Using Stem Suppletion for Semantic Reconstruction: The Case of Indo-European Modals and East Baltic Future Tense Formations

Eugen Hill
Germanic Linguistics, University of Erfurt, Erfurt, Germany
eugen.hill@uni-erfurt.de

Abstract

As is well known, PIE possessed several distinct sigmatic formations with modal or future-like semantics. The paper deals with two sigmatic formations which must be reconstructed for PIE and obviously possessed a similar semantic value. First: a full grade *-si̯e/o*-formation which is attested in Indo-Iranian, Continental Celtic and Balto-Slavonic; and second, an athematic *-s*-formation which is attested in Italic and in the Eastern branch of Baltic. The diverging morphology of these formations implies that they originally also differed in their semantics. The problem is that both formations are reflected as simple future tense in all daughterlanguages which preserved them. However, it seems possible to detect the original semantic difference between these formations by using the evidence of the only IE branch which preserved both formations side by side, i.e. Baltic. The paper investigates the morphology of the sigmatic future tense in dialects of Lithuanian and Latvian and shows that for the common prehistory of East Baltic dialects a secondary conflation of originally independent PIE formations— *-si̯e/o*-formation and *-s*-formation—in one single paradigm must be assumed. The particular distribution of both formations within the unified paradigm of Proto-East-Baltic makes it possible to obtain information on the lost semantic difference between them. Possible traces of the *-si̯e/o*-formation in the only recorded West Baltic language, Old Prussian, seem to confirm the conclusions drawn on the basis of the East Baltic evidence.

Keywords

Indo-European – Baltic – morphology – suppletion – semantics

1   Introduction

We know that Proto-Indo-European possessed several distinct sigmatic forma-
tions with modal or future-like semantics. In particular, the evidence of Indo-
Iranian and Celtic makes it possible to reconstruct a reduplicated thematic
-se/o-formation with zero-grade of the root. Cf.

(1)	Sanskrit	*bhed-* 'to split'	→	3sg. *bí-bhit-sa-ti*
		darś- 'to spot'		3sg. *dí-dr̥k-ṣa-ti*
	Young Avestan	*ji-* 'to earn'	→	3sg. *ji-ji-šaⁱ-ti*
		sru- 'to hear'		3sg. *su-sru-šaⁱ-ti*
	Old Irish	*rigid* 'to stretch'	→	1sg. cnj. ·*ririus*
				(< Proto-Celt **ri-rix-sū*
				< pre-Proto-Celt **ri-riǵ-sō*)

In Indo-Iranian this formation has desiderative semantics. Its Old Irish coun-
terpart is a future tense, which probably is due to a secondary development.[1]

The evidence of Greek and, again, Celtic reveals another PIE thematic *-se/o*-
formation, this time with full grade of the root. Cf.

(2)	Greek	ἕλκω 'to drag'	→	1sg. ἕλξω
		σπένδω 'to donate'		1sg. σπείσω
	Old Irish	1sg. *tíagu* 'to walk'	→	1sg. abs. *tíassu*
				(< Proto-Celt **tei̯x-sū*
				< pre-Proto-Celt **tei̯gʰ-sō*)

In Old Irish this formation functions as subjunctive mood. In Greek it is a future
tense which may be, again, secondary.[2]

In my paper I will discuss two further well-known sigmatic formations which
must be reconstructed for PIE and obviously possessed a similar semantic
value. The first is a thematic *-si̯e/o*-formation with full grade of the root. Cf.

---

1   Cf. on this formation Güntert (1912), Charpentier (1912) and, most recently, Heenen (2006).
2   Cf. Rix (1977: 148–154). For a different approach to this formation (allegedly *s*-aorist subjunc-
    tive) cf. most recently Willi (2011).

(3) Sanskrit *dā-* 'to give', *vac-* 'to utter' → prcl.act. *dā-syá-nt-, vak-ṣyá-nt-*

Young Avestan *zan-* 'to produce' → prcl.med. *zą̄-hiia-mna-*

Old Irish *ad·cí*, Gaulish 3sg.ipv. *ap-pise-tu* 'to see' → Gaul 1sg. *pissíu-mí*
(< Proto-Celt *$kʷis$-sii̯ū)

Church Slavonic *by-ti* 'to be' → prcl. *by-šǫšt-* 'being in future'
(< pre-Proto-Balto-Slav *$bʰū$-sii̯ónt-*)

Lith *eĩ-ti*, Latv *iê-t* 'to walk' → prcl. Lith *eĩ-siant-*, Latv *iê-šuõt-*
(< Proto-Balt *ˈeĩ-si̯añt-*)

The second is an athematic *-s*-formation which is attested in the Sabellian branch of Italic and in the Eastern branch of Baltic. Cf.

(4) Umbrian 3sg.imp.II *ee-tu* 'to walk' → 3sg. *ee-s-t* (< Proto-It *ei̯-s-ti*)

Lith *eĩ-ti*, Latv *iê-t* 'to walk' → 3sg. Lith *eĩ-s*, Latv *iê-s* (< Proto-Balt *eĩ-s* < pre-Proto-Balto-Slav *éi̯-s-t*)

Whether or not the divergent morphology of these PIE sigmatic modals was accompanied by diverging semantics is a disputed matter. We know that in the conjugation systems of IE daughter languages, differences in morphology do not necessarily imply functional differences. For instance, no detectable functional difference has so far been observed between descendants of PIE sigmatic and asigmatic aorists in Indo-Iranian, Greek, Celtic or Slavonic. In these daughter languages, the distribution of the two aorist types is determined lexically and, to a lesser degree, by the phonology of the verbal roots. A comparable situation may be assumed for the common prehistory of the languages, i.e. for late PIE. Concerning especially the sigmatic modals, a similar position is taken by Jasanoff (2003: 135) and Villanueva Svensson (2012). These scholars assume that all sigmatic formations in question functioned as desideratives, while their distribution in the lexicon of late PIE was determined by structural properties of the particular verbal paradigms (in that reduplicated presents paired with reduplicated *-se/o*-desideratives, etc.).

I think that the evidence of the IE daughter languages which attest sigmatic modals or future tense formations rather speaks in favour of differences not only in their morphology, but also in their semantics. Several daughter languages of PIE preserve more than one sigmatic modal formation. The distribution of these sigmatic modals with different morphology is nowhere reminiscent of the situation with sigmatic and asigmatic aorists. For instance, Old Irish preserves the PIE reduplicated -*se/o*-desiderative as a future tense and the full grade -*se/o*-formation as subjunctive mood, i.e. with a clear difference in function. In Sanskrit, the reduplicated -*se/o*-desiderative and the full grade -*si̯e/o*-formation are frequently formed from the same verbal root.[3]

For this reason, it seems probable that also in the case of the two sigmatic modals or future tense formations to be discussed in the present paper—the full grade -*si̯e/o*-formation and the athematic -*s*-formation—an original difference in function should be assumed. The problem is that both formations are reflected as a simple future tense in all daughter-languages which preserve them. How can the original semantic difference be detected?

This seems possible by using the evidence of the only IE branch which attests both formations, i.e. Baltic. In this paper I will investigate the morphology of the sigmatic future tense in dialects of Lithuanian and Latvian. I will show that for the common prehistory of East Baltic dialects, a secondary conflation of both PIE formations in one single paradigm must probably be assumed. I will demonstrate that the particular distribution of the formerly independent formations within the unified paradigm of Proto-East-Baltic makes it possible to obtain information on the lost semantic difference between them. Possible traces of the -*si̯e/o*-formation in the only recorded West Baltic language, Old Prussian, might confirm the conclusions reached on the basis of the East Baltic evidence.

---

3 Cf., already in the R̥g-Veda, *í-yak-ṣa-* beside *yak-ṣyá-* from *yaj-* 'to worship', *sí-ṣā-sa-* beside *san-iṣyá-* from *san-* 'to gain' and *jí-ghāṁ̇-sa-* beside *han-iṣyá-* from *han-* 'to smite'. In Atharva-Veda, for instance, *cí-kīr-ṣa-* beside *kar-iṣyá-* from *kr̥-* 'to make' is attested.

2   The East Baltic Future Tense Formation

The East Baltic future tense formation is derived from the infinitive of the verb (whose ending is Lith *-ti*, Latv *-t*) by adding a suffixal *-s-* to its stem.

(5)	Lithunian		Latvian		
	inf.	3fut.	inf.	3fut.	
	piřk-ti	*piřk-s*	*pìrk-t*	*pìrk-s*	'to buy'
	kél-ti	*kél-s*	*ceî-t*	*ceî-s*	'to lift'
	saký-ti	*saký-s*	*sacî-t*	*sacî-s*	'to say'

Despite more than 150 years of research into the grammatical systems of East Baltic languages, the latter sentence still seems to contain all the securely established facts about the morphology of their future tense. Nearly everything else in the morphology of this formation is, especially from the diachronic point of view, a matter of controversy between different scholars and traditions.

This unsatisfactory situation seems to have arisen due to the following facts. First, the East Baltic dialects, especially on the Lithuanian side of the border, often differ considerably from each other in their future tense inflection. Second, the inflectional paradigm of the East Baltic future tense mostly comprises two or more different inflectional stems in different combinations. In the following paragraphs I will introduce the most basic facts about the inflection of the future tense in dialects of Lithuanian and Latvian. I will also try to draw some basic conclusions which, as I hope, will help to establish how the East Baltic future tense was probably inflected in the common prehistory of these languages, i.e. in Proto-East-Baltic and Proto-Baltic times. After this is accomplished, one can try to compare the Proto-Baltic situation with what is known about related formations in the other branches of Indo-European.

3   The Future Tense in Lithuanian

The conjugation system of the East Baltic languages Lithuanian and Latvian is, in its central parts, based on the following simple principle. The tense forms of a verb are distinguished by means of different tense stems. The inflectional endings which are used by these different tense stems remain virtually the same. Cf. the following present and preterite forms of East Baltic verbs:

(6)

	Lithunian		**Latvian**		
3prs.	**3prt.**	**3prs.**	**3prt.**		
peřka-Ø	*piřko-Ø*	*pę̃rk-Ø*	*pìrka-Ø*	'to buy'	
kẽlia-Ø	*kė́lė-Ø*	*ceḷ-Ø*	*cêla-Ø*	'to lift'	
sãko-Ø	*sãkė-Ø*	*saka-Ø*	*sacĩja-Ø*	'to say'	
1pl.prs.	**1pl.prt.**	**1pl.prs.**	**1pl.prt.**		
peřka-me	*piřko-me*	*pę̃rka-m*	*pìrkã-m*		
kẽlia-me	*kė́lė-me*	*ceḷa-m*	*cêlã-m*		
sãko-me	*sãkė-me*	*sakã-m*	*sacĩjã-m*		

The first fact one immediately notices when dealing with the Lithuanian future tense is that its inflectional paradigm comprises at least two different stems.[4] The most frequent form, the 3fut., is an athematic inflectional form without a vocalic ending in any dialect. Cf.

(7)

	Lith	*bū́ti*	→	3fut. *bū́s* or *bùs*	'to be'
		dúoti	→	3fut. *dúos* or *duõs*	'to give'
		eĩti	→	3fut. *eĩs*	'to walk'

In verbs with a monosyllabic stem, the shortening of acute monophthongs (cf. *bū́ti → bùs*, *gýti → gìs* 'to recover', *dė́ti → dès* 'to put', *jóti → jàs* 'to ride') and metatony in acute diphthongs (cf. *dúoti → duõs*, *líeti → liẽs* 'to rain') in the eastern High Lithuanian dialects conclusively show that the 3fut. never contained a vocalic ending, being monosyllabic and hence athematic at least since Proto-Baltic times.[5] Concerning this well-known development (the so-called Leskien's Law), cf. the data below:

---

4 Cf. most comprehensively Zinkevičius (1966: 359–362) and Ambrazas et al. (1991: 104–107).

5 Cf. on this point Pedersen (1933: 13–18), Stang (1942: 203, 1966: 398–399) and, most recently, Petit (2002). Slightly different conclusions are drawn in Kortlandt (2002, 2005: 151). Petit's approach is advocated in Pronk (2012: 236–238), where both positions are carefully compared.

(8)

	Before clitic	**Polysyllables**	**Monosyllables**
		***ā*-stems**	
nom.sg.	*geróji*	*gerà*	*tà*
instr.sg.	*gerája*	*gerà*	*tà*
acc.pl.	*gerą́sias*	*geràs*	*tàs*
nom.du.	*geríeji*	*gerì*	*tiẽ*(*-dvi*)
		***o*-stems**	
instr.sg.	*gerúoju*	*gerù*	*tuõ*
acc.pl.	*gerúosius*	*gerùs*	*tuõs*
nom.du.	*gerúoju*	*gerù*	*tuõ*(*-du*)

The corresponding 1sg.fut. is nearly everywhere in Lithuanian *bū́siu*, *dúosiu*, *eĩsiu*, which means it is formed like a present stem of the *i̯e/o-* or the *i*-class.

The most prominent deviation from this symbiosis of two obviously different inflectional stems is the pattern 1sg.fut. *bū́su*, *dúosu*, *eĩsu* ~ 3fut. *bū́s*, *dúos*, *eĩs* in many Low Lithuanian dialects (roughly between Šilutė, Šilalė, Kelmė in the South and Plungė, Telšiai, Akmenė in the north). However, this particular pattern is most probably a recent innovation of these dialects, having arisen on the model of the most prominent pattern of present stem inflection, which emerged through a comparatively recent apocope of short vowels at the end of a word. Cf.

(9)

		High Lith		**Low Lith**	
dìrbti	1sg.prs. *dìrbu*	3prs. *dìrba*	3prs. *dìrb*	'to work'
miřti	1sg.prs. *mìrštu*	3prs. *mìršta*	3prs. *mìršt*	'to die'
gélbėti	1sg.prs. *gélbu*	3prs. *gélba*	3prs. *gélb*	'to help'

The major point of controversy concerning the inflection of the Lithuanian future tense is the original shape of the dual and plural inflectional forms. The problem is that all inflectional patterns which are attested in Lithuanian dialects can be explained as secondary. Clearly secondary are inflections of the type 1pl.fut. *bū́sam*, *dúosam*, *eĩsam*, which are found beside the innovative

1sg.fut. *bū́su*, *dúosu*, *eĩsu* only. The plural forms of this type must have emerged in the same way, following the same prominent class of present stems.

Presumably recent creations are also inflections like 1pl.fut. *bū́siam*, *dúosiam*, *eĩsiam*, which are widespread in the northern part of Low Lithuanian but hardly occur outside of this area. The pattern 1sg.fut. *bū́siu*, *dúosiu*, *eĩsiu* ~ 1pl.fut. *bū́siam*, *dúosiam*, *eĩsiam* may be basically following the inflection of *i̯e/o*-presents. Note that the assumed analogy could only work after the stress retraction, which is a characteristic feature of the dialects in question. Cf.[6]

(10)	**High Lith**		**Low Lith**		
ìrti	1sg.prs. *iriù*	1sg.prs. *ìriuo*	1pl.prs. *ìriam*	'to row'
stùmti	1sg.prs. *stumiù*	1sg.prs. *stùmiuo*	1pl.prs. *stùmiam*	'to push'
tìrti	1sg.prs. *tyriù*	1sg.prs. *týriuo*	1pl.prs. *týriam*	'to learn'

The remaining two patterns of the Lithuanian future tense inflection have been repeatedly considered as inherited in the scholarly literature.

In Low Lithuanian between Tauragė and Mežeikiai, in the neighbouring High Lithuanian dialects around Raseiniai, Šiauliai and Radviliškis as well as in the most of the eastern High Lithuanian dialect area (roughly between Biržai, Panevėžys, Ukmergė, Vilnius, and Tverečius), the dual and plural inflections of the future tense do not contain a thematic vowel, cf.

(11) 1sg.fut. *bū́siu*, *dúosiu*   1du.fut. *bū́sma*, *dúosma*   1pl.fut. *bū́sme*, *dúosme*
3fut. *bū́s* or *bùs*,
dúos or *duõs*

Finally, in the remaining part of High Lithuanian (including the dialects around Jurbarkas, Kaunas, Marijampolė and Alytus, Varėna, Lazdijai) the dual and plural inflections of the future tense are built with -*i*-, which makes them look like *i*-presents, cf.

---

6 For a more precise account of differences between High and Low Lithuanian in the phonetic realisation of segments and intonations, cf. most comprehensively Zinkevičius (1966) and Grinaveckienė et al. (1982). Being immaterial for the present discussion, these differences are not indicated by spelling here.

(12) 1sg.fut. *bū́siu, dúosiu* 1du.fut. *bū́sima*, 1pl.fut. *bū́sim(e), dúosim(e)*
      dúosima
      3fut. *bùs, duõs*

Which of these two inflection patterns is more original can hardly be decided
with any certainty. It is conceivable that inflections like 1pl.fut. *bū́sme, dúosme*
emerged secondarily beside 3fut. *bū́s* or *bùs* and *dúos* or *duõs* on the model of
the present or preterite inflection, where the plural nearly always follows the
3rd person. Cf.

(13) 3prs. *dìrba* 1pl.prs. *dìrba-me* 'to work'
             kẽlia   *kẽlia-me* 'to lift'
             gùli   *gùli-me*   'to lie'
             válgo   *válgo-me* 'to eat'
      3prt. *dìrbo* 1pl.prt. *dìrbo-me*
             kė́lė   *kė́lė-me*
             gulė́jo   *gulė́jo-me*
             válgė   *válgė-me*

To be plausible, this analogy would have to be assumed already for the time
before the loss of word-final short vowels in Low Lithuanian and probably also
before the shortening and metatony in High Lithuanian monosyllables, but this
is chronologically not impossible.

It is also conceivable that inflections like 1pl.fut. *bū́sim(e), dúosim(e)* have
been only recently created as a match for the 1sg.fut. *bū́siu, dúosiu*. The model
for this development could be provided by the prominent inflectional class of
i-presents; the required analogy would be equally trivial.

A principled decision as to which scenario is more plausible and hence to
be preferred seems impossible. What is possible, however, is a decision on a
slightly different point. The assumption that 1pl.fut. *bū́sme, dúosme* are more
original than *bū́sim(e), dúosim(e)* seems to be more economical than vice versa.
This conclusion is based on the following well-known fact.

In all classes of Lithuanian present stems, the corresponding participle is
always derived from the same stem as the inflections which constitute the
paradigm. The participle of the Lithuanian future tense always has the shape
bū́siąs, dúosiąs, i.e. it is formed like a *i̯e/o*-present.[7] The -*i̯e/o*-stem underlying

---

7 Cf. on this point especially Stang (1932).

the participle can be identified with the stem of the 1sg.fut. *bū́siu*, *dúosiu*. If one now assumes that 1pl.fut. *bū́sme*, *dúosme* are more original than *bū́sim(e)*, *dúosim(e)*, one arrives at a Proto-Lithuanian paradigm consisting of two different stems, a *-i̯e/o*-stem (1sg.fut. *bū́siu* and prcl.fut. *bū́si̯as*) and an athematic stem (3.fut. *bùs* and 1pl.fut. *bū́sme*). By contrast, if one assumes that 1pl.fut. *bū́sim(e)*, *dúosim(e)* are more original than *bū́sme*, *dúosme*, one is operating with three different stems somehow secondarily united in a single paradigm. It is clear that the former assumption is more economical than the latter.

4 The Future Tense in Latvian

Let us now turn to Latvian, the only other Baltic language with a future tense formation of the given type. At first glance, the future tense paradigm attested in the most conservative varieties of Latvian seems to support the antiquity of the Lithuanian pattern with *i*-stem inflections in the dual and plural (cf. Endzelin 1923: 656–665).

(14)	Latv	*bût*	→	1sg.fut. *bûšu* ~ 3fut. *bûs* ~ 1pl.fut. *bûsim*	'to be'
		duôt	→	1sg.fut. *duôšu* ~ 3fut. *duôs* ~ 1pl.fut. *duôsim*	'to give'
		iêt	→	1sg.fut. *iêšu* ~ 3fut. *iês* ~ 1pl.fut. *iêsim*	'to walk'

The Latvian pattern is basically the same as in the southern dialects of Lithuanian, which exhibit

(15)	Lith	*bū́ti*	→	1sg.fut. *bū́siu* ~ 3fut. *bùs* ~ 1pl.fut. *bū́sim(e)*
		dúoti	→	1sg.fut. *dúosiu* ~ 3fut. *duõs* ~ 1pl.fut. *dúosim(e)*
		eĩti	→	1sg.fut. *eĩsiu* ~ 3fut. *eĩs* ~ 1pl.fut. *eĩsim(e)*

However, the Latvian future tense participle is also formed in a way otherwise only possible for *i̯e/o*-presents (cf. Endzelin 1923: 723–725).

(16)

		Latv
bût	→	prcl.fut. nom.sg. m. *bûšus*
iêt	→	prcl.fut. nom.sg. m. *iêšus*
duôt	→	prcl.fut. nom.sg. m. *duôšus*
		Lith
bū́ti	→	prcl.fut. nom.sg. m. *bū́siąs*
eĩti	→	prcl.fut. nom.sg. m. *eĩsiąs*
dúoti	→	prcl.fut. nom.sg. m. *dúosiąs*

Exactly as in Lithuanian, the deviating morphology of the future tense participle can only be explained by assuming that at least one inflectional form in the future tense paradigm originally inflected according to the pattern of the *i̯e/o*-presents. Since Lith 3fut. forms such as *bùs*, *eĩs* and *duõs* cannot be explained as recent creations either, the most economical hypothesis about the common prehistory of Lithuanian and Latvian would be, again, a historical analysis operating only with a *i̯e/o*-formation (1sg.fut. Lith *bū́siu*, Latv *bûšu* and prcl.fut. Lith *bū́siąs*, Latv *bûšus*) and an athematic formation (3fut. Lith *bùs*, Latv *bûs*).

To be sure, this conclusion is only true if Latvian *i*-stem inflections such as 1pl. *bûsim*, *iêsim*, *duôsim* can be plausibly explained as secondary creations arisen independently of their Lithuanian counterparts *bū́sim*(*e*), *eĩsim*(*e*), *dúosim*(*e*). However, such a scenario seems perfectly possible and plausible. In Latvian, the inflectional pattern 1sg.fut. *bûšu*, *iêšu*, *duôšu* ~ 3fut. *bûs*, *iês*, *duôs* (with *š* in the 1sg. vs. *s* in the 3rd person) exhibits a morphophonological alternation of the type which must be assumed for the inflection of inherited *i*-presents and is not found anywhere else in the inflectional system. Cf. Latvian *ziêdêt* 'to flourish' and *dzìrdêt* 'to hear' in different dialects of Vidzeme:

(17)

	Skulte	**Valmiera**
1sg.prs.	*ziêžu, dzìržu*	*ziêdu, dzìrdu*
3prs.	*ziêž, dzìrž*	*ziêd, dzìrd*

The variation shows that the original inflectional pattern most probably looked as follows:

(18) 1sg.prs. *ziêžu*   *dzìržu*
     3prs.   *ziêd*   *dzìrd*

This pattern is clearly identical to the inflection of the corresponding Lithuanian verbs which form *i*-presents (cf. Lith *žíedėti*, 1sg.prs. *žíedžiu*, 3prs. *žíedi* 'to flourish' and *girdéti*, 1sg.prs. *girdžiù*, 3prs. *gìřdi* 'to hear'). Moreover, the *i*-inflection of the given type is directly attested at the periphery of the Latvian language area, at its southwestern and eastern boundaries. Cf. the inflection of Latv *sêdêt* 'to sit' (cf. Lith *sėdéti*, 1sg.prs. *sėdžiu*, 3prs. *sėdi*) and *gulêt* 'to lie' (cf. Lith *guléti*, 1sg.prs. *guliù*, 3prs. *gùli*) in the dialects of Vidzeme (Central Latvian of Valmiera and High Latvian of Alūksne) and in the peripheral dialects of southwestern (Central Latvian of Priekule) and eastern Latvia (High Latvian of Baltinava):[8]

(19)

	Valmiera	**Alūksne**		**Priekule, Baltinava**
1sg.prs.	*sêžu, guļu*	*sêdu, gulu*	but	*sêžu, guļu*
3prs.	*sêž, guļ*	*sêd, gul*		*sêd, gul*

It is easy to imagine that this morphophonological alternation—originally present, for different reasons, both in the paradigm of *i*-presents and in the future tense—led to the creation of secondary *i*-inflections also in the future tense paradigm:

(20) 1sg.prs. *dzìržu*   *sêžu*   *guļu*   1sg.fut. *bûšu* *iêšu* *duôšu*
     3prs.   *dzìrd*   *sêd*   *gul*   3fut.   *bûs*   *iês*   *duôs*

     1pl.prs. *dzìrdim* *sêdim* *gulim*   1pl.fut.   x

⇒   x = *bûsim, iêsim, duôsim*

---

8 For a detailed description of the situation in different parts of Latvia, cf. Endzelin (1923: 609–615).

5   The Future Tense in Proto-East-Baltic

Thus, the evidence of Lithuanian and Latvian dialects is most economically explained by the following reconstruction of the future tense inflection in the common prehistory of these languages, i.e. in Proto-East-Baltic:[9]

| (21) | **Proto-East-Baltic** | | |
	sg.	**du.**	**pl.**
1fut.	**bˈū́sı̯ō̃, *dˈṓsı̯ō̃*	**bˈū́smā́, *dˈṓsmā́*	**bˈū́sme, *dˈṓsme*
2fut.	**bˈū́s(s)ḗ, *dˈṓs(s)ḗ*	**bˈū́stā́, *dˈṓstā́*	**bˈū́ste, *dˈṓste*
3fut.		**bˈū́s, *dˈṓs*	
	prcl. fut. **bˈū́sı̯añt-, *dˈṓsı̯añt-*		

This reconstruction suggests that in the inflectional paradigm of the East Baltic future tense two different verbal stems with suffixal *s* have secondarily merged. One stem ended in Proto-Baltic **-s-*. It is reflected in the dual and plural forms, in the 2sg. and in the third person (the grey cells in the paradigm given in 21 above). The other stem ended in Proto-Baltic **-sı̯a-* (the black cells). This stem contributed the 1sg. and the participle.

6   The Traditional Approach

The proposed reconstruction of the Proto-East-Baltic future tense paradigm is very similar to and, at the same time, very different from the more traditional approach, on which cf. most recently Jasanoff (1978: 104–107, 2003: 133) and Villanueva Svensson (2010: 218–222, 2012). Like the present author, these scholars also try to account for the East Baltic future tense inflection on the basis of only

---

9 Whether diphthongisation of Proto-East-Balt **ō̄*, **ē̄* into *uo*, *ie* (so in High Lithuanian and Central Latvian) preceded or followed the disintegration of Proto-East-Baltic is immaterial for the present discussion. The 2sg. probably ended in Proto-East-Balt **-sḗ*, cf. the 2sg. of athematic presents such as Lith *eisì*, *desì*, *dúosi* from *eĩti*, 3prs. *eĩti* 'to walk', *dě́ti*, 3prs. *dẽsti* 'to put' and *dúoti*, 3prs. *dúosti* 'to give'. The double **ss* which should be expected at the boundary between the stem and this ending might have been simplified to a single **s* very early. Cf. Lith 2sg.prs. *esì* from *bū́ti*, 3prs. *ẽsti* 'to be' where the simplification seems be of PIE date already because it has to be assumed also for Skt *ási*, OAv *ahī*, Gk εἶ and Old Church Slavonic *jesi*.

two different stem formations which cannot be explained as arisen secondarily within East Baltic itself and must therefore be inherited from more ancient times. These formations are the athematic sigmatic formation reflected in the 3fut. such as Lith *bùs*, *duõs*, Latv *bûs*, *duôs* and the *i̯e/o*-formation of the participle such as Lith *bū́siąs*, *dúosiąs*, Latv *bûšus*, *duôšus*. The fundamental difference between the reconstruction suggested in section 5 and the more traditional approach lies in the traditional attempt to explain all finite forms of the East Baltic future tense on the basis of the athematic formation alone. To achieve this, Jasanoff and Villanueva Svensson propose a "Narten"-type paradigm with the 3pl. ending in PIE *-*s-n̥ti* > Proto-Balto-Slav *-*s-inti* (cf. similarly Schmalstieg 1958, Endzelīns 1971: 233–234). It is assumed that this hypothetical Proto-Balto-Slav *-*s-inti* was secondarily reanalysed as *-*si-nti*, which led to a spread of *i as a new stem formative throughout the plural and dual. The new *i*-plural allegedly generated a new 1sg.fut. of the type Lith *bū́siu*, *dúosiu*, Latv *bûšu*, *duôšu* by adopting the model of the ordinary East Baltic *i*-presents.[10]

In my view, this traditional theory of the East Baltic future tense inflection is, first, unnecessarily complex and, second, unconvincing in terms of Baltic historical morphology. The theory is too complex because it requires too much morphological analogy to explain the attested inflectional forms. Note that this approach necessarily separates the athematic dual and plural inflections like Lith 1pl.fut. *bū́sme*, *dúosme* from the corresponding athematic 3fut. *bùs*, *duõs*. While the latter is thought of as reflecting the original athematic future tense directly, the former are believed to be a secondary replacement for more ancient *bū́sim(e)*, *dúosim(e)* which themselves replaced athematic inflections of the type Lith 1pl.fut. *bū́sme*, *dúosme* in Proto-Baltic times. Much less analogy is required if one is prepared to explain the morphology of the East Baltic 1sg.fut. such as Lith *bū́siu*, *dúosiu*, Latv *bûšu*, *duôšu* simply by reference to the Proto-Baltic *i̯e/o*-formation preserved in the corresponding participle.

The traditional theory is unconvincing in terms of Baltic historical morphology because it is not in harmony with the facts about the morphological behaviour of Baltic verbs, which are already securely established in the field.

---

10 Note that the reconstruction of "Narten" inflection for the East Baltic future tense formation is only seemingly corroborated by the full grade of such forms as, for instance, 1pl.fut. *eĩs-me* or 2pl.fut. *eĩs-te* from *eĩti* 'to walk' in dialects of Lithuanian. The old difference between the strong and the weak stem (preserved, for instance, in Skt 1sg.prs. *é-mi* ~ 1pl.prs. *i-más*, YAv 3sg.prs. *aē͡i-ti* ~ 3pl.prs. *y-ei̯ṇti*, Gk 1sg.prs. εἶ-μι ~ 1pl.prs. ἴ-μεν) is always levelled out in the indicative of Baltic athematic verbs. Cf. in the corresponding present tense Lith 1sg.prs. *ei-mì*, 3prs. *eĩ-ti* ~ 1pl.prs. *ei-mè*, Latv dial. 1sg.prs. *eĩ-mu*, 3prs. *eĩ-t* ~ 1pl.prs. *eĩ-ma*, Old Prussian 2sg.prs. *ēi-sei*, 3prs. *ēi-t* ~ 1pl.prs. *-ēi-mai*.

East Baltic has two verbs which can be safely assumed to have possessed a
3pl. PIE *-n̥ti > Proto-Balto-Slav *-inti. These are the reduplicated athematic
presents Lith 1sg.prs. *dúomi*, 3prs. *dúosti* 'to give' and 1sg.prs. *demì*, 3prs. *dẽsti* 'to
put'. Their 3pl.prs. ended in PIE *-n̥ti, cf. Skt *dádati* 'give', *dádhati* 'put' and Old
Church Slavonic *dadętъ* 'give'. In East Baltic, these presents clearly generalised
the plural stem allomorph in the whole paradigm. However, they do not exhibit
the assumed reanalysis of the inherited 3pl. ending and subsequent spread of
*i, not even in their plural (cf. 1pl.prs. *dúome*, *demè* and 2pl.prs. *dúoste* in Lithua-
nian texts from the 16th c.)[11]

The only Baltic verb Jasanoff (1978: 105–107) can use as evidence supporting
the plausibility of the assumed spread of *i from Proto-Balto-Slav 3pl.prs. *-inti
(< PIE *-n̥ti) is Old Prussian *waist* 'to know', the Baltic counterpart of the
old perfect OCS *vědĕti* (1sg.prs. *vědĕ* or, secondarily, *vĕmь*). In Old Prussian,
the athematic 2sg.prs. *waissei* (cf. OCS *vĕsi*) is accompanied by the *i*-forms
1pl.prs. *waidimai* (instead of something like OCS *vĕmъ*) and 2pl.prs. *waiditi*
(instead of something like OCS *vĕste*). Jasanoff assumes that the *i* of these
Old Prussian plural forms spread from the 3pl.prs. in Proto-Balto-Slav *-inti,
cf. OCS *vĕdętъ*. However, the assumed spread of *i* is not the only possible
and not the most plausible explanation for OPr 1pl.prs. *waidimai* etc. Due
to its stative meaning 'to know', the verb seems to have acquired a second
stem in Proto-Balto-Slav *-ē-, cf. OCS 3sg.aor. *vĕdĕ* (secondarily also in the
infinitive *vĕdĕ-ti*). If the unattested preterite of OPr *waist* was originally built
with *ē too, the stative semantics of the verb would have nearly predicted an
i-present, cf. the well-known pattern OCS 3sg.aor. *mьnĕ* ~ 3sg.prs. *mьni-tъ*, Lith
inf. *minĕ-ti* ~ 3prs. *mìni* 'to think' etc. Thus, the peculiar inflection of OPr *waist*
can be explained differently, without any conflict with facts known about the
behaviour of verbs with a 3pl.prs. in Proto-Balto-Slav *-inti in Baltic.

The stem suppletion approach to the East Baltic future tense inflection
(proposed in section 5 of the present paper) has the advantage of being both

---

11   Kortlandt's (1982: 6–8, 2005: 152) assumption that the alleged secondary spread of *i in the
      future tense had a second source in the 1sg. desinence PIE *-s-m̥ > Proto-Balto-Slav *-s-im
      (before it was replaced by the thematic ending Lith, Latv *-u*), does not make the tradi-
      tional theory more plausible. The Slavonic reflexes of the so-called "secondary" 1sg. ending
      PIE *-m̥ in the sigmatic aorists show that here (at least after *s) the resonant probably
      developed into Proto-Balto-Slav *-um. Cf. OCS 1sg.aor. *rĕxъ*, *nĕsъ*, *mrĕxъ* (< pre-Proto-Balto-
      Slav *rḗk-s-m̥, *nḗk-s-m̥, *mḗr-s-m̥) from 1sg.prs. *rekǫ* 'to utter', *nesǫ* 'to carry', *mьrǫ* 'to die'
      ect. Explaining this OCS *-ъ* as a recent takeover from the thematic aorist and therefore a
      reflex of Proto-Balto-Slav *-om (cf., for instance, Aitzetmüller 1991: 180) requires an analogy
      which is very difficult to motivate for an originally entirely athematic paradigm.

more economical and more in line with facts already securely established about the Baltic conjugation.

7   The Proto-Indo-European Roots of the East Baltic Future Tense

As already mentioned above, both reconstructed future tense formations of East Baltic possess parallels outside of the Baltic branch of Indo-European. The athematic future ending in Proto-Baltic *-s- (for instance in Proto-East-Baltic 3fut. *bʼū́s, *dʼṓs) is perfectly matched by the -s-future attested in the Sabellian subbranch of Italic.[12] Cf.

(22)	**Umbrian**			
3sg.imp.II *ee-tu*	→	3sg.fut. *ee-s-t*	'to walk'
3sg.imp.II *fer-tu*	→	3sg.fut. *fere-s-t*	'to carry'
3sg.imp.II *-peha-tu*	→	3sg.fut. *peha-s-t*	'to atone'

A perfect match of the thematic future constructed with Proto-Baltic *-sia- (such as in Proto-East-Baltic 1sg.fut. *bʼū́si̯ṓ, *dʼṓsi̯ṓ) is found in the -sia-future of Indo-Iranian.[13] Cf.

(23)	**Sanskrit**			
dā-	→	prcl.act. *dā-syá-nt-*	'to give'
vac-	→	prcl.act. *vak-ṣyá-nt-*	'to utter'
yaj-	→	prcl.med. *yak-ṣyá-māna-*	'to worship'
	Young Avestan			
dā-	→	prcl.med. *už-dā-hiia-mna-*	'to put'
zan-	→	prcl.med. *zą-hiia-mna-*	'to beget'
varz-	→	prcl.med. *varə-šiia-mna-*	'to work'

---

12   For a detailed account and references, cf. most recently Hill (2004: 115–146).

13   Cf. again Hill (2004: 100–103) with references.

Consequently, we have to assume that the formations reflected in the East Baltic future tense paradigm probably existed already in the common prehistory of East Baltic and Sabellian (in the case of the athematic formation) or East Baltic and Indo-Iranian (as far as the thematic formation is concerned). This means that both formations must be inherited from PIE, the common ancestor of these branches. The different morphology of the formations indicates that originally they must have differed also in their functions. However, this functional difference is not directly observable in the relevant daughterlanguages. All relatives of East Baltic that show reflexes of the old future tense formations have preserved only one of these, whereas the other has disappeared without a trace. Synchronically both formations, the athematic Sabellian and the thematic Indo-Iranian, seem to be the unmarked future tense formation of these languages.

The only possibility to establish the lost functional difference is to make use of the internal evidence of East Baltic, where the distribution of both ancient futures within the unified paradigm is strikingly asymmetric. The thematic formation with Proto-Balt *-sįa- only contributes the 1sg., whereas the athematic future with Proto-Balt *-s- provides all the remaining inflectional forms. It is obvious that the reason for this anomaly has to be sought in some functional difference between originally independent formations. Thus, our aim is to find a functional pattern that motivates a split between the 1sg. and the rest of the paradigm in the inflection of verbs with suitable semantics.

8 The East Baltic Future Tense Paradigm from a Typological Perspective

The first thing one learns from typological surveys of future tenses is that they are often secondary, comparatively young formations. Many languages display future tenses which have evolved from constructions with non-future semantics. It is possible to draw up a typology of secondary future tenses.[14] The best evidence for crosslinguistically common paths of development from non-future to future is provided by languages which make use of grammaticalised auxiliary verbs whose original semantics are often directly attested in texts from earlier stages of the relevant languages. The following types of sec-

---

14   Cf. Ultan (1978), Fleischman (1982), Bybee et al. (1987, 1989: 90–94, 1991: 251–280), Heine & Kuteva (2002); a further type is described by Botne (1998).

ondary future tense formations can count as securely established by typological research:

(24) *a* secondary future tense with auxiliary 'to become' and the infinitive of the main verb, i.e. 'he becomes cooking' → 'he will cook' (for instance in Russian and Polish, cf. most recently Wiemer 2011: 745–746 with references);

    b secondary future tense with verbs of movement such as 'come' or 'go' and the infinitive of the main verb, i.e. 'he is going to cook' → 'he will cook' (for instance in Basque, cf. Ortiz de Urbina 2003: 293–294);

    c secondary near future with auxiliary 'to say' and the main verb in serial construction in several Bantu languages, i.e. 'he says he cooks' → 'he will cook immediately' (cf. Botne 1998);

    d secondary ingressive future with auxiliary 'to take' and the infinitive of the main verb in Ukrainian, i.e. 'he takes cooking' → 'he will start cooking' (cf. Danylenko 2010, 2012: 23–26);

    e secondary future tense with the infinitive of the main verb and the modals 'want', i.e. 'he wants to cook' → 'he will cook' (for instance in Serbian and Croatian, cf. Wiemer 2011: 744–745) or 'must', i.e. 'he must cook' → 'he will cook' (for instance in English, cf. most recently Arnovick 1990, Wischer 2009).

Due to their sigmatic formatives, the future tense formations of East Baltic are obviously morphologically related to such modals as the Indo-Iranian desiderative or Old Irish subjunctive (cf. 1 and 2 above). This seems to exclude the paths of semantic development described in (24) *a* to *d* as potential etymological sources. At the same time, relatedness to desideratives and subjunctives speaks in favour of (24) *e*, i.e. for evolution from some ancient modal formations with semantics of desire or obligation. One should therefore look for modal formations which, first, are capable of developing into an unmarked future tense and, second, allow for a paradigmatic split of the given type.

    The latter condition requires that the semantics of the modal provide a natural dividing line between the 1sg. and the rest of the paradigm. This requirement would be satisfied, for instance, by an imperative mood where the 1sg. slot often remains unfilled because one rarely directs a request towards oneself. Cf. the imperative inflection of Finnish *antaa* 'to give' and Nivkh (East Sakhalin dialect) *vid'* 'to go':[15]

---

15   On the latter cf. Panfilov (1965: 129–131), Gruzdeva (1992: 56–58, 1998: 33–35).

(25)

	Finnish			
1sg.imp.	×	1pl.imp.	*antakaamme*
2sg.imp.	*anna*	2pl.imp.	*antakaa*
3sg.imp.	*antakoon*	3pl.imp.	*antakoot*
	Nivkh			
1sg.imp.	×	1pl.imp.	*vida*
2sg.imp.	*vija*	2pl.imp.	*vive*
3sg.imp.	*viĝaro*	3pl.imp.	*viĝarĝaro*

This empty slot in the inflection of an imperative may be later filled by the 1sg. of a different formation. This may generate a paradigm whose structure is similar to that found in the Proto-East-Baltic future tense. Cf. the conflation of Vedic imperative and subjunctive present in Classical Sanskrit (as in the inflection of Skr *bhárati* 'to carry'):

(26)

	Vedic Sanskrit				**Classical Sanskrit**	
1sg.imp.	×	1sg.sbj.	*bhárāṇi*		1sg.imp.	*bharāṇi*
2sg.imp.	*bhára*	2sg.sbj.	*bhárāsi*	→	2sg.imp.	*bhara*
3sg.imp.	*bháratu*	3sg.sbj.	*bhárāti*		3sg.imp.	*bharatu*

However, an imperative mood is hardly capable of developing into a future tense.[16] It follows that the athematic component of the Proto-East-Baltic future tense paradigm can hardly reflect a more ancient imperative.

---

16   As it seems, such a development has not been described in a language with a documented history. The only potential exception known to me is the employment of the imperative mood as a future tense in Itelmen (cf. Volodin 1976: 250–251 for a detailed account). However, this is not the only special feature of the Itelmen imperative. When negated, the inflectional forms of the imperative function exclusively as a future tense, and this is at the same time the only possibility to form a negated future in Itelmen (Volodin 1976: 276–277). Prohibitions, on the other hand, are expressed in an entirely different manner. This seems to suggest that the Itelmen imperative should be considered an old future

Fortunately, the imperative mood is not the only modal with a special treatment of the 1sg. but a member of a whole class of related formations. In functional terms, modals with semantics of desire or obligation can be divided into two groups.[17] The first group is constituted by modals with so-called "subject-oriented" modality. This kind of modality defines the relation between the action expressed in the verb and its subject. To this group belong such modals as, for instance, the desiderative (i.e. 'he wants to cook'). The second group is constituted by modals with so-called "speaker-oriented" modality, which refers to the relation between the action and the speaker of the sentence. This latter group includes, beside the imperative, such modals as, for instance, the hortative (i.e. 'let us cook') or jussive (i.e. 'I want him to cook').

In a speaker-oriented modal, the 1sg. necessarily has a special status because here the speaker and the subject are identical. From this it follows that the 1sg. of a speaker-oriented formation expressing desire has roughly the same semantics as the 1sg. of a corresponding subject-oriented modal (i.e. 'I want me to cook' vs. 'I want to cook').

If one now assumes that the PIE athematic -s-formation originally had subject-oriented desideratival semantics whereas the -si̯e/o-formation was a speaker-oriented jussive, both the fact of their conflation in Proto-East-Baltic and the particular configuration of the new paradigm become understandable. Due to its more expressive semantics ('I want me to cook (at last)!'), the 1sg. of the inherited jussive may have secondarily replaced the less expressive but semantically very close 1sg. of the desiderative ('I want to cook') in its paradigm. At the same time, the different semantics of the remaining paradigmatic forms in said formations (cf. in the 3rd person 'I want him to cook' vs. 'he wants to cook') would have precluded mixing anywhere else in the inflection. The last step in the evolution of the two PIE formations in the late prehistory of Proto-East-Baltic would be the typologically unremarkable development of the morphologically modified desiderative into a future tense and the loss of the jussive.

---

tense which has developed a secondary imperative meaning in non-negated clauses. After the rise of a more recent future tense (with a desiderative marker, cf. Volodin 1976: 217–219), the temporal usage of the inherited future tense formation would have become limited to negative contexts. The use of a future tense as imperative, typologically far less remarkable, is also attested in the neighbouring Chukchee (cf. Nedjalkov 1992: 51–52). Thus, the case of Itelmen probably presents an example of the reverse development of a future tense into imperative mood.

17   Cf. Bybee et al. (1994: 177–181) and especially Bybee & Fleischman (1995).

9   The 3rd Person Imperative in Old Prussian

The proposed reconstruction of the prehistory of the Proto-East-Baltic future tense paradigm is potentially directly confirmed by the evidence of the West Baltic language Old Prussian. Old Prussian texts might preserve a formation which may be directly equated with the *-si̯e/o*-component of the East Baltic future tense. The semantics of this Old Prussian formation, attested in the 3rd person only, seem to confirm the hypothetically assumed speaker-oriented jussive semantics of the *-si̯e/o*-formation in Proto-Baltic times.

The relevant Old Prussian formation may be called "3rd person imperative".[18] Its single inflectional form is based on the infinitive, like the East Baltic future tense, and ends in OPr *-sei* which may be also spelled ⟨-se⟩, ⟨-si⟩ or ⟨-sai⟩. Cf.

(27)   *boū-t*   →   3imp. *boū-sei, -se, -sai*   'to be'
     -ēi-t   →   3imp. *-ey-sei*   'to walk'
     dā-t   →   3imp. *dā-sei, -se, -sai*   'to give'
     wīrs-t   →   3imp. *wir-se*   'to become'

The semantics of the Old Prussian 3rd person imperative may be demonstrated by the following occurrences in the Old Prussian translations of Luther's Catechism:

(28) | | Old Prussian | German |
|---|---|---|
| 3.105.10 | *Perklantīts **bouse** stas laucks* | 'Verflucht sei der Boden!' = 'Cursed be the ground!' |
| 3.109.19–20 | *Deiws **dase** ioumas swaian packun* | 'Gott gebe euch seinen Frieden!' = 'May God give you his peace!' |
| 2.9.14–15 | *Swyntits **wirse** tways emmens* | 'Geheiligt werde dein Name!' = 'Hallowed be your name!' |

---

18   Cf. Schmid (1963: 48–49). Trautmann (1910: 285–286), Stang (1964: 442–443) and Schmal-
     stieg (1974: 153, 1976: 202) call it "optative", Smoczyński (2005: 470–480) "subjunctive". The
     many hypotheses concerning the origin of this formation are reviewed in Schmalstieg
     (2000: 257–262) and Hill (2004: 86–94).

Old Prussian *-sei#* seems to be the regular reflex of Proto-Balt *-sįa#* (< PIE *-sįo#* or *-sįo-C*), cf. the evidence of the masculine genitive singular in the inflection of gendered pronouns:[19]

(29)   **Proto-Indo-European**

nom.sg. *Hįós*	→	gen.sg. *Hįé-sįo*	'which'
(Skt *yás*, OAv *yā̆*)		(Skt *yá-sya*, OAv *ye-hiiā*)	
nom.sg. *kʷós*	→	gen.sg. *kʷé-sįo*	'who?'
(Skt *kás*, OAv *kā̆*)		(Skt *ká-sya*, OAv *ca-hiiā*)	

                        Old Prussian

nom.sg. *stas*	→	gen.sg. *ste-ssei, -sse*	'the'
nom.sg. *tāns*	→	gen.sg. *tenne-sei*	'this'
nom.sg. *subs, sups*	→	gen.sg. *sup-sei, sub-sai*	'himself'

This sound change is confirmed by the desinence of the 3rd person of *įe/o*-presents, which must have originally ended in Proto-Balt *-C-įa#* (where *C* is the last consonant of the root, cf. Lith *-Cia*, Latv *-Ø* with palatalisation of *C*):

(30) inf. *et-wiērp-t*   →   3prs. *et-wiērpei*   'to forgive'
      inf. *po-kūns-t*   →   3prs. *po-kūnti*   'to protect'

In Baltic conjugation, an infinitive like OPr *et-wiērp-t, po-kūns-t* (i.e. without a stem formative between the root and the infinitive ending) can only pair with an athematic present, an *e/o*-present or, finally, a *įe/o*-present. Most obviously, OPr 3prs. *et-wiērpei, po-kūnti* belong neither to athematic presents nor to *e/o*-presents. The only remaining source are the *įe/o*-presents, whose 3prs. desinence Proto-Balt *-įa#* must hence have yielded OPr *-ei*.[20]

---

19   Cf. already Hill (2004: 92–93).

20   Cf. also OPr 3prs. *turrei, turri* 'has to, should', which belongs to an inherited *i*-present, cf. Lith *turĕti*, 3prs. *tùri* 'to have', Latv *turêt*, 3prs. *tùr* 'to hold' and the inherited 3prs. (used as 2sg.prs.) OPr *tur* (with the well-known development Proto-Balt *-i#* > OPr *-Ø#* found also in

It may therefore be assumed that the Old Prussian 3rd person imperative of the type *boū-sei*, *dā-sei* etc. reflects the same formation as 1sg.fut. Lith *bū́-siu*, *dúo-siu*, Latv *bû-šu*, *duô-šu*. The clearly imperatival semantics of OPr *boū-sei*, *dā-sei* etc. seem to confirm the above reconstruction of jussive function for the -*si̯e/o*-component of the East Baltic future tense.

Unfortunately, the proposed analysis of the Old Prussian 3rd person imperative is not the only possible explanation of this formation. Imperatives like OPr *boū-sei*, *dā-sei* etc. are also explainable as descending from the other sigmatic formation of the East Baltic future tense, the PIE athematic -*s*-formation.[21]

In Italic, the athematic -*s*-formation was capable of forming its own moods. Cf. the formation of the future-based imperfect subjunctive in Sabellian and Latin:[22]

(31)	Future	Imperfect subjunctive	
	Umbr 3sg. *ferest*	Osc 3pl. *ferríns*, Lat 2sg. *ferrēs*	'to carry'
	Umbr, Osc 3sg. *fust*	Osc 3sg. *fusíd*, Lat 2sg. *forēs*	'to be'

OPr 3prs. *as-t*, *es-t* 'is', *ēi-t* 'walks' beside Lith *ẽs-ti*, *eĩ-ti*). The *i*-presents and the *i̯e/o*-presents probably shared the 1sg.prs. ending in Proto-Balt *-*i̯ṓ* (cf. Lith 3prs. *stùmia* ~ 1sg.prs. *stumiù* from *stùmti* 'to push' and 3prs. *tùri* ~ 1sg.prs. *turiù* from *turḗti*). This identity in the 1sg.prs. might have led to mixing in the other paradigmatic forms, including the 3prs. (cf. in the 1pl.prs. *et-wērpi-mai* on the model of *turri-mai* etc.). For different approaches to OPr 3prs. *turrei*, *turri*, cf. Kortlandt (1987: 106–110), Smoczyński (2005: 448) and Petit (2010: 240–241).

21 Traditionally, the athematic component of the East Baltic future tense is compared to OPr 2sg. *po-stā-sei* of *po-stā-t* 'to become'. This form is attested twice, both times with a clear reference to future. Cf. 3.65.21 *kantou sen brendekermnen postāsei* 'wenn du schwanger wirst' (= 'when you become pregnant') and 3.65.32–33 *kai tu etkumps prei semman postāsei* 'bis dass du wieder zur Erde werdest' (= 'until you become soil again'). OPr -*sei* of 2sg. *po-stā-sei* can be directly equated with Proto-East-Baltic *-sḗ* in the 2sg.fut. Lith *bū́si*, *dúosi*, Latv *bûsi*, *duôsi* (cf., for instance, Endzelin 1944: 176, Schmid 1963: 52, Endzelīns 1971: 231). However, it cannot be excluded that *po-stā-sei* is a recent analogical form of an athematic present, formed on the model of such inherited athematic presents as, for instance, OPr *dā-t*, 3prs. *dāst* 'to give'. That the 2sg.prs. of such verbs ended in -*sei* is shown by 2sg.prs. *ēi-sei*, *-ey-sey* from -*ēi-t*, 3prs. *ēi-t* 'to walk' and 2sg.prs. *assei*, -*se*, -*sai* from *boūt*, 3prs. *as-t* 'to be'.

22 Cf. most recently Hill (2004: 121–133) with references.

There is no reason to exclude this possibility for the Baltic descendant of the same PIE formation. It is well known that Proto-Baltic preserved the PIE optative mood. This mood is clearly reflected first in the Lithuanian so-called "permissive", which exists only in the 3rd person, secondly in the Old Prussian 2nd person imperative. In thematic verbs, the Lithuanian permissive is formed in the following way:

(32) *dìrbti* 'to work'   3prs. *dìrba* 'he works'   3prm. *te-dirbiẽ* 'he may work'
      áugti 'to grow'   3prs. *áuga* 'he grows'   3prm. *te-augiẽ* 'he may grow'

The etymology of the particle *te-* which precedes the proper verb form is unknown. The desinence Lith *-iẽ* seems to reflect Proto-Balt *-aĩ# < PIE 3sg. opt. *-oi̯-t* (cf. Skt *-e-t*, OAv, YAv *-ōi-t̯*, Gk -oι, Goth *-ai*). Cf. for this equation the masculine nominative plural of gendered pronouns:

(33) Lith *tiẽ*, Latv *tiẽ* 'these'   <   PIE *tói̯* 'these' (cf. Skt *té*, OAv *tōi*, Goth *þai*)
      Lith *jiẽ* 'they'   PIE *Hi̯ói̯* 'which' (cf. Skt *yé*, OAv *yōi*, Gk oἵ)

The Old Prussian 2nd person imperative of thematic verbs exhibits a formative *-ai-* which clearly reflects the *-oi̯-*marker of the PIE thematic optative. Cf.

(34) *īm-t*   →   2sg.imp. *immai-s*   2pl.imp. *immai-ti*   'to take'
      gērb-t   →   2sg.imp. *gerbai-s* 2pl.imp. *gerbai-ti*   'to talk'
      mukin-t   →   –   2pl.imp. *mukinai-ti*   'to teach'

Thus, the PIE optative mood is clearly reflected both in East Baltic and in Old Prussian. It must be assumed for the common prehistory of the subbranches, i.e. for Proto-Baltic.

Now, the athematic presents of Old Prussian form their 2nd person imperative, which reflects the ancient optative mood, in a different manner. Here the imperative marker is OPr *-eī-*.

(35) *-ēi-t*, 3prs. *ēi-t*   →   2sg.imp. *j-ei-s*   2pl.imp. *j-ei-ti*   'to walk'
      boū-t, 3prs. *as-t, es-t*   →   –   2pl.imp. *s-eī-ti*   'to be'

The origin of OPr *-eī-* remains unclear. However, the overall similarity of the whole formation to the PIE athematic optative (note the zero grade of the root) seems to suggest that this marker somehow reflects PIE $*\text{-}i\!\!\!̯ \acute{e}h_1\text{-} \sim *\text{-}ih_1\text{-}$ in such optatives as, for instance,

(36) ind., injunctive PIE $*h_1\acute{e}s\text{-} \sim *h_1s\text{-}$ → opt. PIE $*h_1s\text{-}i\!\!\!̯\acute{e}h_1\text{-} \sim *h_1s\text{-}ih_1\text{-}$
      (Skt 3sg.prs. *ás-ti*, 3pl.prs. *s-ánti*,   (Skt 2sg.opt. *s-yā́-s*,
      Goth 3sg.prs. *is-t*, 3pl.prs. *s-ind*)   Lat 2sg.subj. *s-iē-s*, 2pl.subj. *s-ī-tis*)

Since the second constituent of the East Baltic future tense paradigm, the *-s*-formation, was athematic, its optative should have been derived in the same way. This means that Old Prussian 3rd person imperative forms such as *boūsei*, *dāsei* etc. are also explainable as descending from the Proto-Baltic optative of the athematic *-s*-formation reflected in 3fut. Lith *bùs*, *duõs*, Latv *bûs*, *duôs* etc.

It cannot be decided with certainty which of the proposed explanations, the 3rd person indicative of the *-si̯e/o*-formation or the 3rd person optative of the athematic *-s*-formation, reflects the real prehistory of the Old Prussian 3rd person imperative in *-sei*. This formation therefore remains only potentially relevant to the main issue of the present paper, the paradigmatic structure and original semantics of the East Baltic future tense.

10   The Participle

Two points remain to be addressed. First, the participle of the East Baltic future tense has the same morphology as the 1sg. The proposed hypothesis implies that this participle originally belonged to the inherited jussive modal with PIE *-si̯e/o-*. How plausible is the development of a jussive participle into a future tense participle? How to explain its success in East Baltic despite the loss of the corresponding finite forms (save the 1sg.)? Second, how plausible is the assumption of originally jussive semantics for corresponding *-si̯e/o*-formations outside of Baltic, i.e. in Indo-Iranian, Church Slavonic and Continental Celtic?

The evolution of a jussive participle into a future tense participle becomes plausible as soon as one takes into consideration the pragmatic dimension of its use. Clauses with finite forms of a jussive formation, such as *I want you to marry me* or *I want him to guard the house*, have the function of direct or indirect requests or demands. These requests or demands can hardly be reinterpreted as anything else but orders or, perhaps, permissions. By contrast, noun phrases with jussive participles as their dependent constituent do not contain a demand, but merely inform the hearer about the desires and expectations of the speaker. For this reason, such noun phrases can be easily understood and then also reinterpreted by the hearer as statements about the expected future of their heads. For instance, noun phrases which should be translated as *girl I want to marry me* and *dog I want to guard the house* can be easily understood as *girl who (probably) will marry me* and *dog which (probably) will guard the house*.

The fact that the *-si̯e/o*-jussive participle was generalised in Proto-East-Baltic, ousting the participle of the desiderative *-s*-formation, is not surprising. Due to its semantics (desires and expectations of the speaker, who is of course always human), the jussive participle was more universally applicable to nouns of different semantics and thus probably also more frequently used than the desiderative participle. Cf. the noun phrases given in (37), where the jussive participle is equally adequate with a human head noun, a non-human animate and a non-animate head noun.

(37)	'girl I want to marry me'	→	'who will marry me'
	'dog I want to guard the house'	→	'which will guard the house'
	'crops I want to grow fast'	→	'which will grow fast'

By contrast, the desiderative participle was undoubtedly applicable to humans, but only sometimes to non-human animates and hardly ever to non-animate nouns, cf. (38)

(38)	'girl who wants to marry me'	→	'who will marry me'
	? 'dog which wants to guard the house'		
	*'crops which want to grow fast'		

The Indo-European *-si̯e/o*-formations outside of Baltic are usually interpreted as instances of an unmarked future tense. It is, however, a well known fact

that most occurrences of this formation in the most ancient Indo-Iranian texts (such as the Ṛg-Veda) are participles.[23] For these participles, the same semantic evolution can be assumed as was just proposed for the prehistory of East Baltic. The rare finite forms might be explained as recent back-formations to the participles.

This is equally valid for Gk κείω, which is the future tense of κεῖμαι 'to lie' and has been plausibly identified by Hollifield (1981: 173–188) as the single remnant of the PIE full grade -si̯e/o-formation in Greek. The participle κείοντ- is attested already in the Iliad, whereas the finite forms of the verb do not occur until the Odyssey and therefore may be recent.

The single remnant of the -si̯e/o-formation in Slavonic is the Church Slavonic participle byšǫšt- 'which will be in future'.[24] Here, an evolution into an unmarked future tense need not be assumed.

In Celtic, the clearest attestation of the PIE -si̯e/o-formation is 1sg. pissíu-mí in the Gaulish inscription from Chamalières.[25] This verb form belongs to the inflection of Proto-Celt *kʷis-e/o- 'to see' (cf. Gaul 3sg.imp. ap-pisetu from Thiaucourt and Old Irish ad-cí 'to see').[26] The phrase exops pissíu-mí 'being weak-eyed …' is the last in a sequence of wishes, being preceded by two phrases with imperatives. The verb form might, therefore, be equally well interpreted as future tense 'I will see (again)' or as jussive 'I want me to see (again)'.

11   Conclusions

An in-depth investigation of the East Baltic future tense leads to the following conclusions:

(a)   the inflectional paradigm of the Proto-East-Baltic future tense formation was composed of two originally independent sigmatic formations of PIE ancestry, an athematic -s-formation and a thematic -si̯e/o-formation;

(b)   the asymmetric structure of the inflectional paradigm of the Proto-East-Baltic future tense can be accounted for if one ascribes subject-oriented desiderival modality to the former sigmatic formation and speaker-oriented jussival modality to the latter;

---

23   Cf. for Sanskrit Macdonell (1910: 386–387), for Avestan Kellens (1984: 160–162).

24   Cf. most recently Birnbaum (1995) and Hill (2004: 104–106) with references.

25   Cf. Schumacher (2004: 58–59).

26   Cf. the references given in Hill (2004: 107–109).

(c)   this reconstruction of the original semantics of both formations is compatible with the relevant data from outside of Baltic and helps to explain the preference for participles which is observed for the Indo-Iranian descendant of the *-si̯e/o*-formation.

References

Aitzetmüller, Rudolf. 1991. *Altbulgarische Grammatik als Einführung in die slavische Sprachwissenschaft*. 2., verbesserte und erweiterte Aufl. Freiburg i.Br.: Weiher.

Ambrazas, S. et al. 1991. *Lietuvių kalbos atlasas*. III. *Morfologija*. Vilnius: Mokslas.

Arnovick, Leslie K. 1990. *The Development of Future Constructions in English. The pragmatics of modal and temporal Will and Shall in Middle English*. New York: Peter Lang.

Birnbaum, Henrik. 1995. The Church Slavonic future participle from a comparative perspective. *Die Welt der Slaven* 40: 85–100.

Botne, Robert. 1998. The evolution of future tenses from serial 'say' constructions in Central Eastern Bantu. *Diachronica* 15: 207–230.

Bybee, Joan L. & Östen Dahl. 1989. The creation of tense and aspect systems in the languages of the world. *Studies in Language* 13: 51–103.

Bybee, Joan L. & Suzanne Fleischman. 1995. Modality in grammar and discourse. An introductory essay. In: Bybee, Joan L. & Suzanne Fleischman (eds.). *Modality in Grammar and Discourse*. Amsterdam: Benjamins. 1–14.

Bybee, Joan L. & William Pagliuca. 1987. The evolution of future meaning. In: Ramat, A. Giacolone & Onofrio Carruba, Giuliano Bernini (eds.). *Papers from the 7th International Conference on Historical Linguistics*. Amsterdam-Philadelphia: Benjamins. 109–122.

Bybee, Joan L. & William Pagliuca, Revere D. Perkins. 1991. Back to the future. In: Traugott, Elizabeth C. & Bernd Heine (eds.). *Approaches to Grammaticalization*. Vol. II. *Focus on Types of Grammatical Markers*. Amsterdam-Philadelphia: Bernjamins. 17–58.

Bybee, Joan L. & Revere D. Perkins, William Pagliuca. 1994. *The Evolution of Grammar. Tense, aspect, and modality in the languages of the world*. Chicago-London: University of Chicago Press.

Charpentier, Jarl. 1912. *Die desiderativbildungen der indoiranischen Sprachen*. Upsala: Appelberg.

Danylenko, Andrii. 2010. Is there any inflectional future in East Slavic? A case of Ukrainian against Romance reopened. In: Nomachi, Motoki (ed.). *Grammaticalization in Slavic Languages: from areal and typological perspectives*. Sapporo: Slavic Research Center, Hokkaido University. 147–177.

Danylenko, Andrii. 2012. Auxiliary clitics in Southwest Ukrainian: Questions of chronology, areal distribution, and grammaticalization. *Journal of Slavic Linguistics* 20: 3–34.

Endzelin, J. 1923. *Lettische Grammatik*. Heidelberg: Winter.

Endzelin, J. 1944. *Altpreussische Grammatik*. Riga: Latviju Grāmata.

Endzelīns, Jānis. 1971. *Comparative Phonology and Morphology of the Baltic Languages*. The Hague-Paris: Mouton.

Fleischman, Suzanne. 1982. *The Future in Thought and Language. Diachronic evidence from Romance*. Cambridge: Cambridge University Press.

Grinaveckienė, E. et al. 1982. *Lietuvių kalbos atlasas*. II. *Fonetika*. Vilnius: Mokslas.

Gruzdeva, Ekaterina. 1992. Povelitel'nye predloženija v nivxskom jazyke. In: Xrakovskij, Viktor S. (ed.) *Tipologija imperativnyx konstrukcij*. Sankt-Peterburg: Nauka.

Gruzdeva, Ekaterina. 1998. *Nivkh*. Munich-Newcastle: Lincom.

Güntert, Hermann. 1912. Zur Bildung der altindischen Desiderativa. *Indogermanische Forschungen* 30.80–137.

Heine, Bernd & Tania Kuteva. 2002. *World Lexicon of Grammaticalization*. Cambridge: Cambridge University Press.

Heenen, François. 2006. *Le désidératif en védique*. Amsterdam-New York: Rodopi.

Hill, Eugen. 2004. Die sigmatischen Modus-Bildungen der indogermanischen Sprachen. Erste Abhandlung: Das baltische Futur und seine Verwandten. *International Journal of Diachronic Linguistics and Linguistic Reconstruction* 1.69–171.

Hollifield, Patrick H. 1981. Homeric κείω and the Greek desideratives of the type δρᾱσείει. *Indogermanische Forschungen* 86.161–189.

Jasanoff, Jay H. 1978. *Stative and Middle in Indo-European*. Innsbruck: Institut für Sprachwissenschaft der Universität Innsbruck.

Jasanoff, Jay H. 2003. *Hittite and the Indo-European verb*. Oxford: Oxford University Press.

Kellens, Jean. 1984. *Le verb avestique*. Wiesbaden: Reichert.

Kortlandt, Frederik. 1982. Innovations which betray archaisms. *Baltistica* 18.4–9.

Kortlandt, Frederik. 1987. The formation of the Old Prussian present tense. *Baltistica* 23.104–111.

Kortlandt, Frederik. 2002. Shortening and metatony in the Lithuanian future. *Baltistica* 27.15–16.

Kortlandt, Frederik. 2005. Holger Pedersen's *Études lituaniennes* revisited. *Baltistica* VI priedas. 151–157.

Macdonell, Arthur A. 1910. *Vedic Grammar*. Strassburg: Trübner.

Nedjalkov, Vladimir. 1992. *Tense-Aspect-Mood Forms in Chukchi*. Stockholm: European Science Foundation.

Ortiz de Urbina, Jon. 2003. Periphrastic constructions. In: Hualde, José I. & Jon Ortiz de Urbina (eds.). *A Grammar of Basque*. Berlin-New York: de Gruyter.

Panfilov, Vladimir Z. 1965. *Grammatika nivxskogo jazyka*. Tom II. *Glagol, narečie, obraznye slova, meždometija, službenye slova*. Moskva-Leningrad: Nauka.

Pedersen, Holger. 1932. *Études lituaniennes*. København: Levin & Munksgaard.

Petit, Daniel. 2002. Abrègement et métatonie dans le futur lituanien: pour une reformulation de la loi de Leskien. *Bulletin de la Société de Linguistique de Paris* 97.245–282.

Petit, Daniel. 2010. *Untersuchungen zu den baltischen Sprachen*. Leiden-Boston: Brill.

Pronk, Tijmen. 2012. Proto-Indo-European long vowels and Balto-Slavic accentuation. *Baltistica* 47.205–247.

Rix, Helmut. 1977. Das keltische Verbalsystem auf dem Hintergrund des indo-iranisch-griechischen Rekonstruktionsmodels. In: Karl H. Schmidt & Rolf Ködderitzsch (eds.). *Indogermanisch und Keltisch. Kolloquium der Indogermanischen Gesellschaft am 16. und 17. Februar in Bonn*. Wiesbaden: Reichert. 132–158.

Schmalstieg, William R. 1958. The vocalism of the Lithuanian sigmatic future. *The Slavic and East European Journal* 16.120–129.

Schmalstieg, William R. 1974. *An Old Prussian Grammar. The phonology and morphology of the three catechisms*. University Park-London: Pennsylvania State University Press.

Schmalstieg, William R. 1976. *Studies in Old Prussian. A critical review of the relevant literature in the field since 1945*. University Park-London: Pennsylvania State University Press.

Schmalstieg, William R. 2000. *The Historical Morphology of the Baltic Verb*. Washington: Institute for the Study of Man.

Schumacher, Stefan. 2004. *Die keltischen Primärverben. Ein vergleichendes, etymologisches und morphologisches Lexikon*. Unter Mitarbeit von B. Schulze-Thulin und C. aan de Wiel. Innsbruck: Institut für Sprachwissenschaft.

Schmid, Wolfgang P. 1963. *Studien zum baltischen und indogermanischen Verbum*. Wiesbaden: Harrassowitz.

Smoczyński, Wojciech. 2005. *Lexikon der altpreussischen Verben*. Innsbruck: Institut für Sprachwissenschaft.

Stang, Christian S. 1932. Partizipium futuri im Baltischen. *Norsk Tidsskrift for Sprogvidenskab* 5.82–86.

Stang, Christian S. 1942. *Das slavische und baltische Verbum*. Oslo: J. Dybwad.

Stang, Christian S. 1966. *Vergleichende Grammatik der baltischen Sprachen*. Oslo-Bergen-Tromsø: Universitetsforlaget.

Trautmann Reinhold. 1910. *Die altpreussischen Sprachdenkmäler. Einleitung, Texte, Grammatik, Wörterbuch*. Göttingen: Vandenhoeck & Ruprecht.

Ultan, R. 1978. The nature of future tenses. In: Greenberg, Joseph H. & Charles A. Ferguson, Edith Moravcsic (eds.). *Universals of Human Language*. Vol. III: *Word Structure*. Stanford: Standford University Press. 83–123.

Villanueva Svensson, Miguel. 2010. Baltic *sta*-presents and the Indo-European desiderative. *Indogermanische Forschungen* 115.204–233.

Villanueva Svensson, Miguel. 2012. A note on the Baltic future participle. *Baltistica* 47.15–21.

Volodin, Aleksandr P. 1976. *Itel'menskij jazyk*. Leningrad: Nauka.

Wiemer, Björn. 2011. Grammaticalization in Slavic languages. In: Narrog, Heiko & Bernd Heine. *The Oxford Handbook of Grammaticalization*. Oxford: Oxford University Press. 740–753.

Willi, Andreas. 2011. Morphosyntaktische Überlegungen zum Ursprung des griechischen Futurs. In: Krisch, Thomas & Thomas Lindner (eds.). *Indogermanistik und Linguistik im Dialog. Akten der XIII. Fachtagung der Indogermanischen Gesellschaft vom 21. bis 27. September 2008 in Salzburg*. Wiesbaden: Reichert. 605–615.

Wischer, Ilse. 2009. *Will* and *shall* as markers of modality and/or futurity in Middle English. *Folia Linguistica Historica* 29.125–143.

Zinkevičius, Zigmas. 1966. *Lietuvių dialektologija. Lygamoji tarmių fonetika ir morfologija*. Vilnius: Mintis.