"*Before* strikes *Back*. An *ABA constraint on temporal expressions" ^

The empirical observation that in many genetically unrelated languages the words used to talk about the location of things in *space* are also used to talk about the orientation of events in *time* has intrigued many scholars (cf. Clark 1973; Jackendoff 1983; 1996; Tenbrink 2007, among many others). In his seminal work Clark (1973, 50) wrote:

"Time can be viewed as a highway consisting of a succession of discrete events. We humans are seen in one of two ways with respect to this highway: either (1) we are moving along it, with future time ahead of us and the past behind us; or (2) the highway is moving past us from front to back. These two metaphors might be called the *moving ego* and *moving time* metaphors, respectively."

In cognitive linguistics, the universality of such vocabulary *sharing* has been assumed in the framework of Conceptual Metaphor Theory (Lakoff and Johnson 1999).[1]

Haspelmath (1997) has proposed a fairly robust generalization (sketched in Table 1 below) which states that when an adverbial item encoding the spatial meaning [BEHIND/ BACK] is used temporally, then it expresses the meaning [AFTER], and conversely, an item expressing [IN FRONT] is interpreted as encompassing a [BEFORE] meaning (cf. also Zinken 2010).

[Insert Table 1]

---

[1] According to Lakoff and Johnson (1999) the space-to-time mapping involves three "metaphors" and not two as previously argued by Clark (1973, 50). Lakoff and Johnson (1999, 140-141) distinguish among:

   a) *Time Orientation* (*static*, namely present is where we are, the future is in front and the past is behind).

   b) *Moving Observer* (where we move towards the future and the past is where we moved *past*).

   c) *Moving Time* (where the present is moving by us, the future is moving towards us, the past has moved by us).

Hence, forms expressing spatial relations of *front* and *back* regularly express, respectively, anteriority and posteriority across languages when they are 'shifted' from space to time (namely, before ≈ in front; after ≈ back).[2] Relying on a sample of 55 languages, Haspelmath (1997) provided many examples (e.g. Japanese, German, Basque, Polish, Hebrew, Lezgian, Maltese, Hausa) of this kind of *conceptual drift* (Haspelmath 1997, 20).

He affirmed that "almost all cases" follow this path (Haspelmath 1997, 56).[3] In (1) I present data from Japanese, were the word *mae* (front) is employed with a temporal meaning, both with (1a) and without (1b) a deictic (contextual) anchoring.

(1) (a)   *Mae-ni*   asonda   koto-ga   aru.

          front-loc   play-pst   fact-nom   exist/have

          'We have played before (now).'

          lit. '(We) have the fact that (we) played at front.'

          (Moore 2011, 766)

    (b)   Satoo-o   ire-ru   yori   *mae-ni*   sio-o

          sugar-acc   put.in-non-pst   from   front-loc   salt-acc

---

[2] Cross-linguistically, there are many different lexical sources that give rise to 'sequential' temporal items, other than anterior and posterior markers *based on* spatial anterior and posterior markers (cf. Haspelmath 1997, 63-65). For instance, in a number of languages temporal before-like prepositions are derived from the ordinal number 'first'. Italian uses *prima*, which is based on the adverb *prima* 'earlier', from *primo* 'first'. Other languages that use such a strategy are e.g. Punjabi, Latvian and Kannada, among many others. Notice that for some languages (e.g. Dutch) it has been argued that low (*suppletive*) ordinals may be actually superlatives forms (cf. Barbiers 2007). The crucial fact here is that when a language uses spatial markers to convey a sequential temporal meaning before in based on *(in) front* and after is based on *back*.

[3] Regarding the fixed lexicalization [FRONT > BEFORE] / [BACK > AFTER], and the dual route of conceptual encoding of time proposed by Clark (1973), Haspelmath (1997, 60) argues that: "*it is the moving-time model that is generally responsible for the use of spatial front/back terms as anterior and posterior markers.*"

ire-ru

put.in-non-pst

'Before putting in sugar, I put salt.' *Japanese*

(Moore 2011, 765)

Many other languages not included in Haspelmath's (1997) sample confirm the 'space to time' conceptual shift. Just to give an example, consider the case of Jamsay, a Dogon language spoken in Mali, where the locative postposition *jíré,* 'in front' can convey temporal anteriority (cf. Heath 2008; Franco 2011).

(2)   (a)   [má   *jíré*   lé]   dà:^{n}Ø   [locative use of *jíré*]

            [1sgp in-front   in]   sit-perf.l-3sgs

            'He/She is sitting in front of me.'   *Jamsay*

            (Heath 2008, 296)

    (b)   [ɛ'mɛ' *jíré*]   y'ɛr'ɛ-bà   [temporal use of *jíré*]

            [1plp before]come.perf.l-3pls

            'They came here before us.' Lit. 'They came here in front of us.'

            (Heath 2008, 297)

Empirical psycholinguistic research (see Boroditsky 2000 and subsequent works) supports the conceptual 'closeness' of spatial and temporal relations.

To my knowledge, the only known counterexample to Haspelmath's generalization discussed in the literature is Aymara, a Jaqi language spoken in the Andes (see Núñez and Sweetser 2006). In Aymara, the past is construed as being in front of *ego* (see the quotation from Clark 1973 above) and the future behind. Further, this language would provide an *across-modality* counterexample to

Haspelmath's (1997) generalization. Indeed, Núñez and Sweetser (2006) found that in their *co-speech* gesture, Aymara speakers produce hand gestures 'forward from their body' when they talk about past events, and gestures 'towards their back' when explicating issues concerning future events.

Nevertheless, Moore (2011, 768) has shown that at least in some of their temporal use, the Aymara words for [FRONT] (*nayra* 'eye / sight / front') and [BACK] (*qhipa* 'back/ behind') are mapped in the 'right' way. Consider the example below where, as predicted by Haspelmath's generalization, 'after is based on back':

(3)   chacha-x   *qhipa*-t-rak   sara-ni   *Aymara*

        husband-top   back/behind-from-also   go-fut

        'Her husband from behind will also go.' > 'Her husband will go later/after.'

Another, so far unnoticed counterexample to Haspelmath's generalization is represented by diachronic facts of Italian. Indeed, the temporal adverbial (*per*) *addietro* (lit. (for) at-back)), was commonly used in Old Florentine (i.e. Old Italian) texts to encode a meaning corresponding *prima facie* to [BEFORE]. Namely, when used spatially, *addietro* expresses posterior location [BEHIND/BACK], as shown in (4), whereas, when used temporally, it seems to express anteriority [BEFORE], as shown in (5).

(4)   nel   mare   questo cotale   correre   innanzi   e   *addietro…*

        in-the sea   this   such   run-inf   in-front   and   at-back

        'Such a run up and down into the see.'

        Bono Giamboni, Vegezio, a. 1292 (Fior.)

(5)	I	servi	che	*per*	*addietro*	in Roma	si
	the	slaves	that	for	at-back	in Rome	cl-refl

ribellaro…

rebel-3pl-pst

'The slaves who rebelled before in Rome.'

Bono Giamboni, Orosio, a. 1292 (Fior.)

We will see that a fine-grained model of temporal expressions (of distance) can easily capture facts like the ones reproduced above in (4)-(5).

The temporal items introduced so far are general {ANTERIOR/POSTERIOR} markers, and they locate points in time by marking them as prior to or subsequent to other events. Hence, they are *sequential* markers. But "*we can locate situations even more accurately by indicating their temporal distance from a prior or subsequent reference point*" (Haspelmath 1997, 35). This possibility presupposes that *temporal distance* can be quantified (e.g. by the means of cyclic time units: day, month, year, etc.). Consider the example below:

(6) (a) Italy was a happy country *after* the end of civil war.

(b) Gennaro was released from jail *six minutes after* the end of the civil war.

In (6a) we have a 'simple' posterior marker, which locates the situation *later* than the reference time (here, the end of the civil war). In (6b) the temporal extent is quantified (i.e. signalled by a measure phrase), measuring the *distance* from a prior time anchor.

According to Haspelmath (1997, 96), temporal distance of the type introduced in (6b) is invariantly expressed in natural languages by canonical (i.e. sequential) {ANTERIOR} and {POSTERIOR} markers associated with a tool which specifies the distance (e.g. a cyclic time unit).

Nevertheless, many languages employ special markers/words (i.e. different from general {ANTERIOR} and {POSTERIOR} markers) when they have to signal the temporal distance elapsed from the moment of speech. Haspelmath (1997, 36-37) dubbed the semantic functions expressed by these items {DISTANCE-PAST} and {DISTANCE-FUTURE}. Consider the examples below.

(7)   (a)   Soraya died five years *ago*   {DISTANCE-PAST}

         (b)   John will arrive *in* three weeks   {DISTANCE-FUTURE}

As shown in (7), English has specific items (*ago* / *in*) to encode *deictic* temporal distance, namely the distance related to the time of speech. Still, this is not a general property which holds cross-linguistically. In fact, many languages mark the distance from the moment of speech with the same item which marks the distance with respect to an explicitly indicated point of time (i.e. when the temporal item takes a complement), as shown below with the examples in (8-9) from Turkish, Armenian and Ancient Greek:

(8)   (a)   Hasan Ali-den   *önce*   git-ti {ANTERIOR}

                Hasan Ali-abl.   before   go-past

                'Hasan left a little before Ali'

         (b)   Hasan biraz   *önce*   git-ti {DISTANCE-PAST}

                Hasan a little   before   go-past

                'Hasan left a little (while) ago'

                (*Turkish*, Kornfilt 1997, 102)

(9)   (a)   virahatut'yun-ic   *aṙaǰ*   {ANTERIOR}

                surgery-abl   before

'before the surgery'

(b)   mi k'ani   amis   *aṙaǰ*   {DISTANCE-PAST}

a few   month   before

'a few months ago'

(*Armenian*, Dum Tragut 2009, 222; 369)

(10) (a)   Sah-dan   *sonra* bura-da   ol-acağ-ım   {POSTERIOR}

Tuesday-abl. after   here-loc   be-fut-1sg

'I'll be here after Tuesday.'

(b)   iki   saat   *sonra* don-eceg-im   {DISTANCE-FUTURE}

two   hour   after   return-fut-1sg

'I'll be back in two hours.'

(*Turkish*, Kornfilt 1997, 262-263)

(11) (a)   ek   d'   autòs   *metà* toùs   dómou   éluthe

out   ptc   dem-nom   after   dem-acc-pl   home-gen   go-aor-3sg

dîos   Odusseús   {POSTERIOR}

divine-nom   O.-nom

'the divine Ulysses himself went out of the house after them' (Od. 21.190).

(b)   Humeĩs   dè   en   pneúmati   baptisthḗsesthe

you-pl   but   in   spirit-dat   baptize-pass-fut-2pl

hagíōi   ou   *metà* pollàs   taútas   hēméras {DISTANCE-FUTURE}

holy-dat   not   after   many-acc   these-acc   days-acc

'You will be baptized in the Holy Spirit in not many days' time.' (NT, Acts 1.5)

(*Ancient Greek*, Luraghi 2003, 248; Haspelmath 1997, 85)

Given these premises, the aim of this work is twofold: (a) to build a syntactic model that is able to capture the fact that two different semantic functions ({ANTERIOR}={DISTANCE-PAST} / {POSTERIOR}={DISTANCE-FUTURE} can be expressed with the same lexical item; and (b) to explain why apparent counterexamples to Haspelmath's generalization (such as Old Italian *(per) addietro*) can be easily accounted for with a morphosyntactic-based lexicalization *constraint* (i.e. an *ABA pattern).

The rest of the paper is organized as follows. Section 2 presents finer-grained cross-linguistic data relevant for the present investigation. An analysis of the syntax (see (8-9)) of items meaning *before/ago* and *after/in* based on a) cartographic insights into the 'layered' (i.e. fine grained) configuration of spatial (and temporal) prepositions (cf. Cinque 2010; Svenonius 2006; Roy and Svenonius 2009); b) the mechanism of *Phrasal Spell-out* (Starke 2009; 2011; Caha 2009; Neeleman and Szendrői 2007) is presented in section 3. A previously unnoticed *ABA constraint on *lexical spans* (Bobaljik 2012; Caha 2009; Starke 2009) in the domain of temporal distance is discussed in section 4 and we will see that it will be crucial to account for possible counterexamples of Haspelmath's generalization represented in Table 1. The conclusions follow.

2. *A fine-grained perspective on temporal expressions of distance: retrospective and prospective markers.*

In this section, I will propose a fine-grained system of temporal expressions (of distance) and we will see that this fact is crucial to account for the behaviour of potential counterexamples to Haspelmath's generalization such as Old Italian time adverbial (*per*) *addietro*, where at first sight BEFORE ≈ BACK.

Actually, in many languages, a different morpheme must be used when the reference point *is not* the moment of speech. Haspelmath (1997, 36-38) introduced the terms {DISTANCE-RETROSPECTIVE}

and {DISTANCE-PROSPECTIVE} for these cases. The difference between *retrospective* and *past* distance expressions, and between *prospective* and *future* distance expressions is illustrated by the English examples below, adapted from Haspelmath (1997, 98).

(12) a. (*distance past*) Our son returned from the army two weeks *ago*.

b. (*distance-retrospective*) Do you remember when your brother paid us an unexpected visit, coming all the way from Chile? Fortunately, all of us were at home. Our son had returned from the army two weeks *earlier/before* (*ago).

(13) (a) (*distance future*) Will Switzerland exist *in* fifty years' time?

(b) (*distance prospective*) Tito died in 1980. Ten years *later/after* (*in ten years) Yugoslavia began to crumble.

Crucially, in (12b) - (13b) the elapsed time is not necessarily linked to the time of speech. {DISTANCE-PROSPECTIVE} and {DISTANCE-RETROSPECTIVE} markers share with {DISTANCE PAST} and {DISTANCE FUTURE} ones the properties of being 'intransitive' and of being anchored to the context (*vs.* markers of 'general' anteriority and posteriority which are able to introduce *independent* arguments).

Very interestingly, Haspelmath (1997, 98-100) has found that in 13 languages of a sample of 27, the {DISTANCE-PROSPECTIVE} marker was identical to the {DISTANCE FUTURE} marker. Hence, the *overt* distinction {DISTANCE FUTURE} *vs.* {DISTANCE-PROSPECTIVE} is attested in an ample proportion of the languages included in his sample, but there are also many languages in which this distinction is lacking. In addition, Haspelmath (1997, 100) found that {POSTERIOR} markers are also often formally identical to {DISTANCE-PROSPECTIVE} markers and proposed an *implicational generalization*, reported below in (14):

(14)   *If in a language the posterior and the distance-future markers are identical, then the distance-prospective marker also takes the same form.*

In Table 2, I report Haspelmath's data for {DISTANCE FUTURE} / {DISTANCE-PROSPECTIVE} / {POSTERIOR} markers.

[Insert Table 2]

Unfortunately, Haspelmath did not provide data for {DISTANCE PAST} / {DISTANCE-RETROSPECTIVE} / {ANTERIOR} markers. I have collected evidence that the claim he made for markers of *posteriority* in (14), is also valid for markers of *anteriority*.

In Table 3 below, I provide data from 37 languages [see appendix A for details on the languages included in the sample and the criteria followed].

[insert Table 3]

In Table 3 we can see that, parallel to (14), if in a language the {ANTERIOR} and the {DISTANCE PAST} are *lexicalized* with the same item, then the {DISTANCE-RETROSPECTIVE} marker also takes the same form.[4] Comparing Table 2 and Table 3, we can also see that there are some languages in which {DISTANCE FUTURE} = {DISTANCE-PROSPECTIVE} ≠ {POSTERIOR} markers (e.g. Hungarian, Lezgian) and at the same time there are languages in which {DISTANCE PAST} = {DISTANCE-

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[4] In {DISTANCE PAST} expressions, the reference point is NOW. In {DISTANCE RETROSPECTIVE} expressions, the point of reference is a *past* event and the point of reference is basically THEN. This is reminiscent of the HERE/THERE distinction is the spatial domain.

RETROSPECTIVE} ≠ {ANTERIOR} (e.g. Kolyma Yukaghir or Old Italian).

There are also various languages that have {DISTANCE FUTURE} ≠ {DISTANCE-PROSPECTIVE} ≠ {POSTERIOR} markers (e.g. Modern Greek or Indonesian) and, at the same time, languages that have {DISTANCE PAST} ≠ {DISTANCE-RETROSPECTIVE} ≠ {ANTERIOR} markers (e.g. Madurese). Before proposing an analysis for the empirical facts introduced above, we have to consider a further descriptive issue, crucial for the present discussion. In a number of languages, the spatial directional adverb '*back*' is used for the {DISTANCE PAST} function (cf. Haspelmath 1997, 92-93). Consider the examples below from Evenki, Bulu and Welsh.

(15)   (a)   Tar   beje   ilan-ma   tyrgani-1-va   *amaski*   suru-che-n.

that   man   three-accd   day-pl-accd   back   go.away-pst-3sg

'That man left three days ago.'

(b)   Esikeken   erne-re-p,   si-de   suru-mu-d' e-nni

and.now   come-nfut-1pl.inc   you-clt   go.away-vol-prs-2sg

amaski.

back

'We have just come, and/but you (already) want to go back.'

Evenki (Nedjalkov 1997, 186)

(16)   melu   metane   *mvus*

days   five   back

'five days ago.'

Bulu (Hagen 1914, 268, taken from Heine and Kuteva 2002, 49)

(17)   Wedes I   'r   un   peth   wrtho   ddwy   flynedd   *yn ôl*.

| told | I | the | same | thing | two | years | in back |

'I told him the same thing two years ago.'

Welsh (King 1993, taken from Haspelmath 1997, 93)

Notice that also English in (18) and Modern Italian in (19) can express {DISTANCE PAST} functions in the same way. Interestingly, Modern Italian uses the same lexical item, *addietro*, which seems to encode the meaning *before* in Old Italian as shown in (5) above.[5]

---

[5] In Old Italian {DISTANCE PAST} was expressed with *addietro* or a biclausal construction involving the verb *fare* (do) or *essere* (be), as shown below in (i) and (ii), respectively:[vi]

(i) Pochi   tempi   addietro   tornando
     few-pl times   at.back   coming.back
     'Coming back some time ago.'
     Bono Giamboni, Orosio, a. 1292 (Fior.)

(ii) Oggi   fa   l'   anno   che   nel   ciel   salisti
      Today make-3sg-prs   the   year   that into sky   rise-2sg-pst
      'You died a year ago.'
      Dante, Vita Nuova a. 1292-1293 ca. (Fior.)

In previous work on the topic, Vanelli (2002) argues that whereas the deictic value of the Old Italian expression resulted from the compositional meaning of the single elements which formed it (in the bi-clausal construction), in Modern Italian the syntactic *transparence* is lost and the modern form has become "lexically deictic". See also Franco (2012a) for a syntactic analysis of the reconstruction [YP [XP]] > [XP] that derived the particle *fa* from the verb *fare* (to do). Notice also that *addietro* retains a temporal {DISTANCE-PAST} *deictic* meaning in contemporary Italian, sharing approximately the same distribution as particles like *fa* and *or son/orsono* (lit. now.are). See the examples in (iii) below:

(iii) *Ho*   *incontrato*   *Gianni due*   *anni*   *fa/or sono/addietro*
       have-1sg-prs   meet-pst-ptcp   Gianni two   years   ago
       'I met him two years ago'.

Further notice that, interestingly, many languages employ only clausal adverbials in order to express DISTANT PAST functions (Haspelmath 1997). An example of these bi-clausal constructions, which match the Old Italian type in (15), is given here in (iv), for Babungo, a West African language.

(18)   three years ago ≈ three years *back*

(19)   tre anni fa ≈ tre anni *addietro*

         'three years ago.'

The grammaticalization BACK > AGO, according to Heine and Kuteva (2002, 49):

"appears to be an instance of a more general process whereby certain body parts, on account of their relative position, are first used as structural templates to express deictic location and then develop further into temporal markers".

Actually, this kind of grammaticalization path can be a potential issue for Haspelmath's generalization (i.e. an item meaning back/behind acquires a +deictic before value) and Haspelmath (1997, 93) himself noted that:

"the most interesting point about this use of 'back' is that it contrasts strikingly with the use of 'before' or 'in front' for expressing the same semantic function. Clearly, in this case the image of the observer moving forward in stationary time is predominant, whereas in cases like Turkish *önce* 'before, ago' the image of time moving toward the observer is predominant."

In the next section, I will try to give a rather simple explanation of the descriptive facts reported above.

3. *An explanation of the lexicalization of temporal distance based on the 'height' of spell-out.*

(iv)   ŋwə́ kû.   ndwə́ lùu ŋú'sə̄ bɔ̀ɔ   *Babungo* (Schaub 1985, 169)
         [he die]   [now be years two]
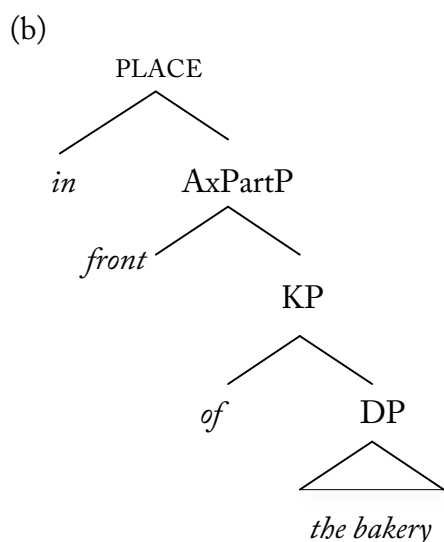   'He died two years ago.' (lit. 'He died. It's now two years.')

In recent work, Cinque (2010, 10) proposes a very fine-grained configuration for spatial preposition on a basis of cross-linguistic data. Cinque's structure is reported in (20):

(20)   [PP$_{Dir}$ [PP$_{Stat}$ [PP$_{Place}$ [$_{Deg}$P [$_{ModeDir}$P [$_{AbsView}$P [$_{RelView}$P [$_{RelView}$P [$_{Dectic}$P [$_{AxPart}$P X° [PP P [

NP$_{Place}$ DP [PLACE]]]]]]]]]]]]]

It is beyond the scope of this work to test if such an articulated structure can be argued for temporal expressions, but it is very likely that at least a portion of this structure is employed when we talk about things/events in time. In particular, the postulation of an Axial Part (AxPart) projection in the temporal domain seems easily conceivable. AxPart is a definition used by Svenonius (2006) (basing on Jackendoff's (1996) idea of axial structures) to refer to a distinct set of prepositional items denoting a region and constituting a syntactic category on their own, and thus differentiating these elements from spatial *relational nouns* expressing a portion of a whole (namely, a part-whole relationship).[6] A rough sketch of the syntactic representation of spatial prepositions, according to Svenonius (2006), is reported in (21).

(21)   (a)   in front of the bakery

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[6] Specifically, Svenonius (2006), basing on a set of diagnostics (e.g. axial parts, *contra* homophonous relational nouns, do not have articles, do not pluralize, do not take modifiers etc.; see also Johns and Thurgood 2011 for interesting applications to Uzbek and Inuktitut) argues against the idea that axial parts, namely items like *front*, *beside*, *behind* and so on, are a subclass of nouns, specifically, they are relational nouns (cf. also Hagège 2010, 162ff): relational nouns and axial parts enter different syntactic configurations.

(b)

```
                    PLACE
                   /      \
                  in      AxPartP
                         /       \
                      front       KP
                                 /   \
                                of    DP
                                     /  \
                                  the bakery
```

The involvement of AxPart in the domain of temporal expressions is explicitly argued for in Roy and Svenonius (2009, 108), who say that "*AxPart is a function from the temporal 'region' denoted by KP (a portion of the time line) to some subpart of that, named by the word lexicalizing AxPart.*"

We have seen in the introduction that the frontal axis (front-back) grammaticalizes into basic temporal expressions with overwhelmingly greater than chance frequency in natural languages. The fact that time-perception is mono-dimensional / unidirectional / unbounded on both sides, possibly forces this fact. The use of the vertical axis, as in the Italian and Chinese examples in (21a-b), is marginally attested (cf. Traugott 1978; Evans 2004; Moore 2006), while the use of lateral axis is unattested, even if "cardinal/ absolute" frames of reference could play a role for possibly related *left–right* phenomena described in Belhare, a Tibeto-Burman language spoken in Nepal (Bickel 1996), Yucatan Mayan (Bohnemeyer 1998) and Kuuk Thaayorre, an Australian language spoken on the Cape York Peninsula of Queensland (Gaby 2006).

(22) (a)   sotto   il   fascismo

            under ≈ during   the   fascism   *Italian*

      (b)   shàng-nián

up ≈ last year   *Chinese*

Thus, given the use of frontal (and marginally the vertical) axis as a *temporal tool*, it seems highly motivated to posit (at least) a Time Axis Projection (possibly, instantiated as a (phrasal) modifier of an abstract head noun TIME, along the lines of Cinque 2010) that matches (i.e. is absolutely equivalent to) *spatial* axial parts such as *in front, behind, below,* etc. (see Svenonius 2006; Roy 2006; Roy and Svenonius 2009; see also Aboh 2010; Terzi 2008, among many others). A rough set of possible *time-axes* (all matching spatial expressions) is given in (23), with Italian examples.

(23)   APPROXIMATIVE

Le ombre *verso* sera.

'the shadows *towards* evening.'

DURATIVE

L'immagine della città *durante/attraverso* i secoli.

'the image of the city *during/through* the centuries.'

RELATIONAL

L'astronomia *presso* gli antichi Egizi.

'the Astronomy *among* (lit. *nearby*) the ancient Egyptians.'

FORWARDERS

Le interviste *in vista* delle elezioni.

'the interviews *in view* of the elections.'

BACKWARDERS

I pronostici *in base* all'esito delle elezioni.

'the forecasts *in base of* the result of the election.'

MEDIAL

Le domande *a cavallo tra* il convegno e la pubblicazione degli atti.

'the questions *between* (lit. *at horse in*) the conference and the publication of the proceedings.'

LIMITATIVE

I risultati *entro* la primavera del prossimo anno

'the results *within* the spring of next year'.

These examples of space to time *drift* suggest a strong parallelism between the syntactic 'environment' of spatial axial parts and temporal axes. Consider also the French examples below, taken from Roy and Svenonius (2009, 110-111).
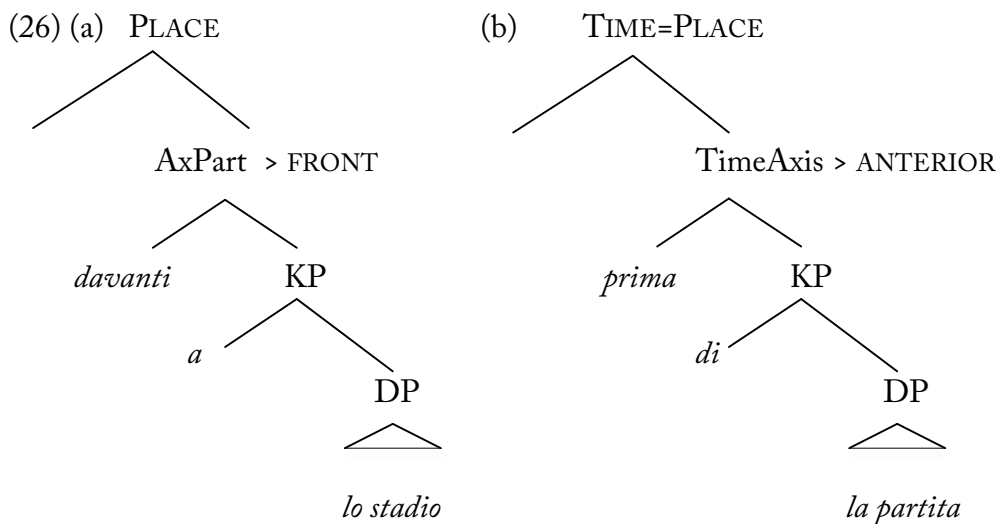
(24) (a) au   terme de   ses   efforts

           at-the end   of   his   efforts

           'after his efforts'

      (b) à   la   fin   du   siècle

           at   the   end   of.the century

           'at the end of the century'

      (c) au   début de   sa   carrière

           at-the beginning of his   career

           'at the beginning of his career'

Expressions like the ones in (24), according to Roy and Svenonius (2009, 110) do not have a distinct spatial use, and the specialization for time of items such as *terme*, *fin* and *début* seems to be a '*matter of semantic selection (s-selection) rather than featural or syntactic subcategorization (c-selection)*.'[7]

---

[7] Selection for syntactic category, namely c-selection (for instance a preposition commonly requires NP complements), was introduced by Chomsky's (1965) theory of subcategorization. S-selection basically derives certain aspects of c-

Following Svenonius (2006) and Roy and Svenonius (2009), I propose a common representation for them, as roughly shown in (26) for the Italian phrases in (25).[8]

(25)   (a)   davanti   allo   stadio

             in-front   at-the stadium

             'in front of the stadium.'

       (b)   prima della   partita

             before of-the match

             'before the match.'

(26) (a) PLACE
              AxPart > FRONT
           davanti   KP
                       a
                            DP
                         lo stadio

     (b) TIME=PLACE
              TimeAxis > ANTERIOR
           prima   KP
                     di
                          DP
                       la partita

---

selection from the semantic character of a given head (e.g. the verb *ask* selects for questions). Chomsky proposed that non-semantic information about complementation is given as *features* (cf. also Grimshaw 1979; Pesetsky 1981; Adger 2003).

[8] Following Cinque (2010) it is possible to postulate a finer structure in which the complex preposition is actually a (phrasal) modifier of an unpronounced head noun [*place/time*] (cf. also Kayne 2004; 2007; Terzi 2010; cf. also Holmberg 2002; Schweikert 2005).

Thus, I assume that anterior, posterior and *other* time markers such the ones illustrated in (23) for Italian and in (24) for French are generated in the same projection, labelled here *Time Axis*, which is nothing else than the temporal counterpart of AxPart.

At this point, trying to follow the Cinquean model of spatial prepositions given above in (20), we should postulate a Deictic Projection immediately above TimeAxisP:
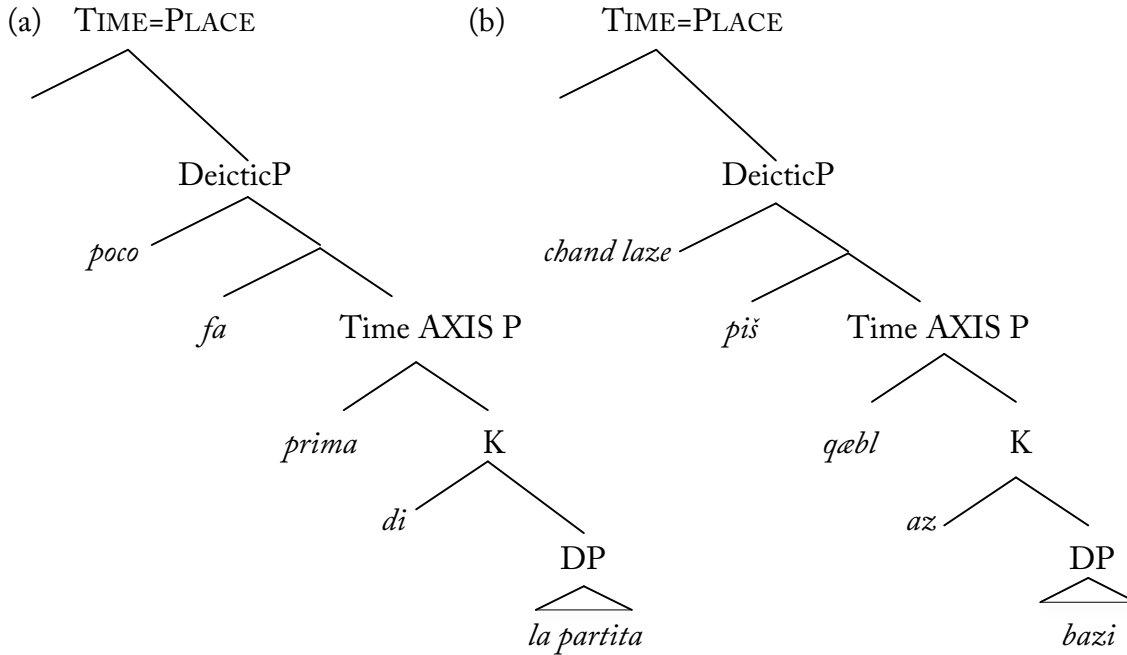
(27)   [PLACE/TIME … [DecticP [AxPart/TimeAxisP X° [PP P [NPPlace DP [PLACE]]]]]]

Consider now the Italian and Persian sentences below in (28a-b) and the rough possible representations given in (29): [9]

(28)   (a)   poco *fa*,   *prima* della   partita

               'few   ago   before of-the match.'

               'not long ago before the match.' *Italian*

        (b)   chand lahze *piš*,   *qæbl*   æz (*piš*)   bazi

               a.few   time   ago   before of   match

               'not long ago before the match.' *Persian*

        (c)   *qæbl*   æz */ piš* æz   bazi

               before of   match

               'before the match.' *Persian*

---

[9] Note that Persian is a language with a mixed structure: it is head initial in the nominal and the prepositional domain and head final in the verbal domain. Refer to Karimi (2005) and Megerdoomian (2012), among others, for formal treatments of Persian's phrase structure.

(29)

(a) TIME=PLACE

    DeicticP

    poco

      fa   Time AXIS P

        prima   K

          di   DP

             la partita

(b) TIME=PLACE

    DeicticP

    chand laze

      piš   Time AXIS P

        qæbl   K

          az   DP

             bazi

Notice that in the Persian examples in (28b-c) *piš* can spell out the Time AXIS head, but when it inserted in DeicticP, *qæbl* (which is more specific, cf. Table 3) must be used to spell out the Time AXIS Spec.[10]

Thus, we can hypothesize a parallelism between the Cinquean model in (20) and the structure of temporal expressions, with a Deictic node that immediately dominates a Time Axis Projection: *DeicticP > Time Axis P*. This fact, translated into Haspelmath's terms, would mean that – syntactically – {DISTANCE PAST/DISTANCE FUTURE} markers are generated *above* anterior/posterior markers. We will see below that a *plain* translation of Cinque's (2010) model into the temporal domain is not without problems. Nonetheless, the structure(s) just sketched in (29) can lead to interesting considerations on the basis of cross-linguistic facts.

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[10] This fact has the 'flavour' of being a consequence of the application of the *Elsewhere Condition* (cf. Kiparsky 1973; 1982; Anderson 1986; Caha 2009 among others). Indeed, the Elsewhere Condition gives precedence to the *lexical candidate* with the most restricted potential distribution, namely to the more specific *lexical item* in a given sequence.

Indeed, according to an approach in which an item can *lexicalize* a sequence of *contiguous* nodes in a given syntactic structure (cf. Caha 2009 on Case affixes; see also Starke 2009; 2011; Muriungi 2009 for a general picture), a structure such as the one in (29) is able to explain the reason why many languages (e.g. Persian, Turkish, Armenian, etc.; consider the data collected in Table 3 and examples in (8), (28b-c)) use the same lexical item to express simple *anterior* meaning (i.e. before) and *deictic-past* meaning (i.e. ago), 'temporally' enhancing Cinque's (2010, 3) claim about spatial prepositions:

"Phrases composed of spatial prepositions, adverbs, particles, and DPs do not instantiate different structures but merely spell-out different portions of one and the same articulated configuration."

Take the examples in (30) from Punjabi, another language which spells-out the *ago* and *before* meaning with a single morpheme, and the rough illustration of a possible *Phrasal Spell-out* mechanism that allows the spell-out of non-terminal nodes in (31).

(30) (a)   maŋgalvaar   tõ   páílãã

              Tuesday   from   before

              'before Tuesday'

         (b)   do   saal   páílãã asĩĩ   Multaan   gae

              two   year   before we   Multaan   went

              'Two years ago we went to Multaan.'

              Punjabi, Bhatia 1993, 206ff.)

(31)   [PLACE/TIME P [… [DEICTIC P [TimeAXIS P […]]]]

                          Spell-out chunk

Phrasal Spell-Out is a model of lexical insertion that allows the spell-out of non-terminal nodes (cf. Starke 2009; 2011; on non-terminal spell-out, see also Weerman and Evers-Vermeul 2002; Williams 2003; Neeleman and Szendrői 2007; Abels and Muriungi 2008; Caha 2009; 2011; Dékány 2009; Taraldsen 2010; Pantcheva 2010; 2011; Franco 2012b, among others). Phrasal Spell-Out holds that lexical insertion targets constituents: heads as well as syntactic phrases. Hence, if morphemes are able to target phrasal nodes, this means that lexical items potentially correspond to syntactic structures and not (exclusively) single heads (Fábregas 2009:165-166).[11] Given a Phrasal Spell-Out approach, if a morpheme <α> is able to spells out the features X and Y, and X is higher in the functional sequence than Y, then <α> can spell out the phrasal node XP in a given natural language. See the representation in (32).

(32)   XP ⇒ <α>
            ╱   ╲
          X   YP
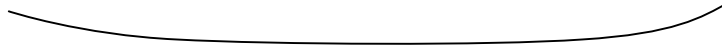   │
                        Y
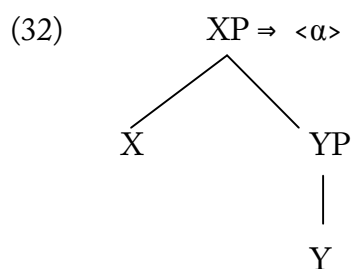
We have seen that in many languages *before* and *ago* are expressed with the same lexical item. The same happens for *after* and *in* meanings in many languages as shown in Table 2 above (cf. also the examples in (9)). Given the mechanism of Phrasal Spell-out these 'conflations' of meaning can be easily explained: contiguous stretches of structure, like *Deictic P > TimeAxis P,* can be lexicalized by the same item.

Hence, in the terminology of Haspelmath (1997), and referring to Table 2 and 3, we may rewrite (31) as (33):

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[11] Note that the idea that a lexical item can be inserted straight into a phrasal node has been originally proposed by McCawley (1968) in the framework of Generative Semantics.

(33)   (a) [{DISTANCE PAST} (deicticP) [{ANTERIOR} (Time Axis P]]

Spell–out chunk

(b) [{DISTANCE FUTURE} (deicticP) [{POSTERIOR} (Time Axis P]]

Spell–out chunk

Nevertheless, as anticipated, the Cinquean structure faces some problems when transposed into the temporal domain. I sketch them below and -following the suggestion of an anonymous reviewer- I propose a better alternative.

Consider the examples give above in (28). "*Prima della partita*" in (28a) is difficult to be analyzed as the complement of "*poco fa*", and similarly, "*qaebl az bazi*" in (27b) is difficult to be seen as the complement of "*chand lahze pis*". Indeed, "*poco fa*" and "*chand lahze pis*" appear to be whole, complete phrases on their own, and so do "*prima della partita*" and "*quaebl aez pis bazi*". The DeicticP and Time Axis P seem to be in a *modifier-modifyee* relation, so one should simply be an adjunct of the other and putting them on the same extended projection stretch appears to be unmotivated.

Furthermore, in (28a) and (28b), there is a *comma* between the phrases in question, which means an intonation break - a clear sign of the two phrases not being in a (functional) head - complement relation (unless we adopt Giorgi's 2012 idea of comma as a functional projection, and in that case, DeicticP would be the specifier and Time Axis P would be the complement of a projection headed by the comma, but we will not pursue this possibility any further here). Thus, it is arguable that the Cinquean structure with a Deictic Projection immediately dominating the temporal AxPart one is not the better option.

A solution is to build a model which takes into consideration the complement of the AxPart/Time Axis phrase. Indeed, as noted by an anonymous reviewer – with the mechanism of Phrasal Spell-Out in mind – we can say that *ago*, *fa* and their counterparts clearly convey the meaning [BEFORE [NOW]], and should be decomposed as such. Thus, I propose that a deictic [NOW] is in the complement position of the PP, and [BEFORE] lexicalizes both the Time AxisP and the temporal PlaceP. The idea is precisely that the *combination* [BEFORE [NOW]] is not used in English or Italian to express (punctual) temporal distance in the past because the mono-morphemic items "ago" or "fa" are more economical (see Muriungi 2009, cf. also Taraldsen 2010) and so *win* the competition for lexical insertion (cf. Starke 2009; 2011). We can state that:

(34)   [PLACE/TIME P [TimeAxisP BEFORE [DeicticP NOW [NP place/time]]]] spells out > *"ago"/ "fa"*

Once this *decomposition* is accepted, it is easy to see that {DISTANCE PAST} items of the type of *ago* stand for a whole phrase. So they cannot be in a structural head position and the phrase projected by *ago-like* items cannot be a DeicticP. Indeed, in (34) the deictic element is contributed by [NOW], which is the most deeply embedded element: the DeicticP is 'inside' *ago/fa*, not equivalent to it. The Deictic phrase is *topped off* by the phrase projected by the [BEFORE] item.

The same reasoning can be applied to {DISTANCE FUTURE} items like English *in*, which convey the meaning [AFTER [NOW]].

Following contemporary implementation of the syntax of spatial expressions (see Svenonius 2008; Dékány 2009; den Dikken 2010; Koopman 2010, among others) it is arguable that the Measure Phrase involved here (i.e. *seven years, three days*) is hosted in the specifier of a temporal Degree Phrase. Then, the question is: why is a Measure Phrase *obligatory* with *ago/in*?

It is possible to say that these elements not only spell out the structure [BEFORE [NOW]], but also a Degree head on top.[12] Then, the involvement of a Degree head would make obligatory the expression of some degree modifier (the Measure Phrase) in the specifier of the Degree head. The resulting picture would be as in (35) and this kind of representation is coherent with the model assumed in Svenonius (2006, 2008) for spatial prepositions.

(35)   [Deg' [PLACE/TIME P [AxPartP BEFORE [DeicticP NOW [NP place/time]]]]] spells out >*"ago"/"fa"*

Clearly, a structure like the one in (34)-(35) reverses the perspective on the mechanism of Phrasal Spell-Out: we have seen that in the Cinquean model the deictic item is *above* the Axial phrase, while in the [BEFORE [NOW]]/[AFTER [NOW]] approach the deictic items is *below* the Axial phrase. Adopting the '*deictic below*' view the question is: how to account for the identity of {ANTERIOR} / {POSTERIOR} and {DISTANCE PAST} / {DISTANCE FUTURE} items that is widespread in many languages? Consider again the Punjabi example given in (30a,b). In (30a) the temporal item *páílāā* (before/ago) can take an overt DP complement (as expected for markers of general anteriority), whereas in (30b) there is no overt DP complement. However, in this latter case the interpretation of the complement is [NOW]. As suggested by an anonymous reviewer, there are two possible lines of reasoning. An immediate solution is to say languages like Punjabi, Armenian, Persian, Turkish and so on (see Table 3) have a silent [NOW], roughly extending Kayne's (2003; 2007) discussion of silent elements, like [NUMBER/AMOUNT], [COLOR], [YEAR], [AGE], [HOUR], etc. Thus, *páílāā* would have the same structural representation as the English *before*. An alternative – couched in the framework of nanosyntax – is to posit that elements such Punjabi *páílāā*, Turkish *once*, Armenian

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[12] Once again, I am thankful to an anonymous referee for pointing out this possibility.

aŕaǰ and so on spell out the deictic complement [NOW] themselves, by means of the *Superset Principle*, which precisely says that a lexical item can in principle spell out a range of different syntactic structures as long as it is *bigger* (or equal) to the syntactic structures taken into consideration (see Caha 2007; 2009; Starke 2009). Specifically, the Superset Principle states that the structure contained in a lexical item can be bigger than the structure that it lexicalises. In such cases, the lexical item is a superset of the syntactic structures being spelled out. The Superset Principle can be exactly characterized as follows:

(36) "The phonological exponent of a lexical item is inserted to spell out a sequence of syntactico-semantic features if the item matches all or a superset of the features specified in the syntactic structure. Insertion does not take place if the lexical item does not contain all features present in the syntactic structure. Where several lexical items meet the conditions for insertion, the item containing less features unspecified in the syntactic structure must be chosen." (Caha 2007, 3)

In our case, [NOW] is not empty, namely there is no separate null [NOW] element. In the Punjabi sentence in (30a) part of the structure contained in the lexical item *páílāā* is unused for spell-out, namely its [deictic] feature is essentially suspended (i.e. following Ramchand's (2008) terminology *underassociated*).[13]

I shall not elaborate on this matter any further. What is crucial here is that the syntactic mechanism of Phrasal Spell-Out can elegantly account for the relation between markers of general {ANTERIORITY}/ {POSTERIORITY} and markers of {DISTANCE PAST}/ {DISTANCE FUTURE}, crosslinguistically.

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[13] According to the Nanosyntax glossary on the Web (cf. http://nanosyntax.auf.net/glossary.html), *Underassociation* can be interpreted as the result of applying the superset principle non-vacuously: when part of the structure in a lexical item is unused for the spell-out of a given syntactic structure, that unused piece is 'underassociated'.

In the next section we will extend the discussion to items conveying {RETROSPECTIVE} / {PROSPECTIVE} features and we will see that again an explanation based on the *height* of spell-out is able to: a) motivate Haspelmath's *implicational generalization* reported above in (14) and extended by our own research to the domain of {RETROSPECTIVE} markers; and b) explain in a principled way potential counterexamples to the generalized spatial to temporal drift of the type [before ≈ in front; after ≈ back].

4. Before strikes back: an *ABA constraint on temporal expression.

We have seen in section 2 that {DISTANCE-PROSPECTIVE} and {DISTANCE-RETROSPECTIVE} markers (see Table 2 and Table 3):

a) Can be identical to {DISTANCE-PAST}, {DISTANCE-FUTURE} markers and anterior/posterior markers;

b) Can pattern with {ANTERIOR}, {POSTERIOR} markers only;

c) Can pattern with {DISTANCE-PAST}, {DISTANCE-FUTURE} markers only;

d) Can be instantiated by a specific word/morpheme different from both {DISTANCE-PAST}, {DISTANCE-FUTURE} markers and {ANTERIOR}, {POSTERIOR} markers.

Interestingly, the only pattern that seems to be unavailable in natural languages, coherently with Haspelmath's implicational generalization in (14), is the one in which {DISTANCE-PAST}, {DISTANCE-FUTURE} marker are identical with {ANTERIOR}, {POSTERIOR} markers and {DISTANCE-PROSPECTIVE}, {DISTANCE-RETROSPECTIVE} ones are expressed with a different

item. Following cartographic insights,[14] Haspelmath's generalization in (14) and the data collected here on *anteriority* (cf. Table 3), we can accommodate the {DISTANCE-PROSPECTIVE} and {DISTANCE-RETROSPECTIVE} *features* in a separate slot in the extended projection of an abstract DP$_{time}$, sandwiched between Deictic P and Time Axis P as in (37), independently of the fact that we posit the deictic item *above* (à la Cinque) as in (37a) or *below* as in (37b) the Axial Part/Time Axis Projection (standardly hosting makers of anteriority/posteriority):

(37) (a) [*distance future / past* [*distance prospective / retrospective* [*posterior / anterior*]]]

 (b) [*posterior / anterior* [*distance prospective / retrospective* [*distance future / past*]]]

An empirical argument for the existence of a specific projection expressing a feature [+*retrospective/propective*] could be given by the fact that, in many languages {DISTANCE-PROSPECTIVE} and {DISTANCE-RETROSPECTIVE} markers (also when expressed with the morpheme identical to *posteriority/anteriority* markers) are instantiated by different syntactic configurations. A few examples are given below:

(38) (a)

DISTANCE PROSPECTIVE   POSTERIOR

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[14] Cartography (cf. Rizzi and Cinque 2010 for an introduction) is a paradigm of research based on the fine-grained mapping of the syntax/semantic-pragmatics interface where basically we have 'one feature ≈ one syntactic projection'. Cartography strictly follows the antisymmetrical doctrine of Kayne (1994), who claims that specifiers are adjuncts and the *linearization axiom* prevents having more than one adjunct/specifier (otherwise they would c-command each other, thus not allowing a *linearizable* structure). Hence, Cartography states that, if Specifiers of functional Projections are semantically related to the value of the projection, and if it is not possible to cumulate features on a single projection, then there is the need of more than one projection to host specifiers. For instance, in Cinque (1999), we find that - for what concerns e.g. the ordering (height) of aspectual adverbs - each projection *hosts* a very specific semantic content and generally only two adverbs can occupy its Specifier position: one with a positive and the other with a negative *value*.

Spanish	X después	después de X
Maltese	X wara	wara X
Estonian	X pärast	pärast X

(b)

	DISTANCE RETROSPECTIVE	ANTERIOR
Italian	X prima	prima di X
Catalan	X abans	abans de X
Persian	X piš	piš az X

Consider for instance how Italian expresses {DISTANCE RETROSPECTIVE} features:

(39) Tito si avvicinò a Nasser nel 1956. Otto anni prima/
     Tito cl-refl approach-3sg-pst to Nasser in 1956. Eight year before
     (*prima di otto anni) aveva rotto i rapporti con
     before of eight years have-3sg-ipfv broken the relations with
     Stalin.
     Stalin

'Tito approached Nasser in 1956. Eight years before he had broken off relations with Stalin.'

Consider also the Old Italian example below with the 'tricky' item *addietro*, clearly expressing a {DISTANCE RETROSPECTIVE} value:

(40) […] fu fatto Podestà Messer Federigo d'Antioccia
     was do-pst-ptcp mayor sir F.d'A.
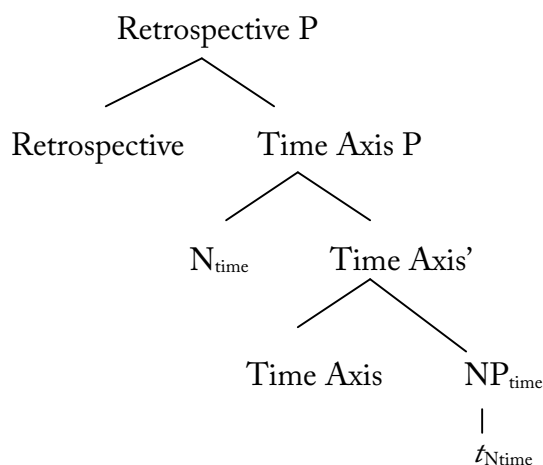
la	seconda	volta,	perciò che	*du'*	*anni*	*addietro*	era
the	second	time	since	two	years	at-back	be-3sg-ipfv

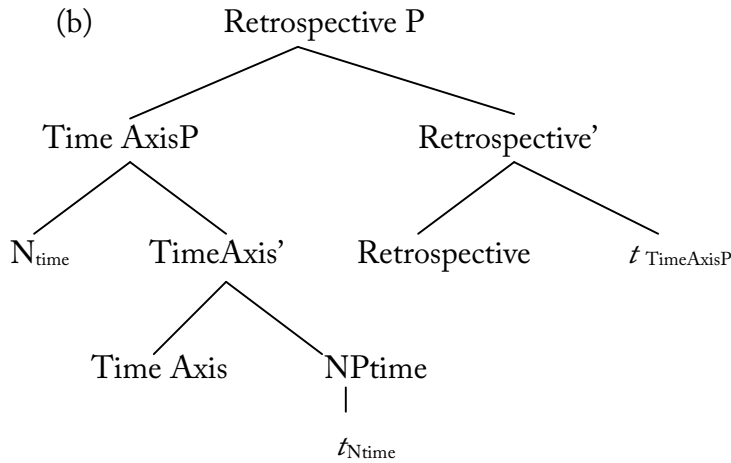| stato	un'altra	volta.
be-pst-ptcp	another	time

'Sir Federigo d'Antioccia was proclamed mayor for the second time, since he had been mayor another time two years before.'

Paolino Pieri, Cronica, 1305 c. (Fior.)

Taking as a starting point the cartographic configuration given in (20), we may propose that the different word order necessary to express {DISTANCE RETROSPECTIVE} meaning is a consequence of a movement operation. Following Cinque (2005) and Nevins (2011), among others, it can be assumed that that, in constructions such the ones in (39)-(40), N_{time} (*otto anni / du'anni*) moves through the Specifier of Time Axis P (*prima / addietro*), and pied-pipes Time Axis P to the Spec of a higher projection to check feature [+retrospective]. Namely, the different word order would be given by the necessity to target a (possibly *vacuous*) node higher than Time Axis P, where markers of anteriority are hosted. Such a possible *two-step* mechanism is illustrated in (41a-b).

(41)   (a)

```
              Retrospective P
             /              \
   Retrospective          Time Axis P
                          /          \
                     N_time        Time Axis'
                                   /         \
                             Time Axis      NP_time
                                              |
                                           t_Ntime
```

(b)

```
                  Retrospective P
                 /            \
        Time AxisP           Retrospective'
        /        \            /          \
   N_time    TimeAxis'   Retrospective   t TimeAxisP
             /      \
       Time Axis   NPtime
                     |
                   t_Ntime
```

In (41b), the Noun_time and the *rolled-up* Time Axis P (of which it is the specifier) represent the complex specifier of a (hypothesized) Retrospective node. Here the idea is that Time Axis acquires [+retrospective] via spec-head agreement, and its entire projection subsequently undergoes spec-head agreement for [+retrospective] with the higher node (labelled here *Retrospective*). Tentatively, this fact can be the reason why there is a strong cross-linguistic tendency of spelling-out {ANTERIOR / POSTERIOR} markers (in Time AxisP) and {RETROSPECTIVE / PROSPECTIVE} markers (in a higher node) with the same item.

This cartographic approach, however, faces many difficulties. First, in (41) I have illustrated a temporal model even more fine-grained that the spatial one argued for in Cinque (2010) and represented in (20) (namely, Cinque does not assume more projections between Deictic P and Axial Part P). Second, we may give only *indirect* evidence - based on cross-linguistic positional facts - of a dedicated slot for {retrospective} features (namely, we have not found, in our cross-linguistic survey, constructions in which deictic, retrospective, and anterior markers are all present *simultaneously*). Third, expression like *otto/du' anni* in (39)-(40) seems to measure phrases in the specifier position of Degree P (see (35) above)), rather than the complement of the Time Axis P (cf. Svenonius 2008, Koopman 2010).

An alternative hypothesis to explain the facts in (38)-(40) can be directly based on a Phrasal Spell-out mechanism and on the parameterization of the *height* of Spell-out (see Starke 2011; Fábregas 2009). Assume that, again, the need of checking [+retrospective] features triggers the movement of the NP_{time} in (39)-(40) to the Time Axis node. If, following Starke (2004), we argue for a specifier-less syntax,[15] and we apply his 'Doubly Filled Nothing' generalization (Starke 2004, 253), according to which no projection can have both its head-terminal and its specifier present at the same time, we are allowed to hypothesize the derivation below.

(42)   Time Axis P > *Phrasal Spell-Out*

        N_{time} NP_{time}

                         t
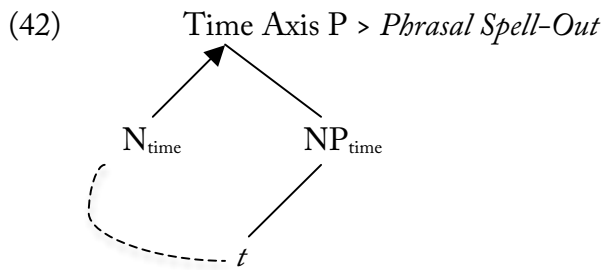
In (42), I assume that if N_{time} moves in order to check its [+retrospective] features and targets the Time Axis node, the Time Axis morpheme is (forced to be) Spelled-out in its maximal projection and inherits a retrospective value from the N_{time} landed in its head-terminal (which triggers a sort of *chain reaction*). Hence, we have the order N - TimeAxis (*vs*. Time Axis - N) again due to a movement of operation, but we do not have to postulate further projections (and roll-ups). We simply *parameterize* the height of spell-out of Time Axis (terminal / maximal). This fact can easily explain why some languages employ a different item for [+retrospective] (and [+prospective]) *valued* Time Axis, including the immediately dominating (or dominated) [+deictic] *word*, once we stretch the structure (cf. the discussion in section 3). Namely, it is possible that Time Axes bearing a

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[15] Starke (2004) points out the undesirable complicatedness and redundancy represented by the notion of *specifier* within contemporary approaches to syntactic representations and derivations (cf. also Jayaseelan 2008 for a similar approach).

retrospective value are spelled out with a *suppletive* form because they are forced to be spelled out in a maximal node. This mechanism, even if somewhat speculative, is coherent with phrasal spell-out applications to irregular verb forms (e.g. **goed* vs. *went*, which would be spelled out directly in TP/PastP; cf. Starke 2009; Fábregas 2009, 165-166). However there is again the problem that we have already pointed out for the structure in (39): what we have labelled NP$_{time}$ (e.g. otto anni, *eight years*) seems to be again a modifier of a Degree Phrase, rather than anything else. Nonetheless, a solution can be to posit that NP$_{time}$ is necessary 'bigger' when it has a [+retrospective/prospective] features and what moves is the structure [NumP [NP$_{time}$]].[16]

Finally, a third possibility would be to consider the 'relative ordering' of the features *distance past – distance retrospective – anterior* as a matter of morphology (e.g. following a feature hierarchy *a là* Noyer 1992; see also Bobaljik 2012 or a feature geometry *a là* Harley and Ritter 2002). But a 'morphological' approach to temporal expressions seems to be ruled out by cross-linguistic facts. Indeed we found practically no language (consider again Tables 2 and 3) in which deictic, retrospective and anterior values are expressed *compositionally* contra many 'regular' examples given, for instance, by comparative morphology (see Bobalijk's 2012 Containment Hypothesis, according to which the representation of the *superlative* properly contains that of the *comparative*, universally). Consider the examples below from Persian and Cimbrian (taken from Bobalijk 2012, ex. 35):

(43) a. *Persian*:   kam   kam-tar$_{cmpr}$ kam-tar-in$_{sprl}$ 'little'

      b. *Cimbrian*: šüa   šüan-ar$_{cmpr}$ šüan-ar-ste$_{sprl}$ 'pretty'

---

[16] Notice that in the approach to noun-phrase structure developed by Borer (2005), it is assumed that the base interpretation of roots is *mass*, while additional functional projections above the root are necessary to convey *count* readings. More precisely roots are '*unspecified for count or mass; but deriving a count reading from the abstract root invariantly requires additional functional structure*' (cf. Ott 2011, 1-2). Considering the insights of Borer (2005), it is possible that the basic interpretation of abstract *Time* is mass and when *Time* is turned to a countable entity (i.e. in expressions of *temporal distance*) a functional structure above is necessary to convey a count meaning. Hence the involvement of a possibly bigger structure (i.e. NumP or precisely following Borer a *DivP*).

I have not found examples of *containment* in the temporal field and this clearly goes against a morphological representation/ordering of features of *anteriority / posteriority*. Thus, they seem to be a matter of syntactic projections.

Actually, even if we propend for the parameterized spell-out option (*vs.* e.g. a 'cartographic' rolling up mechanism), we can remain agnostic about the real underlying mechanism that accounts for the empirical facts originally illustrated by Haspelmath in (14). What is crucial here is that we assume/predict a configuration in which *retrospective/prospective* is sandwiched between *deictic* and *anterior/posterior* slots. This interpretation is enforced by the fact that retrospective/prospective items share some features with both deictic and posterior/anterior items, as shown by the possible representation in (44). In particular retrospective/prospective elements share with anterior/posterior ones the property of being detached from the time of speech and share with distance past/future items the property of being *deictic* (in a broad sense anchored to the temporal context, e.g. retrospective can spell out the meaning [THEN]). Note that the relative position of the deictic item (i.e. *above* or *below* the temporal AxPart, cf. section 3 above) is not relevant for what follows. The relevant fact is that prospectives and retrospectives *lie in between*.

(44)   ANTERIOR/POSTERIOR {- deictic; - anchored to time of speech}

                      RETROSPECTIVE/prospective {+ deictic; - anchored to time of speech}

                                  DISTANCE PAST/FUTURE {+ deictic + anchored to time of speech}
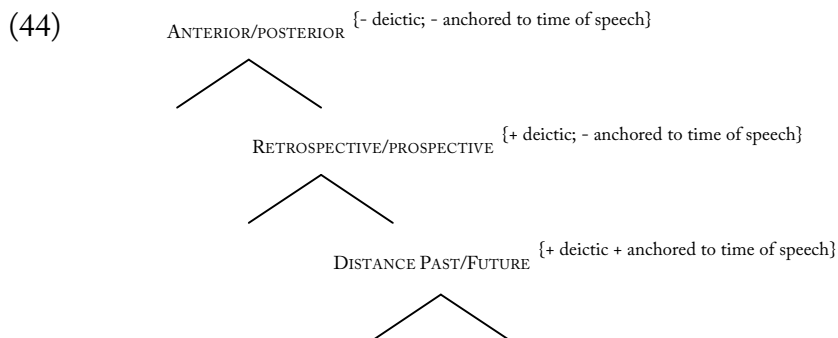
The fact that retrospective/prospective items share a deictic value with distance-past/future ones can be seen very well with data from Hungarian, as pointed out by an anonymous reviewer. In Hungarian (cf. also Table 3) the temporal markers of distance in the past are:

(45)   *Distance Past*   *Retrospective*   *Anteriority*

        ez-előtt   az-előtt   előtt

        ago   before/earlier   before

In Hungarian, *előtt* means 'before' (both spatially and temporally), *ez* means 'this' and *az* means 'that'. *Ezelőtt* can only mean *ago*, due to the use of the proximal demonstrative *ez*. Crucially, both retrospective and distance past have a deictic value overtly expressed by the (distal/proximal) demonstrative: they can be decomposed respectively into {that-before} (with the use of the distal demonstrative *az*), and into {this-before}, as shown by the examples in (46).

(46)   (a)   két   hét-tel   ez-előtt

               two   week-instr   this-before

               'two weeks ago' (lit. two weeks before this)

        (b)   két   hét-tel   az-előtt

               two   week-instr   that-before

               'two weeks earlier' (lit. two weeks before that)

The Hungarian data above can be seen as evidence that the difference between distance future/ retrospective/posterior (and their equivalent in the past) is in the complement of the PP-sequence,

and not in the middle of the PP-sequence, motivating a phrasal spell-out mechanism as the one depicted in (34)-(35).[17]

If we are on the right track, we are very near to a principled explanation of Haspelmath's implicational generalization and the consequent ban of *distance past/future = anterior /posterior ≠ distance prospective/retrospective.

The explanation is based on *nanosyntactic* insights. Starke's (2009, 2011) Nanosyntax assumes that if a word spells out adjacent features (hosted in different nodes), then the *A-B-A principle (possibly as a corollary of the *Superset Principle* introduced above), as defined below holds (cf. Caha 2009; Taraldsen 2010; Pantcheva 2011; Bobaljik 2012; Vangsnes to appear, among others):

(47)   *if a given span is lexicalised by A, and a slightly bigger version of this span is lexicalised by B, then it is impossible for A to lexicalise a span even bigger than B.*

Thus, the *A-B-A basically refers to the observation that discontinuous syncretism (two As across a distinct B) is ruled out.
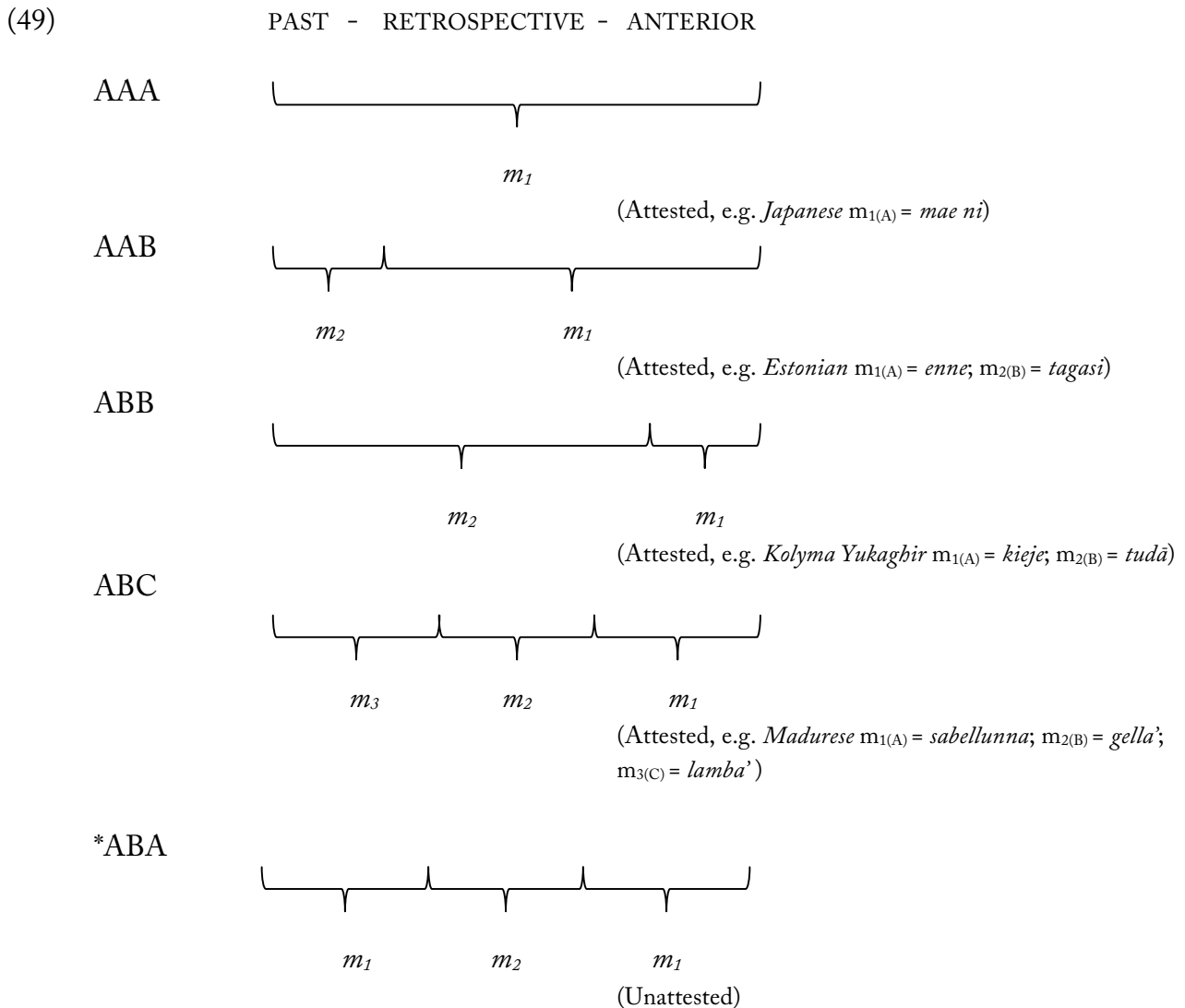
Given the strings *Anterior < Distance retrospective < Distance Past* and *Posterior < Distance perspective < Distance Future*, and the *A-B-A constraint as introduced in (47), we have a principled explanation of our cross-linguistic data, ranked below on the basis of their apparent un-markedness:

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[17] As suggested by an anonymous reviewer, given the Hungarian facts, we can also use alternative (and possibly, more useful) labels to describe markers of temporal distance as in (i) and (ii):

(i)	Distance Future	Prospective	Posteriority
	after [now/ this (event)]	after [past event/that (event)]	after [event / DP]

(ii)	Distance Past	Retrospective	Anteriority
	before [now/ this (event)]	before [past event/that (event)]	before [event/DP]

(48)   (a) AAA [37.1 % of Haspelmath's Sample (10/27); 43.3% of our sample (16/37)]

(b) AAB [25.9 % of Haspelmath's Sample (7/27); 35.1% of our sample (13/37)]

(c) ABB [14.8% of Haspelmath's Sample (4/27); 16.2% of our sample (6/37)]

(d) ABC [22.2% of Haspelmath' Sample (6/27); 5.4% of our sample (2/37)]

(e) *ABA [unattested]

I give a *plain* graphic representation of the *ABA constraint for temporal expressions of anteriority in (49), where m_1, m_2, and m_3, are variables over morphemes (cf. the data I have collected in Table 3).

(49)   PAST - RETROSPECTIVE - ANTERIOR

AAA

m_1

(Attested, e.g. *Japanese* $m_{1(A)}$ = *mae ni*)

AAB

m_2 m_1

(Attested, e.g. *Estonian* $m_{1(A)}$ = *enne*; $m_{2(B)}$ = *tagasi*)

ABB

m_2 m_1

(Attested, e.g. *Kolyma Yukaghir* $m_{1(A)}$ = *kieje*; $m_{2(B)}$ = *tudā*)

ABC

m_3 m_2 m_1

(Attested, e.g. *Madurese* $m_{1(A)}$ = *sabellunna*; $m_{2(B)}$ = *gella'*; $m_{3(C)}$ = *lamba'*)

*ABA

m_1 m_2 m_1

(Unattested)

37

Furthermore, with an explanation based on the *ABA constraint on 'Spell-out chunks' we may give a simple principled interpretation of the exceptionality of potential counterexamples to Haspelmath's generalization, like Old Italian *addietro*.

Addietro merely represents an instance of an ABB string, where the {ANTERIOR} marker is different from the {DISTANCE RETROSPECTIVE} marker (B, the middle node), which is equal to the {DISTANCE PAST} marker (spelled out again as B). This is an attested pattern in the temporal domain of 'anteriority' (as shown in Table 3) and the same ABB sequence is also attested in the domain of 'posteriority'.[18] Consider for instance Hungarian *mulva* and the Chechen suffix *–älča*, where {POSTERIOR} is different from distance {PROSPECTIVE} which is equal to {DISTANCE FUTURE}.

With such an explanation, Haspelmath's generalization as presented in Table 1 is preserved (possibly as the reflex of a cognitive constraint), due to the fact that it applies to markers of general *anteriority/posteriority* only.

Nothing prevents a {DISTANCE RETROSPECTIVE} marker from being expressed by means of a word meaning [BACK], just as happens for *distance past* markers in many languages (cf. examples (15)-(19) above). Crucially, in our survey we have not found an item meaning [BACK], that is able to spell out a marker of general *anteriority* (i.e. no traces of an AAA when [back] lexicalizes a {DISTANCE PAST} marker and, again, Haspelmath's generalization is safe).

Hence, Old Italian *addietro* is only an apparent counterexample to Haspelmath's generalization, made more *exceptional* by the fact that while in Old Italian anteriority *spans* ABB, in modern Italian it spans AAB, namely distance retrospective is expressed with *prima*, which is the specific maker for general anteriority (both in Old and in Modern Italian).

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[18] Note that the AAB pattern is unattested in Bobaljik's (2012) research on comparative morphology (e.g. *good – gooder – best). But, as said above, we have found no trace of *morphological containment* (with the possible exception of Mosetén, cf. Table 3) in temporal expressions, and thus nothing seems to prevent an AAB span.

5. *Conclusion*

In this paper, I have presented a cross-linguistic picture of the syntax of items signalling temporal distance. Basing on insight form cartography and nanosyntax, I have shown that the mechanism of *Phrasal Spell-out* (and the *Superset Principle*) can elegantly explain why in many language *before* and *ago* meanings are expressed with the same word. Above all, I have presented a previously unnoticed *ABA constraint on *lexical spans* in the domain of temporal distance, crucial to account for possible counterexamples of Haspelmath's fairly robust generalization, illustrated in Table 1. In particular, with the example of Old Italian *per addietro*, we have shown that nothing prevents a {DISTANCE RETROSPECTIVE} marker to be expressed by means of a word meaning [BACK], just as it happens for {DISTANCE PAST} markers in a full set of genetically non-interrelated languages.

Appendix A

The results reported in Table 3 are drawn from:

i) The *off-line* investigation of ca. 75 languages. Targets of our research have been comprehensive descriptive grammars (e.g. Croom Helm/Routledge Descriptive Grammars, Mouton Grammars, LINCOM Europa series, LOT dissertations series, etc.) published up to 2012.

ii) The *on-line* data provided by a number of informants for a few languages and personal native knowledge of Italian.

Results are reported for 37 languages only, simply because the relevant data are not available for many languages (namely, they are often not included in an *average* reference grammar). Only where we have found unambiguous data for all the three features under investigation (*distance past – distance retrospective – anterior*), did we include the language in the table.

Below, I provide a rough description of the languages included in Table 3; the references/data point to the relevant *temporal* information:

(a) *Abui* is a language of the Alor Archipelago (Eastern Indonesia), that belongs to the Trans–New Guinea family. Data are taken from Kratochvíl (2007, 265; 274-275).

(b) *Albanian* is a Indo-European language. Data have been provided by Ervis Shkoza (p.c.).

(c) *Armenian* is a Indo-European language. Data are taken from Dum Tragut (2009, 222; 225; 296-297; 469; 490; 668).

(d) *Catalan* is a Romance Language. Data are taken from Hualde (1992, 67; 99; 273).

(e) *Cavineña* is a Pano-Tacanan language spoken on the Amazonian plains of northern Bolivia. Data are taken from Guillaume (2008, 52; 82; 166; 361)

(f) *Croatian* is a South Slavic language. Data have been provided by Tereza Čavlović (p.c.).

(g) *Czech* is a West Slavic language. Data are taken from Janda and Townsend (2000, 55; 78; 84).

(h) *English* is a West Germanic language. Data have been provided by Molly McIlwrath (p.c.).

(i) *Estonian* belongs to the Finnic branch of the Uralic language family. Data are taken from Erelt (118; 121; 124).

(j) *Finnish* belongs to the Finnic branch of the Uralic language family. Data are taken from Sulkala and Karalainen (1992, 14; 76; 112; 193; 262).

(k) *French* is a Romance language. Data have been provided by Erell Davoli (p.c.).

(l) *German* is a West Germanic language. Data are taken from Dodd et al. (2003, 8; 169; 247; 269-270).

(m) *Hungarian* is a Uralic language, of the Ugric branch. Data are taken from Kenesei et al. (1998, 227; 251-253; 316).

(n) *Italian* is a Romance language. Data are from personal native knowledge.

(o) *Japanese* is a member of the Japonic (or Japanese-Ryukyuan) language family. Data are taken from Iwasaki (2002, 109-110; 114; 253; 318).

(p) *Kashmiri* is Indo-Aryan language. Data are taken from Wali and Koul (1997, 187-189).

(q) *Kolyma Yukaghir* is a Yukaghir language spoken in the Russian Far East. Data are taken from Maslova (2003, 199; 238; 243; 275; 419; 425).

(r) *Korean* is a language isolate. Data are taken from Sohn (1994, 71; 113-114; 264-266).

(s) *Lezgian* is a Northeast Caucasian language. Data are taken from Haspelmath (1993, 216; 219; 305).

(t) *Ma'di* is a Central Sudanic language spoken in the south of Sudan and the north of Uganda. Data are taken from Blackings and Fabb (2003, 330; 502; 509; 525).

(u) *Madurese* is a Malayo-Polynesian language spoken in the Madura Island and eastern Java. Data are taken from Davies (2010 182; 192; 234; 241; 513; 533; 559).

(v) *Malayalam* is a Dravidian language spoken in southwest India. Data are taken from Asher and Kumari (1997, 77-78; 113; 244-247)

(w) *Maltese* is a Semitic language spoken in Malta. Data are taken from Borg and Azzopardi-Alexander (1997, 39-41; 97; 233; 171-172).

(x) *Modern Breton* is a Celtic language spoken in Brittany. Data are taken from Press (1986, 9; 76; 118-120; 175-177).

(y) *Mosetén* is a Mosetenan language spoken in Bolivia. Data are taken from Sakel (2004, 75; 183; 237-238; 364; 452; 456).

(z) *Ndyuka* is a creole language of Suriname. Data are taken from Huttar and Huttar (1994, 125; 212; 218; 447-450).

(aa) *Persian* is an Iranian language within the Indo-Iranian branch of the Indo-European family. Data have been provided by Saloomeh H. Varje (p.c.).

(bb) *Punjabi* is an Indo-Aryan language spoken in northern India and Pakistan. Data are taken from Bhatia (1993, 206-208; 143).

(cc) *Spanish* is a Romance language. Data have been provided by Ignacio A. Perez (p.c.).

(dd) *Turkish* is a Turkic language. Data are taken from Kornfilt (1997, 262-263; 289; 346; 366; 425; 452-453).

(ee) *Udihe* is a member of the Tungusic family spoken in the Primorsky Krai and Khabarovsk Krai regions in Russia. Data are taken from Nikolaeva and Tolskaya (2001, 92; 219-220; 401; 405; 414; 624; 689).

(ff) *Vaeakau Taumako* is a Polynesian language spoken in some of the Reef Islands as well as in the Taumako Islands in the Temotu province of the Solomon Islands. Data are taken from Næss and Hovdhaugen (2011, 30; 239; 280; 286; 298).

(gg) *Wardaman* is an Australian language of the Northern Territory. Data are taken from Merlan (1994, 93; 116; 144; 153; 163-165; 194; 444).

(hh) *Yurakaré* is a language isolate of central Bolivia. Data are taken from Van Gijn (2006, 18; 43; 65; 77; 83; 342; 346).

(ii) *Warrongo* was an Australian language spoken in North-eastern Queensland. Data are taken from Tsunoda (2011, 177; 181; 190; 208; 247; 270; 696-697).

(jj) *Zialo* is a language spoken in Guinea. It belongs to the South-Western group of the Mande branch of the Niger–Congo family. Data are taken from Babaev (2010, 87; 91; 196).

(kk) *Old Florentine* is the direct ancestor of Modern Italian (cf. Salvi and Renzi 2010). Data are taken from the OVI Database.

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	spatial		temporal
Haspelmath (1997)	[FRONT]	>	[BEFORE]
	[BACK]	>	[AFTER]

Table 1

	FUTURE	PROSPECTIVE	POSTERIOR
Albanian	pas	pas	pas
Ancient Greek	metá	metá	metá
Arabic	baʕda	baʕda	baʕda
Bulgarian	sled	sled	sled
Chechen	-älča	-älča	tʼäħa
Chinese	yǐhòu	yǐhòu	(guo)hòu
Croatian	do	poslije	poslije
English	in	later, after	after
Estonian	pärast	pärast	pärast
Finnish	-ssa (INESSIVE)	myöhemmin	jälkeen
French	dans	plus tard	après
German	in	später, nach	nach
Haitian Creole	nan	apré	apré
Hungarian	múlva	múlva	után
Indonesian	lagi	kumudian	sebelum
Irish	i gcionn	ina dhiaidh sin	roimh
Japanese	go ni	go ni	go ni
Latin	post/ABLATIVE	post	post
Latvian	pēc	pēc	pēc
Lezgian	SUPERELATIVE	SUPERELATIVE	gŭǧüniz/qʼuluqh
Lithuanian	po/praslinkus	po/už/praslinkus	praslinkus/po
Maltese	fi	wara	wara
Modern Greek	se	ístera apó	metá
Russian	čerez	spustja	posle
Spanish	dentro de	después	después de
Swedish	om	senare, efter	efter
Turkish	sonra	sonra/geçince	sonra

Table 2 (adapted from Haspelmath 1997, 99)

	PAST	RETROSPECTIVE	ANTERIOR
Abui	afe	el	el
Albanian	parë	para	para
Armenian	aṙaǰ/valuc	aṙaǰ	aṙaǰ
Catalan	fa	abans	abans
Cavineña	(-kware) beru	beru	beru
Croatian	prije	prije	prije
Czech	před	před	před
English	ago	before/earlier	before
Estonian	tagasi	enne	enne
Finnish	sitten	ennen	ennen
French	il y'a	avant	avant
German	vor	vor	vor
Hungarian	ezelőtt	azelőtt	előtt
Italian	fa/or sono/addietro	prima	prima
Japanese	mae ni	mae ni	mae ni
Kashmiri	brõh	brõh	brõh
Kolyma Yukaghir	tudā	tudā	kieje
Korean	cen-ey	icen-ey	icen-ey
Lezgian	wilik	wilik	wilik
Ma'di	ɛzɛ'	gbù	gbù
Madurese	lamba'	gella'	sabellunna
Malayalam	munpɵ	munpɵ	munpɵ
Maltese	ilu	qabel	qabel
Modern Breton	zo	a-raok	a-raok
Mosetén	poroma-win	poroma-jike	poroma
Ndyuka	pasa	fosi	fosi
Persian	piš	piš/qæbl æz	piš/qæbl æz
Punjabi	páílāā	páílāā	páílāā
Spanish	hace	antes	antes
Turkish	önce	önce	önce
Udihe	anana	anana	zulie-ni/-te
Vaeakau-Taumako	huamua	huamua	huamua
Wardaman	burrugawi/buljuwi	guji	guji
Warrongo	ganba	ganba	ganba
Yurakaré	shinama	shinama/ushta	shinama/ushta
Zialo	aysa	aysa	aysa/tùwò
Old Florentine	*addietro*	*(per/in) addietro*	*prima*

Table 3