

# Verb Stems in Russian and BYT’\*

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## Abstract

The present paper aims at a formal analysis of Russian verb stems, and, specifically, at the integration of the forms of the lexeme BYT’ ‘be’ (copula and/or auxiliary) into the resulting verb system. It is argued that Russian verbs usually exhibit two stem variants that do not differ with respect to morphosyntactic features, argument structure and semantics. Inflectional affixes add specific morphosyntactic features to a verb form, however they do not contribute to its meaning. Semantic information is assumed to be introduced by semantic operators that are stored in the mental lexicon and projected in syntax as functional heads. Agreement between these operators and fully inflected verb forms results in interpretable structures.

BYT’-forms derived from the stem variants /by/ and /bud/ behave almost exactly as other Russian verb forms. It turns out that the *zero form* of BYT’ as well as the marginal forms *est’* and *sut’* diverge from the general pattern insofar as they are fossilized, suppletive forms. They differ from the ‘regular’ forms, which are derived from /by/ or /bud/, in several important respects. Also, the present analysis offers a plausible way of explaining the ‘future forms’ derived from /bud/ without claiming these forms to be perfective aspect, and without having to resort to a morphosyntactic feature [ $\pm$ Fut(ure)].

## 1 Introduction

According to a well established view, most Russian (Rus) verbs have two stems: *infinitive stem* and *present stem* (see, e.g., Bielfeldt 1952; Vinogradov 1952, 270ff.; Isačenko 1960, 27ff.; 1962, 214ff.; Gabka et al. 1988, 40; Kempgen 1989, 87-90; Švedova & Lopatin <sup>2</sup>1990, 287-288; Belošapkova <sup>3</sup>1997, 574-577). However, it is mostly left open if these stems are associated with semantic or grammatical content, or – in case they are not – how they are furnished with the relevant meaning components.<sup>1</sup>

The present paper aims at a formal analysis of the system of Rus verb stems. It is concerned with the division of labor between stems and inflectional suffixes in both semantics and morphosyntax. This discussion will serve as a vehicle to

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1 Jakobson (1948) offers an analysis known as the one-stem system. He proposes only one single *full stem* for each ‘regular’ Rus verb, from which all inflected forms are derived by means of an extensive rule component (see Chvany 1990). Note that Jakobson himself emphasizes that his model serves primarily didactic purposes.

account for the forms of BYT' 'be' which function either as copula or auxiliary.<sup>2</sup> Concerning these important functions, it is desirable to integrate them into the overall verb system.<sup>3</sup> It will be shown that BYT' presents no crucial exception wrt. the latter. Only its *zero form* diverges in being a suppletive and generalized third 'stem' (see section 6 for details).

This paper sticks to the view that Rus verbs indeed have two stems, one ending in a vowel, the other one ending in a consonant. This is the common two-stem system of most traditional descriptions (see Scatton 1984; Chvany 1990; Hippisley 1998). It will be claimed that stems do not come with any semantics other than the lexical meaning of the verb itself, i.e., they constitute mere phonetic variants.<sup>4</sup> Equally, inflectional suffixes are purely formal elements that mark lexical items with morphosyntactic features, but do not introduce any semantic content related to these features or categories.

A central issue of the present investigation is that inflectional morphology and semantics should be dissociated. The task of inflectional markers is to add morphosyntactic features which, then, underlie syntactic structure building. It follows that they mirror semantics in an only indirect manner. I will pursue a central idea of von Stechow (2007, 43-47; 2009, 12) who claims that inflectional morphology merely 'reflects' semantic operators (OPs) that are present in syntax. The advantage of such a view is that syntax can indeed be reconstructed as a mere combinatorial mechanism that applies on the basis of morphosyntactic features of lexical items. I believe that semantic OPs can be taken to be (silent or overt) functional heads, originating in the mental lexicon as any lexical item. These suggestions will be formulated in more detail in section 5.

Finally, it will be argued that the absence of overt present tense forms of BYT' amounts to the presence of a *zero form* which is fully specified wrt. tense and agreement. Like most forms of BYT', it can function either as copula or auxiliary. The above-mentioned dissociation of morphology and semantics will also prove advantageous in accounting for the controversial 'future forms' of BYT' which are derived from its consonantal ('present') stem /bud/.

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2 Lexemes are placed in SMALL CAPITALS, forms of lexemes in *italics* (Matthews 1991).

3 *Est'* with its negated form *net* belongs to another lexeme, namely existential BYT'. It can also be *zero* under specific conditions. Existential BYT' is excluded from the present investigation. See Zybatow & Mueller-Reichau (2011) for a recent analysis.

4 Consequently, terms such as *present stem* or *infinitive stem* are, at least, misleading.

## 2 Syntax theory

I assume a modular grammar in the lines of Minimalism with heterogeneous modules interacting via so-called interfaces (see Chomsky 1995). Syntax is a computational mechanism that combines lexical items originating in the mental lexicon. It relies on morphosyntactic features irrespective of semantics. Semantic information is read by an interface system ('Logical Form') which is, in turn, blind to morphosyntactic features. Its readings are sent to an extragrammatical performance system in order to be processed.

Every sentence is based on a lexical VP.<sup>5</sup> Arguments are projected according to lexical entries (LEs). Multiple VPs (VP\*) are possible. If so, the lowest VP comprises the main predicate, whereas upper VPs may be headed by auxiliaries, phasal and/or modal verbs. Negation is encoded in an optional NegP.<sup>6</sup> IP represents both verbal mood and tense. I assume that Rus tense auxiliaries are in general located in an upper V<sup>0</sup>, while I<sup>0</sup> is mostly filled by an abstract operator.<sup>7</sup> An important exception is the enclitic subjunctive marker *by*.<sup>8</sup> CP encodes sentence type and mood:<sup>9</sup>

(1) CP > IP > (NegP >) VP\*

Lexical items enter syntax fully inflected, i.e., they are equipped with bundles of morphosyntactic features that have been brought about by inflection markers in the mental lexicon. Examples for such derivations will be given in section 7.

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5 Abbreviations: CP = complementizer phrase; IP = inflection phrase; NegP = negation phrase; VP = verb phrase.

6 Zimmermann (2009) proposes a polarity phrase (PolP). See Błaszczak (2009) for an exhaustive overview of possible syntactic analyses of negation phenomena.

7 Cf., e.g., Kosta (2001) who, based on negation data from Czech, also assumes different structural positions for different types of auxiliaries. Auxiliaries in an upper V<sup>0</sup> (or Aux<sup>0</sup>) are sometimes called 'lower auxiliaries', those in I<sup>0</sup> (or T<sup>0</sup>) 'upper auxiliaries'.

8 'Subjunctive' is used as a cover term; see section 4 for details.

9 Zimmermann (2009) proposes a ModP for verbal mood. However, IP seems to suffice for Rus to capture both verbal mood and tense (see Emonds & Veselovská 2012 with a similar proposal wrt. English and Czech). vP is not assumed since semantic, argument-structural and thematic information (causativity, agentivity, voice, etc.) is taken to be generally encoded in the (inflected) verb form in V<sup>0</sup>.

11 Importantly, such a scenario does not exclude later reanalysis (or reconstruction) of initially ‘rote-learned’ forms. As to the theory of ‘rote-learning’ in early verb acquisition see Gagarina (2003) and Gülzow & Gagarina (2006), among others.

## 4 Verbal Mood and Tense as semantic operators

I assume that Rus has the semantic tenses PRESENT, FUTURE and PAST. The assumption of FUTURE in Rus diverges from most standard analyses which take the perfective aspect to be responsible for a (merely) future-like interpretation if combined with PRESENT. However, there is evidence that Rus has a FUTURE even despite of its aspect distinction (see Paslawska & von Stechow 2003c, 15-16).

Agreeing with von Stechow (2007) in that (inflectional) morphology merely reflects semantic OPs, I assume that semantic tenses are brought about by abstract OPs located in  $I^0$ . Their presence is reflected by appropriately marked verb forms located in the closest  $V^0$ . Since  $I^0$  is responsible for both verbal mood and tense, the various possible OPs do not merely introduce temporal semantics (see Klein 1994), but also determine indicative mood as they existentially quantify the verbal situation argument (cf., e.g., Zimmermann 2009):

- (3)  $/\emptyset/$  [+I]  $\lambda P [\exists s [[t \text{ AT } t_0] \wedge [P \text{ s } t]]]$  (PRES-OP)  
 $P \in [+V, -N, -\text{Perf}, +\text{Fin}, -\text{Past}, +\text{Agr}]$
- (4)  $/\emptyset/$  [+I]  $\lambda P [\exists s [[t \text{ AFTER } t_0] \wedge [P \text{ s } t]]]$  (FUT-OP)  
 $P \in [+V, -N, +\text{Perf}, +\text{Fin}, -\text{Past}, +\text{Agr}]$
- (5)  $/\emptyset/$  [+I]  $\lambda P [\exists s [[t \text{ BEFORE } t_0] \wedge [P \text{ s } t]]]$  (PAST-OP)  
 $P \in [+V, -N, +\text{Fin}, +\text{Past}, +\text{Agr}]$

The PRES-OP in (3) and the FUT-OP in (4) both select verb forms marked  $[-\text{Past}]$ , but require different aspectual features.<sup>12</sup> It follows that Rus aspect morphology does not only ‘directly’ reflect semantic aspect, but also ‘indirectly’ reflects tense. As pointed out by Paslawska & von Stechow (2003b, [20]), this is a case where morphology and semantics diverge. Rus aspect morphology is, thus, bifunctional. It will be shown that this is exploited in the Rus periphrastic future where auxiliary *bud*-forms, which are *formally* marked as perfective aspect, equip imperfective infinitives with FUTURE. The PAST-OP in (5) differs from (3) and (4) in that it is indifferent wrt. aspect. It does not select inflected ‘present tense’ verbs, but *l*-forms which are equipped with a morphosyntactic feature  $[\text{+Past}]$ . Historically, these verb forms were participles. From a synchronic point of view, however, most grammars treat them as finite forms. I agree with this analysis. Hence, despite of their ‘adjectival’ (or ‘participial’) agreement, *l*-forms are treated as finite (tensed) verb forms.

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12 Cf. Junghanns (1995, 195, fn. 12) who indicates the possibility that aspect features are inherent specifications of verb forms and, hence, no proper morphosyntactic features.

The OPs in (3)-(5) determine tense and indicative verbal mood. Subjunctive mood, on the other hand, is tense-neutral.<sup>13</sup> It is overtly realised by means of the enclitic marker *by* which is often described as a particle. I believe that it can more adequately be classified as an overt subjunctive OP that selects either (finite) *l*-forms or infinitives:

- (6) /by/ [+I]  $\lambda P$  [MOOD [ $\exists s$  [P s t']]] (SUBJ-OP)  
 $P \in [+V, -N, +Fin, +Past, +Agr] \vee [+V, -N, -Fin, -Part]$

According to (6), *by* selects an *l*-form or an infinitive, blocks their temporal argument (see, e.g., Zimmermann 1988) and existentially quantifies the situation argument. Additionally, it introduces the modal OP MOOD which is later on responsible for one of the possible readings, viz. irrealis, conditional or (true) subjunctive. Its final interpretation depends on contextual factors (see Zimmermann 2009 for a similar treatment of sentence mood). Both infinitives and *l*-forms come from the lexicon with their morphosyntactic features, but they do not differ from the underlying verb stems in terms of their SF. Hence, it is still possible for *by* to block their temporal argument despite of these markers. It follows that an *l*-form that co-occurs with *by* does not reflect PAST in spite of the feature [+Past] it is equipped with. Following Junghanns (1995, 189), one may also say that *by* renders the temporal specification of the *l*-form ‘ineffective’.

There is yet another option, namely ‘tenseless’ verb forms (infinitives, gerunds) as heads of complement or adjunct clauses. Their tense is usually interpreted relative to a given matrix tense, while their highest argument is controlled by one of the argument expressions of the matrix predicate. I assume the following (tenseless) [–T]-OP to underlie such structures:

- (7) /Ø/ [+I]  $\lambda P$  [ $\exists s$  [P s t']] ([–T]-OP)  
 $P \in [+V, -N, -Fin, \alpha Part]$

The set of semantic OPs in (3)-(7) should suffice to furnish Rus inflected verb forms with the necessary semantics (the OP in (7) will not play any role in the remainder of this paper). Before it can be shown how these OPs work, the Rus system of verb stems has to be considered in more detail.

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13 There is neither a ‘present’ nor a ‘past subjunctive’ in Rus despite of the fact that the involved *l*-forms seem to suggest this. Given appropriate contexts, Rus subjunctives can receive an irrealis, conditional, or (true) subjunctive interpretation. Therefore, its basic semantics must be underspecified.

## 5 Verb stems as PF variants

Proceeding from the assumption that Rus verbs usually exhibit two stems that do not differ wrt. CF and SF, it seems justified to treat them as mere PF variants. It should be possible to capture them by elaborate PF representations in LEs:

- (8) /ud'ela(j)/ [+V,−N,+Perf]  $\lambda y \lambda x \lambda s \lambda t$   $[[\tau(s) \subseteq t] : s \text{ INST } [x \text{ MAKE } y]]$   
 (9) /posmotr'(e)/ [+V,−N,+Perf]  $\lambda y \lambda x \lambda s \lambda t$   $[[\tau(s) \subseteq t] : s \text{ INST } [x \text{ WATCH } y]]$   
 (10) /b'i(j)/ [+V,−N,−Perf]  $\lambda y \lambda x \lambda s \lambda t$   $[[t \subseteq \tau(s)] : s \text{ INST } [x \text{ BEAT } y]]$   
 (11) /p'i{sa}{š}/ [+V,−N,−Perf]  $\lambda y \lambda x \lambda s \lambda t$   $[[t \subseteq \tau(s)] : s \text{ INST } [x \text{ WRITE } y]]$   
 (12) /z{o}v{a}/ [+V,−N,−Perf]  $\lambda y \lambda x \lambda s \lambda t$   $[[t \subseteq \tau(s)] : s \text{ INST } [x \text{ CALL } y]]$   
 (13) /r'is{ova}{uj}/ [+V,−N,−Perf]  $\lambda y \lambda x \lambda s \lambda t$   $[[t \subseteq \tau(s)] : s \text{ INST } [x \text{ DRAW } y]]$   
 (14) /p'ek/ [+V,−N,−Perf]  $\lambda y \lambda x \lambda s \lambda t$   $[[t \subseteq \tau(s)] : s \text{ INST } [x \text{ BAKE } y]]$

Apart from (14), PF captures two stem variants: Round brackets in (8)-(10) indicate that the respective consonant or vowel is optional. Curly brackets in (11)-(13) mark PF segments in complementary distribution. The verb in (14) stands out in that it has a consonantal stem only; such verbs lack a vocalic stem altogether. Their stem final consonants are /k/, /g/, /t/, /d/, /s/, /z/, /b/ (cf. Jakobson 1948, 124-125). These consonants seem to be characterized by an extraordinarily high degree of 'phonological reactivity', i.e., when consonants are attached, they allow phonological accommodations excluded for other ('non-reactive') consonants. It seems that these purely consonantal stems are an example of lexical economy, where the possibilities preset by Rus phonological principles are exploited.<sup>14</sup>

Whatever notation one may choose to represent stem variants, the central claim of the present analysis is that the latter do not differ wrt. CFs and SF.<sup>15</sup> This claim is traditional as far as stems are considered to be appropriate 'docking sites' for suffixes which start either in a vowel or in a consonant (cf.,

14 Vinogradov (1947) gives different analyses for NESTI (1Sg *nesu*) 'carry' and VESTI (1Sg *vedu*) 'lead'. Concerning NESTI, he assumes /nes/ to be the only stem. Concerning VESTI, he distinguishes an infinitive stem /ve/ from a present stem /ved/. This analysis forces the assumption of an additional variant of the infinitival suffix, namely /sti/, which is expendable if one assumes merely one underlying stem and considers the relevant accommodations synchronic phenomena in today's Rus.

15 The present analysis of Rus verb stems is not exhaustive. Familiar problems of the two-stem system must remain untackled, e.g., *nu*-verbs and various 'irregular' paradigms as the ones of DAT 'give' or EST 'eat', etc.

e.g., Belošapkova 1997, 574-577). It follows that there must be principles that regulate which type of suffix may attach to which type of stem. Only as an approximation, I assume the following rules as an absolute minimum:<sup>16</sup>

(15) a. **stem**-V + C-suffix

b. **stem**-C + V-suffix

Consonantal stems show a more intricate behavior than vocalic ones. If their final consonant is non-palatal, vocalic suffixes starting in /e/ are attached. Note that stem final /j/ counts as non-palatal, cf. (8), (10), (13). If the stem final consonant is palatal, suffixes starting in /a/ or /i/ are attached, cf. (9). Suffixes starting in /u/ are attached to both palatal and non-palatal stems, but cause ‘substitutive’ palatalization of the final consonant if it is palatal (e.g., *vižu* ‘(I) see’ with the stem /vid’(i)/, cf. (9)). These regularities are left unexpressed in (15) due to the assumption that they follow from general phonological principles of Rus. If (15) is also taken to follow from such principles, even these basic rules would be superfluous.

## 6 Stems and forms of BYT’

### 6.1 The copula

The lexeme BYT’ has more stems or forms than one would expect against the background of the two-stem system. One stem is /by/ which serves to derive, a.o., the infinitive and the *l*-forms. In unmarked cases, present tense is expressed by means of a *zero form* that is inherently finite and underspecified or generalized wrt. agreement (cf. Geist 2008). In specific contexts, its overt counterpart *est’* is used which is equally finite and underspecified (Geist 2006, 6, 166). The form *sut’* also occurs, but it is restricted to 3Pl and is more and more replaced by the more general form *est’*.

BYT’ stands out among other Rus verbs due to the fact that it has forms which explicitly reflect future tense. Their true status is, however, under discussion. Whereas traditional grammars treat these forms as ‘true’ futures, some analyses take them to be perfective aspect, which causes a merely future-like interpretation (cf. Franks & Greenberg 1994; Franks 1995, 232; Junghanns 1997, 252). From a diachronic perspective, this is plausible because these forms were indeed perfective (and inchoative) in older stages (see, e.g., Miklosich 1926, 262; Potebnja 1958, 133-134; Bielfeldt 1961, 202; Leskien <sup>9</sup>1969, 165;

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16 Chvany (1990, 432) reaches a similar conclusion: “[...] the fundamental regularity of Russian conjugation is {STEM<sub>1</sub>+C | STEM<sub>2</sub>+V}“.



18 The selectional feature  $[\pm P]$  in (16) is the Jakobsonian feature ‘peripheral’, which is used to define cases together with the features  $[\pm D]$  ‘directional’ and  $[\pm Q]$  ‘quantificational’ (cf. also Zimmermann 2003b). While the nominative is characterized by  $[-D, -P, -Q]$ , the instrumental is marked by  $[-D, +P, -Q]$ . It follows that the restriction in (16), where all negative features are omitted, says that a nominal expression might either be marked with nominative or instrumental case. Nothing will be said wrt. the semantic effects of this case variation in Rus copular sentences (see, e.g., Geist 2006; Markman 2008).

am', *jesi* '(you) are', *jestb* '(s/he) is', etc. (see, e.g., Trunte <sup>5</sup>2005, 71).<sup>19</sup> Since the modern *zero copula* can be used in any person and number context, and since it generally reflects PRESENT, it should be represented by means of a fully specified (generalized) LE as the one in (17):

- (17) /Ø/    [+V,−N,−Perf,−Past,+Agr]     $\lambda P \lambda x \lambda s \lambda t [[t \subseteq \tau(s)] : s \text{ INST } [P \ x]]$   
 $P \in [\beta V, \gamma N] <\beta = + \rightarrow \gamma = +>$

Consequently, the *zero copula* is stored in a separate LE. It is nonetheless part of the paradigm of BYT' since its SF is identical to the one in (16). I assume that 'suppletive' forms are generally stored in separate entries. This does not merely account for their diachronic, but also for their synchronic 'otherness'. In the case of the *zero copula*, this 'otherness' and separate storing can also capture an important difference as compared to the overt forms represented by (16), namely that the *zero copula* does not licence the predicative instrumental on predicate nominals.

Like the *zero copula*, the overt form *est'* is finite and underspecified wrt. agreement. It needs specific preconditions to be licenced. According to Geist (2006, 164-165), *est'* is restricted to contexts involving contrastive focus (it is archaic when used as identity copula). Whatever the detailed conditions may be, they should be representable. I will use the feature [+F] to abbreviate them, which is, of course, a rough simplification.<sup>20</sup>

- (18) a. /jes't'/  
 b. [+V,−N,−Perf,−Past,+Agr,+F]  
 c.  $\lambda P \lambda x \lambda s \lambda t [[t \subseteq \tau(s)] : s \text{ INST } [P \ x]]$   
 $P \in [\beta V, \gamma N] <\beta = + \rightarrow \gamma = +>$

19 The stem /by/ goes back to the Indoeuropean root *\*b<sup>h</sup>ū-* (cf. Bielfeldt 1961, 202). It was extended by *\*n* and *\*d* which led to Old Church Slavonic *bqd-* and Rus *bud-*, respectively. Possibly, the latter extensions introduced the above-mentioned perfectivity and inchoativity. Cf. Migdalski (2012, 9) who claims that also modern *bud-*forms are semantically perfective.

20 Clearly, this kind of feature has a completely different status than usual morphosyntactic features. It seems to refer to pragmatics, information structure or word usage. A possible way to capture this might be to assume a separate slot within LEs that contains annotations referring to such factors.

According to (18), *est'* is chosen if the above-mentioned preconditions hold. As a suppletive form, it is stored separately in the mental lexicon.<sup>21</sup>

Finally, *sut'* is even more restricted than *est'* in that it can only be found in sophisticated and/or archaic styles (Geist 2006, 166). I conclude that *sut'* must also be represented in a separate LE, cf. (19):

- (19) a. /sut'/  
 b. [+V, -N, -Perf, -Past, +3Pl, +G]  
 c.  $\lambda P \lambda x \lambda s \lambda t [[t \subseteq \tau(s)] : s \text{ INST } [P \ x]]$   
 $P \in [\beta V, \gamma N] <\beta = + \rightarrow \gamma = +>$

The CFs in (19) contain a special feature [+G] that abbreviates the specific conditions that licence *sut'*. The set of conditions for *sut'* seems to partially overlap with the one of *est'*, as the latter more and more replaces the former.

In sum, copular BYT' has been reduced to four LEs, namely the one in (16) which represents the two overt stems /by-/ /bud/, the one in (17) which covers the *zero form*, the one in (18) which accounts for the marked form *est'*, and the one in (19) for the even more restricted form *sut'*. Of these, the LEs in (16)-(17) can be said to be unmarked. The ones in (18)-(19) are less frequent and gradually more marked. This is well compatible with the diachronic development of these forms: While the *zero copula* has become the unmarked present tense form, its 'predecessor' *est'* has been partially marginalized by being restricted to marked contexts. The 3Pl form *sut'* has been marginalized even more. Today, it seems to be a mere remnant.

The LEs in (16)-(19) suffice to capture the copular lexeme BYT'. However, forms of BYT' may also be used as auxiliaries.

## 6.2 The auxiliary

In periphrases, auxiliaries express finiteness and agreement features which non-finite forms (infinitives and participles) are unable to realize. In Rus, inflected forms of BYT' are used as auxiliaries. Whereas the copula BYT' (in lower  $V^0$ ) is a lexical stative verb, the auxiliary BYT' (in upper  $V^0$ ) merely 'raises' the situation argument of the non-finite main predicate (in lower  $V^0$ ) in order for the whole structure to receive a modal and temporal characterization. While the copula BYT' selects non-verbal complements, the auxiliary selects verb forms.

21 Concerning their mutual origin, I do not exclude the possibility that both the *zero form* and *est'* are stored within one LE. The feature  $[\pm F]$  would, then, be related to the presence or absence of PF material.



work with a reduced number of LEs irrespective of dealing with the copula or with the auxiliary. Concerning the stems /by/ and /bud/, the LE in (16) can be conflated with the LE in (20) which yields the one in (22):

- (22) a. /b(y)<sub>-α</sub>(ud)<sub>α</sub>/
- b. [+V, -N, αPerf]
- c.  $\lambda P \lambda x \lambda s \lambda t ([t \subseteq \tau(s)] : s \text{ INST})_\beta [P \times (s \ t)_{-\beta}] ( )_\beta$   
 $P \in ([\gamma V, \delta N, (\epsilon P)_\delta] <\gamma = + \rightarrow \delta = +>)_\beta ([+V, -N, -Fin, \gamma Part]_{-\beta})$

The same can be done wrt. the *zero form/s*. The LEs in (17) and (21) can be conflated into the unified LE in (23):

- (23) a. /Ø/
- b. [+V, -N, -Perf, -Past, +Agr]
- c.  $\lambda P \lambda x \lambda s \lambda t ([t \subseteq \tau(s)] : s \text{ INST})_\beta [P \times (s \ t)_{-\beta}] ( )_\beta$   
 $P \in ([\gamma V, \delta N] <\gamma = + \rightarrow \delta = +>)_\beta ([+V, -N, -Fin, \gamma Part]_{-\beta})$

These LEs could be simplified even more if one assumes that all selectional restrictions follow from a general principle of ‘redundancy avoidance’ and, thus, do not have to be made explicit. Thus, it might be possible that forms of the copula BYT’ simply co-occur with nominal (predicate) expressions because the latter need to be furnished with verbal properties. On the other hand, the usage of the auxiliary BYT’ might be restricted to non-finite verb forms because only these forms need auxiliary support in order for specific grammatical categories to be realized. In Rus, these are imperfective infinitives and (mostly) perfective passive participles. While the former are the only way to obtain an ‘imperfective future’, the latter are the only (standard) option to utter a ‘perfective passive’ (see section 8 for illustrations, further comments and syntactic analyses).

## 7 Deriving fully inflected verb forms

In this section, I will give some examples to illustrate how fully inflected verb forms are derived in the mental lexicon. This can be considered a reconstruction of the processes involved in Rus inflectional morphology.

## 7.1 Infinitives

I assume that the Rus infinitival suffix has a LE as in (24):<sup>24</sup>

- (24) /t(i)/    [–Fin,–Part]     $\lambda P \lambda_{\underline{n}} \lambda s \lambda t [P \underline{n} s t]$   
 $\lambda P \in [+V, -N]$

This suffix selects verb stems. It is an identity function that does not alter the SF of the affected verb. It merely adds the features [–Fin,–Part].

The infinitival suffix starts in a consonant. Consequently, it is attached to vocalic stems (as far as the verb exhibits one). Note that (24) displays the PF variants /t/ and /tʲ/. Which variant is chosen depends on the phonetic shape and the stress pattern of the stem. Examples are given in (25)–(28).<sup>25</sup> The SF is omitted since it is not affected by this suffixation:

- (25) /udʲelatʲ/    [+V,–N,+Perf,–Fin,–Part]     $\lambda y \lambda x \lambda s \lambda t [ \dots ]$   
(26) /bʲitʲ/    [+V,–N,–Perf,–Fin,–Part]     $\lambda y \lambda x \lambda s \lambda t [ \dots ]$   
(27) /pʲečʲ/    [+V,–N,–Perf,–Fin,–Part]     $\lambda y \lambda x \lambda s \lambda t [ \dots ]$   
(28) /bytʲ/    [+V,–N,–Perf,–Fin,–Part]     $\lambda P \lambda x \lambda s \lambda t [ \dots ]$

## 7.2 Present tense forms

Rus inflected verb forms marked for person and number are generally also marked with [–Past] (see Jakobson 1948, 123). They are, hence, finite. I give the LEs for the suffixes of 1Sg, 2Sg and 3Pl in (29)–(31). The suffixes for 3Sg, 1Pl and 2Pl are analogous to the one in (30). The choice of the initial vowel in (30) and (31) depends on whether the final consonant of the respective verb stem is non-palatal or palatal (see section 5, final paragraph):

- (29) /u/    [+Fin,–Past,–Pl,+1,–2]     $\lambda P \lambda_{\underline{n}} \lambda s \lambda t [P \underline{n} s t]$     (1Sg)  
 $\lambda P \in [+V, -N]$

24 In order for (24) to be applicable to all verb types (n-place predicates), a slightly modified notation from Zimmermann (2003a) is used where ‘ $\lambda_{\underline{n}}$ ’ and ‘ $\underline{n}$ ’ stand for n  $\lambda$ -operators in AS and the same number of bound variables in PAS. The feature [ $\pm$ Part(icipale)] distinguishes infinitives from participles.

25 These entries are derived ones that result from inflectional morphology. Possibly, derived forms like these become stored in fully specified LEs given that they are frequent enough. Such forms could, then, be accessed more effectively. This is, however, a speculation as long as it is impossible to say what it needs for a form to be ‘frequent enough’. Still, it does not seem to be much too bold a claim to assume that the mental lexicon is capable of such a secondary development (or ‘internal growth’).

- (30) /{e}{i}š/    [+Fin,−Past,−Pl,−1,+2]     $\lambda P \lambda \underline{n} \lambda s \lambda t [P \underline{n} s t]$     (2Sg)  
 $\lambda P \in [+V, -N]$
- (31) /{a}{u}t/    [+Fin,−Past,+Pl,−1,−2]     $\lambda P \lambda \underline{n} \lambda s \lambda t [P \underline{n} s t]$     (3Pl)  
 $\lambda P \in [+V, -N]$

Suffixation of verb stems with these markers yields fully inflected verb forms which enter syntax in  $V^0$ . Since these suffixes generally start in a vowel, they are attached to stems which end in a consonant, cf. (32)-(35):

- (32) /ud'elaju/    [+V,−N,+Perf,+Fin,−Past,−Pl,+1,−2]     $\lambda y \lambda x \lambda s \lambda t [ \dots ]$
- (33) /b'iješ/    [+V,−N,−Perf,+Fin,−Past,−Pl,−1,+2]     $\lambda y \lambda x \lambda s \lambda t [ \dots ]$
- (34) /p'eč'eš/    [+V,−N,−Perf,+Fin,−Past,−Pl,−1,+2]     $\lambda y \lambda x \lambda s \lambda t [ \dots ]$
- (35) /budut/    [+V,−N,+Perf,+Fin,−Past,+Pl,−1,−2]     $\lambda P \lambda x \lambda s \lambda t [ \dots ]$

There is no change in the SF of the suffixed verbs. The suffixes merely add morphosyntactic features as the tense feature [−Past]. They do not, however, introduce semantics related to these categories. Semantic tense is introduced by OPs located in  $I^0$ . The PRES-OP in (3) selects inflected forms with the features [−Perf,−Past], the FUT-OP in (4) selects those marked with [+Perf,−Past]. Thus, the morphosyntactic combination of tense and aspect features determines the ultimate temporal interpretation. Therefore, the forms in (33) and (34) will reflect PRESENT, while those in (32) and (35) will reflect FUTURE.

### 7.3 Past tense forms

As already indicated above, Rus *l*-forms are finite forms. While the attachment of the *l*-suffix formed participles in earlier stages (cf., a.o., Leskien <sup>9</sup>1969, 136; Trunte <sup>5</sup>2005, 73), it yields finite forms in modern Rus (cf., e.g., Kempgen 1989, 303-332). This is probably due to the diachronic loss of overt present tense forms of BYT'. These were used with *l*-participles to constitute the former periphrastic perfect.<sup>26</sup> Noticeably, modern Rus *l*-forms do not occur with

26 The (perfect) auxiliaries with *l*-participles were only superficially identical to those with passive participles. The difference is preserved, among others, in West Slavic languages like Czech where the former are clitic, while the latter are non-clitic (cf. Toman 1980). A striking difference obtains wrt. the forms for 3Sg, as can be observed in (i) vs. (ii):

(i) Císař                      Ø                      stavěl                      hrad.                      ('perfect')  
 emperor-Nom.Sg    Aux-3.Sg    build-LPart.Sg.Masc    castle-Acc.Sg  
 'The emperor was building a castle.'

auxiliaries altogether. I assume that the mentioned ‘perfect auxiliaries’ turned into the abstract PAST-OP in  $I^0$ . This change shifted the ‘burden of finiteness’ onto the *l*-forms.

However, although being finite today, *l*-forms retained number and gender agreement from their participial ancestors. I propose the LE in (36) for the *l*-suffix. It selects verb stems and adds its features [+Fin,+Past]. It does not add agreement features. The latter are added later by agreement suffixes. Once again, the SF of the relevant verb is left unaffected by this suffixation:

- (36) /l/      [+Fin,+Past]       $\lambda P \lambda \underline{n} \lambda s \lambda t [P \underline{n} s t]$   
 $\lambda P \in [+V, -N]$

Some examples of fully inflected *l*-forms with attached agreement markers are given in (37)-(40):

- (37) /ud’elala/ [+V, -N, +Perf, +Fin, +Past, -Pl, -Masc, +Fem]     $\lambda y \lambda x \lambda s \lambda t [ \dots ]$   
(38) /b’ilØ/    [+V, -N, -Perf, +Fin, +Past, -Pl, +Masc, -Fem]     $\lambda y \lambda x \lambda s \lambda t [ \dots ]$   
(39) /p’ekl’i/    [+V, -N, -Perf, +Fin, +Past, +Pl]     $\lambda y \lambda x \lambda s \lambda t [ \dots ]$   
(40) /bylo/    [+V, -N, -Perf, +Fin, +Past, -Pl, -Masc, -Fem]     $\lambda P \lambda x \lambda s \lambda t [ \dots ]$

Semantic tense is brought about by the PAST-OP in (5). A crucial argument for the claim that *l*-forms (as any inflected form) are devoid of tense semantics is that they also occur in the so-called analytical subjunctive together with the overt OP *by*. The formulation of many traditional grammars according to which subjunctive mood is formed by means of a ‘past verb’ plus the particle *by* is highly misleading as far as ‘past verb’ is taken literally. As already pointed out in section 4, subjunctive mood is tense-neutral. If *l*-forms were indeed equipped with past tense semantics, subjunctive *by* would have to ‘delete’ or at least ‘overwrite’ this meaning. This is, however, unacceptable since, by lexicalist assumptions, semantic components can be added to SF, but cannot be removed.

According to the present analysis, *by* is an abstract spell-out of  $I^0$  which selects fully inflected *l*-forms (or infinitives; see (7), section 4). It blocks the temporal argument of the verb and binds the situation argument. The under-

- 
- (ii) Hrad                      je                      stavěn                      (císařem).                      (passive)  
castle-Nom.Sg    Aux-3.Sg    build-Pass.Part.Sg.Masc    emperor-Instr.Sg  
‘The castle is being built (by the emperor).’

This indicates that auxiliaries with *l*-participles are upper auxiliaries in  $I^0$ , while those with passive participles are lower ones in  $V^0$ . In Rus, the former can be identified with the PAST-OP in (5), while the latter are preserved in terms of the *zero auxiliary* in (23).



specified OP MOOD brings about the possible subjunctive readings, one of which is eventually specified according to the given context.

## 8 Syntactic representations

In this last section, syntactic representations of Rus sentences with various combinations of verbal mood, tense and voice will be presented. They serve to illustrate how morphology and semantics are dissociated according to the present proposal. Put differently, they show how the initially mentioned division of labor between semantic OPs and fully inflected verb forms works.

### 8.1 Present tense

The sentence in (41) represents indicative verbal mood, present tense, active voice.  $V^0$  is occupied by the inflected verb *pišet* which is marked [–Perf,–Past] and can, hence, be selected by the abstract PRES-OP merged in  $I^0$ . This OP furnishes the structure with semantic PRESENT and binds the situation argument of the verb (indicative mood).  $C^0$  is empty and determines that this is a non-embedded declarative sentence (cf. Zimmermann 2009, 486-487):

- (41) [<sub>CP</sub>  $C^0$  [<sub>IP</sub> *ona*<sub>i</sub>  $\emptyset$ <sub>PRES-OP</sub> [<sub>VP</sub> *t*<sub>i</sub> *pišet*<sub>V-Perf</sub> *pis'mo* ]]]  
'She is writing a/the letter.'

Rus imperfective processual passives are formed by means of fully inflected imperfective verbs with the reflexive marker *-sja* (REFL). In this case, however, REFL is not a reflexivizer, but a passivizer which blocks the external argument of the verb it attaches to. Consequently, this argument cannot be syntactified as a subject expression with nominative case. It follows that the internal argument of the verb is moved into the subject position where it checks the nominative.<sup>27</sup> Apart from that, the structure in (42) is quite parallel to the one in (41):

- (42) [<sub>CP</sub>  $C^0$  [<sub>IP</sub> *pis'mo*<sub>i</sub>  $\emptyset$ <sub>PRES-OP</sub> [<sub>VP</sub> *pišetsja*<sub>V-Perf</sub> *t*<sub>i</sub> ]]]  
'A letter is being written.'

The processual passive of perfective verbs is formed analytically by means of a perfective passive participle which co-occurs with an auxiliary form of BYT'.<sup>28</sup> The participial *n/t*-suffix does not alter the grammatical meaning of the

27 See Fehrmann, Junghanns & Lenertová (2010) for detailed analyses of REFL.

28 Analytical passives involving imperfective passive participles are marginal or ungrammatical in modern Rus, cf. (iii)-(v):

(iii) #*Pis'mo (bylo) pisano (Mariej)*.

affected verb, but it blocks its highest (usually the external) argument position such that the respective argument cannot be syntactified as a subject expression with nominative case. Thus, the passive participle structure can be taken to be the perfective counterpart of the imperfective ‘reflexive passive’ (see (42)).

In the case of present tense, the auxiliary is represented by the *zero form* (see section 6). This auxiliary is void of any aspectual or temporal semantics, but formally marked as [–Perf,–Past]. Due to these morphosyntactic features, it is selected by the PRES-OP in I<sup>0</sup>. The crucial aspectual marking is, thus, the one of the passive participle. I assume that this aspectual semantics is also responsible for the ‘perfect’ interpretation (and translation) of these ‘auxiliary-less’ structures (cf., e.g., Lehmann 1992; 2009):

- (43) [CP C<sup>0</sup> [IP *pis'mo*<sub>i</sub> Ø<sub>PRES-OP</sub> [VP Ø<sub>V-Perf</sub> [VP *napisano*<sub>V+Perf</sub> *t<sub>i</sub>* ]]]]  
 ‘A/the letter has been written.’

It is important to be aware of the fact that Rus also offers the possibility of superficially identical structures which are, however, copular sentences as (44) that involve the *zero copula* (PRESENT) and an adjective derived from a participle:

- (44) [CP C<sup>0</sup> [IP *pis'mo*<sub>i</sub> Ø<sub>PRES-OP</sub> [VP *t<sub>i</sub>* Ø<sub>Cop-Perf</sub> [AP *napisano*<sub>A</sub> ]]]]  
 ‘A/the letter is written.’

The *zero copula* allows the external argument of the adjective *napisano* to be syntactified as a subject expression with nominative case. The copula expresses a state in which *pis'mo* ‘letter’ has the property of ‘being written’. As opposed to (43), it is the imperfective aspect of the *zero copula* which is interpreted, while the aspect of the adjectival participle is neutralized due to the change of category. I assume that copular structures like (44) represent what is usually referred to as ‘statal passive’. Note that structures like (44) do not allow for an instrumental DP in Rus, whereas sentences like (43) allow such a ‘by-phrase’ expressing the agent (cf., e.g., Schlegel et al. 1992, 101-102). Since both structures are superficially identical, only appropriate contexts can clarify which one is at hand.

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(iv) \**Pis'mo (bylo) pišemo (Mariej)*.

(v) *Marija (byla) uvažema (studentami)*.

Although (v) is grammatical, it is not representative and probably idiomatic. As (iv) shows, the so-called *m*-participle cannot even be derived from all verbs. Example (iii) indicates that imperfective *n/t*-participles are also marginal (cf., e.g., Isačenko 1962). Imperfective processual passives are standardly realized by the so-called ‘reflexive passive’ as illustrated in (42).

## 8.2 Future tense

Future tense can be formed with perfective and imperfective verbs, too. With perfective verbs, all that is needed in Rus is that they fully inflect for person and number. Their resulting morphosyntactic feature combination [+Perf,–Past] enables the FUT-OP to select them. The structure can, thus, be furnished with semantic FUTURE and indicative mood; cf. (45)

- (45) [<sub>CP</sub> C<sup>0</sup> [<sub>IP</sub> ona<sub>i</sub> Ø<sub>FUT-OP</sub> [<sub>VP</sub> t<sub>i</sub> napišet<sub>V+Perf</sub> pis 'mo ]]]]  
'She will write a/the letter.'

With imperfective verbs, future tense cannot be formed by means of their fully inflected person/number forms since these are restricted to reflect PRESENT; cf. (41)-(43). The *bud*-auxiliary intervenes: It can be selected by the FUT-OP due to its morphosyntactic features [+Perf,–Past]. Being an auxiliary, it is, however, void of aspectual semantics. Hence, the structure is furnished with FUTURE due to the presence of *budet*, but the crucial aspect is the one of the infinitive:

- (46) [<sub>CP</sub> C<sup>0</sup> [<sub>IP</sub> ona<sub>i</sub> Ø<sub>FUT-OP</sub> [<sub>VP</sub> budet<sub>V+Perf</sub> [<sub>VP</sub> t<sub>i</sub> pisat'<sub>V–Perf</sub> pis 'mo ]]]]]]  
'She will be writing a/the letter.'

Analogous to the imperfective future in (46), which is active voice, it is possible to form a passive imperfective future. Like in example (42), this happens by means of REFL which occurs on the infinitive. Again, the auxiliary is only formally perfective; the crucial aspect is located in the infinitive:

- (47) [<sub>CP</sub> C<sup>0</sup> [<sub>IP</sub> pis 'mo<sub>i</sub> Ø<sub>FUT-OP</sub> [<sub>VP</sub> budet<sub>V+Perf</sub> [<sub>VP</sub> pisat'sja<sub>V–Perf</sub> t<sub>i</sub> ]]]]]]  
'A/the letter will be (being) written.'

A passive voice perfective future is formed along the same lines as shown for present tense in (43), namely by combining a perfective passive participle with a *bud*-auxiliary. The latter is selected by the FUT-OP which gives FUTURE and indicative. The crucial aspectual specification is the one of the passive participle:

- (48) [<sub>CP</sub> C<sup>0</sup> [<sub>IP</sub> pis 'mo<sub>i</sub> Ø<sub>FUT-OP</sub> [<sub>VP</sub> budet<sub>V+Perf</sub> [<sub>VP</sub> napisano<sub>V+Perf</sub> t<sub>i</sub> ]]]]]]  
'A/the letter will be written.' / 'A/the letter will have been written.'

Just like in the case of (43), the sentence in (48) represents a processual passive (licencing a 'by-phrase'). It has a superficially identical statal passive counterpart where the 'future copula' *budet* co-occurs with an adjective derived from a participle which excludes a 'by-phrase'.

### 8.3 Past tense

Turning to past tense, I will start with active voice structures. The example in (49) shows that the main predicate in  $V^0$  is an *l*-form. As such, it is marked with  $[\pm\text{Perf}, +\text{Past}]$ . The tense feature  $[\text{+Past}]$  is a sufficient identifier for the PAST-OP in  $I^0$  which introduces semantic tense and verbal mood. The inflected verb form is void of any such semantics.

- (49)  $[_{CP} C^0 [_{IP} \text{ona}_i \emptyset_{\text{PAST-OP}} [_{VP} t_i \text{na/pisala}_{V\pm\text{Perf}} \text{pis}'\text{mo} ]]]$   
 ‘She wrote a/the letter.’ / ‘She has written a/the letter.’

To form a past tense passive voice structure with imperfective verbs, REFL must be attached to the fully inflected *l*-form as illustrated in (50):

- (50)  $[_{CP} C^0 [_{IP} \text{pis}'\text{mo}_i \emptyset_{\text{PAST-OP}} [_{VP} \text{pisalos}'_{V-\text{Perf}} t_i ]]]$   
 ‘A/the letter was being written.’

On the other hand, if a past passive from perfective verbs is needed, the participial structure is chosen (parallel to (43), (48)). This implies the presence of an *l*-form-auxiliary which can be selected by the PAST-OP, cf. (51):

- (51)  $[_{CP} C^0 [_{IP} \text{pis}'\text{mo}_i \emptyset_{\text{PAST-OP}} [_{VP} \text{bylo}_{V-\text{Perf}} [_{VP} \text{napisano}_{V+\text{Perf}} t_i ]]]]$   
 ‘A/the letter was written written.’ / ‘A/the letter had been written.’

Again, a superficially identical statal passive arises if the *l*-form of the copula takes an adjective derived from a participle as its complement, cf. (44).

### 8.4 Subjunctive mood

Subjunctive mood is formed by the SUBJ-OP (*by*) which selects either finite *l*-forms or infinitives. Example (52) illustrates how a perfective or imperfective *l*-form is selected by the SUBJ-OP. Since the *l*-form is finite, it allows to syntactify the external argument as a subject expression with nominative case. The SUBJ-OP blocks the temporal argument of the verb and equips the structure with underspecified subjunctive mood ‘semantics’. The latter’s interpretation depends on the context which may cause an irrealis, conditional or subjunctive reading. Note that since *by* is enclitic, the *l*-form will usually adjoin to it, yielding the unmarked surface order where *by* follows the verb:

- (52)  $[_{CP} C^0 [_{IP} \text{ona}_i \text{na/pisala}_{V\pm\text{Perf}} + \text{by}_{\text{SUBJ-OP}} [_{VP} t_i t_V \text{pis}'\text{mo} ]]]$   
 ‘She would write a/the letter.’ / ‘She would be writing a/the letter.’

A subjunctive imperfective passive is formed by means of REFL that shows up on the *l*-form; cf. (53):

- (53) [<sub>CP</sub> C<sup>0</sup> [<sub>IP</sub> *pis* 'mo<sub>i</sub> *pisalos* 'V-Perf<sup>+</sup> *by*<sub>SUBJ-OP</sub> [<sub>VP</sub> t<sub>V</sub> t<sub>i</sub> ]]]]  
 'A/the letter would be written.'

A past tense passive of perfective verbs needs a perfective passive participle and an auxiliary. As the latter must be selectable by the SUBJ-OP, it must be an *l*-form. Similar to (52), adjunction of the auxiliary supports the clitic *by*, cf. (54):

- (54) [<sub>CP</sub> C<sup>0</sup> [<sub>IP</sub> *pis* 'mo<sub>i</sub> *bylo*<sub>V-Perf</sub><sup>+</sup> *by*<sub>SUBJ-OP</sub> [<sub>VP</sub> t<sub>V</sub> [<sub>VP</sub> *napisano*<sub>V+Perf</sub> t<sub>i</sub> ]]]]]]  
 'A/the letter would be written/would have been written.'

Subjunctive marking may also serve to identify non-factive complement clauses. In such cases, *by* adjoins to the overt complementizer *čto* 'that' in C<sup>0</sup>:<sup>29</sup>

- (55) [ ... [<sub>CP</sub> *čto*<sub>C</sub><sup>+</sup> *by*<sub>SUBJ-OP</sub> [<sub>IP</sub> *ona*<sub>i</sub> I<sup>0</sup> [<sub>VP</sub> t<sub>i</sub> *na/pisala*<sub>V±Perf</sub> *pis* 'mo ]]]]  
 '... in order for her to write a/the letter.'

In similar contexts, *by* may also select infinitives. Since these are non-finite, they do not licence a subject expression with nominative case. I assume that PRO is projected which is controlled by some antecedent (x<sub>i</sub>) and shares the latter's features and reference. Otherwise, arbitrary control must obtain:

- (56) [ x<sub>i</sub> ... [<sub>CP</sub> *čto*<sub>C</sub><sup>+</sup> *by*<sub>SUBJ-OP</sub> [<sub>IP</sub> PRO<sub>i</sub> I<sup>0</sup> [<sub>VP</sub> t<sub>i</sub> *na/pisat'*<sub>V±Perf</sub> *pis* 'mo ]]]]  
 '... in order to write a/the letter.'

## 9 Summary

The present paper has been concerned with the system of verb stems in Rus and with the integration of the forms and stems of the copula and auxiliary BYT' into this system. Proceeding from basic ideas of von Stechow (2007), a generative lexicalist model has been outlined that allows to clearly dissociate inflectional morphology from semantics. Thus, the paper offers a model of the semantics–morphology–syntax interface in which inflectional morphology is void of semantics and merely reflects semantic operators. By this, syntax is indeed reduced to the exclusive combination of lexical items according to their morphosyntactic features. Since semantic operators are merged as functional heads, the same syntactic mechanism determines their co-occurrence with specific inflected verb forms that have been furnished with the necessary morphological information by inflectional morphology (considered a sub-component of the mental lexicon).

29 As a clitic, *by* moves in PF and, thus, does not leave a trace in syntax. I am grateful to an anonymous reviewer for bringing this to my attention.

The paper argues in favor of the traditional two-stem system. BYT' fits into this system at least wrt. its overt forms derived from the stems /by/ and /bud/. The stem /bud/ has been analyzed as semantically imperfective, but formally perfective. In combination with the above-mentioned assumptions, the controversial *bud*-forms could thus be given a consistent analysis. Furthermore, the *zero form* of BYT' was identified as the unmarked form reflecting present tense. It is stored in a separate and fully specified lexical entry.

Importantly, the dissociation of inflectional morphology and semantics allows to account for identical verb forms occurring in multiple 'constructions' as, e.g., the Rus *l*-forms (subjunctive mood/past tense) or finite verbs marked for person and number (present tense/future tense).

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