two PM functions of *-ške/a-* that are documented are the spatial distributive and the generic imperfective functions (even though these functions are attested in our corpus, we prefer to illustrate them with passages taken from other sources, in which the proposed interpretation is more straightforward).¹⁴

Spatial distributive is defined as the use of the suffix in contexts in which plurality affects not the participants or the temporality of the event but rather its place, so that what is highlighted is the displacement of the event across different locations. An example of this use is given in (17), in which the form *papparaškizzi* ‘he sprinkles’ possibly indicates that the event of sparkling water is distributed across different locations, as also suggested by the occurrence of the distributive spatial adverb *duwan duwann=a* ‘here and there (lit. here and here)’.

(17) SPATIAL DISTRIBUTIVE

nu wātar [IŠTU ^{GIS}PA] *duwan duwann=a pappara-ški-zzi*

CONN water:ACC with staff here here=CONJ sprinkle-IPFV-PRS.3SG

‘And he sprinkles water here and there with the staff’ [KBo 12.40 ii 8, NS]

With the term *generic imperfectivity*, Mattiola (2017, 2019) refers to statements that indicate general truths or properties of an entity, and that as such always hold true. A case in point is the use of the verb *huišnuškizzi* ‘keeps alive’ in (18). In this case,

¹⁴ Another function that according to Mattiola (2019) falls within the functional range of PMs is reciprocity. There is no evidence that this was among the functions of Hittite *-ške/a-*. The suffix does occur in reciprocal contexts, but when it does so it always co-occurs with other markers of reciprocity, e.g., polyptotic reciprocal pronouns of the type *šia-...šia-* ‘one another’ and *ara-...ara-* ‘each other (lit. fellow fellow)’ (see KBo 2.5 iv 18; cf. Dressler 1968: 178–179; Inglese 2017 fn. 14), so that it cannot be ascribed a reciprocal function *per se*.

the suffixed verbal form indicates the property of grains, which by encyclopedic knowledge are known to serve the purpose of feeding, i.e., keeping alive, human beings and animals.

(18) GENERIC IMPERFECTIVITY

<i>ḫalkiš=wa</i>	<i>maḥḥan</i>	NAM.LÚ.U ₁₉ .LU	GUD	UDU
grain:NOM=QUOT	as	human	cattle	sheep
<i>ḫuitarr=a</i>	<i>ḫūman</i>	<i>ḫuiš-nuški-zzi</i>		
game(N):ACC=CONJ	all:ACC.N	live-CAUS-IPFV-PRS.3SG		

‘Just as grain keeps all humans, cattle, sheep and wild game alive’

[KBo 4.2 i 58-59, NS]

Finally, Hittite *-ške/a-* attests to a function that does not feature in the conceptual space of pluractional constructions discussed in Section 3, i.e., the inceptive function. This usage of *-ške/a-* is shown in (19), in which the predicate *šeš-* ‘sleep’, which normally indicates a state, receives an inceptive interpretation ‘start to, go to sleep’ when suffixed with *-ške/a-*. Notably, the inceptive reading of finite *-ške/a-* forms is only available to atelic predicates (cf. Hoffner and Melchert 2002: 384–385, cf. also *iya-* ‘march’ vs. *iy-anna-* ‘begin to move’; see Pisaniello 2016: 132–166 for discussion).

(19) INCEPTIVE

šeš-(š)ki-ška-nzi=ya=at=za
 sleep-IPFV-IPFV-PRS.3PL=CONJ=3PL.NOM=REFL

‘(The horses eat all night long) and they go to sleep’ [KUB 29.54 i 10, MH]

The inceptive function is admittedly scarcely documented with finite forms of the verb, but it is robustly attested in the supine construction. This construction, which is typical of NH historical and mythological texts (cf. Daues 2007), is a type of auxiliary verb construction and is made up by the supine in *-ške/a-* combined with finite forms of the verbs *dai-* ‘put’ and *tiye/a-* ‘step’, which function as auxiliaries (see discussion in Luraghi 1998 and García Ramón 2007). The resulting periphrastic construction roughly means ‘begin to X’ (Hoffner and Melchert 2008: 322, 338), i.e., it profiles the ingressive phase of an event (cf. Cotticelli Kurras 2015). Notably, whereas the inceptive interpretation of finite forms with *-ške/a-* is limited to atelic predicates, this is not the case of the supine periphrastic construction, which also may involve telic predicates (see García Ramón 2007: 287–288). Consider in this respect the use of telic *pai-* ‘give’ in (20).

(20) <i>nu=mu</i>	ÉRIN ^{MES}	<i>pe-ške-wan</i>	<i>dāir</i>
CONN=1SG.DAT	troop(PL)	give-IPFV-SUP	put:PST.3PL
‘They began to give me troops’			[KBo 3.34 iii 34, NH]

4.2 The semantic map of Hittite *-ške/a-*

In the previous section, we have shown that *-ške/a-* can be rightfully described as a PM, as it covers a range of functions typical of PMs. Moreover, not only does *-ške/a-* displays functions which are typically associated to PMs, but its polyfunctionality also complies with the conceptual space of pluractional constructions set up by Mattiola (2017), as the functions associated with the suffix occupy a contiguous region on the conceptual space (Figure 2).

Admittedly, the map in Figure 2 presents two problems. In the first place, the map apparently features a gap, since the event internal plurality node is not covered. In this respect, the map would violate Croft’s (2001) semantic map connectivity hypothesis. This is however not a major issue. On the one hand, the absence of this function might simply be accidental, and reflect the limited nature of the corpus, on the other hand, evidence for postulating an intensive node is rather scanty at best, as discussed for example (16).

A more serious problem is placement of the inceptive function. As we have discussed for examples (19) and (20), when used with atelic predicates and in the supine construction, the suffix *-ške/a-* may indicate entry in a state/beginning of an action. This function is however absent from Mattiola’s conceptual space, so that it is not immediately clear where one should place it in the semantic map of Hittite *-ške/a-*. Note that this is partly a by-product of the methodology behind Mattiola’s map, since in building up the conceptual

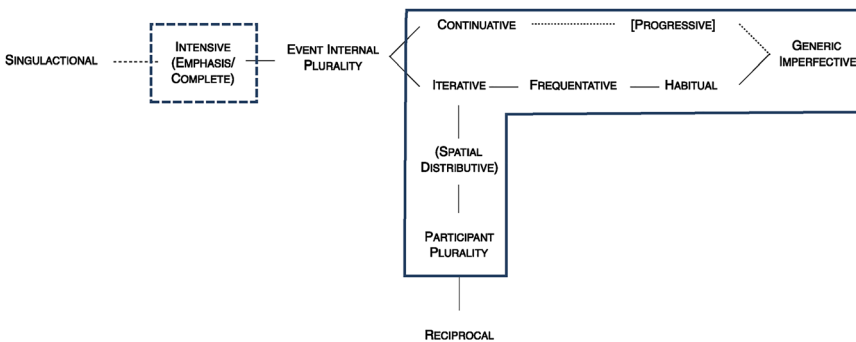


Figure 2: The semantic map of Hittite *-ške/a-*.

space in Figure 1, the author has only taken into account functions that are robustly associated with PMs and has excluded other functions that individual language-specific markers may occasionally encode (Mattiola 2017: 128). Therefore, the lack of the inceptive function in the conceptual space simply means that this function is only rarely performed by PMs, but the map in principle does not rule out the possibility that individual PMs may additionally perform this function (Mattiola 2019: 40–42). Indeed, a closer look at Mattiola’s sample shows that the inceptive function is sporadically attested for other PMs (cf. Zúñiga and Díaz-Fernández 2014 on the functions of reduplication in Mapudungun – Araucanian).

In absence of relevant cross-linguistic data, we cannot securely place the inceptive function within the conceptual space of PMs following the standard methodology for first-generation semantic maps. However, we would like to propose a possible semantic connection of this function with iterativity. As a matter of fact, iteration implies boundedness, in that in order to be repeated events must have a beginning and an endpoint. When applied to events that are usually construed as atelic, a marker that conveys iterativity might simply impose a boundary on the beginning of the atelic situation, hence yielding an inceptive reading.

The semantic map in Figure 2 is a useful tool to neatly visualize the pattern of polyfunctionality of Hittite *-ške/a-*. This geometrical representation can be further enriched with quantitative data concerning the frequency of individual nodes, in order to show what meanings on the maps are more robustly associated with the suffix in its actual usage and what are only marginally so. Data concerning the frequency of the individual functions of *-ške/a-* is given in Table 4.

Table 4: Frequency of the functions of *-ške/a-*.

Function	Tokens	Types
Frequentative	149	53
Continuative	77	37
Plurality of participants	70	29
Habitual	44	17
Inceptive	31	17
Iterative	31	8
Generic imperfectivity	2	2
Spatial distributive	1	1
Intensive	1	1

As the data in Table 4 show, the frequentative function is the most frequently attested both in terms of types and tokens, whereas the continuative, iterative, plurality of participants, and habitual functions all display a lower and comparable distribution. Still, one should be aware that the frequencies in Table 3 should be handled with due care, since they partly reflect a bias in the selection of the corpus, and as such they might not accurately represent the actual distribution of the suffix in the language. For example, the high frequency of the frequentative function partly reflects the high incidence of the verbal form *hatrae-ške/a-*, which is often found as a greeting formula ‘keep writing me letters/greetings’ in MH letters. Note also that the high incidence of the inceptive function is due to the frequency of the supine constructions in NH texts (out of 31 tokens with inceptive meaning, 28 are non-finite supine forms).

In discussing the different functions of the suffix, it should be kept in mind that suffixed forms of the same verb can have different interpretations. Consider as an example the verb *eku-* ‘drink’, whose *-ške/a-* forms can either have iterative (21a), habitual (21b), or plurality of participants (21c) meaning. Disambiguation between the functions is entirely dependent on the context, and can be facilitated by the occurrence of temporal adverbs, as in the case of *2-iš* ‘twice’ supporting the iterative reading of (21a).

(21) a. ITERATIVE

nu=kan 2-iš 8-taš makitaš akku-skē-ši
 CONN=PTC twice 8:DAT.PL m.:DAT.PL drink-IPFV-PRS.2SG
 ‘And you drink twice from 8 m. cups’ [KUB 31.143 ii 16, OH]

b. HABITUAL

šuwāru kue GAL^{HLA} akku-ški-z[i]
 much REL.NOM.PL.N cup(PL) drink-IPFV-PRS.3SG
 ‘(The king drinks) from those cups from which he usually drinks a lot’
 [KBo 17.11+ iv 26, OH]

c. PLURALITY

n=ašta GAL GUŠKIN-[az GEŠ]TIN-nan parkuin akku-škē-wani
 CONN=PTC cup gold:ABL wine:ACC pure:ACC drink-IPFV-PRS.1PL
 ‘And each of us drink pure wine from a golden cup’
 [KUB 36.110 rev. 6–7, OH]

The question is thus whether one can detect constraints on the distribution of the individual functions. A close investigation of our corpus data shows that the only

Table 5: Distribution of the functions according to the verb's lexical aspect.

Function	Accomplishment	Achievement	Activity	State
Frequentative	5	118	25	1
Continuative	8	37	30	1
Iterative	3	19	9	–
Plurality of participants	13	57	–	–
Habitual	12	26	6	–
Inceptive	1	25	5	–
Intensive	1	–	–	–
Spatial distributive	–	1	1	–
Generic imperfectivity	–	1	1	–

factor that seemingly plays a role in constraining the interpretation of *-ške/a-* verbs is the verbs' lexical aspect.¹⁵

Indeed, our corpus data largely confirms the widespread observation (cf. Bechtel 1936) that the suffix is unavailable to stative verbs.¹⁶ Interestingly, this is a common behavior of PMs in the languages of the world (cf. Mattiola 2019: 144). The distribution with the other actional classes shows an interesting picture. As the data in Table 5 neatly show, most functions predominantly occur with telic predicates, with a preference for achievements. However, the frequentative and the continuative functions are also available for atelic activity predicates, and this is also the only class of predicates that license the inceptive reading with finite verbal forms. This distribution complies with Mattiola's (2017: 135) observation that functions on the right side of the semantic map are unconstrained with respect to the lexical aspect of the verb they apply to, whereas "the functions on the left side express a semantics that sometimes can be incompatible with some of type of verbs."

¹⁵ Other factors such as verbal tense, number of the participants, and transitivity seem to play no role, since all functions are equally likely to occur with all values of such features. The only exception is plurality of participants, which is clearly unavailable as a reading when the *-ške/a-* verb has a singular intransitive subject/direct object.

¹⁶ As a matter of fact, out of more than 400 occurrences of *-ške/a-* analyzed, we found that the suffix combines with stative verbs only in two cases, i.e., with *šakuwantariya-* 'be suspended' (KBo 3.4 i 18, NH) and *tarḫu-* 'be able' (KUB 3.119+ I 16; note that this verb also has an alternative telic construal 'win, overcome, defeat'). Notably, in both cases the suffix arguably adds a continuative reading, in that it indicates the maintenance of a state. This complies with our observation that the continuative function can also apply to atelic predicates.

4.3 From PIE *-*ske/o-* to Hittite -*ške/a-*: a diachronic scenario

In this section, we discuss aspects of the diachrony of Hittite -*ške/a-* and tackle the issues of how the different functions of -*ške/a-* diachronically relate to one another. Specifically, we try and pinpoint an original function, if any, and explore possible pathways whereby the other functions arose out of it. In doing so, we combine comparative evidence from cognate suffixes in other IE languages with typological considerations on the processes that give rise to PMs in the world's languages.

As is well known, Hittite -*ške/a-* continues the PIE thematic suffix *-*ske/o-* (the latter perhaps from earlier *-*s-ke/o-*; cf. Jasanoff 2003: 134–136, Oettinger 2017, Willi 2018: 480), with cognates in several ancient IE languages, e.g., Skt. -*ccha-*, Av. -*sa-*, Gr. -*ske/o-*, Lat. -*sce/o-*, OIr. -*c-*, OHG -*sc-* (Zerdin 2000: 21–37, Jasanoff 2003: 133–134, Kloekhorst 2008 s. -*ške/a-*, Lundquist and Yates 2018: 2164; see also Adams 2014 for a systematic comparison of the suffixes in individual languages and discussion of possible Baltic, Armenian, and Albanian comparanda, which we do not discuss further here). Let us briefly review the main features of outcomes of PIE *-*ske/o-* in some ancient branches of the IE family.

In Anatolian, outcomes of PIE *-*ske/o-* are also (scarcely) attested in languages other than Hittite, viz. Luwian and Lycian. The Luwian suffixes -*zza-* (CLuw.) and -*za-* (HLuw.) express continuative, e.g., *ta-za-tu* 'let last/endure', and inceptive functions, e.g., *kappilazzata* 'became hostile' (Melchert 2003: 205; plurality of participants, iterative, and continuative are also associated with the Luwian suffix -*š(š)a-*, cognate with Hittite -*šš(a)-*, cf. Pisaniello 2016). The Lycian *s*-verbs also originally feature the *-*ske/o-* suffix, but by the time of their earliest attestation, they fail to show any semantic difference with the corresponding base verbs (cf. Serangeli 2018).

Greek and Indo-Iranian provide crucial evidence for the reconstruction of PIE *-*ske/o-*. In these branches, outcomes of *-*ske/o-* are predominantly connected with imperfectivity, as they are used to form (imperfective) present stems as opposed to (perfective) aorist stems (on Greek see e.g., Rix 1992: 213–214; Willi 2018: 479–488, and Zerdin 2000; on Sanskrit see Burrow 1973: 329–330; on the aspectual systems of Ancient Greek and Vedic see Napoli 2006 and Dahl 2010 respectively).¹⁷

¹⁷ The picture of Ancient Greek is partly blurred by the occurrence of the so-called Ionic -*sk-* preterits. These are verbal forms built with the suffix -(e)*sk-* and secondary endings, e.g., *phain-ésk-eto* from *phain-ō* 'appear', mostly attested in Homer and in Hesiod. These formations have been suggested to display iterative/frequentative semantics, thus similarly to Hittite -*ške/a-*. However, there is little compelling evidence that these Ionic formations continue the semantics of the inherited PIE *-*ske/o-* suffix, and rather likely owe their peculiar functional range to contact with Hittite (see Bianconi 2019 for a reassessment of this issue with references).

Tocharian proves evidence for yet another function of the suffix. In Tocharian, the suffix *-äsk-* (TochB.) is employed in the formation of causatives and intensives. The development of the causative meaning likely reflects a Tocharian innovation (Adams 2014), and thus should not be projected back into the semantics of PIE **-ské/o-*. Note that, whatever the details of the historical relationship between the two, a connection between pluractionality and causativity is not entirely surprising. Within PIE, the suffix **-éye/o-* is commonly reconstructed as causative/iterative (cf. e.g., LIV²: 22–23). Compare the Latin causative *monēre* ‘warn’ < **mon-éye/o-* ‘call to mind’ < **men-* ‘think’ with iterative *tondēre* ‘shave’ < **tond-éye/o-* ‘cut repeatedly’ < **tend-* ‘cut’ (cf. Kölligan 2007). In addition, even in PIE verbal reduplication is commonly associated with both an iterative and a causative meaning (cf. Dempsey 2015 for discussion of the Hittite data). Outside IE, a typological parallel is offered by Khwe (Khoe-Kwadi, Khoe), where verbal reduplication encodes both causativity and pluractionality (cf. Kilian-Hatz 2008: 147, 161).

Latin offers a rather complex picture when it comes to outcomes of **-ské/o-*, as it features several formations of different origin (Keller 1992; Weiss 2009: 407). Firstly, Latin shows traces of inherited present stem formations that have parallels in other IE languages, e.g., (*g*)*nō-sc-ō* ‘know’ < **ǵneh₃-ské/o-*, cf. Gr. (*g*)*gnō-sc-ō* ‘know’. Traces of *-sc-* forms with habitual function are rather scanty. An often-cited piece of evidence is provided by the forms *escit/escunt* from *esse* ‘be’ with future habitual meaning (cf. Sihler 1995: 550). Finally, Latin displays a wealth of innovative *-sc-* formations with inceptive-intransitive meaning, of the type *caleō* ‘I am hot’ > *calē-sc-ō* ‘I become hot’ (cf. Haverling 2000). Overall, as Haverling (2000) discusses, the core meaning of the Latin suffix (with unprefixated verbs) is connected to the indication of durative and dynamic (atelic) events, including inceptives when based on stative verbs (cf. Haverling 2000).

To sum up, IE languages offer clear comparative evidence for the formal reconstruction of present stem verbs with zero grade roots and accent on the **-ské/ó-* suffix: e.g., **g^wem-* ‘go’ > **g^wm₀-ské/ó* > Ved. *gácchati*, Gr. *báske* (cf. LIV² s.v.). Unfortunately, the functional reconstruction is far less immediate, and, similarly to the difficulties in assessing the function of Hittite *-ške/a-*, scholars have offered different reconstructions of what they consider to be the original or core meaning of PIE **-ské/o-* (see Willi 2018: fn. 181 with further references). Clearly, the reconstruction of the original semantics of the PIE suffix **-ské/o-* lies beyond the much more limited scope of this paper, so we do not pursue further here. In the complex issue of the reconstruction of the suffix, what is striking is that Anatolian shows a remarkably wider range of usages of *-ške/a-* as compared to other IE languages, in which the functions seem to be associated more with the right end of the semantic map, i.e., with imperfectivity and other more abstract functions. The question is thus whether Anatolian represents the original state of affairs, and the

other IE languages innovated by narrowing down the functional range of the suffix. This scenario is for instance advocated by Adams, who observes that “there seems no doubt, however, that Hittite preserves the original meaning and that meanings other than imperfectivity [i.e., pluractionality] are innovations.” (Adams 2014: 24–25).

Useful insights concerning the prehistory of Hittite *-ške/a-* can be gained from the general trends in the development of PMs. Unfortunately, to date there is no comprehensive diachronic typology on the origin of PMs in the world’s languages, but recent studies have shown that at least for some areas of the conceptual space of pluractional constructions, directional diachronic links can be established between some of the nodes. For example, there is evidence that plurality of participants is the likely source of the reciprocal function rather than the other way around (cf. Lichtenberk 2000; reciprocals may eventually evolve into antipassives as well, see Sansò 2017). Cross-linguistic research on the development of aspectual markers has also brought to light the existence of two distinct clines of directional semantic change that lead from iterativity to imperfectivity (Bybee et al. 1994: 172; see also Kouteva et al. 2019), as shown in (22):

- (22) A. ITERATIVE > CONTINUATIVE > PROGRESSIVE > IMPERFECTIVE
 B. ITERATIVE > FREQUENTATIVE > HABITUAL > IMPERFECTIVE

The developments shown in (22) display some of the typical features of grammaticalization processes. In the first place, markers that undergo the changes in (22) develop more grammatical (abstract) meanings (cf. Lehmann 2015 [1995]). Whereas iterativity affects the lexical semantics of the event, in that it conveys the repetition of the same event vs. a single instantiation of such event, imperfectivity only entails a certain viewpoint on the event, but does not affect the lexical representation of the event itself. In other words, the more a function is placed towards the grammatical pole the lesser impact it has on the verbs’ lexical meaning. In the second place, in the development from iterativity to imperfectivity one also observes class-host expansion, i.e., the expansion of an item to contexts previously incompatible with its source meaning due to the process of semantic bleaching (Himmelman 2004). In the case of PMs, this means the extension to previously unavailable verb classes. As we have already remarked, whereas iterativity is lexically compatible with telic verbs only, be it achievements or accomplishments, imperfective markers can also apply to atelic verbs. Finally, the development of imperfectivity, which relates to the speaker’s viewpoint of events in discourse, also entails a higher degree of subjectivity, which is another hallmark of grammaticalization processes (Traugott 2010).

What remains unclear is the directionality of the diachronic link between iterativity and plurality of participants. As Mattiola (2017: 131) argues, a link exists between plurality of participants and iterativity in that the repetition of a situation can also be easily conceived as being distributed among different participants and vice versa (or places, in the case of *spatial distributivity*). Further research is needed to establish whether a cross-linguistic directional link can be established between these two functions. Preliminary findings suggest the existence of a two-way relationship between iterativity and plurality of participants. For example, Frajzyngier (1997) identifies different clines of grammaticalization that lead from demonstratives to nominal and verbal number affixes in Chadic languages. Among these paths, one also finds that demonstratives may develop first in markers of nominal plurality (both nominal number and participant plurality) and, then, in markers of event plurality, i.e., iteratives (cf. (23)).

(23) Path of grammaticalization of PMs of Chadic languages

[Frajzyngier 1997: 217]

demonstrative → *object anaphor* → *plural subject of transitive* → *plurality of events*

In the shift from plurality of participants to iterativity, one possible bridging context is provided by the use of singular nouns that refer to groups instead of plural NPs. Consider the Hittite example in (24):

(24) *nu* KUR ^{URU}*Hatti* *akki-ški-ttari*
 CONN land *H.* die-IPFV-PRS.3SG.MID

‘And the land of Hatti is dying’

[KUB 14.14+ rev. 14, NH]

The passage in (24) refers to the fact that due to a widespread plague, the people of the Hittite kingdom keep dying. Clearly, each single event of dying being unique, here the lexical semantics of the verb *āk-* ‘die’ strongly favors a plurality of participants reading, as we already discussed for example (13c). However, in (24) the singular noun phrase KUR ^{URU}*Hatti* ‘the land of Hatti’ occurs as subject, and is used metonymically to stand for its people (on this type of metonymy see e.g., Croft 1993: 353). As a consequence, the individual entity ‘land of Hatti’ can be conceived as undergoing a single continuous event of dying as a whole, thus licensing an iterative reading, and eventually a continuative reading via structural schematization (Croft and Cruse 2004: 63–64). In other words, in contexts such as (24), the combination of metonymy and structural schematization can easily lead from an

event in which the plurality of participants is expressed to one in which the continuation of the event itself is highlighted instead.

The reverse process has been proposed by Mithun (1988), who discusses some cases in which markers that originally indicate iterativity (among other things) start being used as nominal number markers in some Native North America languages. For example, this is the case for the Cayuga examples in (25) where the PM (cf. (25a)) develops into a marker of plurality of entities and starts being applied to nouns (cf. (25b)).

- (25) Cayuga (Iroquoian, Northern Iroquoian) [Mithun 1988: 228–229]
- a. $\text{ɛhsyɛ:}^{\text{?}}\text{tho}^{\text{?}}$ → $\text{ɛhsyɛ}^{\text{?}}\text{thw}^{\text{?}}\text{ahso}^{\text{?}}$
 ‘you will plant’ ‘you will plant a lot of different things’
- b. $\text{eksá:}^{\text{?}}\text{ah}$ → $\text{kaeks}^{\text{?}}\text{ash}^{\text{?}}\text{:}^{\text{?}}\text{ɔh}$
 ‘child, girl’ ‘children’

The diachronic information discussed so far can be integrated with the conceptual space of pluractional constructions discussed in Section 3. The result is a dynamic semantic map, in which the directionality of the historical links among individual nodes is also taken into account (cf. Luraghi 2014; Narrog and van der Auwera 2011) (see Figure 3).

The combination of comparative evidence, along with the common trends in the development of PMs and in the grammaticalization of imperfective markers, allows us to propose a tentative diachronic scenario for the emergence of Hittite *-ške/a-*.

To begin with, it seems reasonable to reconstruct a stage in which the PIE suffix **-ske/o-* functioned as marker of iterative and/or plurality of participants.

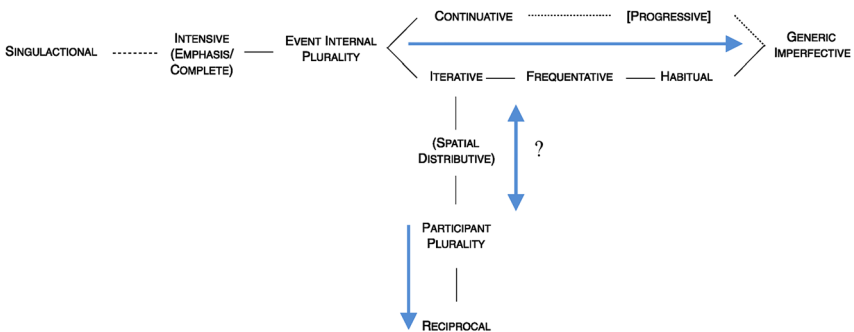


Figure 3: A dynamic conceptual space of pluractional constructions.

As such, it could be rightfully considered as a PM, as it covered only the core PM functions. Out of the core pluractional functions, the suffix started extending its functional range towards the right end of the conceptual space, i.e., towards the expression of aspectual values, in compliance with the cross-linguistic trends of semantic change discussed in (22).¹⁸ In Anatolian (Hittite and possibly Luwian), the original core functions and the new ones coexisted, with a ‘layering’ of functions typical grammaticalization processes (Hopper 1991). In other words, as Josephson puts it, the suffix retained its original functions, and “it is however not obvious that there was a full-scale grammaticalization of the *-ške/a-* form” (Josephson 2008: 138). By contrast, in the other IE languages, as the suffix became increasingly associated with the left-side functions on the map, the original functions of the suffix were partly lost, and **-ské/o-* evolved into a general maker of present stems (imperfectivity) and also underwent language-specific developments and specializations (e.g., causative in Tocharian). Again, this scenario must remain speculative, and needs to be tested against a serious and more systematic reassessment of the formal and functional reconstruction of PIE **-ské/o-* and the aspectual system of PIE, which exceeds the scope of this paper.

A final word is in order concerning the relative chronology of Hittite *-ške/a-* as compared to other means of encoding pluractionality. As a matter of fact, Hittite attests to at least another potential PM, i.e., verbal reduplication. In Hittite, verbal reduplication seems to cover a range of functions similar to *-ške/a-* (see Dempsey 2015 for a thorough discussion): durative, habitual, iterative, repetitive, distributive, intensive/inceptive, and causative. Verbal reduplication is however unproductive in historical times, and many reduplicated verbs are secondarily re-characterized through the addition of *-ške/a-* (Dempsey 2015), e.g., *ku-kkure-ške/a-* ‘cut, mutilate’ (distributive according to Hoffner and Melchert 2002: 384). It seems thus that *-ške/a-* replaced verbal reduplication as the standard PM in Hittite. Again, typological parallels to the Hittite situation exist. Reduplication operates as a PM in some of the world’s languages (such as Pluractional derivation in Beja [Afro-asiatic, Cushitic], cf. Vanhove 2017), and the recessive status of reduplication as a PM with new PM is attested for instance in Maa (Nilotic, Eastern Nilotic; cf. Payne 2013 and Mattioli 2019: 125–142 on the andative *-áa* in Maa).

¹⁸ Incidentally, note that this casts serious doubts on the likelihood of Jasanoff’s (2003: 13) proposal of the semantic development desiderative > habitual > iterative, which in his views accounts for the origin of the polyfunctionality of **-ské/o-*.

5 Conclusions

In this paper, we have investigated the suffix *-ške/a-* in Hittite analyzing data from corpora of three different chronological stages of the language, that is, Old Hittite, Middle Hittite, and New Hittite. In the literature on Hittite, scholars have variously classified this suffix, and proposals as to its function range from actionality to a proper imperfective marker, with hybrid positions in between. The functional domain of this suffix comprises several different functions that sometimes support one of these hypotheses, and sometimes others. We analyzed 406 occurrences of *-ške/a-* classifying them according to their functions. What has emerged from our analysis is that the suffix *-ške/a-* in Hittite is better described by referring to the notion of pluractionality. In order to demonstrate the validity of this typological approach, we have compared the situation of Hittite with the more general description of PMs given in the typological literature. As we have shown, the polyfunctionality of Hittite *-ške/a-* can successfully be described by means of a semantic map plotted against the cross-linguistic conceptual space of pluractional constructions. We have observed that the functions expressed by the Hittite suffix cover a large part of the functions that PMs encode in the languages of the world, both the core and the additional ones.

Moreover, we have also proposed a possible diachronic scenario involving the Hittite *-ške/a-*. Indeed, the occurrence of cognate suffixes in several ancient Indo-European languages (e.g., Gr. *-ske/o-*, Lat. *-sc-*) makes the formal reconstruction of the Proto-Indo-European form **-sḱe/o-* uncontroversial. However, the situation is much less straightforward from a functional standpoint. Our proposal predicts the possibility that the IE suffix **-sḱe/o-* was an actual PM originally expressing iterativity and/or participant plurality. From this functional core, the suffix has undergone a semantic extension toward more aspectual (cf. imperfective) and also some language-specific functions (cf. inceptive, causative, etc.), following patterns of functional extension well attested in the languages of the world. Among IE languages, Anatolian, and especially Hittite, still offers good evidence of the suffix's original meaning besides the newly developed ones.

Abbreviations

ABL	ablative
ACC	accusative
AOR	aurist
CAUS	causative
CONJ	conjunction
CONN	connective
DAT	dative
GEN	genitive
IPFV	imperfective
MID	middle
N	neuter
NEG	negation
NOM	nominative
PL	plural
PLAC	pluractional
POSS	possession
PRS	present tense
PST	past tense
PTC	particle
QUOT	quotative
REFL	reflexive
REL	relative
SEM	semelfactive
SG	singular
SUP	supine

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Appendix: Occurrences of *-ške/a-* verbs

This appendix features the full list of occurrences of *-ške/a-* verbs that we analyzed in this paper. Forms are arranged by lemma, and within each lemma by dating (OH, MH, NH). The listing follows the usual alphabetical order of Hittite dictionaries,

and for consistency's sake lemmas are cited after Kloekhorst (2008). For each occurrence, we indicate our proposed reading. Abbreviations for the individual functions are the following: F = frequentative, C = continuative, P = plurality of participants, H = habitual, Inc = inceptive, It = iterative, Gen = generic imperfectivity, Sp = spatial distributive, Int = intensive.

<i>āk-ⁱ</i> 'die'	NH KBo 16.15 i 8 (P), KUB 14.10+ i 12 (P), KUB 14.10+ i 19 (P), KUB 14.10+ iii 2 (P), KUB 14.10+ iv 9 (P), KUB 14.11+ i 23 (P), KUB 14.11+ i 23 (P), KUB 14.12 rev. 5 (P), KUB 14.12 rev. 6 (P), KUB 14.13+ i 50 (P), KUB 14.13+ iv 19 (P), KUB 14.13+ iv 4 (P), KUB 14.14+ obv. 10 (P), KUB 14.14+ obv. 37 (P), KUB 14.14+ rev. 14 (P), KUB 14.14+ rev. 37 (Inc), KUB 14.8 obv. 38 (P), KUB 14.8 obv. 38 (P), KUB 14.8 rev. 11 (P), KUB 14.8 rev. 28 (Inc), KUB 14.8 rev. 31 (P), KUB 14.8 rev. 7 (P)
<i>anniye/a-²ⁱ</i> 'work, carry out'	OH KBo 6.2 i 18 (F), KBo 6.2+ ii 21 (F) MH HKM 55 rev. 26 (F) NH KUB 1.1+ ii 16 (H)
<i>āppalae-²ⁱ</i> 'deceit'	NH KBo 5.6 iii 23 (C), KBo 5.6 iii 49 (C), KBo 5.6 iii 53 (C)
<i>ārr-ⁱ</i> 'wash'	MH KUB 1.11+ i 27 (It)
<i>ariye/a-²ⁱ</i> 'consult an oracle'	NH KUB 14.13+ i 51 (F), KUB 14.13+ i 53 (F)
<i>arkuwa/e-²ⁱ</i> 'make a plea'	NH KUB 14.8 rev. 37 (F)
<i>aršae-²ⁱ</i> 'plant'	OH KUB 29.35+ iii 6 (P)
<i>ašandulae-²ⁱ</i> 'be on garrison duty'	NH KBo 3.4 i 16 (C), KBo 3.4 iv 61 (C)
<i>ašāš-ⁱ</i> 'make sit, settle'	OH KBo 17.1+ i 6 (P)
<i>au-ⁱ</i> 'see'	MH HKM 47 obv. 3–5 (F), IBoT 1.36 i 19 (C), IBoT 1.36 i 59 (C) NH KBo 14.15 ii 6 (P), KBo 14.15 ii 6 (P), KBo 19.66+ iv 12 (F), KBo 3.4 ii 17 (P), KBo 3.4 ii 18 (P), KUB 1.1+ i 45 (F), KUB 14.20 i 19 (P), KUB 14.4 ii 4 (C), KUB 14.4 ii 8 (C), KUB 3.119+ iii 6 (C)
<i>(para) au-ⁱ</i> 'ignore'	NH KBo 5.13 iii 28 (C)
<i>eku-²ⁱ</i> 'drink'	OH KBo 17.11+ iv 26 (H), KBo 17.11+ iv 34 (H), KUB 31.143 ii 15 (It), KUB 31.143 ii 16 (It), KUB 36.110 rev. 7 (P)
<i>epp-²ⁱ</i> 'take'	MH HKM 17 obv. 8 (P), HKM 68 rev. 19 (C), HKM 89 low. ed. 18 (P), HKM 89 low. ed. 18 (P), KUB 14.1+ rev. 36 (F), KUB 23.72+ obv. 56–57 (F), KUB 23.72+ obv. 59 (F)
<i>eš-^{2i(ṛ)}</i> 'sit down'	OH KBo 3.34 iii 15 (H) MH HKM 10 obv. 5 (C)
<i>ēšša-ⁱ</i> 'do, make'	OH KBo 3.34 ii 7 (Int)
<i>ed-²ⁱ</i> 'eat'	MH KUB 1.11+ i 15 (It), KUB 1.11+ i 37 (F), KUB 1.11+ ii 47 (It), KUB 1.11+ ii 59 (It), KUB 1.11+ iv 31 (It), KUB 29.45+ i 10 (It), KUB 29.45+ i 6 (It), KUB 29.50 i 3 (It), KUB 29.50 i 43 (It)
<i>edriye/a-²ⁱ</i> 'feed'	OH KBo 6.2 iv 59 (F)

(continued)

<i>ḫaḫḫarš-^{zi(?)}</i> ‘laugh’	MH KUB 14.1+ rev. 72 (C)
<i>ḫalihḫla-ⁱ</i> ‘genuflect’	NH KUB 14.10+ iii 5 (F)
<i>ḫantae-^{zi}</i> ‘align’	MH KUB 14.1+ rev. 81 (C)
<i>ḫarni(n)k-^{zi}</i> ‘destroy’	NH KUB 14.16 ii 12 (C), KUB 19.11 iv 31 (P)
<i>ḫatrae-^{zi}</i> ‘write’	OH KBo 22.1 obv. 23 (F)
	MH HKM 10 rev. 29–32 (F), HKM 27 obv. 10 (F), HKM 27 up. ed. 23 (F), HKM 30 rev. 15 (F), HKM 36 left ed. 2 (F), HKM 37 rev. 1 (F), HKM 52 obv. 6–8 (C), HKM 55 rev. 35 (F), HKM 56 rev. 27 (F), HKM 58 low. ed. 16 (F), HKM 58 rev. 29 (F), HKM 60 rev. 34 (F), HKM 63 obv. 9 (F), HKM 66 left ed. 1 (F), HKM 71 obv. 8 (F), HKM 81 low. ed. 17 (F), HKM 82 rev. 13 (F), HKM 84 rev. 18 (F), HKM 91 low. ed. 10 (F), KUB 14.1+ obv. 16–17 (F), KUB 14.1+ obv. 25 (F), KUB 14.1+ obv. 35 (F), KUB 14.1+ obv. 37 (F), KUB 14.1+ obv. 59–60 (F), KUB 14.1+ obv. 64–65 (F), KUB 14.1+ rev. 25 (F)
	NH KUB 1.1+ iii 73 (C), KUB 14.17 iii 11 (C), KUB 19.29 iv 15 (P), KUB 26.79 i 13 (Inc)
<i>ḫē(ya)waniye/a-^{zi}</i> ‘rain’	NH KBo 19.76 i 25 (C), KUB 19.13 iv 12 (H)
<i>ḫuek-^{zi}</i> ‘conjure’	MH IBoT 1.36 ii 46 (It)
<i>ḫuišnu-^{zi}</i> ‘let live, rescue’	NH KBo 4.2 i 59 (Gen)
<i>ḫulle-^{zi}</i> ‘defeat’	NH KBo 4.4. iii 59 (P), KUB 1.1+ ii 43 (Inc)
<i>ḫuwai-ⁱ</i> ‘move, flee’	OH KBo 3.34 ii 23 (It)
<i>ḫuwart-ⁱ</i> ‘curse’	NH KUB 14.4 iii 19 (F)
<i>išḫuwai-ⁱ</i> ‘fill’	NH KUB 1.1+ iv 73 (P)
<i>išiyahḫ-ⁱ</i> ‘reveal’	MH KUB 14.1+ obv. 45–46 (F)
<i>išpānt-ⁱ</i> ‘libate’	NH KUB 1.1+ iv 75 (F), KUB 14.4 iii 20 (F), KUB 14.4 iv 23 (F)
<i>ištamašš-^{zi}</i> ‘hear’	NH KUB 3.119+ iii 6 (C)
<i>kariye/a-^{zi}</i> ‘cover’	NH KUB 19.37 iii 12 (C)
<i>karš(iye/a)-^{zi}</i> ‘cut’	MH HKM 54 ed. 28 (F)
<i>katkatnu-^{zi}</i> ‘make shrug’	MH KUB 1.11+ i 28 (It), KUB 1.11+ iv 48 (It)
<i>kue(n)-^{zi}</i> ‘kill’	NH KBo 14.3 iii 19 (F), KBo 2.5 iv 18 (P), KBo 5.8 ii 38 (C), KBo 5.8 iii 31 (P), KUB 14.14+ obv. 26 (P)
<i>kukkurš-^{zi}</i> ‘mutilate’	OH KBo 3.34 i 25 (P), KBo 3.34 i 29 (P), KBo 6.2 iv 45 (P)
<i>kururiyahḫ-ⁱ</i> ‘wage war’	NH KBo 3.4 i 7 (Inc), KBo 3.4 i 8 (H)
<i>lā-ⁱ</i> ‘release’	NH KUB 14.10+ iii 10 (F)
<i>lahḫiye/a-^{zi}</i> ‘go on an expedition’	NH KBo 4.4. iii 49 (F), KBo 14.4 i 4 (C)
<i>lahlahḫiye/a-^{zi}</i> ‘worry’	MH HKM 2 left ed. 5 (F), HKM 3 left ed. 1 (F), HKM 36 left ed. 2 (F), HKM 37 rev. 7 (F), HKM 48 rev. 32 (F)
<i>li(n)k-^{zi}</i> ‘swear’	MH KUB 14.1+ obv. 51 (F), KUB 23.72+ rev. 6 (F)
<i>linganu-^{zi}</i> ‘make swear’	MH KUB 14.1+ obv. 38–39 (P)
	NH KBo 19.66+ iii 53 (F)
<i>luluwae-^{zi}</i> ‘keep safe’	NH KBo 19.66+ iv 12 (F)
<i>māld-ⁱ</i> ‘make a vow’	NH KUB 14.10+ i 25 (F), KUB 14.4 ii 18 (F)
<i>maniyahḫ-ⁱ</i> ‘govern’	OH KBo 3.34 ii 27–29 (P)

(continued)

	NH KUB 1.1+ i 28 (H), KBo 2.5 iv 20 (C), KUB 19.3 i 17 (C), KUB 19.29 iv 9 (C), KUB 19.29 iv 12 (C)
<i>mēma</i> ⁻ⁱ ‘speak, tell’	OH KBo 17.1+ iii 6 (Inc) MH HKM 24 obv. 7 (C), HKM 52 obv. 6–8 (F), HKM 71 obv. 6 (F), KUB 14.1+ rev. 17 (F), KUB 23.72+ obv. 54 (F) NH KUB 1.1+ iv 17 (F), KUB 1.1+ iv 8 (F), KBo 5.6 iv 10 (H), KBo 5.6 iii 12 (H), KBo 5.9 i 13 (F), KUB 14.4 iv 17 (F), KUB 14.4 iii 26 (F), KUB 14.14+ rev. 28 (C), KUB 14.17 iii 20 (Inc), KUB 19.4 i 9 (F)
<i>mūgae</i> ^{-zi} ‘invoke’	MH KUB 14.4 iii 29 (F)
<i>nai</i> ⁻ⁱ ‘turn’	MH HKM 27 obv. 9 (Sp) NH KUB 1.1+ i 69 (C)
<i>nai</i> ⁻ⁱ ‘send’	MH HKM 10 obv. 22 (F), HKM 27 left ed. 4 (F), HKM 52 rev. 41 (F), HKM 52 rev. 40 (F), HKM 85 obv. 9 (F) NH KBo 16.8 ii 19 (F)
<i>pai</i> ^{-zi} ‘go’	OH KBo 17.1+ iv 13 (H) MH IBoT 1.36 i 60 (H), IBoT 1.36 i 61 (H), IBoT 1.36 i 63 (H), IBoT 1.36 i 63 (H)
<i>pai</i> ⁻ⁱ ‘give’	OH KBo 17.21+ obv. 8 (P), KBo 22.1 obv. 20 (F), KBo 6.2 i 10 (H), KBo 6.2 i 13 (H), KBo 6.2 i 40 (H), KBo 6.2 i 57 (H), KBo 6.2 ii 55 (P), KBo 6.2 iii 25 (H), KBo 6.2 iii 31 (H), KBo 6.2 iii 54 (H), KBo 6.2 iv 41 (H), KBo 6.2+ iii 40 (H), KBo 6.2+ iii 51 (H), KBo 6.2+ iv 16 (H), KUB 29.36+ obv. 8 (H), KUB 43.30 iii 20 (P) MH HKM 81 obv. 13 (F), HKM 81 obv. 15 (F), HKM 84 obv. 17 (F), KUB 1.11+ iv 53 (F), KUB 14.1+ obv. 8 (F), KUB 14.1+ rev. 7 (F), KUB 23.72+ obv. 18 (F) NH KBo 14.18 13 (Inc), KBo 14.3 iii 21 (F), KBo 5.9 ii 33 (F), KUB 14.14+ rev. 32 (F), KUB 14.4 ii 16 (F), KUB 19.18 iv 26 (P), KUB 3.119+ i 10 (H)
<i>(kattan) pai</i> ⁻ⁱ ‘betray’	NH KBo 2.5 iv 16 (P), KBo 2.5 iv 17 (P)
<i>peye</i> ^{-zi} ‘send’	MH HKM 46 rev. 21 (F), IBoT 1.36 i 62 (H) NH KBo 3.4 i 42 (Inc), KBo 3.4 i 43 (F), KBo 3.4 iii 29 (Inc), KBo 3.4 iii 34 (Inc), KBo 3.4 iv 24 (F), KBo 3.4 iv 48 (F), KBo 4.4 iv 34 (Inc), KBo 4.4 iv 46 (Inc), KBo 5.8 ii 3 (Inc), KBo 5.8 ii 5 (Inc), KBo 5.8 iv 10 (F), KUB 14.15 iv 10 (H), KUB 14.16 ii 22 (Inc), KUB 19.37 ii 4 (F), KUB 19.39 iii 12 (F)
<i>papparš</i> ⁻ⁱ ‘sprinkle’	OH KBo 17.18 ii 11 (Sp)
<i>parḥ</i> ^{-zi} ‘chase’	MH KUB 14.1+ rev. 1 (C) NH KBo 19.66+ ii 25 (F), KBo 19.66+ ii 25 (F), KBo 19.66+ iv 15 (F), KBo 19.66+ iv 8 (F), KBo 5.13 ii 25 (F), KBo 5.13 iii 21 (F), KUB 6.44+ iv 33 (F), KUB 6.48 ii 8 (F)
<i>parkiye/a</i> ^{-zi} ‘raise, lift’	NH KUB 19.39 iii 5 (Inc)
<i>parnawae</i> ^{-zi} ‘build’	NH KUB 1.1+ iv 62 (C)
<i>pittae</i> ^{-zi} ‘provide’	NH KBo 5.13 iv 8 (F)

(continued)

<i>šākiye/a-^{zi}</i> ‘reveal’	NH KUB 14.4 iii 8 (Inc)
<i>šakkuriye/a-^{zi}</i> ‘conquer’	MH KUB 23.72+ obv. 55 (F)
<i>šakuwantariye/a-^{zi}</i> ‘linger, be suspended’	NH KBo 3.4 i 18 (C)
<i>šallanu-^{zi}</i> ‘make grow’	OH KBo 22.2 obv. 4–5 (P), KBo 22.2 obv. 6–7 (P)
<i>ša(n)ḥ-^{zi}</i> ‘look for’	OH KBo 22.2 obv. 13–14 (C), KBo 22.1 obv. 25 (P) MH KUB 14.1+ rev. 3 (C), KUB 14.1+ rev. 60 (C) NH KBo 3.4 i 25 (Inc)
<i>šanna-ⁱ</i> ‘hide’	MH KUB 14.1+ obv. 16–17 (F)
<i>šārr-ⁱ</i> ‘break’	MH KUB 23.72+ rev. 37 (F) NH KBo 4.4 i 46 (C), KBo 4.4 ii 9 (C)
<i>šarni(n)k-</i> ‘compensate’	NH KUB 14.10+ iii 10 (F), KUB 14.14+ rev. 20 (F), KUB 14.14+ rev. 26 (F), KUB 14.14+ rev. 33 (F)
<i>šarninkzilēšš-^{zi}</i> ‘offer’	NH KUB 14.14+ rev. 32 (F)
<i>šeš-^{zi}</i> ‘sleep’	OH KUB 29.36+ iv 6 (F), KUB 29.36+ iv 9 (F) MH KUB 29.54+ i 10 (Inc), KUB 29.50 i 36 (Inc) NH KUB 14.10+ iv 14 (F)
SIG ₅ - <i>aḥḥ-ⁱ</i> ‘cure’	NH KUB 14.8 rev. 39 (C)
<i>šiye/a-^{zi}</i> ‘throw (?)’	OH KBo 3.34 ii 33 (P)
<i>dā-ⁱ</i> ‘take’	OH KBo 17.1+ iv 14 (P), KBo 22.1 obv. 12 (H), KBo 22.2 obv. 18–19 (P), KBo 6.2 i 14 (H), KBo 6.2 i 58 (H) MH KUB 14.1+ obv. 32 (F), KUB 14.1+ obv. 34–35 (F) NH KBo 5.8 i 40 (C), KBo 14.3 iii 20 (F), KUB 1.1+ i 43 (H), KUB 1.1+ i 50 (H), KUB 1.1+ i 58 (H), KUB 14.14+ obv. 27 (P), KBo 4.4 iv 28 8 (Inc)
<i>dai-ⁱ</i> ‘put, place’, <i>tiye/a-^{zi}</i> ‘step’	OH KBo 22.2 obv. 16 (P) MH HKM 19 obv. 10 (P), HKM 27 obv. 7 (C), IBoT 1.36 iv 30 (H), KUB 14.1+ obv. 21 (F), KUB 14.1+ obv. 22 (F), KUB 14.1+ obv. 44 (F) NH KBo 19.66+ iii 49 (C), KBo 19.66+ iii 56 (C), KBo 19.66+ iv 19 (C), KBo 4.4 iii 63 (F), KBo 4.4 iii 66 (F), KBo 5.8 i 11 (P), KBo 5.8 i 17 (C), KBo 5.8 i 21 (P), KUB 1.1+ i 34 (Inc), KUB 1.1+ iv 40 (C), KUB 6.44 iv 21 (C)
<i>talliye/a-^{zi}</i> ‘pray’	NH KUB 14.4 iii 29 (F)
<i>tamāšš-^{zi}</i> ‘oppress’	OH KBo 22.1 obv. 3 (C), KBo 22.1 obv. 19 (C) MH HKM 52 obv. 12 (C), HKM 52 rev. 27 (C), HKM 52 rev. 33 (C), HKM 53 obv. 16 (C), HKM 68 obv. 7 (C) NH KBo 14.3 iii 18 (F)
<i>damme/išḥae-^{zi}</i> ‘damage’	MH KUB 23.72+ obv. 55 (P)
<i>tarḥu-^{zi}</i> ‘be powerful, prevail’	NH KBo 16.8 ii 21 (F), KBo 16.8 ii 27 (F), KBo 3.4 iv 46 (P), KBo 5.8 ii 33 (F), KUB 1.1+ i 69 (F), KUB 1.1+ i 73 (F), KUB 3.119+ i 16 (F)
<i>tarkummae-^{zi}</i> ‘report’	MH HKM 74 obv. 10–11 (C)
<i>tarna-ⁱ</i> ‘release, let’	MH HKM 46 up. ed. 27 (F), KUB 23.72+ obv. 41 (F)

(continued)

<i>tepnu</i> ^{-zi} ‘diminish’	MH KUB 23.72+ obv. 62 (F) NH KBo 3.4 i 24 (H), KBo 3.4 ii 13 (H), KUB 19.29 iv 21 (H)
<i>ter</i> ^{-zi} ‘say’	OH KBo 6.2 iii 17 (C), KBo 22.2 obv. 8 (C)
<i>titnu</i> ^{-zi} ‘install, put’	MH HKM 47 obv. 6 (F), KUB 14.1+ obv. 32–33 (P) NH KUB 14.13+ i 26 (H), KUB 1.1+ iv 73 (P)
<i>tūriye/a</i> ^{-zi} ‘harness’	MH HKM 66 obv. 14–15 (P), HKM 66 obv. 15–16 (P), KUB 1.11+ i 38 (F)
<i>uye</i> ^{-zi} ‘send’	MH HKM 55 rev. 30 (F) NH KUB 1.1+ i 66 (H), KUB 1.1+ iv 52 (Inc)
<i>uppa</i> ⁻ⁱ ‘send’	MH KUB 14.1+ obv. 63 (F), KUB 14.1+ rev. 36 (F) NH KUB 1.1+ iv 53 (Inc), KUB 1.1+ iv 54 (F)
<i>ušniye/a</i> ^{-zi} ‘put up for sale’	OH KUB 29.29 ii 8 (C), KUB 29.29 ii 12 (C), KUB 29.29 ii 15 (C)
<i>uwa</i> ^{-zi} ‘come’	MH IBoT 1.36 i 74 (H), KUB 14.1+ obv. 63–64 (P)
<i>wai</i> ⁻ⁱ ‘cry (out)’	NH KUB 19.4 i 8 (Inc)
<i>wahnu</i> ^{-zi} ‘move, make turn’	MH KUB 29.42 ‘2 (It), KUB 29.42 ‘6 (It), KUB 29.42 ‘12 (It), KUB 29.40 iii 9 (It), KUB 29.40 iii 9 (It), KUB 29.40 iii 18 (It), KUB 29.40 iii 24 (It), KUB 29.40 iii 26 (It), KUB 29.46+ iv 11–12 (It), KBo 8.52+ i 11 (It), KBo 8.52+ iv 30 (It)
<i>walḥaḥḥ</i> ⁻ⁱ ‘strike’	NH KUB 14.14+ obv. 26 (P)
<i>walḥanna</i> ⁻ⁱ ‘strike’	MH KUB 14.1+ obv. 86 (C), KUB 23.72+ obv. 28 (It) NH KBo 3.4 i 31 (Inc), KBo 3.4 iii 51 (It), KBo 3.4 iii 72 (It), KUB 1.1 ii 10 (Inc), KUB 1.1 ii 6 (Inc), KUB 1.1 ii 7 (Inc), KUB 1.1+ ii 11 (Inc), KUB 1.1+ ii 42 (P), KUB 14.16 i 20 (It), KUB 19.10 i 10 (F), KUB 19.37 ii 3 (It)
<i>warš</i> ⁻ⁱ ‘harvest’	MH HKM 25 obv. 10 (F), HKM 66 rev. 38 (C)
<i>wašta</i> ⁻ⁱ ‘sin’	MH KUB 23.72+ rev. 36 (F) NH KUB 14.8 obv. 10 (Gen)
<i>wātarḥaḥḥ</i> ⁻ⁱ ‘instruct’	MH HKM 36 rev. 43 (F), HKM 84 left ed. a 2 (F)
<i>wekk</i> ^{-zi} ‘ask for’	NH KBo 14.10 iv 21 (C), KBo 14.10 iv 22 (C), KBo 14.12 iv 17 (C), KBo 16.1 iii 9 (C), KBo 5.6 iii 50 (C), KUB 14.12 iv 10 (C)
<i>wemiye/a</i> ^{-zi} ‘find’	MH HKM 53 rev. 21 (P)
<i>weriyanna</i> ⁻ⁱ ‘call’	NH KUB 14.16 iv 22 (F)
<i>wete</i> ^{-zi} ‘build’	NH KBo 5.6 i 13 (C), KBo 12.26 i 3 (C), KUB 31.7 i 3 (C)
<i>walla/i</i> ‘praise’	NH KBo 5.6 i 4 (C)
<i>zahḥiye/a</i> ^{-zi} ‘fight’	NH KBo 5.8 ii 9 (C), KBo 5.8 ii 37 (C), KUB 3.119+ i 5–6 (H), KUB 3.119+ i 16–18 (H)
<i>zanu</i> ^{-zi} ‘make cross’	OH KBo 6.2 ii 30 (C)
<i>zapnu</i> ^{-zi} ‘sprinkle’	MH HKM 10 rev. 29–32 (F)

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