

EMBEDDED ASPECT. A RUSSIAN PERSPECTIVE.

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[1] DESIDERATA

- (1) podumali_{PAST-PF}, što kozaki **gotovilis'**_{PAST-IMP} sdelat'_{INF} zasadu
 thought that Cossacks prepared do ambush
 [Eng.] it was thought that the Cossacks **were preparing** an ambush
 [Russian National Corpus; Gogol]
- (2) on uvidel_{PAST-PF}, kak ona **vyechala**_{PAST-PF} so dvora
 he saw how she rode-out from courtyard
 [Eng.] he saw her riding out of the courtyard.
 [Wassmo; RuN-Euro parallel corpus]
- (3) On znal_{PAST-IMP}, što ona **stoit**_{PRES-IMP} u okna. (**stojala**_{PAST-IMP})
 He knew that she stands by window (stood)
 [Eng.] He knew she was standing there.
 [Wassmo; RuN-Euro parallel corpus]

[2] PLOT

- explain these challenges to Russian as a non-SOT language
 - the puzzle ([Altshuler 2008](#)) of the **imperfective** past with a simultaneous interpretation in (1).
 - the puzzle of the **perfective** past with a simultaneous interpretation in (2).
 - explain the apparently free alternation ([Khomitsevich 2007](#)) in (3).
- revise the **semantic type of aspect** in order to account for
 - tense/aspect under perception verbs
 - tense/aspect under factive verbs
- the analysis is joint work with Arnim von Stechow, see ([Grønn & von Stechow 2010](#)).

[3] TENSE UNDER ATTITUDES (TRADITIONAL STORY)

- English is an SOT-language
- Russian is a non-SOT-language

- (4) On skazal_{PAST-PF}, što živet_{PRES-IMPF} pod Moskvoj.
 he said that lives outside Moscow
 [Eng.] He said he was living just outside Moscow.
 (Viktor Pelevin, “Pokolenie P”) [RuN-Euro parallel corpus, Univ. of Oslo.]

PAST He said \emptyset -tense he was living outside Moscow (English)



PAST On skazal što \emptyset -tense PRES živet pod Moskvoj (Russian)



FIGURE 1: Simultaneous interpretation under past attitude verb

- past under past \Rightarrow simultaneous interpretation (English)
- present under past \Rightarrow simultaneous interpretation (Russian)

- (5) Ona sprosila_{PAST-PF} spal_{PAST-IMPF} li on.
 she asked slept if he
 [Eng.] She asked him if he had slept. (Lev Tolstoj, “Anna Karenina”)

PAST She asked him \emptyset -tense if he had slept (English)



PAST Ona sprosila \emptyset -tense PAST spal li on (Russian)



FIGURE 2: Backward shifted interpretation under past attitude verb

- past under past + *have* \Rightarrow Backward shifted interpretation (English)
 But: *Mary thought Bill left.*
- past under past \Rightarrow Backward shifted interpretation (Russian)

[4] TENSE AND ASPECT UNDER PERCEPTION VERBS

[4.1] *Simultaneous interpretation of Russian imperfective present under past*
Altshuler (2004):

- (6) Dina videla_{PAST-IMPF}, što (kak) voda l'ětsja_{PRES-IMPF} iz vedra.
Dina saw that (how) water pours from basket.
'Dina saw that (how) water was pouring from the basket'

[4.2] *Simultaneous interpretation of Russian (im)perfective past under past*
Well-known puzzle from the traditional literature on Russian as a relative tense language.

- (7) Dina videla_{PAST-IMPF}, kak (čto) voda lilas'_{PAST-IMPF} iz vedra.
Dina saw that (how) water poured from basket.
'Dina saw that (how) water was pouring from the basket'
- (8) on uvidel_{PAST-PF}, kak ona vyečala_{PAST-PF} so dvora
he saw how she rode-out from courtyard
[Eng.] he saw her riding out of the courtyard.
[Ger.] er sah_{PAST}, daß sie fortritt_{PAST}
[Fr.] il la vit_{PAST-PF} partit_{INF} [Wassmo; RuN-Euro parallel corpus]

[5] TENSE AND ASPECT UNDER FACTIVE VERBS

[5.1] *Imperfective present under past with simultaneous interpretation in Russian*

- (9) On znal_{PAST-IMPF}, što ona stoit_{PRES-IMPF} u okna. (stojala_{PAST-IMPF})
He knew that she stands by window (stood)
[Eng.] He knew she was standing there.
[Ger.] Er wußte_{PAST}, daß sie dort stand_{PAST}.
[Fr.] Il savait_{PAST-IMPF} qu'elle était_{PAST-IMPF} là.
[Wassmo; RuN-Euro parallel corpus]

[5.2] *Imperfective past under past with simultaneous interpretation in Russian*

- (10) On ponjal_{PAST-PF}, što ona ečala_{PAST-IMPF} v Ergušovo
He understood that she drove to Ergushovo
[Eng.] He understood that she was driving to Ergushovo
(Lev Tolstoj, "Anna Karenina")

[5.3] *(Im)perfective past under past with backwards shifted interpretation*

- (11) rodnye znali_{PAST-IMPF}, što on sdal_{PAST-PF} svoj poslednij ékzamen.
family knew that he passed his final exam
[Eng.] they knew he had taken his final examinations at last.
[Ger.] sie wußten_{PAST}, daß er endlich sein Abschlußexamen gemacht_{PART}

hatte_{PAST-AUX}.

[Fr.] on savait_{PAST-IMPf} qu'il avait_{PAST-AUX} enfin passé_{PART} ses derniers examens.

(Herbjørg Wassmo, "Dinas bok")

Russian imperfective with a complete event interpretation (Grønn 2003) can be backward shifted:

- (12) On znal_{PAST-IMPf}, čto na požare **igral**_{PAST-IMPf} samuju važnuju rol'.
 He knew that in fire played most important role
 [Eng.] He knew he had done more than anyone else to save the barn.
 [Ger.] Er wußte_{PAST}, daß er bei den Rettungsarbeiten der Wichtigste gewesen_{PART} war_{PAST-AUX}.
 [Fr.] Il savait_{PAST-IMPf} qu'il avait_{PAST-IMPf-AUX} eu_{PART} le rôle le plus important dans la lutte contre le feu.
 (Herbjørg Wassmo, "Dinas bok")

[6] THE SYSTEM (WITHOUT EVENTS)

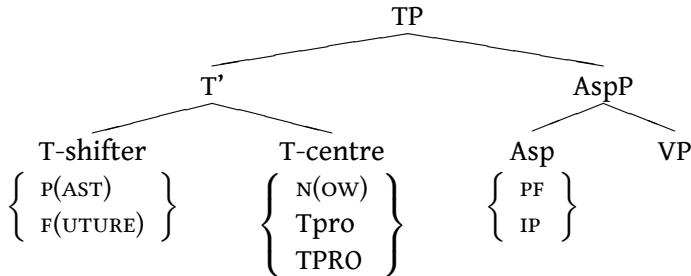


FIGURE 3: Architecture of Tense and Aspect.

- (13) $\llbracket \text{N(ow)} \rrbracket = \lambda w. \text{ the time of the utterance context;}$
 written as s^* . (feature: in = interpretable now)
- (14) $\llbracket \text{TPRO} \rrbracket = \text{undefined!}$
 (SOT languages \Rightarrow featureless; non-SOT languages \Rightarrow the feature in.)
- (15) $\llbracket \text{P(ast)} \rrbracket = \lambda w \lambda t \lambda P_{it}. (\exists t' < t) P(t')$ type (i(it,t))
 (feature: ip)
- (16) $\llbracket \text{F(uture)} \rrbracket = \lambda w \lambda t \lambda P_{it}. (\exists t' > t) P(t')$ type (i(it,t))
 (feature: if)

[6.1] *Temporal LFs*

(17) Maša spala.
‘Mary slept.’

(18) $\llbracket \text{sleep/sleeps/slept/spat}'/\text{spit/spala} \rrbracket = \lambda w \lambda t \lambda x. x \text{ sleeps in } w \text{ at time } t$

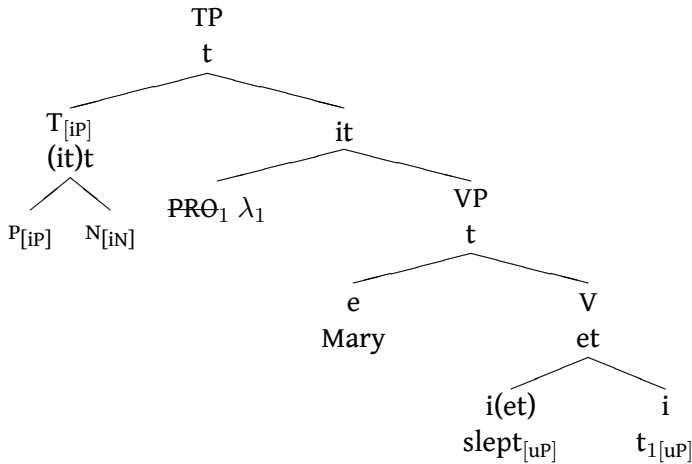


FIGURE 4: LF of Mary slept.

[6.2] *Verbal Quantifiers*

(19) A verb α is a VERBAL QUANTIFIER if and only if
(i) α can be inflected with tense morphology (α has its own verbal morphology)
(ii) α controls the reference time of the embedded verb (α is a temporal quantifier).

(20) $\llbracket \text{budet}_{\text{Rus}}/\text{will} \rrbracket = \lambda w \lambda t \lambda P_{\text{it}}. (\exists t' \succ t) P(t')$ type (i(it,t))
feature of temporal argument of the auxiliary: un.

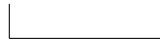
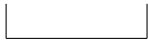
- (21) $\llbracket \text{dumaet}_{\text{RUS}}/\text{thinks} \rrbracket$ type (s(it)),(i(et))
 $= \lambda w \lambda P_{\text{s(it)}} \lambda t \lambda y. (\forall w_1) (\forall t_1) [(w_1, t_1) \text{ is compatible with everything } y \text{ believes of } (w, t) \text{ in } w \text{ at time } t \rightarrow P(w_1)(t_1)]$ (Lewis 1979)
 (feature of temporal variable of the attitude verb: un).
- (22) Dolli podumaet_{FUT-PF}, čto ja ostavljaju_{PRES-IMPF} vtorogo muža.
 Dolly will-think that I leave second husband
 (“present under perfective future”)
 [Eng.] Dolly will think I’m leaving my second husband.
 (“present under will”)
 (Lev Tolstoj, “Anna Karenina”).

N Dolly will think \emptyset -tense I’m leaving my husband (English)



NON-LOCAL AGREEMENT (SOT)

FUT Dolli podumaet čto \emptyset -tense PRES ja ostavljaju muža (Russian)



LOCAL AGREEMENT (NON-SOT)

FIGURE 5: Simultaneous interpretation under future attitude

[6.3] *The SOT Parameter (new formulation, 2015)*

(23) *A language L is an SOT language if and only if*

- (i) verbal quantifiers without their own temporal i-features transmit temporal features.
 (ii) The highest TPRO in the scope of a verbal quantifier does not carry the feature in (interpretable now).

[6.4] *Complement Tense*

(24) Vanja dumal, čto Maša spit.

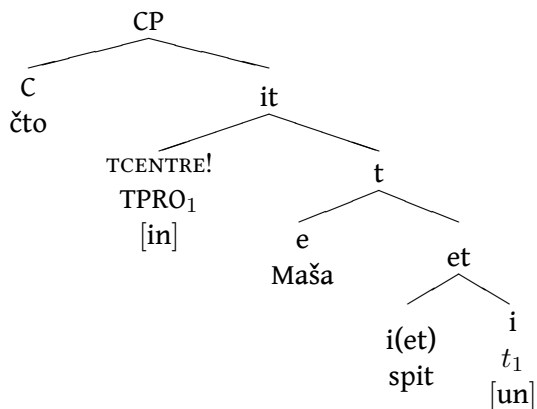
'Vanja thought that Masha was asleep.' (*literally: sleeps*)

FIGURE 6: Simultaneous Complements in Russian.

[7] INTEGRATING ASPECT

[7.1] *Embedded imperfective past with simultaneous interpretation*

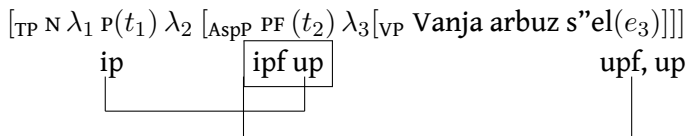
Altshuler (2008) objects against the traditional view that “past under past” means backward shifting in non-SOT languages like Russian. He says that embedded imperfectives in the past can have a simultaneous or a backward shifted reading.

- (25) podumali_{PAST-PF}, čto kozaki **gotovilis'**_{PAST-IMPF} sdelat'_{INF} zasadu
 thought that Cossacks prepared do ambush
 [Eng.] it was thought that the Cossacks **were preparing** an ambush
 [Russian National Corpus; Gogol]

[7.2] *Aspect and features*

- (26) Vanja **el** arbuz. (*imperfective simplex verb*)
 ‘Vanja was eating/used to eat/ate a melon.’
- (27) Vanja **s"el** arbuz. (*prefixed perfective verb*)
 ‘Vanja ate (up) a melon.’
- (28) Vanja **s"edal** arbuz. (*secondary imperfective*)
 ‘Vanja was eating/used to eat/ate (up) a melon.’
- (29) Vanja **s"est** arbuz. (*prefixed perfective verb*)
 ‘Vanja will-eat (up) a melon.’
- (30) $\llbracket \text{el} \rrbracket$ features of variables: [up], [uip]
 $= \lambda w \lambda e \lambda x \lambda y . y \text{ eats } x \text{ in } e \text{ in } w$
- (31) $\llbracket \text{s"el} \rrbracket$ features of variables: [up], [upf]
 $= \lambda w \lambda e \lambda x \lambda y . y \text{ eats up } x \text{ in } e \text{ in } w$
- (32) $\llbracket \text{s"edal} \rrbracket$ features of variables : [up], [uip]
 $= \lambda w \lambda e \lambda x \lambda y . y \text{ eats up } x \text{ in } e \text{ in } w$
- (33) $\llbracket \text{s"est} \rrbracket$ features of variables: [un], [upf]
 $= \lambda w \lambda e \lambda x \lambda y . y \text{ eats up } x \text{ in } e \text{ in } w$
- (34) The feature combination [un, upf] has to be licensed by the presence of the operators F and PF .¹
- (35) $\llbracket PF \rrbracket = \lambda t \lambda P_{vt} . (\exists e) \tau(e) \subseteq t \ \& \ P(e)$ type (i(vt,t))
- (36) $\llbracket IP \rrbracket = \lambda t \lambda P_{vt} . (\exists e) t \subseteq \tau(e) \ \& \ P(e)$ type (i(vt,t))

[1] The reason for this coercion to a future tense is that the perfective temporal configuration $\tau(e) \subseteq s^*$, does not make sense semantically. On the assumption that the speech time s^* denotes a minimal interval, it cannot include the event time.



$(\exists e)(\exists t \prec s^*) \text{ Vanja eats a melon in } e \ \& \ \tau(e) \subseteq t$

FIGURE 7: Combined Feature Checking of Tense and Viewpoint Aspect.

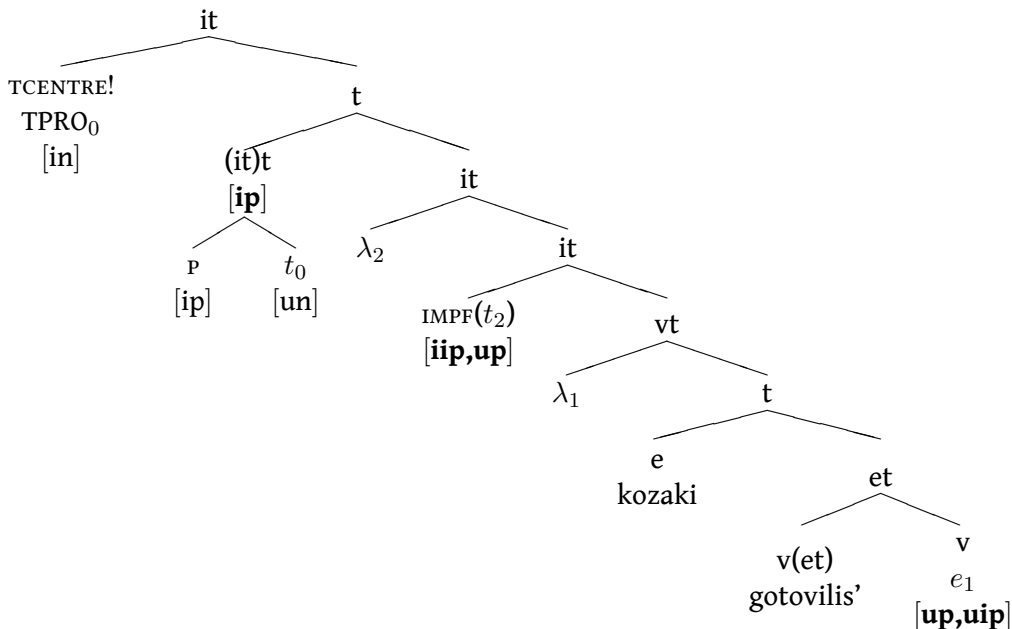


FIGURE 8: Backward Shifted Imperfective Complement in Russian.

- (37) $N \lambda_0 P(t_0) \lambda_7 PF(t_7) \lambda_1 \text{ podumali}(e_1) \text{ PRO}_2 P(t_2) \lambda_4 IP(t_4) \lambda_5 \text{ gotovilis'}(e_5)$
 $= \lambda w.(\exists t \prec s^*)(\exists e_3)[\tau(e_3) \subseteq t \ \& \ e_3 \text{ is a thinking in } w$
 $[\lambda t_1 \lambda w_1.(\exists t_2 \prec t_1)(\exists e)[t_2 \subseteq \tau(e) \ \& \ e \text{ is preparing of an ambush in } w_1]]]$

[7.3] *A side remark: Sequence of Aspect?*

What would a sequence-of-aspect-language look like?

- identity between embedded event and higher event?
- inheritance of reference time and aspectual configuration from higher tense/aspect
- no encoding of temporal relation between embedded event and embedded reference time (there cannot be an embedded reference time in absence of semantic aspect)

[8] UNDER PERCEPTION VERBS

- [Khomitsevich \(2007\)](#): “past under past” expresses simultaneity in perception constructions even for embedded achievements or accomplishments.
- On the default, direct perception reading the event perceived must be simultaneous with the perception.
- With a “present under past” in Russian, the perception verb construction is reminiscent of verbs of attitudes. The perspective is not that of the speaker, but of the perception holder.

Below is the analysis given in ([Grønn & von Stechow 2010](#)):

- direct perception from the speaker’s perspective (\Rightarrow “past under past”)
- visual/acoustic alternatives from the perception holder’s perspective (\Rightarrow “present under past”).

A toy example from [Altshuler \(2004\)](#):

- (38) Dina videla_{PAST}, čto voda l’ëtsja_{PRES-IMPF} iz vedra. (lilas’_{PAST-IMPF})
 Dina saw that water pours from basket (poured)
 ‘Dina saw that water was pouring from the basket.’

[8.1] Analysis of past under past perception verb

[Higginbotham \(1983\)](#) analyses perceptions as a relation between an individual and an event:

- (39) There was a water pouring e & Dina saw e .

Two independent deictic pasts with **consequences for the compositional semantics of aspect**.

- (40) $\lambda w(\exists e)(\exists t \prec s^*)[t \subseteq \tau(e) \ \& \ \text{water pouring}_w(e)]$
 $\& (\exists t_1 \prec s^*)(\exists e_1)[t_1 \subseteq \tau(e_1) \ \& \ \text{see}_w(\text{Dina}, e_1, e)]$

We have to modify the logical type of the aspectual operator:

- (41) usually: $\llbracket \text{IP} \rrbracket = \lambda w \lambda P_{vt} \lambda t. (\exists e)[P(e) \ \& \ t \subseteq \tau(e)]$ type (vt, it)
 here: $\llbracket \text{IP} \rrbracket = \lambda w \lambda e \lambda t \lambda P_{vt}. P(e) \ \& \ t \subseteq \tau(e)$ type (v(i(vt,t)))
 usually: $\llbracket \text{PF} \rrbracket = \lambda w \lambda P_{vt} \lambda t. (\exists e)[P(e) \ \& \ \tau(e) \subseteq t]$ type (vt, it)
 here: $\llbracket \text{PF} \rrbracket = \lambda w \lambda e \lambda t \lambda P_{vt}. P(e) \ \& \ \tau(e) \subseteq t$ type (v(i(vt,t)))

The complement clause is headed by “kak” (“how”), analysed as an existential quantifier over events ([Grønn & von Stechow 2010](#)):

$$(42) \quad \llbracket \text{kak} \rrbracket = \lambda P_{vt} \lambda Q_{vt} (\exists e) [P(e) \& Q(e)] \quad \text{type } (vt(vt,t))$$

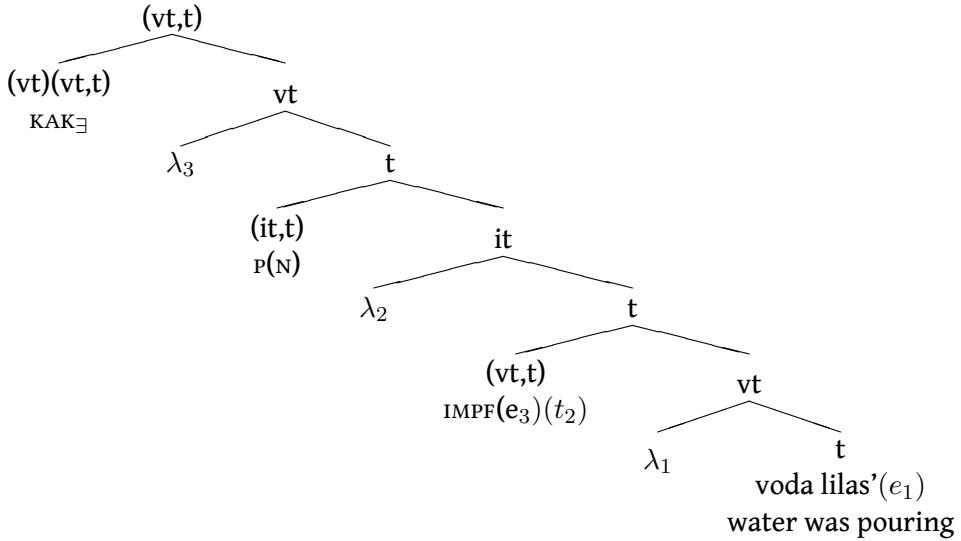


FIGURE 9: Compositional derivation of a past complement under a perception verb

$$(43) \quad \llbracket \text{videla}^1 \rrbracket = \lambda w \lambda e_1 \lambda e_2 \lambda x. e_2 \text{ is a seeing of } e_1 \text{ by } x \text{ in } w \quad \text{type } (v(v(et)))$$

features: up, uip

In order to be able to have the “kak/how”-clause as an object, we must QR the generalised quantifier from the object position.

$$[\text{CP KAK}\exists \lambda_3 \text{ P(N)} \lambda_2 \text{ IP-NEW}(e_3)(t_2) \lambda_1 \text{ voda lilas}'(e_1)]$$

ip iip up up, uip

$$\lambda_4 [\text{S P(N)} \lambda_5 \text{ IP-OLD}(t_5) \lambda_7 \text{ Dina videla}(e_4)(e_7)]$$

ip iip up up, uip

FIGURE 10: LF of past under past with temporal and aspectual features

[8.2] *Analysis of present under past perception verb*

Past perception verbs with subordinate present are verbal quantifiers:

- (44) $\llbracket \text{videla}^2 \rrbracket = \lambda w \lambda P_{s(\text{it})} \lambda t \lambda x. (\forall w_1) (\forall t_1) [(w_1, t_1) \in \text{Acc}_x(w, t) \rightarrow P(w_1)(t_1)]$,
 where $\text{Acc}_x(w, t)$ are the world-times compatible with the visual evidence that x has in w at time t .

“kak/čto” is here a complementiser without meaning.

- (45) $\llbracket \text{pres under past-construction} \rrbracket = \lambda w. (\exists t) [t \prec t_0 \ \& \ (\forall w_1) (\forall t_1) [(w_1, t_1) \in \text{Acc}_{\text{Dina}}(w, t) \rightarrow \text{water is pouring out of the basket in } w_1 \text{ at } t_1]]$

[9] UNDER FACTIVE VERBS

- [Khomitsevich \(2007\)](#): embedded past/present are freely interchangeable.
- Our claim: The derivation at LF must still be different.
- A semantics for factives:

- (46) John knew that it was raining. [Kratzer \(1990\)](#)

- (47) (a) There was a state/event e , which was a raining, and
 (b) John was acquainted with e , and
 (c) John believed of e the property of raining.

- (a) is a purely extensional environment \Rightarrow the past tense is independent of the tense of the main clause.
- (c) is an intensional environment \Rightarrow the complement clause serves for the description of a tenseless property (a zero tense).

We face a dilemma of expressibility:

- If the complement is in the past, it can describe only condition (a).
- If the complement is in the present, it can describe only condition (c).

- (48) On znal_{PAST-IMPF}, čto ona stojala_{PAST-IMPF} u okna.
 He knew that she stood by window

- In the complement, we need the **new version of aspect** where the event argument is not locally bound.
- In the matrix, aspect has its traditional logical type.

[9.1] *Analysis of past under past*

The relevant semantic rule is this:

- (49) *de re* knowledge 1 $\llbracket \text{know}_Q^1 \rrbracket = \lambda w \lambda e \lambda P_{sv,t} \lambda x. (\exists e_1) [P(w)(e_1) \& \text{acquainted}(x, e_1, w) \& \text{believe_of}(x, e, e_1, Q, w)]$
- (50) $\lambda w. (\exists t \prec s^*) (\exists e) [\tau(e) \supset t \& (\exists e_1) (\exists t_1 \prec s^*) [\tau(e_1) \supset t_1 \& \text{stand_at_window}(\text{she}, e_1, w)] \& \text{acquainted}(\text{he}, e_1, w) \& \text{believes_of}(\text{he}, e, e_1, Q, w)]$

The relation $\text{believes_of}(\text{he}, e, e_1, Q, w)$ can be paraphrased roughly as “he believed being in a state of acquaintance with a situation that was a standing at the window of her”.

[9.2] *Analysis of pres under past*

See (Grønn & von Stechow 2010).

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