Perfectivity dilemma

Verbless Aspect and Aspectless Verb

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Overview

- When do aspectual operators enter the derivation in languages like Russian?

(1) Vasja **na-pisa-l** pis'm-o.
V. PRF-write-PST.M letter-ACC
'Vasja wrote a letter.'

Perfectivity dilemma

(2) $[_{CP} \dots [_{F_{i+1}P} \dots [_{F_iP} \dots [_{F_{i-1}P} \dots [_{VP} \dots [_{V}$ **PFV-napisa**$]]]]]$

(3) $[_{CP} \dots [_{F_{i+1}P} \dots [_{F_iP} \dots$ **PFV** $[_{F_{i-1}P} \dots [_{VP} \dots [_{V}$ napisa-$]]]]]$

Overview

- Perfectivity in Russian
- The dilemma
- Argument from process deverbal nominals
- More on the structure of process nominals
- Semantic derivation
  - vP denotations
  - Perfective operators

Perfectivity in Russian

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Perfectivity in Russian

"Imperfective"	**"Perfective"**	**"Imperfective"**
	da-t' 'give'	da-va-t'
pisa-t' 'write'	na-pisa-t'	
	za-pisa-t' 'record'	za-pis-yva-t'
čita-t' 'read'	pro-čita-t'	pro-čit-yva-t'

Today: "perfective" incremental verbs with "resultative prefixes" like *napisat'* 'write'

Perfectivity in Russian

Perfectivity effects

- Morphosyntactic distribution
- Reference time
- Culmination/telicity
- Aspectual composition

Perfectivity in Russian

- **Morphosyntactic distribution**
- Periphrastic Future

(4) *Vasja bud-et **na-pisa-t'** pis'm-o
V. AUX-3SG PRF-write-INF letter-ACC
'Vasja will write a letter.'

- Complement of aspectual verbs

(5) *Vasja nača-l **na-pisa-t'** pis'm-o
V. start-PST.M PRF-write-INF letter-ACC
'Vasja started writing a letter.'

Perfectivity in Russian

- **Reference time**

(6) Kogda ja priše-l, Vasja **na-pisa-l** pis'm-o.
when I come-PST V. PRF-write-PST letter-ACC
1. 'When I came, Vasja wrote a letter'
2. *'When I came, Vasja was writing a letter'

(7) τ(I-came(e)) « τ(Vajsa-write-a-letter(e))

(8) *τ(I-came(e)) $\subset$ τ(Vajsa-write-a-letter(e))

Perfectivity in Russian

- **Telicity: time-span adverbials**

(9) a. Vasja **na-pisa-l** pis'm-o
V. PRF-write-PST.M letter-ACC
za dva čas-a.
in two.ACC hour-GEN
'Vasja wrote a letter in two hours.'

b. *Vasja **na-pisa-l** pis'm-o
V. PRF-write-PST.M letter-ACC
dva čas-a.
two.ACC hour-GEN
'Vasja wrote a letter for two hours.'

Perfectivity in Russian

- **Telicity: conjunction criterion** (Verkuyl 1972)

(10) Vasja **na-pisa-l** pis'm-o v
V. PRF-write-PST:M letter-ACC in
dva čas-a i v tri čas-a.
two hour-GEN and in two hour-GEN
'Vasja wrote a letter at 2 p.m. and at 3 p.m.'

OK: two distinct events
NOT OK: a single continuous event

Perfectivity in Russian

- **Aspectual composition**

(11) Vasja **na-pisa-l** pis'm-a…
V. PRF-write-PST.M letter-ACC.PL
1. 'Vasja wrote (all) the letters.'
2. *'Vasja wrote letters.'

(12) ...no osta-l-o-s' ešče neskol'ko.
but remain-PST-N-REFL more a.few
'… but there are a few more (letters to write).'

- Unique maximal interpretation (Filip 2005)

The dilemma

The dilemma

- **Accounting for perfectivity effects**

(13) Low aspect theory

a. $[_{CP} \dots [_{F_{i+1}P} \dots [_{F_iP} \dots [_{F_{i-1}P} \dots [_{VP} \dots [_V$ **PFV-napisa**$]]]]]]$

b. $[_{CP} \dots [_{F_{i+1}P} \dots [_{F_iP} \dots [_{F_{i-1}P} \dots [_{VP}$ **PFV** $\dots [_V$ napisa$]]]]]]$

(14) High aspect theory

$[_{CP} \dots [_{F_{i+1}P} \dots [_{F_iP} \dots$ **PFV** $[_{F_{i-1}P} \dots [_{VP} \dots [_V$ napisa-$]]]]]]$

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The dilemma

- Low aspect theory recognizes "perfective" and "imperfective" verbs
- Traditional Russian/Slavic Aspectology
- Krifka 1992, Filip 1993/1999, 2000, 2001, 2004, 2005a,b, 2008, Dimitrova-Vulchanova 1996, Verkuyl 1999, Piñon 2001, Paslawska, von Stechow 2003, Ramchand 2004, Filip, Rothstein 2005, Pereltsvaig 2002, McDonald 2008

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The dilemma

- High aspect theory:
  verbs (and VPs) are aspectless
- No proposals so far

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The dilemma

- What kind of empirical evidence can help us to decide between low aspect and high aspect theories?
- The problem of indirect access

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The dilemma

- Problem of indirect access
- Kratzer 2003:

  "The verbs we see – surrounded by their arguments and with all their inflections tucked on – might not be the verbs that are ultimately fed to the semantic interpretation component… We would have to formulate hypotheses about the meaning of uninflected, tense- and aspectless forms, even though we might never encounter those forms in reality."

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The dilemma

- The strategy for solving the problem: get rid of (some of) the clausal functional structure

$[_{CP} \dots [_{F_{i+1}P} \dots [_{F_iP} \dots \quad [_{F_{i-1}P} \dots [_{VP} \dots [_V$ PFV-napisa$]]]]]$

$[_{CP} \dots [_{F_{i+1}P} \dots [_{F_iP} \dots$ PFV $[_{F_{i-1}P} \dots [_{VP} \dots [_V \quad$ napisa$]]]]]$

- If we do not find perfectivity effects in **a structurally deficient configuration**, this can only happen because PFV is not there
- An irrefutable evidence in favor of high aspect theory

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The dilemma

- **More Direct Access Hypothesis**

  The proposal: look at structurally deficient configurations (SDCs) where a part of the structure of a fully projected clause is only present

  SDCs give us an opportunity to see properties of vPs/VPs/verbs at early stages of syntactic derivation, when (at least some of) the clausal structure is not yet there.

  In SDCs characteristics of uninflected vPs/VPs/verbs are more transparently visible.

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Argument from process nominals

- Perfectivity in Russian
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- Argument from process deverbal nominals
- More on the structure of process nominals
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  - vP denotations
  - Perfective operators

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Argument from process nominals

- Process deverbal nominals
- Abney 1987, Grimshaw 1990, Kratzer 1996, van Hout, Roeper 1998, Alexiadou 2001, 2004, Fu, Roeper and Borer 2001, Harley 2006, a.m.o.
- Deverbal nouns in *-nij-/-tij-* in Russian

(15) na-pisa-n-ij-e pis'm-a
PRF-write-N/T-NOUN-NOM letter-GEN
'writing (of) a letter'

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Argument from process nominals

- Process deverbal nominals are SDCs
- Fully-inflected clauses

$[_{CP} \dots [_{F_iP} \dots [_{F2P} \dots$	$[_{F1P} \dots [_{vP} \dots [_{VP} \dots V \dots]]]]]]$
$[_{DP} \dots D \; [_{NP} \dots N \dots$	$[_{F1P} \dots [_{vP} \dots [_{VP} \dots V \dots]]]]]$

- Process deverbal nominals

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Argument from process nominals

- If PFV is a component of functional structure not present in deverbal nominals, deverbal nominals will never show perfectivity effects

$[_{CP} \dots [_{F_iP}$ **PFV** $[_{F2P} \dots$	$[_{F1P} \dots [_{vP} \dots [_{VP} \dots V \dots]]]]]]$
$[_{DP} \dots D \quad [_{NP} \dots N \dots$	$[_{F1P} \dots [_{vP} \dots [_{VP} \dots V \dots]]]]]$

- The crucial argument for the high aspect theory

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Argument from process nominals

Perfectivity effects

- Morphosyntactic distribution
- Reference time
- Culmination/telicity
- Aspectual composition

(16) na-pisa-n-ij-e pis'm-a
PRF-write-N/T-NOUN-NOM letter-GEN
'writing (of) a letter'

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Argument from process nominals

- **Morphosyntactic distribution**
- Complement of aspectual verbs

(17) *Vasja nača-l **na-pisa-t'** pis'm-o
V. start-PST.3SG PRF-write-INF letter-ACC
'Vasja started writing a letter.'

(18) Vasja nača-l **na-pisa-n-ij-e** pis'm-a
V. start-PST.3SG PRF-write-N/T-NOUN-ACC letter-GEN
'Vasja started writing a letter.'

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Argument from process nominals

- **Reference time**

(19)Kogda ja priše-l,
when I come.PFV-PST
Vasja **na-pisa-l** pis'm-o
V. write.PFV-PST.M letter-ACC
1. 'When I came, Vasja wrote a letter'
2. *'When I came, Vasja was writing a letter'

(20) *τ(I-came(e)) $\subset$ τ(Vajsa-write-a-letter(e))

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Argument from process nominals

- **Reference time**

(20) Ja priše-l vo vremja
I come.PFV-PST in time
na-pisa-n-ij-a pis'm-a
PRF-write-N/T-NOUN-GEN letter-GEN
'I came at the time of writing a letter.'

(21) $^{OK}\tau$(I-came(e)) $\subset$ τ(writing-a-letter(e))

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Argument from process nominals

- **Telicity: conjunction criterion** (Verkuyl 1972)

(22) Vasja **na-pisa-l** pis'm-a
V. PRF-write-PST.M letter-ACC.PL
v dva čas-a i v tri čas-a.
in two hour-GEN and in three hour-GEN
'Vasja wrote the letters at 2 p.m. and at 3 p.m.'

OK: two distinct events
NOT OK: a single continuous event

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Argument from process nominals

- **Telicity: conjunction criterion** (Verkuyl 1972)

(23) **na-pisa-n-ij-e** pisem v dva
PRF-write-N/T-NOUN-NOM letter-GEN:PL in two
čas-a i v tri čas-a.
hour-GEN and in three hour-GEN
'writing (the) letters at 2 p.m. and at 3 p.m.'

OK: two distinct events
OK: a single continuous event

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Argument from process nominals

- **Aspectual composition**

(24) Vasja **na-pisa-l** pis'm-a…
V. PRF-write-PST:M letter-ACC:PL
1. 'Vasja wrote (all) the letters.'
2. *'Vasja wrote letters.'

(25) ... *no osta-l-o-s' ešče neskol'ko.
but remain-PST-N-REFL more a.few
'but there still are a few more (letters to write).'

- Unique maximal interpretation (Filip 2005)

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Argument from process nominals

- **Aspectual composition**

(26) **na-pisa-n-ij-e** pisem
PRF-write-N/T-NOUN-NOM letter-GEN:PL
1. 'writing (all) the letters'
2. 'writing letters'

- The unique maximal interpretation is not obligatory

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Argument from process nominals

- Aspectual composition

(27) N**a-pisa-n-ij-e** pisem
PRF-write-N/T-NOUN-NOM letter.GEN.PL
prodolža-l-o-s' ves' den' …
last-PST-N-REFL whole day
'Writing letters lasted for the whole day long...'

(28) ... ^{OK}no osta-l-o-s' ešče neskol'ko.
but remain-PST-N-REFL more a.few
'but there are a few more (letters to write).'

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Argument from process nominals

- Culmination ↔ unique maximal interpretation

(29) **Na-pisa-n-ij-e** pisem
PRF-write-N/T-NOUN-NOM letter-GEN.PL
zanja-l-o dva čas-a.
take-PST-N two hour-GEN
'Writing all the letters took two hours.'

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Argument from process nominals

- Activity → bare interpretation

(30) Ja celyj den' ne vyxodi-l iz
I whole day not come.out-PST.M from
dom-a, zanima-ja-s' **na-pisa-n-ij-em**
house-GEN occupy-CONV-REFL PRF-write-N/T-NOUN-INSTR
pisem.
letter-GEN.PL
'I did not leave home the whole day long, engaged in writing [∅ letters].'

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Argument from process nominals

- Aspectual composition in languages like English

(31) John wrote the letters in an hour || $^{??}$for an hour.

(32) John wrote letters for an hour || #in an hour.

- Before PFV is merged, aspectual composition in Russian is much the same as in English

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Argument from process nominals

- No perfectivity effects in process nominalizations
- Whatever part of the clausal structure, XP, is embedded within nominalizations, PFV merges outside that XP

$[_{CP} \dots [_{F/P}$ **PFV** $[_{F/-tP} \dots$ $[_{XP} \dots V \dots]]]]$

$[_{DP} \dots D$ $[_{NP} \dots N \dots$ $[_{XP} \dots V \dots]]]$

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More on process nominals

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More on process nominals

- Process deverbal nominals

(33) na-pisa-n-ij-e (pis'm-a)
PRF-write-N/T-NOUN-NOM letter-GEN
'writing (of) a//the letter'

[$_{NP}$ -ij- [$_{n/tP}$ -n- [$_{XP}$ … napisa …]]]

- XP=?

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More on process nominals

- Nominalization in Russian and a few other Slavic languages
- **XP=V:** Rappaport 2000, 2001 for Russian
- **XP=VP:** Rappaport 2000, 2001 for Polish, Schoorlemmer 1995 for Russian
- **XP=AspP:** Schoorlemmer 1995 for Polish, Prochazkova 2006 for Czech, Markova 2007 for Bulgarian

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More on process nominals

- A few diagnostics for the structure of nominalizations
- Temporal adverbials, agent-oriented adverbials, aspectual adverbials
- Purpose adjuncts
- Morphological make-up

- Pazelskaya, Tatevosov 2005, 2008, Tatevosov 2008

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More on process nominals

- Temporal adverbials

(34) jest' pokazani-ja dlja **okaza-n-ij-a**
exist.PRS indication-PL for render-NMN-N-GEN
pomoshch-i *nemedlenno.*
assistance-GEN immediately
'There are reasons for rendering assistance immediately.'

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More on process nominals

- Agent-oriented adverbials

(35) **nanes-en-ij-e** sebe *umyshlenno*
inflict-NMN-N-NOM oneself.DAT deliberately
telesn-yx povrezhden-ij
bodily-GEN.PL injury-GEN.PL
'inflicting injuries upon oneself deliberately'

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More on process nominals

- Purpose adjuncts

(36) **otkry-va-n-ij-e** okn-a,
PRF.open-2IPF-N/T-NOUN-NOM winsow-GEN
čtoby vpusti-t' svež-ij vozdux
so.that let.in-INF fresh-ACC air.ACC
'opening the window the let the fresh air in'

More on process nominals

- Morphological make-up
- Superlexical prefixes in appropriate configurations merge outside the "secondary imperfective" *-iva-* → *nominalization

(37) a. [[zabi]-va]-t' (gvozdi)
hammer-2IPF-INF nail.ACC.PL
'hammer (the) nails'
b. [na-[[zabi]-va]]-t' gvozdej
CUM-hammer-2IPF-INF nail.GEN.PL
'hammer a lot of nails'

(38) a. zabi-va-n-ij-e
b. *na-za-bi-va-n-ij-e

More on process nominals

- Morphological make-up
- Superlexical prefixes in appropriate configurations merge outside the "secondary imperfective" *-iva-* → *nominalization

(39) a. [[otkry]-va]-t' (banki)
open-2IPF-INF can.ACC.PL
'open (the cans)'
b. [pere-[[otkry]-va]]-t' (vse banki)
DISTR-open-2IPF-INF all can.ACC.PL
'open (all the cans one by one)'

(40) a. otkry-va-n-ij-e
b. #pere-otkry-va-n-ij-e

More on process nominals

- Morphological make-up
- In other configurations, the same prefixes can merge below *-iva-* → nominalization OK

(41) a. [[na-dar]-iva]-t' (kuč-u podark-ov)
CUM-present-2IPF-INF heap-ACC gift-GEN.PL
'make a lot of gifts (regularly)'
b. OKna-dar-iva-n-ij-e

(42) a. [[pere-my]-va]-t' (vsju posud-u)
DISTR-wash-2IPF-INF all.ACC dishes-ACC
'wash all the dishes one by one (regularly)'
b. OKpere-my-va-n-ij-e

More on process nominals

- Process deverbal nouns in Russian maximally contain a projection of the "secondary imperfective" morpheme *-iva-*.
- Any material that merges outside *-iva-* blocks nominalization
- Note: "secondary imperfective" is a traditional category label assigned to *-iva-*. By continuing using this label I do not imply that *-iva-* is an exponent of the imperfective (viewpoint) aspect. A possible analysis for *-iva-*: inertia/continuation modality operator (Tatevosov, Ivanov 2009; see Bar-el et al. 2005 for a similar proposal)

More on process nominals

- If the above reasoning is correct, and process nominals can contains as much as *iva*P, then PFV, which does not show up in nominals, must merge outside *iva*P

$[_{CP} \ldots [_{F/P}$ **PFV** $[_{F/\text{-}TP} \ldots$ $[_{ivaP} \ldots [_{vP} \ldots [_{VP} \ldots V \ldots]]]]$

$[_{DP} \ldots D \; [_{NP} \ldots N \ldots$ $[_{ivaP} \ldots [_{vP} \ldots [_{VP} \ldots V \ldots]]]]$

- This necessarily makes a theory of Russian aspect a variant of the high aspect theory

Semantic derivation

- Perfectivity in Russian
- The dilemma
- Argument from process deverbal nominals
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  - Perfective operators

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Semantic derivation

- **Explananda**

(43) **na-pisa-n-ij-e** pisem
PRF-write-N/T-NOUN-NOM letter-GEN:PL
1. 'writing (all) the letters' <telic; unique maximal argument>
2. 'writing letters' <atelic; bare argument>

(44) Vasja **na-pisa-l** pis'm-a…
V. PRF-write-PST.M letter-ACC.PL
1. 'Vasja wrote (all) the letters.'
2. *'Vasja wrote letters.'

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Semantic derivation

- **Explananda**
- The range of interpretation of the nominal in (43)
- The perfectivity effects in (44)

- **Components of the analysis:**
- denotation(s) for vP that nominals and fully inflected clauses share
- semantics for PFV

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Semantic derivation

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vP denotations

(45) a. **na-pisa-n-ij-e** pisem
PRF-write-N/T-NOUN-NOM letter.GEN.PL
'writing (all) (the) letters'

b. [... [$_{NP}$ -ij- [$_{n/tP}$ -n- [$_{vP}$ Agent [$_{VP}$ napisa- pisem]]]]]

(46) a. Vasja **na-pisa-l** pis'm-a…
b. V. PRF-write-PST.M letter-ACC.PL
'Vasja wrote all the letters.'

b. [... [$_{FP}$ PFV … [$_{vP}$ Vasja Agent [$_{VP}$ napisa- pisem]]]]]

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vP denotations

- Verb denotation
- Non-prefixed and prefixed verbal stems differ as to their event structure

(47) Non-prefixed stems: activities
|| *pisa-* || = λxλe [write(e) ∧ theme(x)(e)]

(48) Prefixed stems: accomplishments
|| *na-pisa-* || = λxλe∃s [write(e) ∧ theme(x)(e) ∧ i-cause(s)(e) ∧ written(s) ∧ arg(x)(s)].

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vP denotations

- The causal relation

(49) The incremental causal relation
$\forall e \forall s[\text{i-cause}(s)(e) \leftrightarrow \text{cause}(s)(e) \wedge \text{MSbSE}(\text{cause}) \wedge \text{MSoSE}(\text{cause})]$

(50) Mapping to subordinate subevents with temporal coincidence
$\forall R[\text{MSbSE}(R) \leftrightarrow \forall e \forall e' \forall e'' [R(e')(e) \wedge e'' < e \rightarrow \exists e''' [e''' < e' \wedge R(e''')(e'') \wedge \tau(e''') = \tau(e'')]]$

(51) Mapping to superordinate subevents with temporal coincidence
$\forall R[\text{MSoSE}(R) \leftrightarrow \forall e \forall e' \forall e'' [R(e')(e) \wedge e'' < e' \rightarrow \exists e''' [e''' < e \wedge R(e'')(e''') \wedge \tau(e''') = \tau(e'')]]]$

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vP denotations

- Evidence for event structure

- Scope of negation; scope of 'almost' (Dowty 1979 and much subsequent work)
- Restitutive 'again' (especially von Stechow 1996)
- Obligatoriness of the internal argument (Rappaport Hovav and Levin 1998)

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vP denotations

- Scope of negation: clauses

(52) Vasja ne **pisa-l** kursov-uju
V. not write-PST.M term.paper-ACC
'Vasja did not write his term paper.'

- (52) entails that no writing activity has been performed

(53) Vasja ne **na-pisa-l** kursov-uju
V. not PRF-write-PST.M term.paper-ACC
'Vasja did not write his term paper.'

- (53) does not entail the no writing activity has been performed

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vP denotations

- Scope of negation: nominals

(54) **Ne-pisa-n-ij-e** kursovoj
not-PRF-write-N-NOUN-NOM term.paper-ACC
budet imet' serjeznyje posledstvija
will have serious consequences
'Not writing a term paper will have serious consequences.'
1. If no writing activity is performed,…
2. *If the writing activity is not completed,…

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vP denotations

- Scope of negation: nominals

(55) **Ne-na-pisa-n-ij-e** kursov-oj
not-PRF-write-N/T-NOUN-NOM term.paper-GEN
k dedlajnu budet imet' serjeznyje posledstvija
to deadline will have serious consequences
'Not writing a term paper before the deadline will have serious consequences.'
Scenario 1: A warning message to the students before they start writing
Scenario 2: A warning message to the students who are in the midst of writing

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vP denotations

(56) NP denotation
$|| [_{NP} \text{ pis'ma }] || = \lambda y.\text{letters}(y)$
Axiom: CUM(letters)

(57) Cumulativity
$\forall P[\text{CUM}(P) \leftrightarrow \exists x,y[P(x) \wedge P(y) \wedge \neg\, x = y] \wedge \forall x,y[P(x) \wedge P(y) \rightarrow P(x \oplus y)]]$

(58) Quantization
$\forall P[\text{QUA}(P) \leftrightarrow \forall x,y[P(x) \wedge P(y) \rightarrow \neg\, y < x]]$

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vP denotations

(59) D denotations

a. || [$_D$ SIGMA] || = $\lambda P[\sigma x.P(x)]$

where $\sigma x.P(x)$ is the sum of all elements of P, if that sum is in the extension of P, undefined otherwise

b. || [$_D$ INDEF] || = $\lambda P \lambda R \lambda e \exists x[P(x) \wedge R(x)(e)]$

- SIGMA is responsible for the unique maximal interpretation
- INDEF creates the bare (indefinite) interpretation

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vP denotations

(60) DP denotations

a. || [$_{DP}$ SIGMA [$_{NP}$ letters]] || = σx.letters(x)

b.|| [DP INDEF [NP letters]] || = $\lambda R \lambda e \exists x$[letters(x) $\wedge$ R(x)(e)]

(61) v denotations

a. || v_{nomin} || = $\lambda e \exists x$[Agent(x)(e)]

b. || v_{trans} || = $\lambda x \lambda e$[Agent(x)(e)]

- v denotations combine with the denotation of VP through (appropriate versions of) Event Identification (Kratzer 1996)

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vP denotations

- Nominals

(62) || [$_{vP}$ v_{nomin} [$_{VP}$ na-pis- [$_{DP}$ SIGMA [$_{NP}$ pis'ma]]]] || = $\lambda e \exists x$ [Agent(x)(e) $\wedge$ $\exists$s[write(e) $\wedge$ Theme(σy.letters(y))(e) $\wedge$ i-cause(s)(e) $\wedge$ written(s) $\wedge$ arg(σy.letters(y))(s)]

- (62) denotes a set of writing events in which there is an agent and the maximal individual consisting of all the contextually relevant letters is the theme; this individual enters the result state of being written.
- The event predicate is quantized: no proper part of an event in which the maximal individual consisting of all the letters has been written and entered the result state is an event in which the same individual has been written and entered the result state

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vP denotations

- Nominals

(63) || [$_{DP}$ INDEF [$_{NP}$ pis'ma]]$_1$ λ_1 [$_{vP}$ v_{nomin} [$_{VP}$ na-pis- t_1]] || = $\lambda e \exists y$ [letters(y) $\wedge$ $\exists$x [agent(x)(e) $\wedge$ $\exists$s[write(e) $\wedge$ theme(y)(e) $\wedge$ i-cause(s)(e) $\wedge$ written(s) $\wedge$ arg(y)(s)]]

- The internal argument undergoes QR for type reasons
- (63) denotes a set of writing events in which there is an agent and an individual that falls under *letters* is the theme; this individual enters the result state of being written.

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vP denotations

- The event predicate in (63) fails to be quantized. Given that, by assumption, λy.letters(y) is not quantized, but cumulative, and the Theme relation is incremental, and given the properties of the i-cause relation, if *e* is an event in which some letters *y* have been affected by writing and entered a result state *s* of being written, then *e*', *e*' < *e*, is an event in which some letters *y'*, *y'* < *y,* have been affected by writing and entered a result state *s'*, *s'* < *s*. Therefore, both *e* and *e'* fall under the denotation of the event predicate in (63), hence this predicate fails to be quantized.

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vP denotations

- vP denotations in (62)-(63) is all we need to get the right semantics for process nominals

(64) a. **na-pisa-n-ij-e** pisem

PRF-write-N/T-NOUN-NOM letter-GEN:PL

'writing (all) the letters'

<telic; unique maximal argument>

b. $\lambda e \exists x$ [agent(x)(e) $\wedge$ $\exists$s[write(e) $\wedge$ theme(σy.letters(y))(e) $\wedge$ i-cause(s)(e) $\wedge$ written(s) $\wedge$ arg(σy.letters(y))(s)]]

66

vP denotations

(65) a. **na-pisa-n-ij-e** pisem
PRF-write-N/T-NOUN-NOM letter-GEN:PL
'writing letters' <atelic; bare argument>

- b. λe∃y [letters(y) ∧ ∃x[agent(x)(e) ∧ ∃s[write(e) ∧ theme(y)(e) ∧ i-cause(s)(e) ∧ written(s) ∧ arg(y)(s)]]]

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vP denotations

- vP denotations for nominals and fully inflected clauses only differ as to whether the agent argument position is saturated or a corresponding variable gets existentially bound
- This difference is irrelevant for telicity and interpretation of the internal argument

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vP denotations

- vP denotations (clauses)

(66) || [$_{vP}$ Vasja v_{trans} [$_{VP}$ na-pis- [$_{DP}$ SIGMA [$_{NP}$ pis'ma]]]] || =
λe[agent(vasja)(e) ∧ ∃s[write(e) ∧ theme(σy.letters(y))(e) ∧ i-cause(s)(e) ∧ written(s) ∧ arg(σy.letters(y))(s)]

- (66) denotes a set of writing events in which Vasja is an agent and the maximal individual consisting of all the contextually relevant letters is the theme; this individual enters the result state of being written.
- (66) is quantized for the same reasons as (62)

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vP denotations

- vP denotations (clauses)

(67) || [$_{DP}$ INDEF [$_{NP}$ pis'ma]]$_1$ λ_1 [$_{vP}$ Vasja v_{trans} [$_{VP}$ na-pis- t_1]] || =
λe∃y [letters(y) ∧ agent(Vasja)(e) ∧ ∃s[write(e) ∧ theme(y)(e) ∧ i-cause(s)(e) ∧ written(s) ∧ arg(y)(s)]]

(67) denotes a set of writing events in which Vasja is an agent and an individual that falls under *letters* is the theme; this individual enters the result state of being written.

(67) fails to be quantized for the same reason as (63)

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vP denotations

- The non quantized event predicate in (67) never shows up in fully inflected clauses: the latter can only be telic (=quantized) and the internal argument must receive the unique maximal interpretation.
- Perfectivity effect

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Perfective operators

- Perfectivity in Russian
- The dilemma
- Argument from process deverbal nominals
- More on the structure of process nominals
- Semantic derivation
  - vP denotations
  - Perfective operators

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Perfective operators

- Filip 2005: the verb contains a built-in σ-operator

(68) || napisa || = λPλxλe[write(e) ∧ Agent(x)(e) ∧ IncTheme(σx.Px)(e) ∧ …]

- Without a stipulation that (relevant classes of) "perfective verbs" are born with σ, the proposal does not work
- But the stipulation cannot be correct, since it is an instance of the low aspect theory

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Perfective operators

- Klein 2004 and elsewhere: reference time includes event time

(68) || PFV || = λPλt∃e[P(e) ∧ τ(e) ⊂ t]

(69) || [$_{FP}$ PFV [$_{vP}$ [$_{DP}$ INDEF [$_{NP}$ pis'ma]]$_1$ λ$_1$ [$_{vP}$ Vasja v_{trans} [$_{VP}$ na-pis-]]]] t_1 || =
λt∃e∃y [τ(e) ⊂ t ∧ letters(y) ∧ agent(Vasja)(e) ∧ ∃s[write(e) ∧ theme(y)(e) ∧ i-cause(s)(e) ∧ written(s) ∧ arg(y)(s)]]

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Perfective operators

- Klein 2004 and elsewhere: reference time includes event time
- As the initial event predicate is not quantized, neither is the predicate over times in (69)
- The internal argument still has a weak indefinite interpretation
- The predicted (incorrect) reading: 'V. spent some time engaged in writing letters'

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Perfective operators

- PFV is a definite deteriminer

(70) || PFV || = λP[σe.P(e)]

(71) || [$_{FP}$ PFV [$_{vP}$ [$_{DP}$ INDEF [$_{NP}$ pis'ma]]$_1$ λ$_1$ [$_{vP}$ Vasja v_{trans} [$_{VP}$ na-pis- t_1]] || =
σe[(λe'∃y [letters(y) ∧ agent(Vasja)(e') ∧ ∃s[write(e') ∧ theme(y)(e') ∧ i-cause(s)(e') ∧ written(s) ∧ arg(y)(s)]])(e)]

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Perfective operators

- PFV is a definite deteriminer

- (71) results in a telic interpretation: a corresponding event predicate (i.e., λe[e = σe'[(λe''∃y [letters(y) ∧ agent(Vasja)(e'') ∧ ∃s[write(e'') ∧ theme(y)(e'') ∧ i-cause(s)(e') ∧ written(s) ∧ arg(y)(s)]])(e')]]) will denote a singleton set of events and will be quantized
- But the domain can still contain individuals that fall under *letters* but do not participate in writing events, hence no unique maximal interpretation

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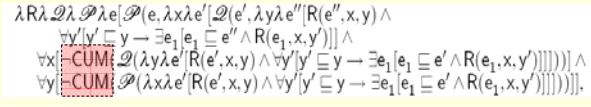
Perfective operators

- Krifka 1992:50: quantization condition

(72) || PFV || = λPλe[P(e) ∧ QUA(P)]

- Piñon 2001: essentially the same idea, but non-cumulativity instead of quantization.



- The result of combining the verb with either of its (generalized quantifier) arguments is required not be cumulative

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Perfective operators

- Krifka 1992:50: quantization condition

(73) || [$_{FP}$ PFV [$_{vP}$ [$_{DP}$ INDEF [$_{NP}$ pis'ma]]$_1$ λ_1 [$_{vP}$ Vasja v_{trans} [$_{VP}$ na-pis-]]]] t_1] || =
λe∃y [letters(y) ∧ agent(Vasja)(e) ∧ ∃s[write(e) ∧ theme(y)(e) ∧ i-cause(s)(e) ∧ written(s) ∧ arg(y)(s)]] ∧
QUA(λe′∃y [letters(y) ∧ agent(Vasja)(e′) ∧ ∃s[write(e′) ∧ theme(y)(e′) ∧ i-cause(s)(e′) ∧ written(s) ∧ arg(y)(s)]])]

Perfective operators

- The event predicate in (73) denotes an empty set of events, since the QUA condition is not satisfied
- In this way, PFV works as a filter, filtering out non-quantized event predicates generated at the *v*P level and only allowing quantized ones to pass through FP. FP (and all projections dominating FP up to the CP level) can thus only be quantized, that is, telic.

Perfective operators

- Filip and Rothstein 2005: maximization
- Maximalization operator MAX_E: a monadic operator, such that $MAX_E(\Sigma) \subset \Sigma$, which maps sets of partially ordered events Σ onto sets of maximal events $MAX_E(\Sigma)$.
- Maximal event are relative to a partial ordering, normally, a "stage-of" relation; Landman 1992, 2004.
- Maximization is only defined if the event description provides an ordering criterion for identifying maximal events
- Event predicates based on indefinite plural or mass incremental themes do not provide such a criterion; events in their extension are not stages of one another.

Perfective operators

- Filip and Rothstein 2005: maximization
- || PFV || = $\lambda P \lambda e.MAX_E(P)(e)$
- The result of the application of PFV to a non-quantized event predicate based on INDEF DP is undefined.
- The filtering-out effect similar to the one induced by Krifka's QUA condition
- A possible alternative within degree semantics (Hay et. al. 1999, Kennedy, Levin 2002, 2008, Piñon 2008): degree maximization

Conclusions

- Evidence from process nominals in favor of the high aspect theory
- Verbs are aspectless
- Both quantized (telic) and non-quantized event predicates at the vP level
- PFV is merged at later stages of syntactic derivation
- PFV filters out non-quantized event predicates generated at the vP level by imposing quantization/maximization condition on them

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