From verbal prefixes to aspectual derivations in early Slavic

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**Introduction**

- Eckhoff and Haug (2015) analyze the rise of the derivation-based system of aspect in early Old Church Slavonic (OCS)
- The bulk of the paper is devoted to a synchronic analysis of the OCS aspectual system
- We also offered some thoughts on how this system arose in terms of “grammaticalization of telicity”
- The latter part was sketchy and very simplified, which is why I want to revisit it here.
Overview

1. Synchronic OCS

2. Diachrony – previous accounts

3. A new account

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Early Slavic aspect

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General

- Most modern Slavic languages express aspect with **derivative** morphology: prefixes and suffixes
- There is evidence of this system in OCS already
- However, there is also a **inflectional** distinction between the aorist and the imperfect in the past tense
Old Church Slavonic verbs

<table>
<thead>
<tr>
<th>Stem</th>
<th>Present</th>
<th>Aorist</th>
<th>Imperfect</th>
<th>Infinitive</th>
</tr>
</thead>
<tbody>
<tr>
<td>tvori-&lt;sup&gt;ipfv&lt;/sup&gt;</td>
<td>tvoritъ</td>
<td>tvori</td>
<td>tvorjaaše</td>
<td>tvoriti</td>
</tr>
<tr>
<td>sъ-tvori-&lt;sup&gt;pfv&lt;/sup&gt;</td>
<td>sъ-tvoritъ</td>
<td>sъ-tvori</td>
<td>*sъ-tvorjaaše</td>
<td>sъ-tvoriti</td>
</tr>
<tr>
<td>sъ-tvarja-&lt;sup&gt;ipfv&lt;/sup&gt;</td>
<td>sъ-tvarjatъ</td>
<td>*sъ-tvarja</td>
<td>sъ-tvarjaaše</td>
<td>*sъ-tvarjati</td>
</tr>
</tbody>
</table>

- Different stem formations (derivations) seem to be associated with aspectual values
- There is an inflectional exponent of ‘aspect’ in the past tenses (and in the participles)
- The present and the infinitive do not express ‘aspect’ in the inflection, but they do have the derivational distinction
Eckhoff and Haug (2015)

- The questions we asked:
  - What are the meanings of the stem formations?
  - What are the meanings of the aorist and imperfect past tenses?
- To answer those we used evidence from the Greek-OCS parallel corpora PROIEL and TOROT
- These contain the New Testament in the Greek original and in two manuscripts of the OCS translation (Marianus and Zographensis)
- The idea was to look at translation correspondences because
  - Greek aspect is relatively well understood (a large traditional literature, and formal analysis in Bary 2009, Bary and Egg 2012)
  - There are no transparent similarities between Greek and OCS aspectual morphology (despite etymological connections)
## OCS translations of Greek aorists and imperfects

<table>
<thead>
<tr>
<th></th>
<th>Sl. aorist</th>
<th>%</th>
<th>Sl. imperfect</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>aorist</td>
<td>2887</td>
<td>98.6</td>
<td>42</td>
<td>1.4</td>
</tr>
<tr>
<td>imperfect</td>
<td>79</td>
<td>11.1</td>
<td>631</td>
<td>88.9</td>
</tr>
</tbody>
</table>

**Table:** Marianus: n=3639

<table>
<thead>
<tr>
<th></th>
<th>Sl. aorist</th>
<th>%</th>
<th>Sl. imperfect</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>aorist</td>
<td>2604</td>
<td>98.2</td>
<td>47</td>
<td>1.8</td>
</tr>
<tr>
<td>imperfect</td>
<td>73</td>
<td>11.0</td>
<td>592</td>
<td>89.0</td>
</tr>
</tbody>
</table>

**Table:** Zographensis: n=3316
Inflectional and derivational aspect

The numbers strongly suggest a functional similarity between the aor./impf. distinctions in Greek and OCS. This raises the question of what the role of the seemingly aspectual, derivational morphology is:

- What do the prefixes mean?
- What do the suffixes mean?
- How does affixation relate to inflectional aspect?
What role for the affixes?

<table>
<thead>
<tr>
<th>affix</th>
<th>aorist</th>
<th>imperfect</th>
</tr>
</thead>
<tbody>
<tr>
<td>none</td>
<td>1143</td>
<td>224</td>
</tr>
<tr>
<td>prefix</td>
<td>1399</td>
<td>6</td>
</tr>
<tr>
<td>suffix</td>
<td>851</td>
<td>1388</td>
</tr>
<tr>
<td>both</td>
<td>1679</td>
<td>499</td>
</tr>
</tbody>
</table>

- The meaning of prefixation (without suffixation) must be incompatible with imperfective aspect, *unlike* in Greek
- We concluded that prefixation is already grammaticalized in the meaning of perfective aspect, but this may have been too quick
- Suffixation increases the frequency of the imperfect, but there is no general incompatibility
The affixation pattern does not by itself reveal aspectual markedness

But we can identify pairs by looking at the past tense behaviour
Pairing up verbs

Group 1 a prefixed verb partnered by an unprefixed verb: _na-uč-i-ti, uč-i-ti_ ‘teach’

Group 2 an unprefixed verb partnered by an unprefixed derived (suffixed) verb: (_pust-i-ti, pušt-a-ti_ ‘let go’)

Group 3 a prefixed verb partnered by a derived prefixed and suffixed partner (typically with vowel lengthening in the root): _o-stav-i-ti, o-stavl-ja-ti_ ‘leave’)

- In group 1, the prefixed verbs typically takes only the aorist, whereas the simplex one can take both aspects
- In group 2, the simplex verb typically takes both aspects and the suffixed one only the imperfect
- In group 3, both verbs take only a single aspect
Verb classes - group 1

Distribution of verbs and aspect in translations of σπείρω

- Pres. (Gk. impf.)
- Pres. (Gk. aor.)
- Impf./pres.ptcp (Gk. impf.)
- Impf./pres.ptcp. (Gk. aor.)
- Other (Gk. impf.)
- Other (Gk. aor.)
- Aor./past (Gk. impf.)
- Aor./past (Gk. aor.)
Verb classes - group 2

Distribution of verbs and aspect in translations of βαπτίζω

- krьstiti
- krьštati
- Pres. (Gk. impf.)
- Pres. (Gk. aor.)
- Impf./pres.ptcp (Gk. impf.)
- Impf./pres.ptcp. (Gk. aor.)
- Other (Gk. impf.)
- Other (Gk. aor.)
- Aor./past (Gk. impf.)
- Aor./past (Gk. aor.)

Freq
0 2 4 6 8 10 12
Verb classes - group 3

Distribution of verbs and aspect in translations of ἐπερωτάω

- Pres. (Gk. impf.)
- Pres. (Gk. aor.)
- Impf./pres.ptcp (Gk. impf.)
- Impf./pres.ptcp. (Gk. aor.)
- Other (Gk. impf.)
- Other (Gk. aor.)
- Aor./past (Gk. impf.)
- Aor./past (Gk. aor.)
Group 1

*tvoriti, svtoriti ‘do’*

*znati, poznati ‘recognize’*

*učiti, naučiti ‘teach’*

*jasti, srnesti ‘eat’*

*pisati, napisati ‘write’*

*rasti, vžzdrasti ‘grow’*

*kleti, prokleti ‘curse’*

*alkati, vžzalkati ‘fast’*

*dělati, srdělati ‘work’*

*sě(ja)ti, všsě(ja)ti ‘sow’*

*slyšati, uslyšati ‘hear’*

---

Group 2

*priimati, prijeti ‘take’*

*prišpati, prišpiti ‘arrive’*

*obrětati, obrěsti ‘find’*

*ostavljati, ostaviti ‘leave’*

*vprashašati, vprositi ‘ask’*

*ubivati, ubiti ‘kill’*

*razumevati, razuměti ‘understand’*

*sapisati, sšpasti*

*icěljati, icěli ‘cure’*

---

Group 3

*dajatai, dati ‘give’*

*padati, pasti ‘fall’*

*krštati, krštiti ‘baptize’*

*puštati, pustiti ‘divorce’*

*kuipovati, kupiti ‘buy’*

*saždati, saditi ‘plant’*

*svestati, světiti ‘sanctify’*

*pluvati, plinšti ‘spit’*
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Pragmatic strengthening

- ‘Default aspect’:
  - telic predicates → perfective interpretation
  - atelic predicates → imperfective interpretation

- This is a common inference in many languages (event realization, Bohnemeyer and Swift 2004)

- Pragmatic strengthening: → entailment
  - *sn-ěsti* ‘eat’, *o-stav-i-ti* ‘leave’ → perfective
  - *jasti* ‘eat’ → imperfective (?)
  - *o-stavl-ja-ti* ‘leave’ → imperfective
Problems

- *jasti* ‘eat’ with a quantized theme should actually come out as telic and hence perfective but it doesn’t (raised by Grønn 2007, p. 4)

- What does it mean to say that *sɔn-ęsti* is a telic *jasti*, especially since the latter can also occur with a quantized theme?

- Preverbs “expressing telicity” are found throughout IE but only in Slavic are they grammaticalized as perfective markers
  - We partly addressed this arguing that what’s special in Slavic is that the prefixes get superimposed on a pre-existing aspectual system
  - But that’s also the case in e.g. Latin
  - Moreover, Latin also restricts the combination of prefixation and perfective aspect (Haug 2005)
Bidirectional OT (Grønn 2007)

\[ f_1 > f_2; m_1 > m_2 \]

<table>
<thead>
<tr>
<th></th>
<th>incomplete events ((m_1))</th>
<th>complete events ((m_2))</th>
</tr>
</thead>
<tbody>
<tr>
<td>simplex ((f_1))</td>
<td>(\sqrt{\text{optimal}})</td>
<td>*(blocked)</td>
</tr>
<tr>
<td>prefixed ((f_2))</td>
<td>*(blocked)</td>
<td>(\sqrt{\text{weakly optimal}})</td>
</tr>
</tbody>
</table>

1. incomplete events unmarked meaning (across verbal situations)
2. generalized to \(f_1\) even with a quantized object
3. \(\langle f_1, m_1 \rangle\) strengthened by associative learning
4. \(\langle f_2, m_2 \rangle\) emerges as weakly optimal
5. \(\langle f_2, m_2 \rangle\) strengthened
6. secondary imperfectivization fills morphological gaps
Problems

- No account of the interaction with inflectional aspect
- Hard to see why $m_1$ would ever be the unmarked meaning for VPs with quantized objects
- Incorrect chronology:
  - assumes $m_1$ becomes central meaning of $f_1$ before $f_2$ associates with $m_2$
- Again, no account of the difference between $s\bar{n}-\check{e}st\check{i}$ and $jasti$ with a quantized object
Strong points

- Grønn is right to start from group 1 (prefixed verbs with unprefixed partners)
- The spread of secondary suffixation takes off in the 16th and 17th centuries, implying that what we see in OCS is the beginning of an S-curve (Andersen 2009)
- So chances are that the origin of aspect lies in group 1 and that secondary suffixation is a response to the grammaticalization of aspect
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A new perspective

- Previous accounts are vague on the meaning of the source construction (e.g. *sъn-ěstъ*) except that it is somehow related to telicity.

- In general there is a large philological literature on the use of ‘telicizing prefixes’ in Old IE, but no account of their meaning.

- A tempting candidate is Bary and Egg’s operator MAX (≈ AOR from Krifka 1989).

- For Bary and Egg, MAX is a coercion operator triggered by perfective aspect in Greek.

- So MAX is not perfective aspect, but a component of it, which would seem like a suitable starting point.

- Ultimately this does not work, but it fails for interesting reasons.
Bary and Egg 2012

- Bary and Egg analyze Greek aspects as relations between event times and topic times
  
  **PFV:** \( \lambda P \lambda t \exists e. P(e) \land \tau(e) \subseteq t \)
  
  **IPFV:** \( \lambda P \lambda t \exists e. P(e) \land t \subseteq \tau(e) \)

- In addition, there are aspectual selection restrictions
  
  **PFV** requires a bounded predicate
  
  **IPFV** requires an unbounded predicate

- These restrictions can be satisfied through various coercion operators, including MAX
Consider an unbounded predicate like *bouleuein* ‘be a senator’

- \( \text{IPFV}(\text{bouleuein}) = \lambda t. \exists e. \text{be.a.senator}(e) \land t \subseteq \tau(e) \)
- \( \text{PFV}(\text{boulein}) = \lambda t. \exists e. \text{be.a.senator}(e) \land \tau(e) \subseteq t \)

Because *be.a.senator* has the subinterval property we predict contrary to facts that \( \text{PFV}(\text{bouleuein}) \) could give us a time containing only a *part* of some maximal eventuality of being a senator

MAX maps a predicate \( P \) on the set of locally maximal, convex (uninterrupted) eventualities

- \( \text{MAX}(P)(e) \text{ iff } P(e) \land \text{CONV}(e) \land \forall e'. e \sqsubseteq e' \rightarrow \neg P(e') \)
- \( \text{PFV}(\text{MAX}(\text{bouleuein})) \) now gives us the right readings
prefixation = MAX?

- What if we took sъn-ѣsti to denote a set of maximal eating events?
- $[sъn-ѣsti] = [\text{MAX}](\lbrack jasti \rbrack) = 
  \lambda e. \text{eat}(e) \land \text{CONV}(e) \land \forall e'. e \sqsubseteq e' \rightarrow \neg \text{eat}(e')$
- sъn-ѣsti would denote the set of all maximal, convex eating events
- While a good fit for the Greek aorist, this notion of maximality turns out to be too permissive for OCS prefixation
Prefixed aorist with local maximality

(1) a. pros tên sklêrokardian humôn egrapsen because of your hardness of heart write.3.SG.AOR humin tên entolên tautên you.2PL.DAT this commandment.acc

b. po žestosrêdiju vašemu napisa because of your hardness of heart na-write.3.SG.AOR vamъ zapovêdь sijo you.2PL.DAT this commandment.acc

‘He wrote you this commandment because of your hardness of heart.’ (Mark 10.5)
Unprefixed imperfect without local maximality

(2) a. ho de Ἰησοῦς katῶ kupsas
the.NOM but Jesus.NOM down bend.AOR.PTCP
tôi daktulôi egraphen eis tên gên
the.finger.DAT write.3SG.IPFV on the ground

b. icь že nizь poklonь sę
the.NOM but Jesus.NOM down bend.PST.PTCP
prêtstomь pisaaše na zemi
finger.DAT ∅-write.3SG.IPFV on the ground
‘But Jesus bent down and was writing with his finger on the ground. (When they kept on questioning him, he straightened up and said.) (John 8.6)
Unprefixed aorist with local maximality

(3) a. peri gar emou ekeinos egrapsen
   about for I.GEN he.SG.M.NOM write.3SG.AOR

b. o mьnё bo tь pisa
   about I.LOC for he.NOM Ø-write.3SG.AOR

‘(If you believed Moses, you would believe me.) For he wrote
about me.’ (John 5.46)

- Here we have a complete, but extendable event
  - The maximal event of Moses writing about Jesus lies within the (past) reference time
  - The aorist is sensitive to this maximality, but the prefix requires something stronger
- So we typically get unprefixed aorists in OCS (but imperfective in MRus.)
David and the consecrated bread v1

(4) a. kai tous artous têς prothéseōs and the.ACC breads.ACC the.GEN presentation.GEN
ephagen
eat.3.SG.AOR

b. i xleby prĕdĕloženiĕ sŏněstĭ and breads.PL.M.ACC presentation.GEN sŏ-eat.3.SG.AOR
(How David went into the house of God) and ate the showbreads. (Mark 2.26)
David and the consecrated bread v2

(5)  a. kai tous artous têς prothéseôs elabên  kai and the showbreads.ACC take.3.SG.AOR

ephagen  kai edôken  kai tois met’ autou eat.3.SG.AOR and give.3.SG.AOR also those with him.DAT

b. i xleby prêdþloženiê priê  i and showbreads.ACC pri-take.3.SG.AOR

estî  i dastî  i  ð-eat.3.SG.AOR and ð-give.3.SG.AOR also
sôštiim sê nîmê being.with.him.DAT

‘(How David entered the house of God), took the showbreads, ate and gave to those with him.’ (Luke 6.4)
Second try

- Prefixation seems to require not only local maximality but global maximality across worlds: the event cannot be extended further.

- Similar observations have been made on verbal prefixes in other languages (incl. Tatevosov on Russian), and about *finish*.

- Piñon: *weak* and *strong* accomplishments, where the latter have two presuppositions:
  - There was a preceding event with the same agent and the same incremental theme such that the theme was partly affected.
  - An event of the type determined by the predicate and the incremental theme QC cannot be continued.

- The first presupposition is optional, as has also been observed for German prefixed verbs (Engelberg 2002, Rossdeutscher 2011).

- For now we focus on the second presupposition.
A standard accomplishment

\[
\begin{align*}
\text{a commandment:} & \quad \lambda R. \lambda e. [y \mid \text{commandment}(y)]; R(e, y) \\
\text{write:} & \quad \lambda y. \lambda x. \lambda e. [\mid \text{write}(e, x, y)] \\
\text{write}^{TR}: & \quad \lambda Q. \lambda x. \lambda e. Q(e, \lambda y. \lambda e. [\mid \text{write}(e, x, y)]
\end{align*}
\]

\[
\begin{array}{|c|c|}
\hline
\text{write}^{TR}(\text{a commandment}): & \lambda x. \lambda e. \text{commandment}(y) \\
\text{write}(e, x, y) & \\
\hline
\end{array}
\]
Global maximality

- In all worlds, all events of the type defined by the predicate and the incremental theme generalized quantifier have no superparts.

- We abbreviate \( \text{MAX}(T, Q) := \)
\[
\begin{align*}
[e'x' \mid ] ; Q(e', \lambda y. \lambda e[ | T(e, x', y)])) & \rightarrow \\
[ | \neg [e'' | e' \prec e''] ; Q(e' \oplus e'', \lambda y. \lambda e[ | T(e, x', y)]))]
\end{align*}
\]

\text{MAX}(\text{write, a commandment})
\[
\begin{align*}
[e'x'y' \mid \text{commandment}(y'), \text{write}(e', x', y')] & \rightarrow \\
[ | \neg [e''y'' | e' \prec e'', \text{commandment}(y''), \text{write}(e' \oplus e'', x', y'')]]
\end{align*}
\]
We will take MAX(write, Q) to be a presupposition of *na-pisati*

This amounts to a selectional restriction on the theme Q (vz. it must be quantized)

Such restrictions are informative in languages like Slavic (and Latin) with no articles

\[ \lambda Q. \lambda x. \lambda e. Q(e, \lambda y. \lambda e. [write(e, x, y), \partial (\text{MAX}(\text{write}, Q))] \]
commandment(\(y\)), write(\(e, x, y\))

\[
\partial \\
\begin{pmatrix}
\text{commandment}(y') \\
	ext{write}(e', x', y')
\end{pmatrix}
\]
Does this help?

- With a careful analysis of the source semantics, we are better equipped to understand what is going on.
- In particular we look at the combination of a prefixed (and unsuffixed) verb with imperfective aspect, which should be ruled out.
- Since the data show that the Slavic imperfect is close to the Greek one, we adopt Bary (2009)’s semantics (based on Dowty 1979).
Synchronic OCS

\[ x \ t_{TT} \]

\[ \square \text{inert} \]

\[ \text{commandment}(y), \ write(e, x, y), \ t_{TT} \subseteq \tau(e) \]

\[ \partial \]

\[ \text{commandment}(y'), \ write(e', x', y') \]

\[ e'' \ y'' \]

\[ e' \prec e'' \]

\[ \text{commandment}(y'') \]

\[ \text{write}(e' \oplus e'', x', y'') \]
The presupposition is irrelevant for the actual world: the P-event could not be continued in any world, but the imperfective does not assert the existence of a P-event in the first place.

Infelicitous for similar reasons as *The sea was rising ten feet when... or John was drinking three cups of tea when...* (Mittwoch 1988)
The infelicity of a strong accomplishment with the imperfective follows from Gricean reasoning.

This is good since we observe the same effect in e.g. Latin, which also has prefixed with no lexical content: *conficio*, *comedo*.

This suggests a grammaticalization path from lexical prefix to strong accomplishment marker.

Incompatibility with the imperfect arises already at the strong accomplishment stage.

So Eckhoff and Haug may have been wrong in claiming that prefixation is already grammaticalized as perfective aspect in OCS.
How *did* it change then?

- Since the verbal prefix *qua* marker of strong accomplishment is incompatible with imperfective aspect, speakers are free to reanalyze it *without* visible results
  - $\text{na-pisa-∅} = \text{AOR}(\text{write}(e, x, Q) \land \partial(\text{MAX}(\text{pisa}, Q)))$
  - $\text{∅-pisa-aše} = \text{IPFV}(\text{write}(e, x, Q))$

- This makes it possible to express aspect outside the past tense (e.g. in infinitives)

- The crucial event now becomes the *loss* of the imperfect/aorist distinction and its replacement with the *l*-form
Infinitives and their Greek originals

Freq
Consequences of the morphology loss

<table>
<thead>
<tr>
<th>Pre-loss</th>
<th>Post-loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>pisaaše ±QUA</td>
<td>pisa ±QUA</td>
</tr>
<tr>
<td>pisal ±QUA</td>
<td>pisal ±QUA</td>
</tr>
</tbody>
</table>

- The loss of the morphology leads to an increase in the scope of imperfective aspect, which makes a number of correct predictions about the later Slavic system.
  - Intimate connection between perfectivity and telicity (Dahl 1985)
  - A very general temporal relation of overlap for the imperfect (Grønn 2003): \( \tau(e) \subseteq t \lor \tau(e) \supseteq t \rightarrow \tau(e) \circ t \)
  - The rise of the imperfective general-factual, limited to class 1 in Old Russian until the 16th century (Kukuškina & Ševeleva 1991)
  - Incompatibility of the perfective aspect with durational adverbs
  - Some of these effects are partly blurred by the (largely post-OCS) development of specialized prefixes po- and pro- as well as the spread of secondary imperfectivization.
What about the first presupposition?

- Strong accomplishments come with an optional presupposition that the event has already started
- In fact, it has been proposed that Modern Russian perfectives have exactly this presupposition, to account for their behaviour under negation (Forsyth 1970, Padučeva 1996, contra Grønn 2003:60ff.)
- Whatever the merits of this analysis for Modern Russian, there’s actually no evidence that negation affects OCS aspect in ways that it does not affect Greek
- It has also been suggested that the use of the imperfective aspect in negated imperatives stems from a desire to prohibit the entire event (Boguslawski 1985, Levinson 2005, see also Partee)
- But again, OCS shows no preference for imperfective aspect in negated imperatives
Conclusions

- We have identified one grammaticalization path from lexical prefix to strong accomplishment marker
- This gives us lexical telicity, which is a better source for perfective aspect than VP-level aspect
- The subsequent change to aspect marker is due to classical reanalysis + subsequent loss that makes the reanalysis visible
- The large remaining question is how this was generalized to larger classes of verbs with the rise of secondary imperfectivization