Before strikes *back*

An *ABA constraint on temporal expressions

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Abstract: In this paper, I will present a cross-linguistic analysis of the syntax of items signalling temporal distance. Based on insight from cartography and nanosyntax, I will argue 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. I will present a previously unnoticed *ABA constraint (cf. Caha 2009; Bobaljik 2012) on lexical spans in the domain of temporal distance. The *ABA pattern will be crucial to account for possible counterexamples of Haspelmath's (1997) fairly robust descriptive generalization, which states that forms expressing spatial relations of 'front' and 'back' regularly express anteriority and posteriority respectively, across languages when they are "shifted" from space to time (namely, *before* ≈ *in front; after* ≈ *back*).

Keywords: preposition; time; space; *ABA; phrasal spell-out

1. Introduction

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) writes:

> "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 & Johnson 1999).[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 (*op.cit.*, 140–141) distinguish among:

Haspelmath (1997) has proposed a fairly robust generalization (shown 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).

Table 1:

spatial		temporal
[FRONT]	>	[BEFORE]
[BACK]	>	[AFTER]

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** (*op.cit.*, 20).

He affirmed that "almost all cases" follow this path (*ibid.*, 56).[3] In (1) I present data from Japanese, were the word *mae* 'front' is employed with a

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(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*).

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

[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 (*ibid.*, 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."

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.' (Japanese, Moore 2011, 766)

    b. Satoo-o   ire-ru   yori *mae-ni*   sio-o   ire-ru.
     sugar-ACC put.in-non-PST from front-LOC salt-ACC put.in-non-PST
     'Before putting in sugar, I put salt.'   (Japanese, *ibid.*, 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. locative use of *jíré*:

     [má *jíré*   lé] dà:$^{n}\emptyset$
     1SG in-front in sit-perf.l-3SG
     'He/She is sitting in front of me.'   (Jamsay, Heath 2008, 296)

    b. temporal use of *jíré*:

     [ɛ'mɛ' *jíré*]   y'ɛr'ɛ-bà
     1PL   before come.perf.l-3PL
     'They came here before us.' Lit. 'They came here in front of us.'
                                                        (Jamsay, *ibid.*, 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 & 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
     husband-TOP back/behind-from-ALSO go-FUT
     'Her husband from behind will also go.' > 'Her husband will go later/after.'
                                                                                    (Aymara)

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   ribellaro...
     the slaves that for at-back in Rome cl-REFL 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/POSTE-RIOR} 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. Humeîs 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 & Svenonius 2009); (b) the mechanism of **Phrasal Spell-out** (Starke 2009; 2011; Caha 2009; Neeleman & 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 close the paper.

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) and (13b) the elapsed time is not necessarily linked to the time of speech. {DISTANCE-PROSPECTIVE} and {DISTANCE-RETRO-SPECTIVE} 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.

Table 2:

	Future	Prospective	Posterior
Albanian	pas	pas	pas
Ancient Greek	metá	metá	metá
Arabic	baʕda	baʕda	baʕda
Bulgarian	sled	sled	sled
Chechen	-älča	-älča	t'äħa
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	güğüniz/q'uluqh
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

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).

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} $\neq$ {POSTERIOR} markers (e.g., Hungarian, Lezgian) and at the same time there are languages in which {DISTANCE PAST} = {DISTANCE-RETROSPECTIVE} $\neq$ {ANTERIOR} (e.g., Kolyma Yukaghir or Old Italian).

There are also various languages that have {DISTANCE FUTURE} $\neq$ {DISTANCE-PROSPECTIVE} $\neq$ {POSTERIOR} markers (e.g., Modern Greek or Indonesian) and, at the same time, languages that have {DISTANCE PAST} $\neq$ {DISTANCE-RETROSPECTIVE} $\neq$ {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-l-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 *amaski.*
        and.now come-NFUT-1PL.INC you-CLT go.away-VOL-PRS-2SG   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 & Kuteva 2002, 49)

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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 in the spatial domain.

Table 3:

	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	munpə	munpə	munpə
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	páílāã	páílāã	páílāã
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

(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]

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

(19) tre anni fa ≈ tre anni *addietro*
      'three years ago'

According to Heine and Kuteva (2002, 49), the grammaticalization BACK > AGO "appears to be an instance of a more general process whereby cer-

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[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:

(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):

(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.

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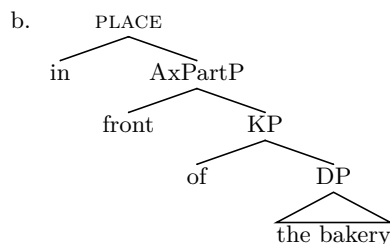   he   die now be years two
       'He died two years ago.' (lit. 'He died. It's now two years.')
                                              (Babungo, Schaub 1985, 169)

tain 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 $_{+\text{deictic}}$ 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

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$_{\text{Dir}}$ [PP$_{\text{Stat}}$ [PP$_{\text{Place}}$ [DegP [ModeDirP [AbsViewP [RelViewP [RelViewP [DecticP [AxPartP X^0 [PP P [NP$_{\text{Place}}$ 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) (based 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 syntac-

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[6] Specifically, Svenonius (2006), based 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 & 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.

tic representation of spatial prepositions, according to Svenonius (2006), is reported in (21).

(21) a. in front of the bakery

    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 & 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 & 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) a. Approximative:
          Le ombre *verso* sera.
          'the shadows *towards* evening.'

      b. Durative:
          L'immagine della città *durante/attraverso* i secoli.
          'the image of the city *during/through* the centuries.'

      c. Relational:
          L'astronomia *presso* gli antichi Egizi.
          'the Astronomy *among* (lit. *nearby*) the ancient Egyptians.'

      d. Forwarders:
          Le interviste *in vista* delle elezioni.
          'the interviews *in view* of the elections.'

      e. Backwarders:
          I pronostici *in base* all'esito delle elezioni.
          'the forecasts *in base of* the result of the election.'

      f. 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.'

      g. 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. Con-
sider 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'

According to Roy and Svenonius (2009, 110), expressions like the ones in
(24) 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]

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   b. TIME = PLACE
        AxPartP > FRONT   AxPartP > ANTERIOR
        davanti   KP   prima   KP
                  a   DP   di   DP
                      lo stadio   la partita
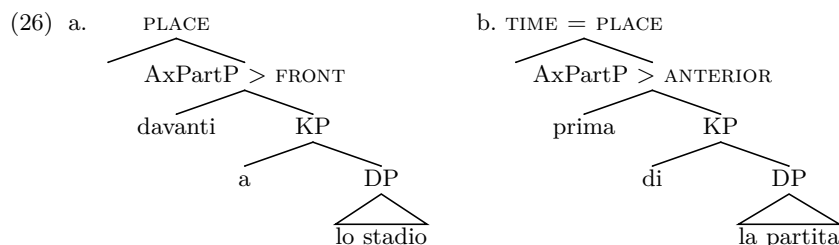
Thus, I assume that anterior, posterior and **other** time markers such the ones illustrated in (23) for Italian and in (24) for French are generated in the same projection, labelled here "Time Axis", which is nothing else than the temporal counterpart of AxPart.

At this point, trying to follow the Cinquean model of spatial prepositions given above in (20), we should postulate a Deictic Projection immediately above Time Axis P:

(27) $[_{\text{PLACE/TIME}} \cdots [_{\text{Dectic}}P \ [_{\text{AxPart/Time Axis}}P \ X^0 \ [PP \ P \ [NP_{\text{Place}} \ DP \ [\text{PLACE}]]]]]]$

---

[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-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 1982; 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. alsoKayne 2004; 2007; Terzi 2010; Holmberg 2002; Schweikert 2005).

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)

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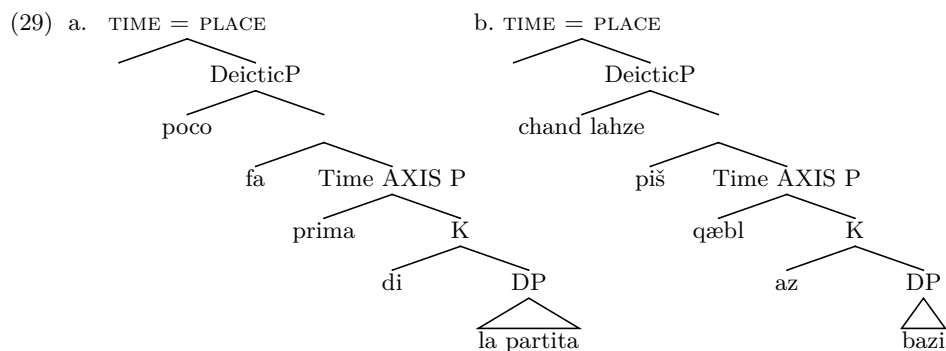
Notice that in the Persian examples in (28b–c) *piš* can spell-out the Time AXIS head, but when it inserted in DeicticP, *qæbl* (which is more specific, cf. table 3) must be used to spell-out the Time AXIS Spec.[10]

    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 – syntacti-

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[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 the phrase structure of Persian.

[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.

cally – {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.

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 & Evers-Vermeul 2002; Williams 2003; Neeleman & Szendrői 2007; Abels & 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 $\langle\alpha\rangle$ is able to spells out the features X and Y, and X is higher in the functional sequence than Y, then $\langle\alpha\rangle$ can spell-out the phrasal node XP in a given natural language. See the representation in (32).

(32)   XP $\Rightarrow \langle\alpha\rangle$
        ╱   ╲
      X   YP
                  |
                  Y
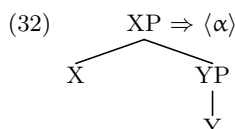
We have seen that in many languages *before* and *ago* are expressed with the same lexical item. The same happens for *after* and *in* meanings in many languages as shown in table 2 above (cf. also the examples in (9)). Given the mechanism of Phrasal Spell-out these "conflations" of meaning can be easily explained: contiguous stretches of structure, like Deictic P > Time Axis 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):

(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 given in (28) above. *Prima della partita* in (28a) is difficult to be analyzed as the complement of *poco fa*, and similarly, *qaebl az bazi* in (28b) is difficult to be seen as the complement of *chand lahze piš*. Indeed, *poco fa* and *chand lahze piš* appear to be whole, complete phrases on their own, and so do *prima della partita* and *quæbl aez piš 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.

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[11] 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.

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 temporal AxPart 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 Axis P 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 monomorphemic items *ago* or *fa* are more economical (see Muriungi 2009, cf. also Taraldsen 2010) and so they win the competition for lexical insertion (cf. Starke 2009; 2011). We can state that:

(34) [PLACE/TIME P [Time Axis P BEFORE [DeicticP NOW [NP place/time]]]]

<div align="right">spells out > *ago/fa*</div>

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; 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) $[_{\text{Deg}'}$ [PLACE/TIME P $[_{\text{AxPartP}}$ BEFORE $[_{\text{DeicticP}}$ NOW $[_{\text{NP place/time}}]]]]]$
                                                                    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 item 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 *páílã̃ã̃* '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, *páílã̃ã̃* would have the same structural representation as English *before*. An alternative – couched in the framework of nanosyntax – is to posit that elements such Punjabi *páílã̃ã̃,* Turkish *once*, Armenian *aṙaǰ* etc., 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:

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

(36) **Superset Principle** (Caha 2007, 3)

> 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.

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 *páílãã* 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.

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 tables 2 and 3) can:

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

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

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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".

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

(d) 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** the Axial Part/Time Axis Projection (à la Cinque), as in (37a), or **below** it, as in (37b) (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:

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[14] Cartography (cf. Cinque & Rizzi 2010a for an introduction) is a paradigm of research based on the fine-grained mapping of the syntax/semantic–pragmatics interface, where there is "one feature ≈ one syntactic projection" posited. 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 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.

(38) a.   DISTANCE PROSPECTIVE   POSTERIOR

        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
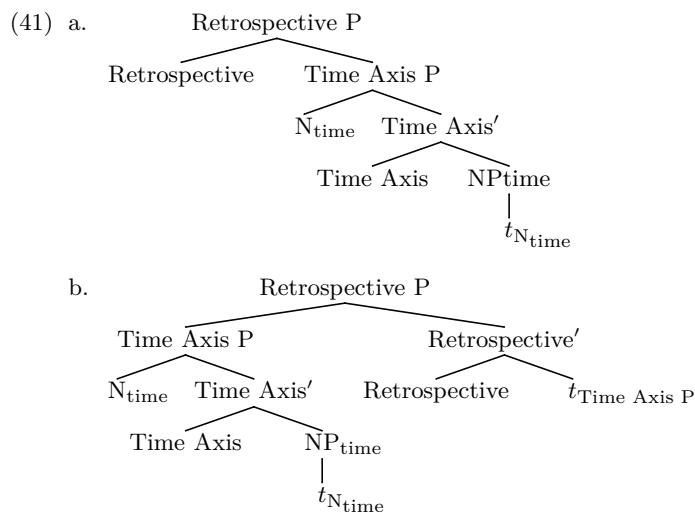
        Persian: X piš   piš az X

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 Stalin.
       before of eight years have-3SG-IPFV broken the relations with 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 in constructions such as those 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      NPtime
                                   │
                                 t_{N_time}
```

b.

```
                        Retrospective P
                  ╱──────────────╲
        Time Axis P               Retrospective′
     ╱────────╲               ╱──────────╲
 N_time    Time Axis′    Retrospective    t_{Time Axis P}
        ╱────────╲
   Time Axis      NP_time
                    │
                  t_{N_time}
```

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 Axis P) 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, expressions like *otto/du' anni* in (39) and (40) seem 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) and (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 (*op.cit.*, 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*
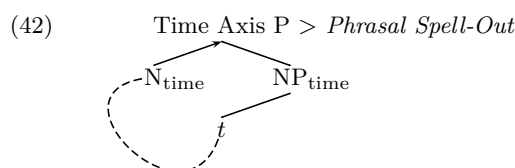
In (42), I assume that if N_{time} moves in order to check its [+retrospective] features and targets the Time Axis node, the Time Axis morpheme is (forced to be) spelled out in its maximal projection and inherits a retrospective value from the N_{time} landed in its head-terminal (which triggers a sort of **chain reaction**). Hence, we have the order N–Time Axis (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 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]

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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).

[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

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 & 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 provided, for instance, by comparative morphology (see Bobaljik'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 Bobaljik 2012, ex. 35):

(43) Persian: kam kam-tar$_{\text{cmpr}}$ kam-tar-in$_{\text{sprl}}$ 'little'
     Cimbrian: šüa šüan-ar$_{\text{cmpr}}$ šüan-ar-ste$_{\text{sprl}}$ 'pretty'

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 the deictic and the 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]).

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" (Ott 2011, 1–2). Based on 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 is necessary above to convey a count meaning, hence the involvement of a possibly bigger structure (i.e., a NumP or, following Borer, a DivP).

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$^{\{-\text{DEICTIC, }-\text{ANCHORED TO TIME OF SPEECH}\}}$

 RETROSPECTIVE/PROSPECTIVE$^{\{+\text{deictic, }-\text{anchored to time of speech}\}}$

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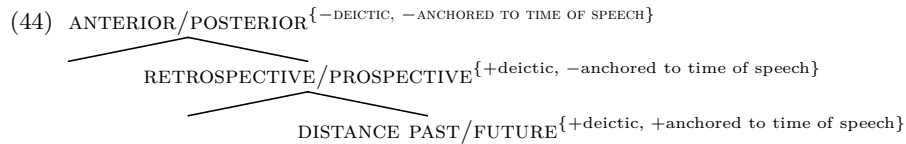
The fact that retrospective/prospective items share a deictic value with distance-past/future ones can be seen very well with data from Hungarian, as pointed out by an anonymous reviewer. In Hungarian (cf. also table 3) the temporal markers of distance in the past are:

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

  b. két hét-tel az-előtt
    two week-INSTR that-before
    '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) and (35).[17]

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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):

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) holds (cf. Caha 2009; Taraldsen 2010; Pantcheva 2011; Bobaljik 2012; Vangsnes 2013, 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 unmarkedness:

(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).

(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]

(49)

$$\text{PAST} - \text{RETROSPECTIVE} - \text{ANTERIOR}$$

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)
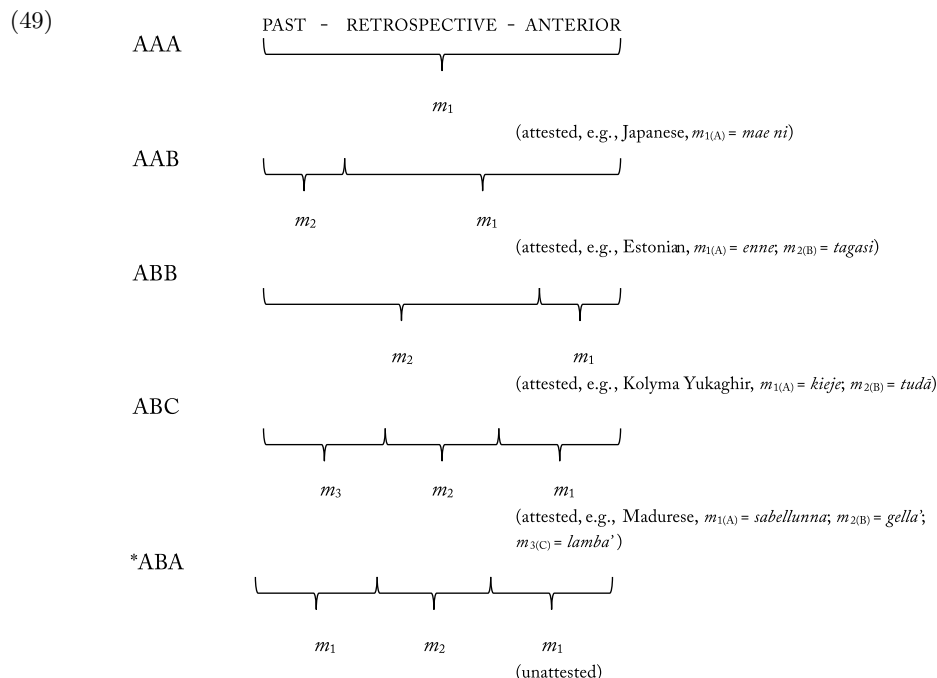
Furthermore, with an explanation based on the *ABA constraint on "Spell-out chunks" we may give a simple principled interpretation of the exceptionality of potential counterexamples to Haspelmath's generalization, like Old Italian *addietro*: this word merely represents an instance of an ABB string, 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 *múlva* and the Chechen suffix *-älča*, in which {POSTERIOR} is different from distance {PROSPECTIVE}, which is equal to {DISTANCE FUTURE}.

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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 in temporal expressions (with the possible exception of Mosetén, cf. Table 3), and thus, nothing seems to prevent an AAB span.

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 like in the case of 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 intact).

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).

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. 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

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:

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).

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

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

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

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

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

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

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

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

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

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

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

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

Italian is a Romance language. Data are from personal native knowledge.

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

Kashmiri is Indo-Aryan language. Data are taken from Wali & Koul (1997, 187–189).

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

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

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

Ma'di is a Central Sudanic language spoken in the south of Sudan and the north of Uganda. Data are taken from Blackings & Fabb (2003, 330; 502; 509; 525).

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).

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

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

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

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

Ndyuka is a creole language of Suriname. Data are taken from Huttar & Huttar (1994, 125; 212; 218; 447–450).

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.).

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

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

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

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

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 & Hovdhaugen (2011, 30; 239; 280; 286; 298).

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

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

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

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).

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

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