Deriving preverbal position in a verb-final language: the case of Hittite

EKATERINA A. LYUTIKOVA

ANDREI V. SIDELTSEV

Author affiliations can be found in the back matter of this article

Abstract

The paper presents an analysis of clause structure in Hittite, a coherently head-final language with SOV word order and an elaborated preverbal position hosting various functional elements of the clause. We argue that the best approach to capturing these phenomena is to assume a universally right-branching structure coupled with phrasal movement driven by selectional feature checking under adjacency of relevant heads.

1 Introduction

The aim of this paper is twofold. For one thing, we present a study of word order patterns in Hittite, an extinct Indo-European language of the Anatolian group, and argue that despite its superficial preference for head-final structures it should be analyzed as a right-branching language, its surface word order resulting from a series of phrasal movements of a specific kind. In this way, the paper contributes to the discussion of the alleged correspondence between structural and linear ordering. At the same time, the paper elaborates techniques of formal theorizing suitable for a dead language represented by a large but nonetheless limited and randomly preserved collection of texts.[1] It shows that if the choice between the possible explanatory models is narrowed down on theoretical grounds, positive data may suffice to argue for the favored analysis.

Hittite belongs to the linguistic type characterized by clause-final position of the verb and subject position preferentially to the left of the object (SOV), the prevalence of suffixation over prefixation, preposition of the genitive possessor to the nominal head (Gen N), and the use of postpositions (N P). In analytic forms the lexical verb precedes the auxiliary verb (V Aux), while in verb clusters, which are formed by the combination of non-finite embedded and matrix predicates, the embedded verb is also found to the left of the matrix verb ($V_E V_M$). Finite dependent clauses precede matrix clauses. All these properties characterize Hittite as a consistently left-branching language, i.e. a language where dependents linearly precede their heads.

Like many other SOV languages (e.g. Persian (Kahnemuyipour 2001), Ossetic (Lyutikova & Tatevosov 2009; Erschler 2012), Hungarian (Kiss 2002), Georgian (Harris 1981), and Turkish (Kornfilt 1997)), Hittite exhibits a prominent preverbal position which hosts various elements associated with the left periphery of the clause, namely *wh-* and focused phrases and complementizers. Other elements occurring preverbally in Hittite are indefinite pronouns, negation markers, preverbs and low adverbials. The intriguing property of languages of this type is that when the preverbal position is sufficiently elaborated and contains various kinds of elements, both heads and phrases, then they are strictly ordered, and this order corresponds to the standardly assumed embedding hierarchy (higher elements are to the left of lower elements), which seems to contradict the general head-final nature of the language and makes the analysis cumbersome. We suggest that this property is diagnostic of an underlying right-branching structure and that our analysis developed here for Hittite can be extended to other languages of the type.

The paper is organized as follows. Section 2 presents the basic word order patterns of Hittite and compares them to the hierarchy of clausal projections previously established for Hittite. In section 3, properties of Hittite word order are identified which provide evidence for a right-branching option; an example derivation of the Hittite clause based on right branching and phrasal movement is provided. Section 4 concludes.

2 Word order and clause structure in Hittite

In this section we will sketch out the regularities of the linear ordering of derivational and inflectional affixes, as well as major clausal functional heads spelled out by separate lexical items. The resulting linear hierarchy is then mapped onto the hierarchical clause structure of Hittite as argued for elsewhere (Sideltsev 2015; 2017a).

2.1 Verbal forms

Hittite verbal forms can be divided into synthetic and analytic.[2] Synthetic verbal forms consist of the verbal stem and one or several markers: inflectional marker (cumulative marker of mood,

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1   Hittite is attested by texts of various genres preserved on clay tablets and tablet fragments, which number over 30,000. They were produced from the 16th to the 13th century BC and come from several archives; the principal one is Hattusa, near the modern Turkish town of Boğazkale.

   We assess the syntax of Hittite as homogeneous with regard to word order throughout its written history for two reasons. First, preliminary research has shown no significant change in this respect during the course of its attestation. Second, the data that are relevant for syntactic studies are so scarce in a natural limited corpus that for practical reasons we wish to make use of as wide an array of texts as possible.

2   Here and elsewhere we consider only finite verbal forms; to keep the model simple, derivational morphemes producing non-finite verbal forms (participle, infinitive, supine) are not assessed. Neither do we take into account agreement markers whose position within the verbal form is frequently not syntactically motivated, as shown by Julien (2002).

tense, voice and person-number agreement), causative marker, imperfective/durative marker (Hoffner & Melchert 2008: passim; Boley 1984; 1992; Shatskov 2012). The shortest and longest word-level strings are represented in (1).

(1)   a.   V + T[3]
            KUB 23.72 + rev. 67[4]
            ḫalzi-ḫḫi
            call-PRS.1SG
            '(I) will call'

       b.   V + Caus + Asp + T
            KUB 17.21 + ii 7'
            ar-nu-ške-uwani
            arrive-CAUS-IMPF-PRS.1PL
            '(we) bring'

Analytic verbal forms are represented by the perfect and the passive. Both perfect and passive use a participle with the suffix *-ant-*. Auxiliary verbs *ēš-* 'be' and *ḫark-* 'have' form the perfect, and *ēš-* 'be' is also used in the formation of the passive (Hoffner & Melchert 2008; Boley 1984; 1992; Shatskov 2012). Thus the participle itself is voice-neutral. The auxiliary verb does not undergo recursion, as the analytic form is either an (active) present/past perfect (with the auxiliary verb in the present or past form), or a passive which expresses tense and mood on the auxiliary verb. The participle precedes the auxiliary verb (2a–b). Auxiliary verbs bear mood and tense markers, whereas derivational morphemes of causative and imperfective are found on the participle (2c).

(2)   a.   V > Aux$_{PERF}$ + T
            HKM 30 u.edge 23–25
            [k]āša = za   GÉME   kuit   [kui]t   **d-ān**
            PERF = REFL   female.slave   what   what   take-PRTC.NOM.SG.N
            day-a < n > n = a   ḫar-zi
            steal-PRTC.NOM.SG.N = and   have-PRS.3SG
            'Whatever the female slave has **taken** and **stolen**…'

       b.   V > Aux$_{PASS}$ + T
            AT 125: 12
            n = at   arḫa   **ḫarr-ant-eš**   eš-er
            CONN = they   away   spoil-PRTC-NOM.PL.C   be-PST.3PL
            'They were **spoiled**.'

       c.   V + Caus > Aux$_{PERF}$ + T
            KBo 5.1 i 41
            mān = wa   AMA = *KA*   našma   *ABU* = *KA*   appezzi-az
            if = QUOT   mother = your   or   father = your   late-ABL
            kuitki   **wašta-nuw-an**   ḫark-anzi
            something.ACC.SG.N   sin-CAUS-PRTC.NOM.SG.N   have-PRS.3PL
            'If your father or mother lately **made it so that some sin occurred**…'

2.2 Sequence of functional heads

The finite verbal form usually occupies final position in the clause. To its left the following functional elements are found.

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3   We use the following notation when schematically marking the linear structure: X + Y — X and Y are parts of one word, X precedes Y; X > Y — X and Y are different words, X precedes Y; X…Y — X and Y are different words, X precedes Y and need not be adjacent to Y; X–Y — X and Y are separate words, X precedes Y and is adjacent to Y.

4   Sources are quoted according to standard editions which are not specially marked in each case. Hittite texts are quoted using the standard Hittitological convention, most commonly by KBo and KUB, primary edition series, followed by volume number, text number and line number, e.g., KUB 15.15 ii 15.

We follow the basic conventions for transliterating Hittite texts originally written in cuneiform, which generally feature some words or phrases written in the foreign languages Sumerian and Akkadian. Hittite words are transliterated in plain text, while Sumerian words are written in SMALL CAPS, Sumerian determinatives are written in SUPERSCRIPT SMALL CAPS, and Akkadian words are written in *ITALIC SMALL CAPS*. Hittite clitics are joined to their host by =. Fragments of the text which are not preserved but have been restored on the basis of the context are enclosed with [ ], whereas fragments of the text restored on the basis of duplicate copies are enclosed with [( )]. ? means that the restoration or reading is uncertain, while ! means that the reading goes against the actual text (i.e., a fragment of the available text (a sign or a form) is interpreted as a mistake and a correction is suggested).

— Preverbs. Preverbs in Hittite are separate words with originally locational or directional semantics. Not only single preverbs, but also combinations of two preverbs denoting direction and location (e.g. 'from behind', 'up to') are attested; in the latter case, the two are strictly adjacent.

(3)   Prev > V
    a.   KUB 13.4 iv 22–23
        šumel=ma=aš=kan   ḫalki-uš   ḫūmand-uš **arḫa** d-anzi
        your=but=them=LOCP grain-ACC.PL all-ACC.PL away take-PRS.3PL
        'But they will take it, all the grain, **away**.'
    b.   KUB 1.1 + iii 30
        n=an   *ANA* ᵐᵈXXX-ᵈU   **EGIR–pa parā** pi-ḫḫun
        CONN=it to   Arma-Tarhunta **back**   **out** give-PST.1SG
        'I gave it **back** to Arma-Tarhunta', lit. 'gave **out back**.'

— 'Low' adverbs. Low adverbs are a closed set of manner adverbs such as *kiššan* 'thus', *apeniššan* 'likewise' which are consistently placed immediately in front of the verb; other adverbs are freely distributed over the clause, scene-setting and temporal adverbs appearing at the left edge of the clause.

(4)   Adv > V
    KBo 15.1 i 12–13
    nu=kan   *ANA* LÚ LUGAL–u-š   **anda kišan**   memai
    CONN=LOCP to   man king-NOM.SG.C into in_this_way speak.PRS.3SG
    'And it is the king who speaks to the man **in this way**.'

— Negation markers. In Hittite, negation markers are sensitive to mood: indicative clauses employ the particle *natta* 'not', often represented by the Akkadogram *UL*; prohibitive clauses employ the particle *lē* 'do not'.

(5)   Neg > V
    KUB 8.81 + iii 5
    nu   12 SAG.DUᴴᴵ·ᴬ *UL*   pāi
    CONN 12 heads   NEG give.PRS.3SG.
    'He does **not** give 12 heads (i.e. persons).'

— Modal particle (IRR). The modal particle *man/mān* can be either a Wackernagel second position enclitic or an independent form in its own linear position. It can be combined with present-future or past indicative finite verb forms.

In (6.1), we see the irrealis particle following the initial complementizer *mān* 'if'. In (6.2), the irrealis particle is clause-initial whereas the complementizer *kuit* 'as' is preverbal.[5]

(6)   Mood > V
    KBo 5.8 iii 15–17
    1.   mān=kan **mān** *ANA* ᵐPittaggatalli=pat warpa   te-ḫḫun
        if=LOCP   IRR to   Pittaggatalli=FOC enclosure.ACC.PL.N put-PST.1SG
    2.   **man**=mu ᴸᵁ́auriyaluš   kuit *ŠA* ᵐPitaggatalli aw-ēr
        IRR=me scouts.NOM.PL   as of Pittaggatalli see-PST.3PL
    '(1) If I **had** surrounded Pittaggatalli, (2) as scouts of Pittaggatalli **would** have seen me…'

— Subordinators. Subordinators are elements signaling the dependent status of the clause, as well as its type (declarative, interrogative, relative, adverbial). Subordinators are instantiated by

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elements of various categories: they may be either heads (complementizers) or phrases located in the projection of such heads (e.g. relative *wh*-phrases). Thus, they do not form a natural class taxonomically, but rather belong to the same functional cluster, and are often complementarily distributed and diachronically related. In Hittite, the distinction between complementizers and *wh*-pronouns is clear-cut in some cases (e.g. *maḫḫan* 'as' can only be a complementizer, and *kuiš* 'who' a *wh*-pronoun) and rather controversial in others (e.g. *kuit* 'which', 'that' can function as a *wh*-pronoun or as a complementizer); however, this is of no immediate concern for us in this paper, since they never co-occur (see below for details).

(7)   C/wh > V
    a.   C
          KUB 15.1 + ii 13–14
          ariyašešnaz   kuitta   **GIM–an**   SI × SÁ-at
          oracle.ABL   each.NOM.SG.N   as   establish-PST.3SG.MED
          '**As** each was established by oracle…'

    b.   wh
          KBo 6.26 i 39
          Ù   A.ŠÀ–*LAM*   karū = pat   **kui-š**   šūnie-t
          and   field   already = FOC who-NOM.SG.C   throw-PST.3SG
          '**Who** first sowed the field…'

The constituents mentioned above display some variability in their position. For instance, preverbs can be positioned either adjacent to the verb, following the negation marker and adverbs (8a–b), or further leftward in front of the negation marker and adverbs (8c–d) (Salisbury 2005). Complementizers appear both in the left periphery of the clause (9) and considerably closer to the verb, in front of the negation marker, preverbs and low adverbs (10) (Sideltsev 2015; 2017b). In the case of complementizers their position in the clause largely correlates with their class. For example, subordinators *mān* 'if', *takku* 'if' belong to the clause-initial subordinators (C$_{IN}$), whereas subordinators *kuit* 'because' (Huggard 2013) and *kuwapi* 'when, where' (Hoffner & Melchert 2008: 417) belong to the preverbal subordinators (C$_{PREV}$). It must be observed, however, that a given subordinator can vary somewhat in its positioning, e.g., *maḫḫan* 'when, as' can behave like an initial or a preverbal subordinator (Sideltsev 2017b). The combination of the complementizer with the irrealis marker is revealing: clause-initial subordinators appear to the left of it, and preverbal subordinators to the right, cf. (11). As for preverbs, by contrast, the two positions identified in (8) are not associated with specific preverbs; any preverb can be verb-adjacent or not. The only restriction is that a preverb cannot appear to the left of a subordinator, see Salisbury (2005).

(8)   a.   Neg > Prev > V
              Bo 86/299 iii 3–5
              zilati^{1} = wa = kan   LUGAL–*UTTA*   ŠA   KUR   URU dU–tašša   *ANA*
              in_the_future = QUOT = LOCP   kingdom   of   land Tarhuntassa   to
              NUMUN   mNIR.GÁL   lē   kuiški   **arḫa**   dā-i
              progeny Muwatalli PROHIB   someone.NOM.SG   away   take-PRS.3SG
              'In the future may no one take **away** the kingdom of Tarhuntassa from the progeny of Muwatalli.'

        b.   Adv > Prev > V
              KUB 29.7 + obv. 28
              n = at   apēdašš = a   *QATAMMA*   **parā**   ēp-zi
              CONN = them   that.DAT.PL = and   thus   out   grab-PRS.3SG
              'She holds them **out** to them.'

        c.   Prev > Neg > V
              Msk. 73.1097 17–19
              kinun = a = šši = kan   apā-t   É–er   GIŠKIRI$_{6}$.GEŠTIN = ya
              now = but = him = LOCP   that.ACC.SG   house.ACC.SG   vineyard = and
              ar[ḫa]   lē   kuitki   ta-t[t]i
              away   PROHIB   something   take-PRS.2SG
              'Now do not take that house and vineyard **away** from him in any way!'

        d.   Prev > Adv > V
              KUB 43.38 rev. 11
              [tag]anzipa-š   **katta**   *QATAMMA*   pāš-u
              earth-NOM.SG   down   thus   swallow-IMP.3SG
              'May the earth likewise swallow (them) **down**.'

(9) C_{IN}…Prev > V
a.   KUB 41.11 + rev. 32′
takku UN-aš   U[DU-]i   našma UZ$_6$ GAM–an wašta-i
if   man-NOM.SG.C sheep-LOC.SG or   goat down   sin-PRS.3SG
'**If** a man sins with a sheep or a goat.'

b.   KBo 17.65 + rev. 22
[n = a]šta **maḫḫan** MUNUS-za   parā ar-i
CONN = LOCP when   woman-NOM.SG out   arrive-PRS.3SG
'**When** the woman goes out…'

(10)   …C_{PREV} > Prev > V
a.   KUB 30.29 obv. 5
DUMU-aš = šan   **kuwapi** katta mauš-zi
child-NOM.SG = LOCP when   down fall-PRS.3SG
'**When** the child falls down…', i.e. 'is born'

b.   KBo 5.9 + ii 31′–32′
n = at = kan   *ANA* URU$^{DIDLI.ḪI.A}$ **kuit** šarā iya-ddari
CONN = they = LOCP to   cities   while up   go-PRS.MED.3SG
'**While** they go up to the cities.'

(11)   a. C_{IN} > IRR
KUB 19.29 iv 10
man = wa = mu **mān** naḫšar-nu-t
if = QUOT = me   IRR   fear-CAUS-PST.3SG
'If he **had** made me show respect…'

b.   IRR > C_{PREV}
KBo 4.4 + ii 43–44
man maḫḫ[an LÚ$^{MEŠ \ URU}$Āššur] ištamašš-ir
IRR   when   Assyrians   hear-PST.3PL
'When the Assyrians **would** have heard…'

In Sideltsev (2015; 2017a), the sequence of functional elements preceding the finite verbal form is characterized for Hittite as the preverbal position. It includes the following constituents: (a) focused phrases[6] and interrogative *wh*-phrases; (b) preverbal complementizers, relative pronouns, indefinite pronouns; (c) preverbs; (d) negation markers; (e) low adverbs. These elements form a strictly ordered array to the left of the verb. If only the sequence of heads is considered and phrases are excluded, it looks like (12):

(12) C_{PREV} > Prev > Neg > Adv > V

Introducing phrasal categories into this image we observe, firstly, that indefinite pronouns in the scope of negation immediately follow the negation marker (cf. (8a), (8c)). So it is quite likely that to the immediate right of the negation marker position there is a head that attracts them. As Hittite indefinite pronouns precede low adverbs irrespective of the presence of the negative operator and their scope with respect to it, we suggest that indefinite pronouns occupy the same structural position in whatever configuration and are attracted there by the same functional head F, cf. Sideltsev (2017a) for a similar idea. Alternatively, they may be supposed to adjoin at the edge of the verbal domain, or, as Huggard (2015: 60) suggests, to be placed in Spec, *v*P, if multiple specifiers are allowed.[7]

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6   Only identificational focus (in the terms of Kiss 1998) seems to be found in preverbal position in Hittite, see Goedegebuure (2014) for more detail and a finer-grained distinction between various subtypes of identificational focus. In what follows, we limit ourselves to the discussion of this type of focus.

7   Indefinite constituents taking wide scope with respect to sentential negation are located to the left of the negative marker, cf. (i):

(i)   IBoT 1.36 i 19
mān andurza **kuiški** ^{URUDU}**zakke-š**   *UL* karpanza
if   inside   some.NOM.SG.C doorbolt-NOM.SG.C NEG lifted.NOM.SG.C
'If inside **some doorbolt** has not been lifted.'

In this case, they seem to move even higher in the tree in order to escape the scope of negation. Huggard (2015: 60) suggests that they target one of the specifiers in TP; we take no particular position with respect to this issue. Importantly, there are reasons to believe that indefinite pronouns with whatever scope are always attracted by F, and only move further to the left if the negative operator is present and if they take wide scope with respect to it. The main evidence comes from complementation constructions, where indefinites appear between the embedded infinitive and the matrix verb even in the absence of negation. Since in this paper we are primarily concerned with the position of narrow scope indefinite pronouns and the linear order of heads this position diagnoses, we only use examples with indefinites taking the narrowest scope and assume them to be situated uniformly in Spec, FP.

Secondly, the linear position of relative pronouns in correlative constructions, interrogative pronouns and focused constituents is to be discussed.

Relative and interrogative pronouns are complementarily distributed with preverbal complementizers and, as expected, with each other. We conclude that they are attracted by a relative/interrogative complementizer in the preverbal position, and the ban on their co-occurrence should be treated as an instantiation of the familiar spell-out constraint known as the Doubly Filled Comp Filter (Chomsky & Lasnik 1977).

Focused constituents, on the other hand, may co-occur with (and invariably precede) both preverbal complementizers (13a) and *wh*-phrases (13b–c).

(13)   a.   Foc > C$_{PREV}$
             KUB 1.1 + iv 7–8
             ammuk = ma   LUGAL–*UTTA* ^{d}*IŠTAR*   GAŠAN = *YA*   **annišan = pat**
             me.DAT.SG = but kingship   Istar   lady = my   previously = FOC
             kuit   memi-ške-t
             because say-IPF-PST.3SG
             'Because to me my lady Istar had **previously** promised the kingship…'

       b.   Foc > wh (interrogative)
             Bo 2810 obv. 9–10
             INA   **UD.1.KAM = pat** = aš = ta   kuwat   GAM–an   ēš-ta
             in   day.1 = FOC = it = you.SG.DAT   why   with   be-PST.3SG
             'Why did it remain with you **even for one day**?'

       c.   Foc > wh (relative)
             HKM 17 obv. 13
             nu = mu   kāšma   **šumeš = pat**   kui-t   ḫatrā-ten
             CONN = me   PRF   you.PL = FOC   what-ACC.SG.N   write-2PL.PST
             'Concerning what **you yourselves** wrote…'

Many researchers agree that constituents bearing identificational focus (Kiss 1998) occur in the preverbal position in Hittite (Goedegebuure 2013; 2014; Huggard 2015). Thus, Goedegebuure (2014) treats the OSV word order in (14) as a consequence of the preverbal placement of the constituent *zik* 'you', which belongs to a specific type of identificational (contrastive) focus, so-called *replacing focus*.[8] Following Goedegebuure (2014: 401), in this example the actual offender is replaced with another person, who might take his sin upon himself.

(14)   HKM 13 rev. 13–14
        nu = za   apēl   waštul   **zik**   dā-tti
        CONN = REFL his   sin.ACC.SG.N   you.NOM.SG.C   take-PRS.2SG
        '**You** take upon yourself his 'sin'.'

On the basis of these data, we conclude that focused constituents are associated with the leftmost head in the array of preverbal elements. They may be attracted by a separate head Foc c-commanding the preverbal complementizer or, alternatively, adjoin to the maximal projection of the preverbal complementizer. While not opting for any specific analysis, in what follows we assume a more economical variant with only one functional head C$_{PREV}$.

It is significant that all the remaining arguments and adjuncts of the verb which are not instantiated by constituents attracted to the preverbal position appear to the left of it. Sideltsev (2017a) suggests that they obligatorily raise to the specifier positions of functional projections within the CP layer; other possible explanations involving remnant movement of the verbal domain to TP will be provided below. In any case, the movement produces the effect of indefinite pronouns, *wh*-pronouns and focused constituents being situated in the preverbal position, to the right of other argumental and adverbial phrases. Incorporating these data, as well as the variable position of the preverb, into the linear sequence of heads in the preverbal position (12) produces the representation in (15):

(15)   [XP$_{wh/foc}$] C$_{PREV}$ > (Prev) > Neg > [XP$_{Indef}$] F > Adv > (Prev) > V

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8   Alongside preverbal position, Goedegebuure (2014) posits another, clause-initial, position of narrow informational foci, such as additive focus.

Finally, combining the data of the linear structure of the preverbal position with the information about the structure of verbal forms and the left periphery of the clause we obtain the resulting linear sequence (16):

(16) C_{IN} > Mood > [$XP_{wh/foc}$] C_{PREV} > (Prev) > Neg > [XP_{Indef}] F > Adv > (Prev) > $V + Caus + Asp$ > $Aux + T$

2.3 Bi-verbal clauses and verb clusters

Another type of monoclausal configuration involving linear ordering of heads is represented by bi-verbal constructions. They can be divided into two types: the inchoative construction, consisting of an inchoative aspectual verb and its supine[9] complement, and the complementation construction, comprising a lexical matrix verb and its infinitival complement. In these constructions, the embedded verb projects only a reduced functional structure: both predications share just one Wackernagel position, preverbal position, negation marker, and set of tense and mood markers.

The inchoative and complementation constructions show different grammatical and interpretational properties, as well as a different linear position of the verbal heads. The inchoative construction is characterized by the following properties: the main predicate is used not in its lexical meaning (*dai-* 'put', *tiye-* 'step', *epp-* 'take'), but rather as a light verb (LV) (Hoffner & Melchert 2008). The inchoative light verb does not project its own argument and thus does not impose specific requirements on its grammatical subject; it can be instantiated by an inanimate noun phrase, and its theta-role need not be agentive, see examples (17a–c):

(17)   a.   KBo 4.2 iii 46–47
       nu = mu   ui-[(t)]   **aši**   **memiaš**
       CONN = me come-PST.3SG this.NOM.SG.C matter.NOM.SG.C
       tešḫani-ški-uwan   tiya-t
       appear_in_dream-IMPF-SUP   step-PST.3SG
       'Then **this thing** started to appear to me in dreams.'

   b.   KBo 3.1 i 63
       [(n = **aš**   DINGIR–*LI*)*M*–i-š (kikkišš-ūwan   dāi-š)]
       CONN = he god-NOM.SG   become.IMPF-SUP put-PST.3SG
       'When **he** started becoming a god…'

In the inchoative construction, the lexical verb is adjacent to the light verb and all the elements of the preverbal position appear in front of the lexical verb. Nothing can intervene between the lexical verb form and the light verb (Hoffner & Melchert 2008: 338). In (18a) we see that the low adverb is placed immediately in front of the supine, and in (18b) we see the indefinite pronoun:

(18)   a.   KBo 11.1 obv. 37
       nu   apūšš = a   *QATAMMA* ē-šš-uwan   ti-anzi
       CONN that.ACC.PL = and thus   do-IMPF-SUP put-PRS.3PL
       '**Thus** they shall begin to celebrate them.'

   b.   KUB 19.3 + i 6–7
       [*UL* = wa = mu]   **kuitki**   [EGIR]–pa pīya-uw[an tiya-ši]
       NEG = QUOT = me something.ACC.SG.N back   give-SUP   step.PRS.2SG
       'You are not starting to give me **anything** back.'

Therefore in Lyutikova & Sideltsev (2021) the inchoative construction is argued to involve functional restructuring (Wurmbrand 2001). The idea of restructuring is in line with the earlier analysis of Hittite inchoative constructions by Koller (2013), although the amount of functional structure Koller associates with the embedded clause is much larger than we suppose it to be.

In the complementation construction the dependent infinitive also projects a reduced structure, but the matrix verb is used in its lexical meaning and has its own argument structure. As a result, semantic restrictions on the compatibility of the matrix and embedded predicates are attested. These restrictions are even more severe in the lexical restructuring configurations available with several matrix verbs, such as *ḫantaye-* 'establish', *zinna-* 'finish': the embedded verb must

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9   Infinitive when the inchoative aspectual verb is *epp-* 'take'.

belong to the class of agentive controllable verbs. For the complementation construction, the linear position of the embedded verb is different from that in the inchoative construction: the embedded infinitive and the matrix lexical verb are separated by elements of the preverbal position, such as negation markers and indefinite pronouns. This is demonstrated in (19).

(19)　a.　$V_{INF} > Neg > V_{MATRIX}$
　　　　　KBo 5.3 + iii 38'
　　　　　danna = ma = za　　**lē**　　ilaliya-ši
　　　　　take.INF = but = REFL　PROHIB　wish-PRS.2SG
　　　　　'But **do not** desire to take (her sexually).'

　　　b.　$V_{INF} > Neg > [XP_{Indef}] F > V_{MATRIX}$
　　　　　KUB 21.27 + i 21–22
　　　　　[ᵁᴿᵁNe]riqqan = ma　URU-an　　　app-anna　*UL*　**kui [šk] i**
　　　　　Neriq.ACC.SG = but　city-ACC.SG　take-INF　NEG　anyone.NOM.SG.C
　　　　　[šan]aḫ-ta
　　　　　seek-PST.3SG
　　　　　'**No one** sought to take the city of Nerik.'

We observe that the linear order of bi-verbal constructions fits nicely into the linear sequence of the monopredicative construction presented above. In the aspectual construction, the supine is found in the position of the lexical verb (V) and the inchoative light verb assumes the position of the auxiliary verb. In the complementation construction, the matrix predicate occupies the position of the lexical verb whereas the embedded infinitive is located in the position of the preverb. This generalization allows us to conclude that the inchoative light verb and the auxiliary verb, on one hand, and the embedded infinitive and the preverb, on the other, occupy identical positions in the syntactic structure. This generalization is particularly important in identifying the structural position of the preverb. As the embedded infinitive construction is clearly the complement of the matrix verb, the preverb is also likely to project a phrase embedded under the lexical verb as its complement.

A possible alternative suggested by a reviewer is to consider the combination of the verb and preverb as a complex head. Although this analysis can presumably be justified for other languages, we do not think that it is well suited to Hittite preverbs. First of all, preverbs can be separated from the verb by other constituents, cf. (8c–d), which can only be obtained by excorporating either of the heads in the alleged Prev + V complex head. Secondly, preverbs often contribute to the argument structure of the verbal predicate, providing a new telos associated with its own argument. The following examples illustrate the point. The verb *šarnink-* without preverb is transitive with the meaning 'compensate' and is used with accusative of the object compensated for (as in (20a)) and with dative of the beneficiary. When used with the preverb *anda* 'in' (illustrated by (20b)) *šarnink-* has the same meaning 'compensate', but with accusative of the person compensated.

(20)　a.　KUB 13.35 + ii 40
　　　　　nu = war = aš　　　　　nawi　　not_yet　šarnik-zi
　　　　　CONN = QUOT = them　not_yet　compensate-PRS.3SG
　　　　　'He has not yet replaced them.'

　　　b.　Bo 86/299 ii 76–77
　　　　　n = an = kan　　　　　　DUMU = *YA*　DUMU.DUMU = *YA*　*QATAMMA*　anda
　　　　　CONN = him = LOCP　son = my　　grandson = my　　　likewise　in
　　　　　šarnik-zi
　　　　　compensate-PRS.3SG
　　　　　'Let my son (and) grandson keep compensating him in the same way.'

Other examples of this kind involve motion and position verbs. As seen in (21a), *iya-* 'go' is intransitive without preverbs. However, when used with the preverb *āppan* 'behind', it can be transitive 'follow (somebody)', as in (21b) (Salisbury 2005: 62):

(21)　a.　KUB 29.4 + iii 28
　　　　　nu　　maḫḫan　iya-ttari
　　　　　CONN　when　　go-PRS.3SG
　　　　　'When he goes.'

　　　b.　KUB 22.70 obv. 37
　　　　　ᵐPalā-nn = a = wa = kan　　　　　　EGIN–an　iya-ḫḫut
　　　　　Pala-ACC.SG.C = and = QUOT = LOCP　behind　go-IMP.MED.2SG
　　　　　'Also follow Pala.'

Likewise, the verb *ar-* 'stand' is intransitive without a preverb, as in (22a), but when used with the preverb *āppan* 'behind' it is transitive with the meaning 'attend to (something)',[10] as seen in (22b) (Salisbury 2005: 62–63):

(22) a. KUB 30.37 i 4
          n = aš = kan   *ANA* UR.MAḪ GIŠ   ar-tari
          CONN = he = LOCP on   lion   wood stand-PRS.MED.3SG
          'He is standing on a wooden lion.'

      b. KUB 21.19 + iv 17
          n = at   EGIR–an   ar-tari
          CONN = it behind   stand-PRS.MED.3SG
          'He attends to it.'

Given that Hittite preverbs commonly specify the resulting state acquired by the internal argument, and can affect the argument structure of the verb by introducing their own argument not selected by the verb, it is reasonable to identify the preverb with the head of ResP (Kratzer 2005; Folli & Ramchand 2005; Ramchand 2008).

In (23) it is shown how the components of the aspectual and complementation constructions are placed in the linear sequence of heads (23a): in (23b) we see the aspectual construction and in (23c) the complementation construction.

(23) a. C_{IN} > Mood > [$XP_{wh/foc}$] C_{PREV} >
          (Prev) > Neg > [$XP_{Indef/NPI}$] F > Adv > (Prev) > V + Caus + Asp > Aux + T
      b. V_{SUP} LV
      c. V_{INF} V_{MATRIX}

Our conclusion is supported by the following evidence. First, in the aspectual construction, the light verb does not attest analytic forms, just like the auxiliary verb, whereas in the complementation construction, the matrix predicate can have analytic forms, just like the lexical verb. In (24) we show complementation constructions where the matrix predicate is passive or perfect. Thus, (24a) is a typical example of the analytic passive (participle of the transitive verb plus a zero present form of the auxiliary *eš-* 'be'), whereas (24b) shows the analytic perfect form of the matrix predicate (participle of the transitive verb plus auxiliary *ḫark-* 'have').

(24) a. KBo 5.13 iii 15–16
          mān ^{LÚ}*ṬEMU* = ma uwanzi   *UL*   **tarnanza**
          if   envoy = but   come.INF[!] NEG allow.PRTC.NOM.SG.C
          'If the envoy **is** not **allowed** to come…'

      b. KBo 43.52 + iv 16
          DINGIR^{MEŠ} = za kūn   memi-an   kišša[n] iya-wanzi
          gods = REFL   this.ACC.SG matter-ACC.SG thus   do-INF
          malān   **ḫar-teni**
          approve.PRTC.NOM.SG.N have-PRS.2PL
          '**Have** you **approved**, o gods, of this matter thus?'

Secondly, it follows from (23) that the preverbal position in the complementation construction is expected to split: the negation marker, indefinite pronouns and low adverbs are located to the right of the infinitive, between the infinitive and the matrix verb, whereas preverbal complementizers, relative and interrogative pronouns as well as focused constituents occur to the left of the infinitive. This expectation is met by the linguistic data. We observe this rule in (25): in (25a–b) the focused phrase and the complementizer are to the left of the infinitive, whereas in (25c–d) the negation marker, indefinite pronouns and low adverbs are to the right:

(25) a. KUB 31.69 obv. 8'
          [LÚ]–*LUM* **kuwapi** wašš-ūwanzi ti-anzi
          man   when   clothe-INF   put-PRS.3PL
          '**When** they clothe a man…'

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10   As an anonymous reviewer rightly observes, the transitive construal of (21b) is further supported by the fact that the subject clitic is not used in these cases. The unmodified intransitive verb is commonly accompanied by subject clitics.

b. KUB 16.77 iii 8
[nu DINGIR–*LU*]*M* **ēšḫar = pat** šarnink-uwanzi
CONN god   blood = FOC receive_compensation-INF
šanḫ-eški-ši
seek-IMPF-PRS.2SG
'Do you, o god, keep seeking to receive compensation **for the blood only**?'

c. KBo 5.9 + iii 26
nu   mān tuk dā-uwanzi **kuitki**   Z[I = K]A
CONN if   you take-INF   something soul = your
'If your wish is to take **something**…'

d. KUB 13.4 iii 26–27
ᵁᴿᵁḪattušan = za = kan   zammura-uwanzi **kuiški**
Hattusa.ACC.SG = REFL = LOCP harm-INF   someone.NOM.SG.C
ti-ške-zzi
step-IMPF-3SG.PRS
'(And if) **someone** endeavors to harm Ḫattusa…' .

This split in the array of preverbal elements revealed in complementation constructions is highly important for modeling the linearization of the Hittite clause. It indicates that "preverbal position" is not homogeneous, but contains two subarrays of functional elements: the **immediate** preverbal position encompasses negation markers, indefinite pronouns and low adverbs, whereas the remaining preverbal elements constitute a separate domain. In what follows we refer to the whole array of preverbal elements as occupying **preverbal position**, and to the subset of them found between the infinitive and the finite verb as being in **immediate preverbal position**.

2.4 Structural hierarchy of the Hittite clause

In the previous section we established that the order of major clausal constituents can be described as the linear sequence (23), repeated here as (26). In this section we confront the linear sequence (26) with the alleged hierarchical structure of the Hittite clause. The latter emerges as a result of identifying specific lexical items and functional elements of Hittite with (a subarray of) a fixed hierarchy of functional heads constituting the clausal spine (Pollock 1989; Rizzi 1997; Cinque 1999). We assume that structural relations between the functional heads implied by this hierarchy are universal, which allows us, for given heads X and Y, to determine their structural relation unambiguously. As to the question whether all the functional heads are equally represented in whatever clause of whatever language, we refrain from taking a specific position. We limit ourselves to discussing those functional heads which are necessary to accommodate all the elements involved in the derivation of the Hittite clause. Accordingly, identifying a lexical item with a specific head and an XP with a specific projection results in structural ordering of these elements. The resulting hierarchy, based on the identification procedure argued for in Sideltsev (2015) and Sideltsev (2017a), is represented with some simplifications and corrections in (27).

(26) C_{IN} > Mood > [$XP_{wh/foc}$] C_{PREV} > (Prev) > Neg > [XP_{Indef}] F > Adv > (Prev) > V + Caus + Asp > Aux + T

(27)   [ForceP… [MoodP… [FinP… [TP… [NegP… [FP… [AuxP… [AspP… [CausP… [VP… [PrevP…]]]]]]]]]]]

Let us discuss several correspondences which are not straightforward.

The first problematic issue concerns complementizers. It is clear that preverbal and clause-initial complementizers should be hosted by different functional heads. Unfortunately, the distribution of complementizers over these two positions cannot provide us with a cue about the specific heads they instantiate. Conventional functions of complementizers, such as clause typing and illocutionary force encoding, are equally available for preverbal and initial complementizers; no difference between them can be drawn in terms of the finiteness of the clause (since higher functional projections are only found in finite clauses). The only property that appears to distinguish between them is that a subset of preverbal complementizers attract *wh*-constituents to their specifier and, accordingly, possess the strong corresponding feature (or the EPP feature), whereas clause-initial complementizers never trigger movement.

There is also a weak correlation between the diachronic source of the complementizer and its position: complementizers originating from *wh*-pronouns (e.g. *kuit* 'that', *kuwapi* 'when') are preverbal, whereas other complementizers are found in both preverbal and clause-initial position. The association of preverbal complementizers with *wh*-pronouns is further manifested in their complementary distribution. By contrast, clause-initial complementizers are compatible with *wh*-elements in the preverbal position, as in (28a–b). (28a) is a subordinate temporal clause with complementizer *kuitman* 'while' in the initial position and *wh*-word (relative pronoun) *kuiēš* 'which' in the preverbal position. (28b) is a conditional clause containing clause-initial complementizer *našma* 'or if' and *kuiēš* 'which'.

(28)   a.   KBo 26.65 + ii 5–7

        1. **kuitman** = wa = šši   MU.KAM^{ḤI.A} kui-ēš   dar-ant-eš
            while = QUOT = him   years   which-NOM.PL.C say-PRTC-NOM.PL.C

        2. nu = war = aš = za   šar[ā] tittanu-zi
            CONN = QUOT = them = REFL up   set-PRS.3SG

        3. tepaw-e = wa = mu   pedi   pa-u[wanzi …]
            little-DAT.SG = QUOT = me place.LOC.SG go-INF

        '(3) [The Stormgod told me] to go to the Little Place (1) **until** (2) he shall fulfill (1) the years which were decreed for him' following (CHD Š: 228a).

    b.   KBo 4.14 ii 31–32

        1. **našma** = tta   karū   ku[i-ēš]   linkiy-aš   UN^{MEŠ}-uš
            or_if = you.DAT already who-NOM.PL.C oath-GEN.SG men-NOM.PL.C
            eš-ir
            be-PST.3PL

        2. nu = tta   kiššan [kuiški]   mema-i
            CONN = you.DAT thus   someone.NOM.SG.C speak-PRS.3SG
            '(If some Hittite comes to you on that matter) (1) **or (if)** (of those) who were formerly your sworn allies (2) someone speaks to you as follows.'

The association of preverbal complementizers with *wh*-pronouns is instructive as important evidence about the emergence of preverbal complementizers (see Erschler 2012 for a specific case study), but does not help us to establish a synchronic identification of preverbal complementizers with a specific functional head.

Interestingly, a number of modern and ancient Indo-European languages attest two different positions for complementizers. Thus, a very similar situation obtains in Ossetic, where complementizers are lexically distributed over preverbal and clause-initial positions (Lyutikova & Tatevosov 2009). Moreover, preverbal complementizers are complementarily distributed with *wh*-constituents attracted to their specifier, but clause-initial complementizers are compatible with them. Lyutikova & Tatevosov (2009) take Fin as the base position of preverbal complementizers in Ossetic and assume that clause-initial complementizers derive through their obligatory raising to Force.

Another well-documented case of preverbal complementizers is provided by Latin. Danckaert (2012: 107ff) argues that the Latin complementizers *cum*, *si* and *ut* are associated with the lowest projection of the split-CP, namely FinP. Similar evidence comes from Modern Greek, where the clause-initial relative complementizer *pou* contrasts with lower declarative or interrogative complementizers like *óti* and *an* (Alexiadou 1997: 76). Two complementizer positions – Force and Fin – are commonly posited for Romance languages, see for Italian and Italian dialects (Ledgeway 2005: 380–389; Paoli 2007; D'Alessandro & Ledgeway 2010), for European Portuguese see (Mascarenhas 2014). The system is also attested in British English journalistic prose (Haegeman 2012: 25–26 fn. 21), and in Gungbe and Saramaccan (Aboh 2006).

We believe that this analysis can be extended to the Hittite data as well. Accordingly, in (27) we identify preverbal complementizers with the Fin head, and clause-initial subordinators with Force.

The specialized topic and focus positions between Fin and Force are not invoked in the further argumentation and are omitted in (27). The Mood head, situated between Fin and Force in (27), seems to be somehow misplaced, since it is usually analyzed as a higher functional element in the split IP domain, and not the split CP domain (Cinque & Rizzi 2008). However, there is evidence that Mood can be bundled with heads belonging to the higher domain: specifically,

Jayaseelan (2014) argues that in Dravidian, Mood is a realization of finiteness, and that it competes with typical left-edge elements, such as a relativizer and a (clausal) coordination marker, for the same structural position in the CP domain. It may also be the case that the irrealis particle is merely an exponent of agreement of some higher head in the CP domain in the relevant formal feature. Taking this into account, we prefer to place Mood between Fin and Force, as its linear position suggests.

We do not introduce separate projections for the passive voice or the perfect, since the same participle is used to form both. This is why we associate these categories (passive and perfect) not with the participle, but with the auxiliary verb (Aux). Low adverbs are provisionally associated with the AspP projection, although some of them, namely manner adverbs, are semantically compatible with the verbal phrase; we are not in a position to distinguish between the various semantic classes of low adverbs, or between various treatments of preverbal adverbs (heads of their own functional projection, specifiers of a dedicated functional projection or adjuncts to a semantically compatible functional projection), and will delve into this complicated issue elsewhere.

It is easy to see that (26) and (27) do not map onto each other: the structural hierarchy does not translate either to straight order (hence, consistent right branching) or to inverse order (hence, consistent left branching). In fact, for a given hierarchical structure [1 [2 [3]]] (i.e. where 3 is embedded under 2, and 2 is embedded under 1), various linear orders are attested in Hittite. Throughout this paper, we will use Svenonius' (2007) notation, represented in (29):

(29)   a.   1 > 2 > 3   'straight' (e.g. C_{IN} > Mood > Neg)
       b.   3 > 2 > 1   'reverse/roll-up' (e.g. V + Caus + Asp)
       c.   1 > 3 > 2   'curl' (e.g. C_{IN} > V > T)
       d.   3 > 1 > 2   'skipping' (e.g. Prev > Neg > V)
       e.   2 > 1 > 3   'hopping' (e.g. V > T > Prev[11])
       f.   2 > 3 > 1   'constituent fronting/sinking' (e.g. Neg > F > T)

Our goal in the rest of the paper is to consider various models of linearization of the syntactic structure and to choose those which are compatible with Hittite patterns.

3 Deriving word order in the Hittite clause

In this section we propose our account of word order in the Hittite clause. In 3.1, we exclude those options that are clearly contradicted by the Hittite data described in section 2. In 3.2, we develop a model representing the derivation of the Hittite clause which accommodates its key features: consistent head-final verbal form, clause-final position of the finite verb, elaborated preverbal position exhibiting a straight order of functional elements, and splitting of the preverbal array by preverbs or embedded infinitives. In 3.3, we provide additional arguments for the proposed analysis.

3.1 Narrowing down the range of options

There exist various theoretical options for deriving structures with a required branching direction in syntax[12] — base generation, head movement and phrasal movement.

Let us start with base generation accounts. Setting the branching direction in syntax amounts to establishing a specific value of the Head Directionality Parameter (HDP, Chomsky 1981: 171). Initially, it was supposed that this parameter setting embraced all types of heads uniformly,

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11   The exceptional case of postverbal preverbs will be discussed in section 3.3.2.

12   Besides, there exists a family of PF-located processes involving either further adjustment of the linear order of constituents created by the syntactic component to morpho-phonological constraints or a syntax-external generation of word order based on the given constituent structure lacking information about branching direction (Embick & Noyer 2001). In this paper, we assume that the output of the syntactic component is a constituent structure with a linear precedence relation defined on it; consequently, PF-internal processes do not generate the linear order but only adjust it to morpho-phonological needs. This view requires that PF movement coperations are only postulated if they cannot be performed in syntax (e.g. lowering). An instructive example is the study of hyperbaton in Classical Greek (Agbayani & Golston 2010; 2016) — the authors show that this type of movement operation (i) violates syntactic constraints and (ii) has a straightforward prosodic motivation. In this paper we aim to develop a syntactic analysis of word order in the Hittite clause; accordingly, we propose a derivation which respects syntactic constraints on movement and is syntactically motivated.

which was in compliance with typological data. Large-scale cross-linguistic studies from the second half of the 20th century have established the prevalence of consistent branching patterns across various categories (Greenberg 1963; Dryer 1992; 2009[13]), and deviations from this rule are usually connected with elements which unambiguously identify the syntactic category of a constituent without being its head, e.g., a possessor inside a noun phrase (Hawkins 1994). At the same time, attempts to accommodate deviant word order patterns led to the idea that HDP can be loosened in order to allow different types of phrases to be right- or left-branching. It has been proposed that branching direction can be connected with the syntactic class of heads: thus, e.g., in German and Dutch, [+V] (verbal and adjectival) heads follow, and [–V] heads (nouns and prepositions) precede their complements (Haider 2015). Not infrequently, the branching direction is different for lexical and functional heads: in Tzotzil, for instance, lexical heads taking a rightward specifier contrast with functional heads taking a leftward specifier (Song 2012: 204). Accordingly, assuming the possibility of variable branching direction is often accompanied by the requirement that left (or right) branching heads form a natural class. The obvious reason for this lies in language acquisition and parsing pressure. The assumption that branching direction varies randomly from head to head entails a scenario where a child acquiring a language has to set the head directionality parameter separately for every head, without any cues from previously acquired patterns. Inconsistent branching direction imposes an additional burden on the parser, since structural relations — and specifically c-command, which translates into scope and binding — cannot be read off directly from the linear order.

Abels & Neeleman (2012) argue for an even less restrictive theory of branching where rules of linearization can mention not only the head's syntactic category and the bar level, but also the category of the dependent. On this proposal, it is possible to base-generate, say, a DP complement to the left of the verb and a CP complement to the right of the verb. Importantly, even in such a system, there are still attested orders that cannot be base-generated and require an extra adjustment of ordering through movement. An additional concern is that this approach creates several homonymous analyses of a phrase which can differ not only as to the movement involved, but also as to the base-generated structure.

In section 2.4, we reached a point where comparing the linear order of heads and the structural hierarchy of the clause led to the conclusion that neither head-initial nor head-final order is consistently observed in clausal constituents in Hittite. Indeed, the uniform HDP setting produces the following linear orders:

(30)   a.   consistent right branching
C_{IN} > Mood > [$XP_{wh/foc}$] C_{PREV} > T > Neg > [$XP_{Indef/NPI}$] F > Aux > Adv > Asp > Caus > V > Prev

        b.   consistent left branching
[$XP_{wh/foc}$] > (Neg)[14] > [$XP_{Indef/NPI}$] > [Adv] > Prev > V > Caus > Asp > Aux > F > (Neg) > T > C_{PREV} > Mood > C_{IN}

        c.   empirically driven linear sequence (= (26))
C_{IN} > Mood > [$XP_{wh/foc}$] C_{PREV} > (Prev) > Neg > [XP_{Indef}] F > Adv > (Prev) > V + Caus + Asp > Aux + T.

It is obvious that neither of the linear orders in (30a–b) fits the linear sequence (26), repeated here as (30c). Right branching fails to derive a verb-final clause and a left-branching complex verbal form. Left branching, by contrast, is accurate in deriving the verbal form and positioning the finite verb at the right edge of the clause, but fails to create the preverbal complex of functional elements represented by both heads and phrases.

Now we will consider the suggestion that the head directionality parameter is inconsistent for different types of heads in Hittite. In (31) the syntactic structure of the Hittite clause is shown,

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13   Cf.: "I argued that the word order correlations reflect a tendency for languages to be consistently left-branching or consistently right-branching" (Dryer 2009: 185).

14   The position of the negation marker is determined by its status: if it is a head, it should occupy a position within the chain of heads, between F and T, while if it is a phrase, its position should be to the right within the sequence of phrases. The status of negation markers is not homogeneous cross-linguistically (see e.g. Zanuttini 1991; 1997; 2001; Haegeman 1995; Zeijlstra 2004): thus, for example, according to the diagnostics provided in Zanuttini (1997) and Zeijlstra (2004), Germanic negation markers display properties of a phrase whereas the Italian negation marker display those of a head. Since diagnosing the status of the negation marker for Hittite involves certain difficulties, we leave the question for future research.

which is supplemented with the information about the branching direction of every head[15] (denoted by an arrow → or ← directed from the head), such that it would produce the required linear ordering. It is easy to see that the heads projecting their complement to the right (C_{IN}, Mood, C_{PREV}, Neg, F) and the heads projecting their complement to the left (Prev, V, Caus, Asp, Aux, T) do not form natural classes in terms of either category type or morpho-phonological status (separate words vs. affixes). Besides, it is evident that this model is unable to derive variable linear position of the preverb and embedded infinitive. Indeed, if the preverb or the embedded infinitive is positioned between the preverbal complementizer and the negation marker, as in (8c–d) or (19a–b), this order cannot be obtained by varying the branching direction exclusively, but should involve phrasal movement as well; moreover, this movement should target NegP or TP, which is highly unlikely if it is feature-driven. Interestingly, deriving the linear position of the Hittite infinitive, Koller (2013) proposes movement of the infinitival complement CP to an FP situated between NegP and TP; he assumes that all arguments except for indefinites are evacuated out of the VP via this movement. Although this assumption raises many objections — e.g. how come a single functional projection can evacuate more than one XP out of the verbal domain if the verb itself remains *in situ* and, therefore, remnant movement of VP is excluded? — it illustrates the need for movement in order to obtain the attested position of the infinitive.

(31) $[_{CP}$ **C_{IN}** → $[_{MoodP}$ XP **Mood** → $[_{FinP}$ XP **C_{PREV}** → $[_{TP}$ XP $[_{NegP}$ **Neg** → $[_{FP}$ XP_{indef} **F** → $[_{AuxP}$ XP $[_{AspP}$ **Adv** $[_{CausP}$ XP $[_{VP}$ XP $[_{PrevP}$ XP ← **Prev** $_{PrevP}]$ ← **V** $_{VP}]$ ← **Caus** $_{CausP}]$ ← **Asp** $_{AspP}]$ ← **Aux** $_{AuxP}]$ $_{FP}]$ $_{NegP}]$ ← **T** $_{TP}]$ $_{FinP}]$ $_{MoodP}]$ $_{CP}]$

Consequently, we abandon the idea that word order in the Hittite clause reflects the base-generated syntactic structure and focus on accounts involving syntactic movement.

The obvious question here is whether we should consider inconsistent branching direction as a starting point for movement accounts, along the lines of Abels & Neeleman's (2012) proposal, or confine these accounts to consistent branching. We believe that the answer to this question is as follows. From a theoretical perspective, assuming inconsistent branching direction, especially if it is not motivated by some characteristic property of a head, amounts to positing a number of additional stipulations in associating every head with its own branching parameter setting. Since the set of assumptions producing inconsistent branching direction is not sufficient to derive basic word order patterns, and phrasal movement must be introduced into the analysis anyway, economy considerations lead us to limit movement accounts to a base structure with consistent branching. From an empirical perspective, assuming branching direction like that in (31) leads to further problems in deriving the linear positions of argumental and adjunct XPs. Indeed, argument-projecting heads of the verbal domain should be left-branching; therefore, all the XPs they project should appear to the left of them, but to the right of the first head projecting its complement to the right, which is F or Neg. In this way, we obtain the ordering where arguments and adjuncts — except for those attracted by F (i.e. indefinites), C_{PREV} (*wh* and focused XPs) and probably T (subject DP) — appear between the lower element of the preverbal complex and the verb. Since this ordering is inconsistent with what we observe in Hittite, we have to evacuate all these constituents to the left, presumably to the specifiers of information-structural heads, or resort to remnant movement of the verbal phrase, having extracted the verb via head movement beforehand. Both operations are highly unlikely: information-structural movements generally lack the degree of obligatoriness which is required to create the rigidly adjacent preverbal array of elements where arguments or adjuncts never intervene; remnant movement of the verbal domain to the left periphery of the clause is difficult to motivate in a feature-driven syntactic system. In view of the above considerations, we see no advantages in assuming the structure created by inconsistent branching as a base for developing movement accounts, and stick to the universally set HDP.

We start with head movement. In this paper, we assume head movement to be an operation present in core syntax, although the issue is highly controversial, and even the unified character of the phenomenon is disputable (see Dékány 2018 for a recent survey and references therein as evidence for a broad spectrum of approaches). However, even if head movement is ultimately

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15   More precisely, in (31) we show the position of complements vis-à-vis the head; we posit that specifiers are invariably to the left of the head.

to be identified as a PF (or mixed) phenomenon, this will apparently not affect the discussion in this section, since the linear order we are interested in may as well be formed post-syntactically.

Head movement within a left-branching structure is either PF-vacuous or yields permutation of adjacent heads, if adjunction to the right is allowed. This means that although it is possible to derive chunks of straight order within a reverse-ordered sequence of heads, the head array would still be situated on the right edge of the clause, and no phrasal constituents could intervene between heads. Head movement within a right-branching structure seems more promising. It can easily derive the verbal form corresponding to the hierarchical sequence of heads [AspP [CausP [VP [PrevP…]]]] as Prev + V + Caus + Asp, which fits the structure of non-finite verbal forms in Hittite. However, further derivation faces a number of difficulties. Firstly, since head movement is heavily constrained with respect to locality (Travis 1984; Baker 1988), intervening heads disrupt the successive head movement. Thus, the resulting complex head (or the higher head Aux) cannot move to T to build the finite form Prev + V + Caus + Asp + T/Aux + T because of the intervening heads F and Neg, which block the movement. Secondly, head movement within right-branching configurations leaves all the dependents of the lower head *in situ*, behind its target position. This implies that if Hittite verbal forms were derived by head movement, all the components of the clause except the functional projections and phrases they attracted (indefinite, relative and interrogative pronouns as well as focused and topicalized phrases) would be located behind the verb. As this is not the case, we do not pursue this line of reasoning either.

Now we will turn to phrasal movement as a potential source of the linear hierarchy of heads and morphological word structure. It has been convincingly demonstrated that effects usually associated with head movement, such as head displacement accompanied by order inversion, can result from phrasal movement of the constituent containing this head (see Rackowski & Travis 2000; Kayne & Pollock 2001; Mahajan 2003). Moreover, Julien (2002; 2007) and Svenonius (2007) argue that adjacent positioning of heads (as a single morphologically complex word or as an uninterruptable word sequence) can correspond not only to the structural relation of minimal asymmetrical c-command (32a) or complex heads obtained via head movement under the same conditions (32b), but also to configurations resulting from phrasal base generation or movement (32c–d). Specifically, (32c) assumes that if a constituent in the specifier of X has a head Y on its right edge, Y and X will be linearly adjacent and can form a morphological word. Similarly, in (32d) a head Y on the left edge of a constituent in the specifier of Z will be linearly adjacent to the higher head X and can form a morphological word with it.

(32)

a.

b.

c.

d.

XP
X — ZP
[Y ...] — ZP
Z
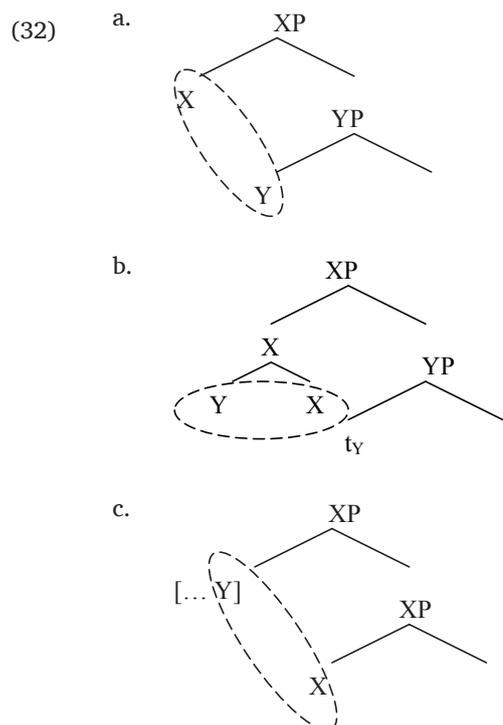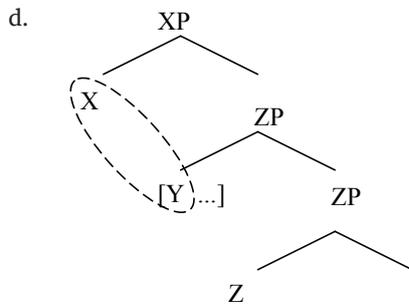
It is important to stress that phrasal movement can create head adjacency only under right branching. Within left-branching configurations, phrasal movement cannot create new head-adjacent combinations which would otherwise be unavailable in the base-generated structure or a structure produced by head movement.

Thus, the less controversial means of obtaining the observed linear sequence of heads based on the syntactic hierarchy above turns out to be consistent right branching supplemented by phrasal movement. The additional advantage of this option is that it belongs to the widely assumed family of antisymmetric approaches compatible with the Linear Correspondence Axiom (LCA, Kayne 1994), which unambiguously translates the asymmetric c-command into linear precedence. The LCA defines a uniform linear structure of the phrase where complements are always to the right and specifiers/adjuncts to the maximal projection[16] to the left of the head ($[_{XP}$ YP $[_{XP}$ X ZP]]). Derivation of left-branching structures in the antisymmetric syntax involves multiple movements of complements in right-branching structures to the left, to the position of the specifier/adjunct.[17]

Obviously, the substantial question involved in modeling word order via phrasal movement concerns the motivation of this movement. Svenonius (2007) develops a theory which is able, on one hand, to substantially restrict the theoretically possible linear orders arising with phrasal movement in right-branching structures and, on the other hand, to motivate phrasal movement. The idea is that the driving force behind phrasal movement can be the selective features of functional heads (e.g. the auxiliary requires a *v*P, the causative a VP/*v*P/PredP, the T head any verbal constituent). If these features are strong, the head which is selected is required to be linearly adjacent to the selecting one. Correspondingly, two options are possible: either the phrase with the selected head at its right edge moves to the (lowest) specifier of the selecting head (cf. (32c)), or the phrase with the selected head at its left edge moves into the (highest) specifier of the phrase which is the complement of the selecting head (cf. (32d)).
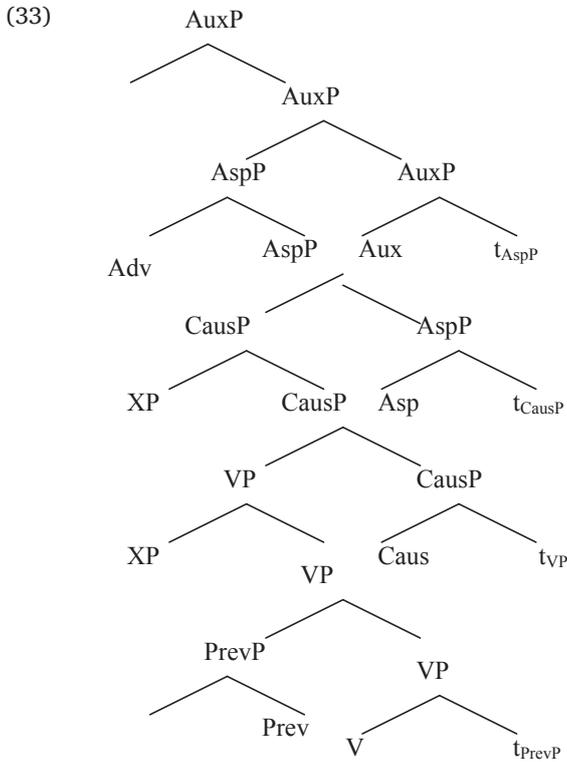
In the next section, we present a sketch of the derivation of the Hittite clause that relies on the idea that phrasal movement is motivated by the checking of selectional features under head adjacency.
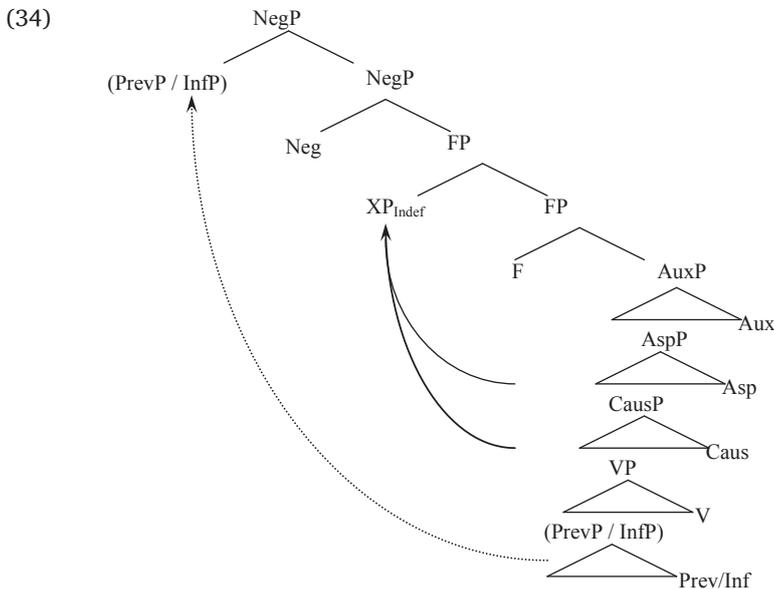
3.2 Developing the model

The derivation of the clause proceeds in four stages. Firstly, the verbal domain and the dedicated functional shells as high as AuxP are projected. At this stage, successive roll-up applies: every newly merged head attracts its complement to the specifier position, and ends up at the right edge of its own constituent, thus ensuring adjacency with the higher head. This provides preconditions for strong selectional feature checking, as well as for the morphological merger of adjacent heads. The successive roll-up process derives the structure in (33). Note that (33) is identical to the consistent left-branching structure as to the linear order it yields: the indivisible chain of heads comes in the reverse order at the right edge, whereas phrasal constituents reside to the left of it.

---

16   In Kayne's theory no difference is drawn between specifiers and adjuncts; there can be only one left dependent of a head.

17   If an antilocality restriction is assumed and a head cannot attract its complements into its own specifier (Grohmann 2002; Abels 2003), the analysis would be slightly more complicated: then every head X with a linearly preceding complement should be dominated by a functional projection ("extractor"), whose specifier the complement of X moves into. In this paper we follow a simpler version of the theory where the antilocality principle does not operate; this decision does not influence the essence of the analysis.

(33)

```
AuxP
  AuxP
    AspP        AuxP
  Adv  AspP    Aux   t_AspP
     CausP       AspP
   XP   CausP  Asp   t_CausP
       VP    CausP
     XP  VP  Caus  t_VP
       PrevP   VP
      Prev   V   t_PrevP
```
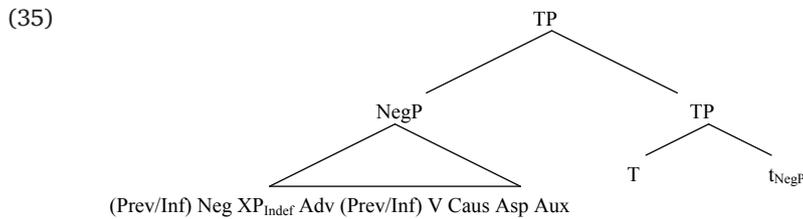
The next step is the merger of the lower functional elements of the clause: the functional head F, which attracts phrasal movement of indefinite XPs and NPIs, and the negation head Neg. This is shown in (34). At this stage, PrevP (or the infinitival phrase in complementation constructions) optionally raises to NegP, thus occupying the higher of the two positions available for Prev/V_{INF}. This is how the immediate preverbal position of these functional elements arises.

(34)

```
                NegP
 (PrevP / InfP)     NegP
                Neg      FP
              XP_Indef      FP
                       F      AuxP
                           AspP    Aux
                         CausP   Asp
                       VP    Caus
              (PrevP / InfP)  V
                            Prev/Inf
```
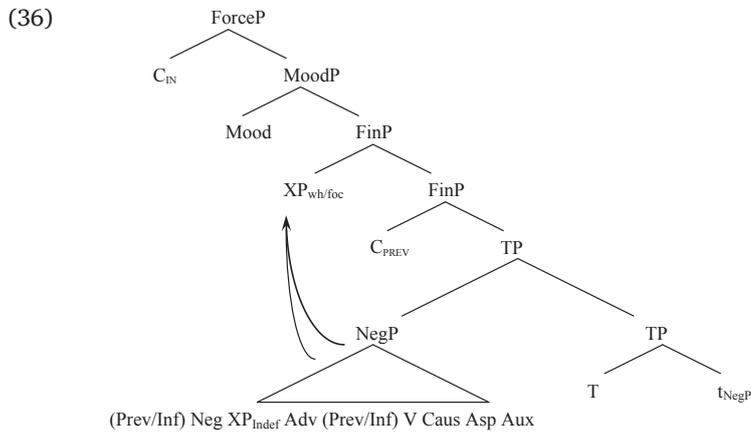
At the third stage, T merges. Apparently, T has a strong selectional feature [+Verbal] that ensures that TP dominates a verbal constituent (AuxP/AspP/CausP/VP). By hypothesis, this feature can be checked in a configuration like (35), where movement of NegP to Spec, TP has created the adjacency configuration for the higher verbal head (Aux) and T.

It should be pointed out that phrasal movement is the only option available for deriving a finite verbal form when the verb and T are separated by a number of functional projections that are spelled out independently. Indeed, in the configuration [T [Neg [F [V]]]], T and V cannot form a complex head either in syntax, through local head movement, or in morphology, through morphological operations equally requiring adjacency.

(35)

```
                              TP
                  ┌───────────┴───────────┐
                NegP                       TP
          ┌───────┴───────┐           ┌────┴────┐
                                      T        t_NegP
(Prev/Inf) Neg XP_Indef Adv (Prev/Inf) V Caus Asp Aux
```

At the last stage, higher functional projections of the clause merge. The preverbal complementizer endowed with relevant features attracts *wh* and focused constituents, then MoodP and ForceP are projected (36).[18]

(36)

```
        ForceP
    ┌─────┴─────┐
  C_IN        MoodP
        ┌───────┴───────┐
      Mood             FinP
              ┌─────────┴─────────┐
          XP_wh/foc              FinP
                          ┌────────┴────────┐
                       C_PREV              TP
                                    ┌───────┴───────┐
                                  NegP              TP
                                              ┌─────┴─────┐
                                              T         t_NegP
(Prev/Inf) Neg XP_Indef Adv (Prev/Inf) V Caus Asp Aux
```

An anonymous reviewer raises an interesting issue by expressing concern about freezing effects which may prevent extraction of *wh-* and focused phrases out of constituents which have been moved previously. The term *freezing* refers to the phenomenon that a constituent becomes an island for subextraction when that constituent has undergone syntactic movement (Wexler & Culicover 1980; Collins 1994; 1997; Müller 1998) — though sometimes freezing affects the moved constituent itself, preventing it from further movement, as in the case of criterial freezing (Rizzi 2006; 2007; Rizzi & Shlonsky 2007). Indeed, if freezing effects are supposed to be universal, the proposed extraction of *wh*-constituents, focused and topicalized phrases out of the NegP (as well as extraction of indefinites out of the AuxP) is excluded. Obviously, this problem has a much wider scope than merely the analysis argued for here, since any antisymmetric account of word order would face a ban on extraction out of left-sided complements, e.g. preverbal objects (which is not the case in many OV languages, e.g. German). Besides, there are a number of counterexamples to freezing involving widely acknowledged types of movement, e.g. A-movement of the *v*P/VP-internal subject, raising, and short scrambling (Corver 2017). Therefore, it is reasonable to suggest that the standard formulation of the freezing principle is too strong and should be replaced by a more empirically adequate principle.

In this regard, we find the approach advocated for in Abels (2007) highly promising. Abels proposes that constraints created by movement, such as traditional freezing, criterial freezing and restrictions on remnant movement, should be replaced by a Generalized Prohibition against Improper Movement (GenPIM), which regulates the order of operations a given constituent (or its subcomponents) can undergo. Specifically, with respect to subextraction, GenPIM predicts that subextraction of type *i* is only possible out of a constituent which has undergone movement of type *j* if $i \geq j$, where the order of operation types is universally defined; roughly, it can be identified with the hierarchy (37), with further detailed elaboration involving scrambling, *wh*-movement, and topicalization as special cases.

(37) θ < A-movement < Operator movement

The GenPIM restricts freezing configurations with respect to the type of intended subextraction relativized to the type of the preceding movement. Thus, it is possible to subextract a *wh*-constituent out of an A-moved constituent, but not vice versa.

Turning back to our proposal, we observe that the analysis involves subextraction of operators (and short movement of indefinites, which might potentially prove to be of A-type); the question is, therefore, what type the successive roll-up movement in the TP domain belongs to. We believe that movement motivated by the checking of selectional features under head adjacency is a natural analogue of θ-relations: functional heads select their complements just as lexical heads select their arguments. If so, the roll-up movement producing head-final constituents is of the lowest type, and subsequent subextraction involving an operation of a higher type (A-movement or Operator movement) is licit.

In this way, the proposed derivation captures all the key features of the Hittite clause identified in section 2. The consistent head-final verbal form is derived as the result of successive roll-ups of verbal projections which locate all the verbal heads adjacently. The clause-final position of the finite verb follows from the two characteristics of clausal projections: first, the strong selective feature of T which is checked by moving the verb-final complement to the left of it to meet the adjacency requirement on checking, and second, the absence of strong selectional features in higher functional heads. The preverbal position emerges as a result of several processes: roll-up derivations in the verbal domain (lower position of the preverb), left-adjunction of lower adverbs (adverb), merger of right-branching functional heads F, Neg and C_{PREV} and attraction of relevant phrasal constituents (indefinite XPs, *wh-* and focused constituents) by F and C_{PREV}. Since selectional features of heads forming the skeleton of the preverbal position are not strong, it exhibits a straight order of functional elements. Finally, the split of the preverbal array by preverbs or embedded infinitives comes as a result of the following combination of properties: intervention of T between the higher and the lower subarrays of heads forming the preverbal complex; the strong selectional feature of T, requiring movement of the verb-final constituent in the position ensuring feature checking under adjacency; and the optional raising of PrevP/InfP to the left edge of NegP, the higher position in the subarray of immediately preverbal elements.

In the last part of this section we provide additional arguments supporting the analysis outlined above.

3.3 More arguments for the analysis

In the presentation above we limited ourselves to the following characteristics of the phenomena under modeling. Firstly, we focused primarily on the linear order of functional heads forming the clause's skeleton, paying less attention to the position of other clausal constituents. Secondly, we assumed the prevalent word order pattern where the finite verbal form occupies the clause-final position; however, clauses with postverbal constituents are attested as well, though much less frequently. In what follows we address these issues and argue that they provide additional arguments for our account.

3.3.1 Adjacency and phrasal intervention

The hypothesis underlying our analysis of Hittite clause structure is that phrasal movement creating the peculiar order of heads attested in Hittite is ultimately motivated by the checking of selectional features under adjacency. Importantly, this hypothesis not only provides a motivation for movement, but restricts the linear position of phrasal constituents in the clause. If phrasal movement is indeed motivated by adjacency requirements, then we can predict an important characteristic of the sequence of heads arising through such movement: straight orders of heads can be interrupted by intervening XPs, whereas reverse orders cannot. Specifically, as Svenonius (2007) argues, the possible linear orders of heads are expected to attest the following properties with respect to phrasal intervention:

(38)   a.   1…2…3   'straight'[19]
         b.   3 – 2 – 1   'reverse/roll-up'
         c.   1…3 – 2   'curl'
         d.   3 – 1…2   'skipping'
         e.   2 – 1…3   'hopping'
         f.   2…3 – 1   'constituent fronting/sinking'

---

19   As noted above, 1 2 3 stands for a hierarchical structure: 3 is embedded under 2, and 2 is embedded under 1.

Importantly, these patterns do not arise either in left-branching structures under phrasal movement, or in right-branching structures under phrasal movement not aimed at creating head adjacency. Therefore, checking obligatory adjacency in reverse orders and the availability of phrasal intervention in direct orders on corpus data provides us with an empirical (although indirect) argument for the analysis presented in 3.2 or with a direct argument against it.

Our data show that the predictions are borne out. Practically all the reverse orders — V + Caus + Asp + T, V-Aux + T, V_{sup}–LV + T and so on — form adjacent sequences which are combined into morphological words or inseparable groups of words. The only type of head which can be separated from the sequence within the reverse order is the preverb and the infinitival complement of the matrix verb, which form a single distributional class. This is unlikely to be accidental. The selection relation between the lexical verb and the preverb/clausal complement is different from the selection relation between a functional head and its complement: the former is based on thematic features, the latter on grammatical or categorial ones. Moreover, the raising of PrevP/InfP which creates a break in the sequence of heads is optional and, we assume, not motivated by selectional feature checking either. Therefore we conclude that no phrasal intervention occurs in relevant reverse orders.

By contrast, straight orders allow breaks. Below we show several examples of breaks between various heads.

(39)   a. C_{IN} > Mood…C_{PREV}…V-T
        KBo 19.69 + iv 28–29
        man = kan   mān   *ANA*   ᴰ**UTU–*Š* = *I*   kuwapi   ḪU[(L–wann-i)]
        if = LOCP   IRR   to   majesty = my   when   evil-LOC.SG
        ki-ttat
        lie-PST.MED.3SG
        'If **his Majesty** had ever been disposed to disfavor…'

        b. C_{PREV}…V-Aux-T
        KBo 3.4 + iii 90–92
        nu = za   ᵐPiḫḫuniya-š   <u>kuit</u>   **KUR**   ᵁᴿᵁ**Ištitina**   tān
        CONN = REFL   Pihhuniya-NOM.SG   as   land   Istitina   take.PRTC.NOM.SG.N
        ḫar-ta
        have-PST.3SG
        '<u>As</u> Pihhuniya had taken for himself **the land of Istitina**…'

        c. V_{INF}-Neg…V_{MATRIX}
        KUB 29.7 + rev. 27–28
        nu = war = at = za   namma   iyatnuwan   ḫāšuwāiˢᴬᴿ
        CONN = QUOT = it = REFL   then   *i*.ACC.SG   soapwort.ACC.SG
        [pu]šš-uwanzi   lē   **kuiški**   taruḫ-zi
        crush-INF   PROHIB   someone.NOM.SG   can-PRS.3SG
        'May **nobody** be able to crush it, *i.* soapwort again.'

        d.   …Neg…V-T
        KBo 3.4 + iii 76
        namma   ᵐPiḫḫuniya-š   *UL*   *ŠA*   ᵁᴿᵁGašga   iwar   tapar-ta
        then   Pihhuniya-NOM.SG.C   NEG   of   Gasga   like   rule-PST.3SG
        'Thereafter, Piḫḫuniya did not rule like a Kaskan.'

        e.   Mood…F > V-T
        KUB 23.103 rev. 14
        man = wa = za   *ŠUM*-an   kuitki   iya-mi
        IRR = QUOT = REFL   name-ACC.SG.N   some.ACC.SG.N   make-PRS.1SG
        'And I could make a certain **name** for myself.'

        f.   Mood…Neg > Prev-V-T
        KBo 5.13 obv. 20
        [m]an = ta = kkan   **É**   ***ABI* = *KA***   **KUR = *KA* = ya**   *UL*   arḫa
        IRR = you.DAT.SG = LOCP   house   father = your   land = your = and   NEG   away
        dā-ir
        take-PST.3PL
        'Could they not have taken **your father's house and your land** away from you?'

        g.   …C_{PREV}…Prev > V-T
        KUB 14.1 + obv. 6
        nu = tta   *ABI*   ᴰ**UTU–*Š* = *I*   maḫḫan   ᵐ**[Attariššiy]an**
        CONN = you.DAT   father   majesty = my   when   Attarissiya.ACC.SG.C
        EGIR–an   arḫa   k[araš-ta]
        back   away   cut-PST.3SG
        'When the father of My Majesty got rid of **Attarissiya** for you.'

h.   Neg…F…Prev > V-T
KBo 3.4 + iii 84–85
nu = wa = tta   *UL* kuwatqa ammel   A.ŠÀ kuer-i
CONN = QUOT = 2SG.DAT NEG somehow 1SG.GEN territory-DAT.SG.C
anda zaḫḫiya   tiya-mi
in   war.DAT.SG.C stand-PRS.1SG
'I will not take a stand to fight you anywhere in my own territory.'

Thus we come to the conclusion that the distribution of strictly adjacent and possibly non-adjacent orders complies with the proposed analysis. The exact mechanisms governing linearization of arguments, and specifically the displacement processes undergone by subjects and direct objects, still need thorough investigation.

3.3.2 Post-verbal constituents

Yet another property which makes analyses based on right branching superior to analyses employing left branching is the ability of the former, but not the latter, to derive clauses with postverbal constituents. While the vast majority of clauses in Hittite texts are verb-final, clauses with postverbal elements are also attested — in a randomly selected database of 1000 clauses sourced from New Hittite compositions the verb is not clause-final in only 30 cases (3%). The inventory of postverbal elements is highly instructive. Sideltsev (2015) lists the possible categories found in the position after the finite verb. They predominantly include elements normally belonging to the immediate preverbal position: preverbs, negation markers, low adverbs and indefinite pronouns; indefinites in the scope of negation in the postverbal position co-occur with negation markers. Some examples are shown in (40). Other functional elements found postverbally are complementizers belonging to the preverbal (but not clause-initial) group, relative and interrogative pronouns (41). Importantly, Sideltsev (2015) emphasizes that *wh*-words are much less frequent postverbally than those elements ordinarily found in the immediate preverbal position: thus, in his corpus he only finds one example where an interrogative *wh*-word appears postverbally, namely (41d), as compared to 15 instances of indefinite pronouns in postverbal position. Postverbal arguments and adjuncts are extremely rare and only occur in texts belonging to certain genres; some examples are presented in (42).[20]

(40) a. Preverb
HKM 71 obv. 4
BELU man = wa **ūnna-tti**   kattan
lord   IRR = QUOT drive-PRS.2SG down
'O lord, if only you **drove** here (*lit.* down).'

b. Negation marker
KUB 13.2 + iii 25–28
1. *DINAM* šarazzi   **katteraḫḫ-i**   lē
case   upper.ACC.SG/PL.N down-PRS.3SG PROHIB

2. katterr-a   **šaraz < zi > yaḫ-i** lē
inferior-ACC.PL.N up-PRS.3SG   PROHIB
'(1) (He) shall not **make winning cases lose**, (2) (he) shall not **make losing ones win**, (you do what is right).'

c. Adverb
KUB 19.31 + iii 29"–30"
nu   k[ū]n   memiy-an   kuwat **iya-tten** *QATAMMA*
CONN this.ACC.SG.C matter-ACC.SG.C why   do-PST.2PL thus
'So, why have you **handled** this matter in this way?'

d. Negation marker and adverb
KUB 21.29 + i 11–19
ašešanu-t = ma = an   nāwi₅   SIG₅–in
resettle-PST.3SG = but = it not_yet well
'But he has not **resettled** it well yet.'

---

e. Indefinite XP
KBo 22.61 + i 4
[takku LÚ-a(n   našma MUNUS-an   *ELLAM* **walaḫ-zi**
if   man-ACC.SG or   woman-ACC.SG free   strike-PRS.3SG
k)]uiški
somebody.NOM.SG.C
'[If] anyone **strikes** a free man or woman, …'

f. Negation marker and indefinite XP
KUB 13.35 + rev. iv 1
nu = nnaš **dā-wen**   *UL* kuitki
CONN = us take-PST.1PL NEG something.ACC.SG.N
'We **have** not **taken** anything for ourselves.'

(41) a. Relative pronoun
KUB 21.19 + ii 9
apāt = ma   ḪUL–lu   uttar   **iya-t**
that.ACC.SG.N = but evil.ACC.SG.N thing.ACC.SG.N do-PST.3SG
kui-š
who-NOM.SG.C
'Who **did** that evil thing, …'

b. Relative XP
KBo 6.29 + ii 14
nu **ḫatrā-nun**   kueda[š   KUR.KU]R–e-aš
CONN write-PST.1SG which.DAT.PL lands-DAT.PL
'The [land]s to which **I wrote** ("Stand by me", they s[t]ood by me).'

c. Complementizer (C_PREV)
KBo 2.5 + iii 34–35
nu ᵐ*Aparru-š*   LÚ ᴷᵁᴿ[Kal]ašma **kūruriaḫ-ta**   kuit
CONN Aparru-NOM.SG.C man Kalasma   get_hostile-3SG.PST as
'As Aparru, the man of Kalasma, **started hostilities**, …'

d. Interrogative pronoun
KBo 3.1 + i 40
[k]-ī = wa   **iya-nun**   kuit
this-ACC.SG.N = QUOT do-1SG.PST why
'Why did I **do** this?' or 'what (is) this (that) I have done.'

(42) a. Adjunct
KBo 15.10 + i 33–34
nu kē   idālaw-ēš   alwanzinni-eš   EME[ᴴᴵ.ᴬ
CONN this.NOM.PL.C evil-NOM.PL.C sorcerous-NOM.PL.C tongues
waḫ-]andu *BEL[Î]* *QADU* DAM = *ŠU* DUMUᴹᴱˢ = *ŠU* É = *ZU*
turn-IMP.3PL lord   with   wife = his children = his house = his
'And let these evil sorcerous tongues **turn** away from the lord together with his
wife, his sons, his house.'

b. Subject and direct object
KUB 17.10 iv 14
ḫāš-ta   ᴸᵁNI.DUḪ 7 ᴳᴵˢIG
open-PST.3SG doorkeeper 7 door
'The doorkeeper **opened** seven doors.'

c. Temporal adverbial and subject
ABoT 60 obv. 7'–8'
šalik-aš = ma = mu   karuwariwar   ᵐNirikkaili-š   LÚ
approach-PST.3SG = but = me following_morning Nerikkaili-NOM.SG.C man
ᵁᴿᵁTapḫa[llu]
Tapḫallu
'Early the following morning Nerikkaili, the man from Tapḫallu, **approached** me.'

The derivation of postverbal elements in SOV languages has been a topic of much debate in the formal syntactic literature, based predominantly on the data of Hindi-Urdu and Bangla. Several approaches have been proposed which treat postverbal constituents as a result of rightward movement. They differ as to (i) whether multiple postverbal elements undergo leftward dislocation independently of each other (Mahajan 1998; Manetta 2012; Simpson & Choudhury 2015 for Hindi-Urdu) or result from a single rightward remnant VP-movement (Bhatt & Dayal 2007) and (ii) whether the rightward dislocation is syntactic or phonological (cf. Manetta 2012 on obligatorily postverbal CPs in Hindi-Urdu). Alternative approaches (Mahajan 1997; Simpson & Bhattacharya 2003) provide antisymmetric accounts which interpret postverbal elements as remnants in the non-consistent roll-up process.

Interestingly, most researchers argue for a non-uniform syntax of postverbal elements across languages (Simpson & Choudhury 2015) and even within a single language (Manetta 2012). Accordingly, distinguishing between analyses yielding postverbal elements relies on a number of diagnostics. These include the order of postverbal elements, the scope of postverbal elements with respect to preverbal ones, and clitic resumption of postverbal elements. Another phenomenon often linked to the syntactic analysis of postverbal constituents is the availability of wide scope for postverbal *wh*-elements. In the light of this discussion, we might ask ourselves what type Hittite postverbal elements belong to.

First of all, it should be emphasized that postverbal elements in Hittite occur much less frequently than they seem to occur in the languages discussed in the literature so far. Secondly, postverbal elements in Hindi-Urdu and Bangla, at least those analyzed in previous work, are core arguments of the verb — subject, direct object and indirect object. Hittite shows quite a different picture: out of 30 clauses with postverbal elements (from 1000 clauses of a randomly composed database) only 6 clauses attest postverbal argumental DPs and PPs (2 of them involve clitic doubling and can be argued to feature afterthought topics, see Sideltsev (2014b) for more detail); the remaining 24 clauses attest functional elements belonging to the preverbal complex as a postverbal element.[21] Note also that these functional elements are not only XPs but also heads, which can hardly undergo conventional rightward dislocation. Thirdly, scope diagnostics for postverbal elements cannot be meaningfully applied in a dead language; besides, the rarity of multiple postverbal DPs and lack of a searchable corpus makes the eventual results of such research dubious. As for postverbal *wh*-elements, which are also rare but nonetheless attested, it appears that they do not differ from preverbal ones in their interpretation. In (41e), the postverbal interrogative pronoun is exemplified. It can be interpreted as a normal question or perhaps a rhetorical question, but definitely not as an echo question. Importantly, the same functions are normally fulfilled by preverbal interrogative pronouns. Additional evidence for the wide scope of postverbal operators is provided by (41a–b), which attest postverbal relative elements. As far as we can tell, the postverbal position of the relative operator does not affect the interpretation of the clause. Besides, it should be noted that postverbal negation does not differ in scope from preverbal negation (40b), and that postverbal indefinites are in the scope of the postverbal negation (40f). Therefore, it is definitely not the case that postverbal elements undergo scope-freezing.

In view of the above, we do not think that analyses based on the rightward dislocation of arguments or VP are on the right track for Hittite, and argue instead for an antisymmetric account of postverbal elements as stranded. We also believe that postverbal elements are not derived uniformly. We distinguish between three types of postverbal constituents: (i) elements normally belonging to the immediate preverbal position, which are most frequent among postverbal elements; (ii) elements normally belonging to the higher preverbal position (preverbal complementizers and *wh*-pronouns), which are rare; and (iii) non-quantificational arguments and adjuncts, which are extremely rare and only occur in stylistically marked contexts.

Let us start with elements of the immediate preverbal position (type (i)). Looking at the examples in (40) and similar examples from Sideltsev (2015) we can draw several tentative generalizations. Firstly, if more than one element is spelled out postverbally, their order is straight, not mirrored, that is, we only find Neg XP_{INDEF}, but never XP_{INDEF} Neg. Similarly, we encounter Neg Adv, as in (40d), but not Adv Neg. Secondly, if an element normally belonging to the immediate preverbal position is found postverbally, other elements are either absent or are postverbal too. Thus, there is no clause attested where an indefinite pronoun is postverbal but negation preverbal, or vice versa. Similarly, negation marker and low adverb, as well as indefinite pronoun and low adverb, are found either to the left or to the right of the verb, but not on opposite sides of the verb. This generalization provides us with an additional contrast between type (i) and type (ii) postverbal elements: if a type (i) element occurs postverbally, other type (i) elements should also be postverbal if present, but type (ii) elements are still found preverbally, cf. example (40c) where a postverbal adverb co-occurs with a preverbal *wh*-pronoun.

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21   This is all the more conspicuous given that preverbal constituents are present in 411 clauses out of 1000 in the selection.

This collection of generalizations allows for a single and elegant explanation under the analysis outlined in 3.2. Remember that the last phrasal movement which makes T the rightmost head is the movement of NegP, motivated by the need of T to check its strong [+Verbal] feature against an adjacent verbal head. NegP is the nearest constituent with a [+Verbal] final head, and this is why it is generally selected for movement. However, it is not the only option: suppose that a smaller verbal constituent, say AuxP, is raised. This movement would suffice to check the [+Verbal] feature of T as well, since the final head is still the same. At the same time, the effect of this movement on word order would be that elements of the immediate preverbal position would remain behind the finite verbal form, preserving the order in which they were merged. The corresponding derivation is shown in the tree diagram (44). We further hypothesize that low adverbs can stay postverbal if no AuxP is projected and a lower AspP is moved.[22]

(44)
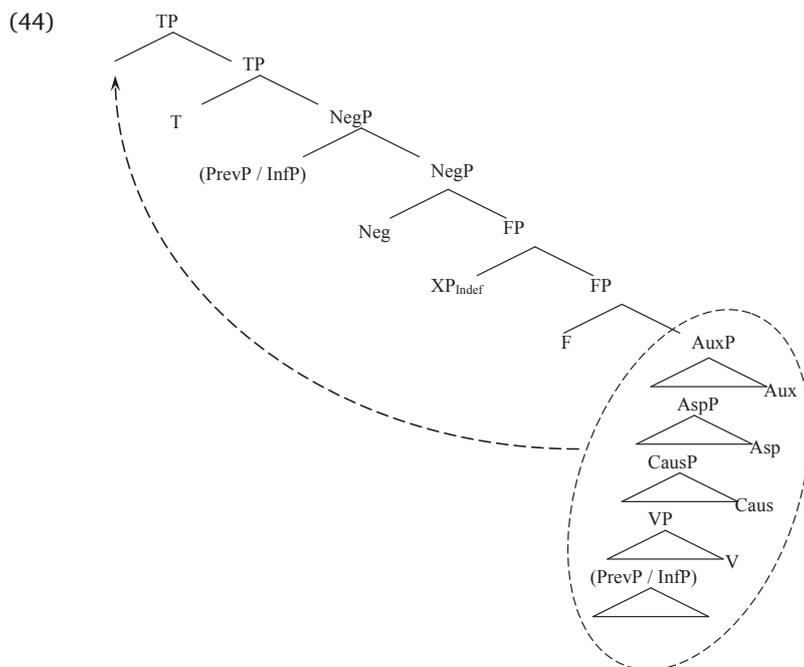
How can postverbal non-quantificational arguments and adjuncts (type iii) be derived? It seems that this derivation requires an additional step. Indeed, to ensure that an argumental or adverbial XP does not move together with its head Y when YP is moved, it is necessary to first extract XP out of YP. Quantificational XPs (interrogative, relative, indefinite pronouns, as well as focused phrases) are extracted out of the verbal domain by dedicated functional heads — C_{PREV}, F. For a non-quantificational XP to remain behind the verb, an additional extractor is necessary which would attract it out of the verbal domain and thus prevent its leftward movement within the verbal constituent. Unsurprisingly, this only happens under very special conditions.

Finally, let us address postverbal complementizers and *wh*-pronouns (type (ii)). We believe that they involve topicalization of TP, whereby TP moves to the left edge of the clause and constituents in Fin or Spec, FinP become stranded, as represented in (45):

(45) $[_{ForceP}... [_{TopP} [_{TP}...]_i$ Top $[... [_{FinP} (wh) C_{PREV} t_i]]]]$

Derivations of this kind are rarely attested in languages like Russian (Zemskaja 1973); however, the pattern involving extraction or phonological deletion of the complement of C is widely attested cross-linguistically in sluicing (Ross 1969; Merchant 2001).

To sum up, we believe that although all postverbal elements in Hittite result from leftward dislocation of a constituent they c-command, the types of dislocation involved differ, and this is why some postverbal elements are more frequent than others. Derivation of postverbal negation, indefinites, preverbs and adverbs does not require any additional movement; it occurs if a smaller verb-final constituent is attracted by T. Derivation of postverbal complementizers

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22   Indeed, in the data available, low adverbs are attested postverbally only in clauses without an auxiliary. However, as the data are fairly limited, we do not consider this to be reliable evidence.

and *wh*-pronouns involves additional topicalization of TP. Finally, derivation of postverbal non-quantificational XPs requires an additional step — the extraction of those XPs out of the verbal constituent.

It is easy to see that in the antisymmetric system developed here, clauses with postverbal elements cannot be analyzed as involving verb fronting, an option suggested by one of the reviewers and discussed in the literature (Luraghi 1990; Bauer 2011; Rieken 2011; Rizza 2011; Sideltsev 2014a; 2015). Not only is this option unavailable in our analysis, which is based on the assumption that morphologically complex verb formation is based on syntactic adjacency of heads; we think that it cannot be maintained for Hittite. Indeed, verb fronting implies head movement of the verb to one of the functional heads of the left periphery of the clause; alternatively, verb fronting may be instantiated by phrasal movement of a verbal constituent after all the material except the complex head is extracted. The head movement variant is not tenable, since head movement cannot skip intermediate heads, which we observe e.g. with postverbal negation or complementizers. The phrasal movement variant requires additional functional projections for the evacuation of the material in question out of the moving XP, which increases the number of stipulations unreasonably. Most importantly, non-verb-final clauses are not necessary verb-initial (or verb-second) clauses; the position of the verb in such clauses is better summarized in terms of *post*verbal, not *pre*verbal constituents (cf. examples (40–42); see Sideltsev 2015: Appendix for further references). Consequently, it is hardly possible to identify a single position associated with the fronted verb.

Another alternative suggested in the literature (Huggard 2015) and mentioned by one of the reviewers is to analyze clauses with postverbal indefinite pronouns (e.g. (40e)) as involving prosodic flip. Our major objection to this analysis is that postverbal elements in Hittite are not obligatorily prosodically weak, and prosodically weak elements are not obligatorily postverbal. Besides, if the postverbal position of indefinite pronouns was motivated prosodically, we would expect to find clauses with preverbal negation but postverbal indefinite pronouns; however, such clauses are not attested.[23] See also Sideltsev (2017b) for additional criticism of the prosodically motivated approach to postverbal elements in Hittite.

4 Conclusions

In this paper we addressed the ordering of lexical and functional heads in Hittite clause structure. We established that despite the prevalence of head-final structures in both word order and word formation, Hittite should be characterized as a right-branching language, whereas its head-final structure is derived through phrasal movement driven by the requirement to check selective features of functional heads in adjacency conditions. We proposed a derivation for the generalized Hittite clause and provided evidence in its favor.

These results can be useful not only for building up the formal model of the Hittite clause, but also in a much wider cross-linguistic perspective, providing one more case study of the prevalent language type displaying SOV word order and grammaticalized preverbal position for a number of functional elements, primarily *wh*-phrases and focused constituents. Apparently, the formal analyses deriving such structures differ, and so do the properties of the languages in question and, especially, the elements which they place in preverbal position. Thus, Julien (2002) offers an analysis of the preverbal position in Turkish that relies on phrasal movement: the low focus projection acts as an extractor for *wh*- and focused phrases out of the *v*P before all the material is moved to the specifier of the highest functional projection, ForceP. Similarly, Jayaseelan (1996; 2001) argues for a Focus projection immediately dominating *v*P and creating preverbal focus hosting *wh*-phrases in Malayalam. Two focus positions — immediately preverbal and postverbal — are posited for Georgian by Skopeteas & Fanselow (2010). The analysis employs several types of movement. Skopeteas and Fanselow suppose that preverbal focus results from both phrasal and head movements: focused constituents move to the specifier of the lower focus projection, and the verb moves to its head, which produces focus–verb adjacency. Postverbal focus is suggested to derive from the preverbal focus structure by the

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23 In fact, as the anonymous reviewer observes, Huggard (2015) also considers this distribution. He argues that if a preverbal negator is present, it can host the low indefinite pronoun, which then need not undergo inversion to find a prosodic host. However, he does not address the postverbal position of both the negation marker and the indefinite pronoun.

subsequent stylistic fronting of the verb. On the other hand, there are analyses based primarily on head movement. One of these is offered in (Lyutikova & Tatevosov 2009) for Ossetic and posits consistent right branching and head movement rather than phrasal movement, which is motivated by a greater number and variety of postverbal phrases. The list of the analyses and languages investigated could be significantly expanded; however, it is also clear that a unified approach to the phenomenon is desirable. It is obvious that this group of languages exhibits both common patterns in word order and its parametric variation — for instance, regarding the position of the negation marker or the availability of postverbal constituents of different types. It is therefore essential to approach them within the framework of a common theoretical model that would allow us to map descriptive generalizations over surface word orders onto the system of parameters conditioning the derivation, such as the presence of certain functional categories in the lexicon, the characterization of functional elements as heads or phrases, and the strength/weakness of selective features. We think it is possible to regard this paper as a step in this direction.

Finally, we believe that the paper also targets the methodological dimension. It is quite obvious that a dead language like Hittite lacks negative data and therefore cannot provide us with appropriate diagnostics to tell apart various potential theories compatible with positive data. However, we see that formal theorizing can be applied even to a dead language, as long as the theoretical framework is sufficiently elaborated to derive substantial predictions which can be checked against the available material, and if the number of alternatives is restricted logically or within this framework. Thus, we effectively exclude the left-branching option for Hittite, since given the theoretical assumptions about possible and impossible movement types there is no way to derive several of the patterns attested in Hittite texts, e.g. postverbal constituents of various kinds, within left-branching configurations. This result can be considered as instructive not only in the study of ancient (Indo-European and Near Eastern) languages, but also in corpus linguistics and the documentation of endangered languages.

Abbreviations

ABL ablative, ACC accusative, ALL allative, AUX auxiliary, C common gender, CAUS causative, CONN clause connective, DAT dative, FOC focus, FUT future, GEN genitive, IMP imperative, IMPF imperfective, INF infinitive, SUP supine, IRR irrealis, LOCP locative particle, MED middle voice, N neuter gender, NEG negative, NOM nominative, PL plural, PRTC participle, PRF perfective, PROHIB prohibitive, PRS present, PST past, QUOT quotative, REFL reflexive, SG singular.

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Competing interests

The authors have no competing interests to declare.

Author affiliations

Ekaterina A. Lyutikova *orcid.org/0000-0003-4439-0613*
Moscow State University, Interdisciplinary Scientific and Educational School of Moscow University «Brain, Cognitive Systems, Artificial Intelligence», RU

Andrei V. Sideltsev *orcid.org/0000-0002-0181-5872*
Institute of Linguistics, RAS, RU

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