

When clauses are Weak NPIs: polarity subjunctives in Russian*

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1 Introduction

- **Question:** How (and why) can the environment in which the embedding verb finds itself affect what kinds of clauses it can take?
- **This talk:** examines a class of polarity subjunctives in Russian and argues:
 - (i) that sometimes environment can affect selection because clauses can contain elements that are sensitive to the entailment properties of the environment;
 - (ii) that the entailment properties of the environment can be changed not only by material outside of a clause, but also by material inside of the clause.
- **Polarity subjunctives** (Rivero 1971, Farkas 1992, Stowell 1993, Brugger & D’Angelo 1995, Giannakidou 1995, Giannakidou & Quer 1997, Quer 1998, Siegel 2009, Quer 2009, Giannakidou 2011, a.o.) is a descriptive term for embedded clauses with subjunctive morphology that occur with a class of verbs only in certain environments—e.g., under negation, in questions, in antecedents of conditionals.
- In this talk I will focus on subjunctive clauses with verbs like *pomnit* ‘remember’:¹²
 - (1) a. Mitja pomnit čto / *čto-**by** Anja kurila.
Mitya remembers COMP / COMP-**SUBJ** Anya smoke.PST
‘Mitya remembers that Anya smoked.’

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¹See appendix A for other contexts of Russian grammar where the subjunctive particle *by* appears.

²The presence of the subjunctive particle *by* comes with X-marking (von Stechow & Iatridou 2020): all the verbs in subjunctive clauses are morphologically past tense. In addition to this, there are some temporal and aspectual restrictions in sentences with polarity subjunctives. See appendix B for more details.

- b. Mitja ne pomnit čto / čto-**by** Anja kurila.
Mitya NEG remembers COMP / COMP-**SUBJ** Anya smoke.PST
'Mitya doesn't remember that Anya smoked.'
- c. Mitja pomnit, čto / čto-**by** Anja kurila?
Mitya remembers COMP / COMP-**SUBJ** Anya smoke.PST
'Does Mitya remember that Anya smoked?'
- d. Tol'ko Mitja pomnit čto / čto-**by** Anja kurila.
only Mitya remembers COMP / COMP-**SUBJ** Anya smoke.PST
'Only Mitya remembers that Anya smoked.'

- In (1) *pomnit* 'remember' cannot combine with subjunctive clauses in an upward-entailing context, but can combine with them in environments that are known to license weak NPIs.

- **Questions:**

- ★ How are polarity subjunctives licensed?
- ★ What verbs do they occur with and why only with those verbs?

- **Preview:**

- ▶ Clauses can be existential quantifiers, and take scope. Subjunctive clauses are weak NPIs and need to occur in Strawson Entailment-Reversing environments.
- ▶ Verbs that can take polarity subjunctives are verbs that can take situations as their internal arguments, and combine with CPs that describe situations.
- ▶ Clauses that describe propositional content (Kratzer 2006, Moulton 2015) cannot be weak NPI subjunctives because they create non-monotonic environments.

2 Subjunctive clauses that behave like weak NPIs

- Which environments license polarity subjunctives depends on the verb, and varies a lot cross-linguistically. For example, 'think':
 - in Italian (*pensare*) takes subjunctives even in upward-entailing environments;
 - in French (*penser*) takes subjunctive only in some environments that license weak NPIs (under negation, scope of *only*, scope of *few*);
 - in Russian (*dumat'*) takes subjunctive only under negation (see appendix D).
- However languages seem to have verbs that show much less variation: e.g., 'remember' in Italian (*ricordare*), French (*se rappeler*) and Russian (*pomnit'*) can take subjunctive complements in the same set of environments (table 2)—these are environments that license weak NPIs in these languages (2). I will restrict my attention to such verbs.

Context	Italian	French	Russian
'Positive'	—	—	—
Under negation	+	+	+
Scope of Only	+	+	+
Scope of Few	+	+	+
Question	+	+ for formal, — otherwise	+
Restrictor of Every	+	+	+
Antecedent of Conditional	+	+	+

Table 2: 'remember' with subjunctive complements

(2) **Verbs that take weak NPI subjunctives**

A verb belongs to this class if for all environments X that licence (pronominal) Weak NPIs in the language, X allows the use of the subjunctive complement with this verb.

- In Russian verbs that take weak NPI subjunctive are: *pomnit'* 'remember', *zamečat'* 'notice', *videt'* 'see', *slyšat'* 'hear', and potentially *čuvstvovat'* 'feel' and *obnaruživat'* 'discover'.

(3) a. *'Positive' context*

Mitja zamečal /videl /slyšal čto / *čto-**by** Lena smotrela futbol.
Mitya noticed /saw /heard COMP / COMP-**SUBJ** Lena watch.PST soccer

'Mitya noticed /saw /heard that Lena watched soccer.'

b. *Under negation*

Mitja ne zamečal /videl /slyšal čto / čto-**by** Lena smotrela futbol.
Mitya NEG noticed /saw /heard COMP / COMP-**SUBJ** Lena watch.PST soccer

'Mitya didn't notice /see /hear that Lena watched soccer.'

c. *Scope of 'only'*

Tol'ko Mitja zamečal /videl /slyšal čto / čto-**by** Lena smotrela futbol.
only Mitya noticed /saw /heard COMP / COMP-**SUBJ** Lena watch.PST soccer

'Only Mitya noticed /saw /heard that Lena watched soccer.'

d. *Scope of 'few'*

Malo kto zamečal /videl /slyšal čto / čto-**by** Lena smotrela futbol.
few who noticed /saw /heard COMP / COMP-**SUBJ** Lena watch.PST soccer

'Few noticed /saw /heard that Lena watched soccer.'

e. *Question*

Mitja zamečal /videl /slyšal čto / čto-**by** Lena smotrela futbol?
Mitya noticed /saw /heard COMP / COMP-**SUBJ** Lena watch.PST soccer

'Did Mitya notice /see /hear that Lena watched soccer?'

f. *Scope of 'every'*

Každyj kto zamečal /videl /slyšal čto / čto-**by** Lena smotrela futbol, govoril
every who noticed /saw /heard COMP / COMP-**SUBJ** Lena watch.PST soccer told
mne ob ètom.
me about it

'Everyone who noticed /saw /heard that Lena watched soccer told me about it.'

g. *Antecedent of a conditional*

Esli Mitja zamečal /videl /slyšal čto / čto-**by** Lena smotrela futbol, on mne
 If Mitya noticed /saw /heard COMP / COMP-**SUBJ** Lena watch.PST soccer he me
 ob ètom skažet.
 about this will.tell

‘If Mitya noticed /saw /heard that Lena watched soccer, he will tell me about it.’

- There is also a number of environments in which cross-linguistically some weak NPIs (e.g., cf. English *any*) can occur, but in which Russian weak NPI subjunctives are not licensed:

(4) a. *Imperatives*

* Pomni /zamečaj čto-**by** Lena smotrela futbol!
 remember.IMP /notice.IMP COMP-**SUBJ** Lena watch.PST soccer

Intended: ‘Remember /notice that Lena is watching soccer!’

b. *Existential modals (e.g. ‘possible’)*

* Možno videt’ čto-**by** Ira smešivala neskol’ko židkостей v probirke.
 possible to.see COMP-**SUBJ** Ira mixed several fluids in test.tube

Intended: ‘It’s possible to see that Ira mixed several fluids in a test tube.’

c. *Future*

* Mitja budet zamečat’ /videt’ /slyšat’ čto-**by** Lena smotrela futbol.
 Mitya will notice /see /hear COMP-**SUBJ** Lena watch.PST soccer

Intended: ‘Mitya will notice /see /hear Lena watching soccer.’

d. *Under non-monotone predicates like ‘want’*

* Ja xoču čto-**by** Mitja pomnil /zamečal čto-**by** Anja prixodila
 I want COMP-**SUBJ** Mitya remember.PST /notice.PST COMP-**SUBJ** Anya came

domoj posle polunoči.
 home after midnight

Intended: ‘I want Mitya to remember /notice Anya coming home after midnight.’³

e. *Scope of ‘between 2 and 5’*

* Ot dvux do pjati devoček zamečali /videli čto-**by** Petja vygulival sobaku.
 from 2 to 5 girls noticed /saw COMP-**SUBJ** Petja walk.PST dog

Intended: ‘Between 2 and 5 girls noticed /saw that Petja walked the dog.’

★ **Question:**

What property determines whether an embedding verb can take a weak NPI subjunctive?

- Note that being factive with an indicative clause is neither necessary nor sufficient property for being able to take polarity subjunctive:
 - *slyšat’* ‘hear’ takes weak NPI subjunctives, (5b)-(5c), despite not being factive (5a);
 - *znat’* ‘know’ does not take subjunctives at all, (6b)-(6c), despite being factive (6a).

³One consultant said that they might allow (4d) with ‘remember’ under the interpretation that the speaker wants Mitya to remember the requirement placed on Anya, according to which she must come home after midnight.

(5) **Slyšat' 'hear': non-factive but takes weak NPIs**

- a. Lena slyšala, čto detjam zdes' pozvoljali progulivat' uroki, no èto lož'.
Lena heard COMP children.DAT here allowed to.miss classes but this lie
'Lena heard that children were allowed to miss classes here, but that's a lie.'
- b. Lena ne slyšala, čto-by detjam zdes' pozvoljali progulivat' uroki.
Lena NEG heard COMP-SUBJ children.DAT here allowed to.miss classes
'Lena hasn't heard that children are allowed to miss classes here.'
- c. Tol'ko Lena slyšala, čto-by detjam zdes' pozvoljali progulivat' uroki.
only Lena heard COMP-SUBJ children.DAT here allowed to.miss classes
'Only Lena heard that children are allowed to miss classes here.'

(6) **Znat' 'know': factive but doesn't take weak NPIs**

- a. #Lena znala, čto detjam zdes' pozvoljali progulivat' uroki, no èto lož'.
Lena knows COMP children.DAT here allowed to.miss classes but this lie
#'Lena knew that children are allowed to miss classes here, but that's a lie.'
- b. *Lena ne znala, čto-by detjam zdes' pozvoljali progulivat' uroki.
Lena NEG knew COMP-SUBJ children.DAT here allowed to.miss classes
Intended: 'Lena didn't know/think that children are allowed to miss classes here.'
- c. *Tol'ko Lena znala, čto-by detjam zdes' pozvoljali progulivat' uroki.
only Lena knew COMP-SUBJ children.DAT here allowed to.miss classes
Intended: 'Only Lena knew/thought that children are allowed to miss classes here.'

- In fact most prototypically factive verbs do not take polarity subjunctives, e.g. *byt' v kurse* 'be aware' and *dogadat'sja* 'figure out' also cannot take polarity subjunctives, as well as all emotive factives (*rad* 'is happy', *rasstroit'sja* 'become sad', *udivit'sja* 'be surprised' etc.).
- I propose that the answer lies in the argument structure of verbs: verbs have to be able to take an internal argument of a certain sort to take a weak NPI subjunctive (7).

(7) **Generalization about verbs that take weak NPI subjunctives**

A verb takes subjunctives in environments that license weak NPIs if it has an internal argument which can denote a situation.

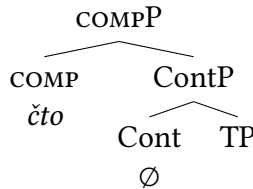
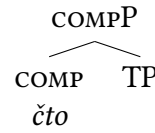
3 Two meanings for embedded CPs

- In my recent work (Bondarenko 2021) I argued based on sentences like (8)-(9) that Russian *čto*-clauses can receive two distinct interpretations: they either describe the propositional content of a certain individual (Cont-CPs) or describe situations (Sit-CPs).

- (8) Mne prišla v golovu **mysl'** [čto belki s"eli vse orexi]. **Cont-CP**
to.me arrived in head **thought** COMP squirrels ate all nuts
'I had a thought that squirrels ate all the nuts.'

- (9) Na prošloj nedele byl **slučaj** [čto belki s”eli vse orexi]. **Sit-CP**
 on last week was **event** COMP squirrels ate all nuts.
 ‘Last week there was an event of squirrels eating all the nuts.’

- After comparing Russian *čto*-clauses to Korean *-n(un)* clauses that combine with nouns, I concluded that Cont-CPs and Sit-CPs have different internal structures:

(10) **The structure of Cont-CPs**(11) **The structure of Sit-CPs**

- I proposed that the structures of Cont-CPs and Sit-CPs are the same in two languages. Cont is phonologically null in the Russian, but has overt exponence in Korean (“declarative” *-ta*).
- The denotations for Cont and COMP are in (12) and (13) respectively.

$$(12) \quad \llbracket \text{Cont} \rrbracket^{s_0} = \lambda p_{st} . \lambda x_e . \text{Content}(x)(s_0) = p \quad (13) \quad \llbracket \text{COMP} \rrbracket^{s_0} = \lambda p_{et} . \lambda x_e . x \text{ exemplifies}_{s_0} p$$

- Here I assume that situations form a subset of the domain of individuals, $D_s \subset D_e$, and that the exemplification relation is defined for all individuals (14).

(14) **Exemplification** (based on Kratzer 1989, 2002, Deigan 2020)

$$s \text{ exemplifies}_{s_0} p =_{\text{def}} s \sqsubset s_0 \wedge s \in p \wedge (\forall s' [s' \sqsubset s \Rightarrow s' \in p] \vee \forall s' [s' \sqsubset s \Rightarrow s' \notin p])$$

- Given the meanings of Cont and COMP, the DPs in (8) and (9) receive interpretations in (15) and (16) respectively.

$$(15) \quad \llbracket \text{mysl}' [\text{čto CONT belki s”eli vse orexi}] \rrbracket^{s_0} = \lambda x . \text{thought}(x)(s_0) \wedge x \text{ exemplifies}_{s_0} \{y \mid \text{Cont}(y)(s_0) = \{s' \mid \text{the squirrels ate all the nuts in } s'\}\}$$

$$(16) \quad \llbracket \text{slučaj} [\text{čto belki s”eli vse orexi}] \rrbracket^{s_0} = \lambda s . \text{event}(s)(s_0) \wedge s \text{ exemplifies}_{s_0} \{s' \mid \text{the squirrels ate all the nuts in } s'\}$$

- The exemplification relation is not contributing anything to the meaning of Cont-CPs as far as I can see, so I will omit it in the future for simplification.
- Two useful differences between Cont-CPs and Sit-CPs:
 - ▷ in Russian only Sit-CPs can occur with a modifier *takoe* ‘such’;
 - ▷ Cont-CPs can include referentially opaque predicates, Sit-CPs cannot.
- In (Bondarenko 2021) I looked at indicative clauses only, and argued that verbs like ‘remember’ can combine with both Cont-CPs and Sit-CPs:

- with Sit-CPs, these verbs create direct perception reports (17);⁴
- with Cont-CPs, they report about facts/claims that the subject encountered (18)-(19).

- (17) Lena pomnit {takoe čto} /{kak} Mitja kuril.
Lena remembers such COMP /COMP.DIRECT Mitya smoked
'Lena remembers Mitya's smoking.' ⇒ Lena directly perceived Mitya smoking.
- (18) Lena pomnit (to) čto Mitja kuril, xot' ona i ne videla ego ni
Lena remembers (that.DEM) COMP Mitya smoked though she CONJ NEG saw him not
razu kurjašćim.
once smoking
'Lena remembers the fact that Mitya smoked, despite not seeing him smoke even once.'
⇒ Lena directly perceived Mitya smoking.
- (19) Lena slyšala čto neopazdyvavšaja včera devočka včera opazdyvala.
Lena heard comp no.having.been.late yesterday girl yesterday was.late
'Lena heard (a claim) that a girl who wasn't late yesterday was late yesterday.'

- Given this distinction, we can reformulate the generalization that I will be arguing for:

- (20) **Generalization about verbs that take weak NPI subjunctives (new formulation)**
A verb takes subjunctives in environments that license weak NPIs if it takes Sit-CPs.

4 Weak NPI subjunctives must be Sit-CPs

- I would like to argue that when verbs of this class combine with subjunctive complements, these complements can only be interpreted as Sit-CPs:

	CONT-CP	SIT-CP
Indicative	✓	✓
Subjunctive	*	✓

Table 3: Subjunctive is restricted to Sit-CPs

- **Subjunctive CPs with these verbs can be Sit-CPs: (21)**
 - direct perception inference is observed;
 - modification by *takoje* 'such', which I've argued in Russian is possible with Sit-CPs only, is possible with them.

- (21) Tol'ko Mitja pomnit (takoje) čto-by Lena opazdyvala.
only Mitya remembers (such) COMP-SUBJ Lena was.late
'Only Mitya remembers Lena being late.' ⇒ Mitya directly perceived Lena being late.

⁴All Russian verbs listed in section 2 as the ones taking weak NPI subjunctives allow direct perception complements. As far as I know, the correlation holds in the other direction as well: I know of no verb that would take direct perception complements but disallow polarity subjunctives.

• **Subjunctive CPs with these verbs cannot be Cont-CPs:**

- *de dicto* readings of predicates in the embedded clause are not possible, (22a) (while in Cont-CPs they are possible, cf. (22b));⁵
- embedded proposition cannot describe a fact that is not subject to change, e.g. a fact of mathematics, (23a) (while Cont-CPs can, cf. (23b)).
- embedded proposition cannot contain individual-level predicate, just as in complements of nouns like ‘situation’.

- (22) a. # Tol’ko Lena pomnit /slyšala (takoe), **čto-by** neopazdyvavšaja
 only Lena remembers /heard (such) **COMP-SUBJ** no.having.been.late
 včera devočka včera opazdyvala.
 yesterday girl yesterday was.late
 ‘Only Lena remembers /heard of a girl who wasn’t late yesterday being late yesterday.’ (requires Lena having inconsistent memories or hearing of inconsistent things)
- b. Tol’ko Lena pomnit /slyšala **čto** neopazdyvavšaja včera devočka
 only Lena remembers /heard **COMP** no.having.been.late yesterday girl
 včera opazdyvala.
 yesterday was.late
 ‘Only L. remembers /heard that a girl who wasn’t late yesterday was late yesterday.’
- (23) a. # Vera ne pomnit (takogo), **čto-by** dvaždy dva bylo četyre.
 Vera NEG remembers (such) **COMP-SUBJ** twice two was four
 Intended: ‘Vera doesn’t remember that 2 x 2 is 4.’
 (OK if we lived in a world where the result of 2 x 2 could change)
- b. Vera ne pomnit, **čto** dvaždy dva četyre.
 Vera NEG remember **COMP** twice two four
 ‘Nastya doesn’t remember that 2 x 2 is 4.’
- (24) a. # Miša ne zamečal, **čto-by** u Oli byli golubye glaza.
 Misha NEG noticed **COMP-SUBJ** by Olya be.PST blue eyes
 ‘Misha didn’t notice Olya having blue eyes.’
 (possible only if Olya changes the color of her eyes)
- b. # Miša ne zamečal situacii, **čto-(by)** u Oli byli golubye glaza.
 Misha NEG noticed situation **COMP-(SUBJ)** by Olya be.PST blue eyes
 ‘Misha didn’t notice a situation of Olya having blue eyes.’
 (possible only if Olya changes the color of her eyes)
- c. Miša ne zamečal, **čto** u Oli golubye glaza.
 Misha NEG noticed **COMP** by Olya be.PRS blue eyes
 ‘Misha didn’t notice that Olya has blue eyes.’

⁵Note that the choice of an environment plays an important role here: the presupposition of *only* is upward-entailing, and that is what ensures the infelicity of (22a). Under negation, for example, no infelicity would arise: *It’s not the case that Lena remembers a situation of a girl who wasn’t late being late.*

- If I am correct about the connection between the ability to take Sit-CPs and the ability to take a weak NPI subjunctive, then I expect the following to also hold:
 - verbs that can't take Sit-CPs shouldn't take weak NPI subjunctives;
 - other verbs (not discussed here) that take Sit-CPs should take weak NPI subjunctives.
- These predictions are borne out:
 - e.g., verbs *verit* 'believe', *dogadat'sja* 'figure out', *zabyt* 'forget' can't combine with *takoj* 'such' or create direct perception reports (25a), but can include referentially opaque expressions (25b), and they also can't take weak NPI subjunctives (25c)-(25d);
 - e.g., verbs *byvat* 'happen' and *slučat'sja* 'occur', which take Sit-CPs but not Cont-CPs (see the lack of *de dicto* readings in (26a)), can take weak NPI subjunctives, (26b)-(26d).

(25) **Verbs that don't take Sit-CPs can't take weak NPI subjunctives**

- a. * *Lena verit /dogadalas' /zabyla {takoe čto} /{kak} Mitja kuril.*
 Lena believes /figured.out /forgot such COMP /COMP.DIRECT Mitya smoked
 'Lena believes /figured out /forgot that Mitya smoked.'⁶
- b. *Lena verila čto ovcy na ètoj gore byli kozy.*
 Lena believed COMP sheep on this mountain were goats
 'Lena believed that sheep on this mountain were goats.'
- c. * *Tol'ko Lena verit /dogadalas' /zabyla čto-by Mitja kuril.*
 only Lena believes /figured.out /forgot **COMP-SUBJ** Mitya smoked
 'Only Lena believes /figured out /forgot that Mitya smoked.'
- d. * *Lena verila /dogadalas' /zabyla čto-by Mitja kuril?*
 Lena believed /figured.out /forgot **COMP-SUBJ** Mitya smoked
 'Did Lena believe /figure out /forget that Mitya smoked?'

(26) **Other verbs that take Sit-CPs take weak NPI subjunctives**

- a. # *Byvalo /slučalos' (takoe), čto ovcy na ètoj gore byli kozy.*
 happened /occured (such) COMP sheep on this mountain were goats
 'It happened/occurred that sheep on this mountain were goats.'
 (OK only if animals can be sheep and goats at the same time)
- b. *Byvalo/slučalos', čto /*čto-by četyre gimnastki delili zolotuju medal'.*
 happened/occured **COMP /COMP-BY** four gymnasts shared gold medal
 'It happened /occurred that four gymnasts shared the gold medal.'
- c. *Byvalo /slučalos' li, čto-by četyre gimnastki delili zolotuju medal'?*
 happened /occured Q **COMP-BY** four gymnasts shared gold medal
 'Has it (ever) happened /occurred that four gymnasts shared the gold medal?'
- d. *Ne byvalo /slučalos' takogo, čto-by èti gimnastki delili zolotuju medal'.*
 NEG happened /occurred such **COMP-BY** these gymnasts shared gold medal
 'It has not happened /occurred that these gymnasts shared the gold medal.'

★ **Desideratum for our theory:** Only Sit-CPs can be weak NPI subjunctives.

⁶Some of these are grammatical under the manner reading of the word *kak* 'how'.

5 Proposal

5.1 Clauses as existential quantifiers

- I propose that Russian *čto*-clauses can in principle have two meanings: they can be predicates of individuals with certain propositional content (Cont-CP), (27a), or predicates of exemplifying situations (Sit-CPs), (27b).⁷

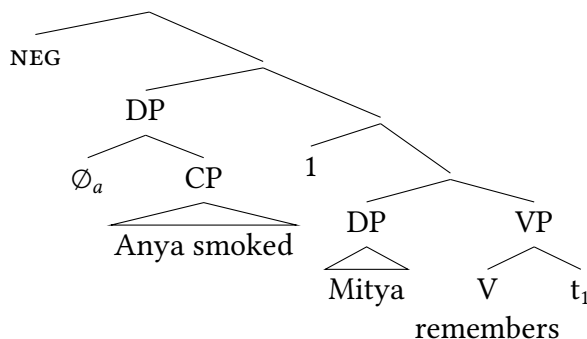
- (27) a. $\llbracket [\text{Cont}_{CP} \text{ čto CONT Anja kurila}] \rrbracket^{s_0} = \lambda x. \text{CONT}(x)(s_0) = \{s': \text{Anja smoked in } s'\}$.
 b. $\llbracket [\text{Sit}_{CP} \text{ čto Anja kurila}] \rrbracket^{s_0} = \lambda s. s \text{ exemplifies}_{s_0} \{s': \text{Anja smoked in } s'\}$.

- These CPs can become restrictors of a null existential quantifier \emptyset_a , thus becoming existential QPs, (28a)-(28b).

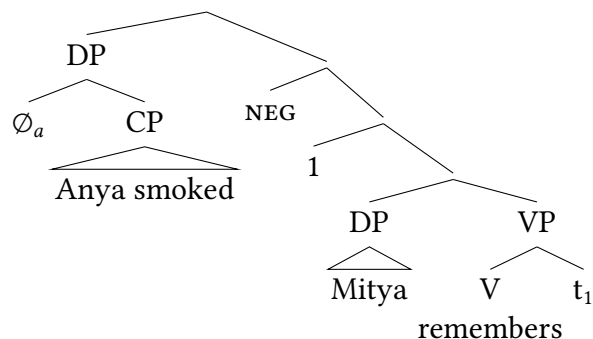
- (28) a. $\llbracket [\emptyset_a \text{ čto CONT Anja kurila}] \rrbracket^{s_0} = \lambda f. \exists x [f(x)=1 \wedge \text{CONT}(x)(s_0) = \{s': \text{Anja smoked in } s'\}]$
 b. $\llbracket [\emptyset_a \text{ čto Anja kurila}] \rrbracket^{s_0} = \lambda f. \exists s [f(s)=1 \wedge s \text{ exemplifies}_{s_0} \{s': \text{Anja smoked in } s'\}]$

- As any existential QP, they can take scope over different operators, e.g. they can scope below or above negation, (29)-(30). Cf. QR of clauses in (Özyıldız 2018).

(29) **Low Scope of the CP**



(30) **High Scope of the CP**



★ Licensing polarity subjunctives:

- Polarity subjunctives under consideration are existential quantifiers which are weak NPIs: they can only occur in a context with certain entailment properties.
- In Russian weak NPIs (e.g., pronouns like *kto-libo* and *kto by to ni bylo*) are licensed only in Strawson Entailment Reversing (SER) Environments.
- Cont-CPs cannot function as weak NPIs because the Cont head changes the SER environment into a non-monotonic environment.
 ⇒ Only verbs that can take Sit-CPs will be able to combine with weak NPI subjunctives.

⁷I omit here the exemplification in the meaning of Cont-CPs (cf. (15)) for simplification.

- 2 possible meanings for CPs x 2 possible scopes for CPs x 2 possible mood markings:

Mood	Low Scope		High Scope	
	CONT-CP	SIT-CP	CONT-CP	SIT-CP
Indicative	✓	✓	✓	✓
Subjunctive	*	✓	*	*

Table 4: The range of interpretations

- Indicative CPs do not contain any element that is sensitive to the entailment properties of the environment, and thus all four options should be attested.
- I believe all four are indeed generally possible, however I will not go through them here. See appendix C, which also talks about when factive inferences are observed.
- **Current goal:** derive the distribution of subjunctive, i.e.
 - ▶ the impossibility of high scope for subjunctive clauses;
 - ▶ the impossibility of subjunctive Cont-CP.

5.2 Condition for licensing weak NPIs

- Russian has several series of indefinite pronouns, many of which are built by attaching particles to *wh*-words (see Pereltsvaig 2000, 2004, Partee 2005, Paducheva 2011, Eremina 2012, Paducheva 2015, 2018 a.o.).

Pronoun (series)	Description
<i>wh-to</i>	specific (wide-scope) indefinite #1
<i>koe-wh</i>	specific (wide-scope) indefinite #2
<i>ni-wh</i>	negative concord pronouns
<i>wh-libo</i>	weak NPI # 1
<i>wh by to ni bylo</i>	weak NPI # 2
<i>wh-nidub'</i>	non specific (low scope) indefinite
<i>ljuboj</i>	free choice pronoun

Table 5: Series of pronouns in Russian⁸

- Prenominal weak NPIs take two forms: *wh-libo* ‘wh-PTCL’ and *wh-by to ni bylo* ‘wh-SUBJ-SPEC-NEG-BE.PST’. These items have mostly identical distribution (Paducheva 2011, 2015).
- Prenominal weak NPIs and polarity subjunctives with verbs like *pomnit'* ‘remember’ have the same distribution with the exception of clause-mate negation: with pronouns we see morphological blocking of weak NPIs by negative concord items (Pereltsvaig 2004).

⁸It is not clear that *-to* pronouns always have to take wide scope.

Context	<i>ni-wh</i>	<i>wh-libo</i> & <i>wh by..</i>	čto-by as NPI	<i>wh-nibud'</i>	<i>ljuboj</i>
episodic UE context	*	*	*	*	*
clausemate negation	✓	*	✓	*	*
scope of <i>only</i>	*	✓	✓	?	*
scope of <i>few</i>	*	✓	✓	?	*
polar questions	*	✓	✓	✓	*
restrictor of every	*	✓	✓	✓	*
conditional antecedent	*	✓	✓	✓	*
imperatives	*	*	*	✓	✓
modals (<i>may</i>)	*	*	*	✓	✓
future	*	*	*	✓	✓
desire predicates	*	*	*	✓	✓

Table 6: Comparison of contexts in which indefinites of different kinds & polarity subjunctives can appear (most of the information about indefinites is taken from (Pereltsvaig 2000, 2004, Paducheva 2011, 2015, 2018))

- (Pereltsvaig 2000) argues that a monotonicity-based approach can better account for the distribution of weak NPIs in Russian, but it needs to be supplemented by morphological blocking to deal with the ‘Bagel Problem’.
- The relevant notion of entailment seems to be Strawson Entailment (von Fintel 1999):

(31) **Strawson Entailment** (\Rightarrow_s) (von Fintel 1999, here via Crnič 2019: p.2, (2))

- For any p, q of type t: $p \Rightarrow_s q$ iff $p = 0$ or $q = 1$.
- For any f, g of type $(\sigma\tau)$, $f \Rightarrow_s g$ iff for every x of type σ such that g(x) is defined, $f(x) \Rightarrow_s g(x)$.

(32) **Strawson Entailment-Reversal (SER)** (Crnič 2019: p.4, (7))

A Constituent C is Strawson Entailment-Reversing with respect to a sub-constituent X iff for every X' such that $X' \Rightarrow_s X$, it holds that $C \Rightarrow_s C[X/X']$ (where $C[X/X']$ is identical to C except that X' replaces X).

- Here's an example showing that a sentence involving *only* (=C) is Strawson Entailment-Reversing with respect to the scope of *only* (=X):

(33) P = Only Anya [ate any ice-cream] \Rightarrow_s Q = Only Anya [ate any vanilla ice-cream].

- P is true: Anya ate ice-cream and no one else ate ice-cream.
- Presupposition of Q is true: Anya ate vanilla ice-cream.
- \Rightarrow No one else ate vanilla ice-cream.

- Then the condition for weak NPIs being in licensed in Russian is as in (34).

(34) **Condition for licensing pronominal weak NPIs**

A *wh-libo* or *wh by to ni bylo* is an indefinite that is acceptable only if it is dominated by a constituent that is Strawson Entailment-Reversing with respect to its domain.

5.3 Why Cont-CPs cannot be subjunctive

- First, note that the same contrast is observed with complements to Cont-DPs and Sit-DPs:

(41) *Complements to Cont-DPs can not be subjunctive in SER environments*

- a. *Mitja ne pomnit **utverždenija /sluxa, čto-by** grabitel' pytalsja
Mitya NEG remembers **claim** /**rumor COMP-SUBJ** robber tried
proniknut' na sklad.
to.get.in on warehouse
'M. doesn't remember a claim/rumor that the robber tried to get into the warehouse.'
- b. *Tol'ko Mitja pomnit **utverždenije /slux, čto-by** grabitel' pytalsja
only Mitya remembers **claim** /**rumor COMP-SUBJ** robber tried
proniknut' na sklad.
to.get.in on warehouse
'Only M. remembers a claim /rumor that the robber tried to get into the warehouse.'

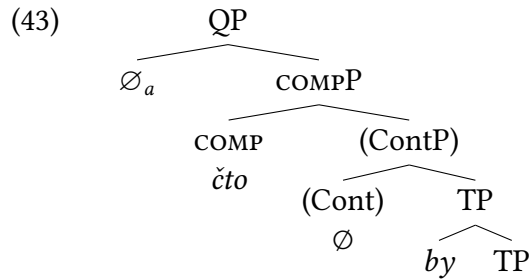
(42) *Complements to Sit-DPs can be subjunctive in SER environments*

- a. Mitja ne pomnit **situaciji, /slučaja čto-by** grabitel' pytalsja
Mitya NEG remembers **situation /event COMP-SUBJ** robber tried
proniknut' na sklad.
to.get.in on warehouse
'M. doesn't remember situation/event of the robber trying to get into the warehouse.'
- b. Tol'ko Mitja pomnit **situaciju, /slučaj čto-by** grabitel' pytalsja
only Mitya remembers **situation /event COMP-SUBJ** robber tried
proniknut' na sklad.
to.get.in on warehouse
'Only M. remembers a situation/event of the robber trying to get into the warehouse.'

- I'd like to argue that the data in (41)-(42) and the inability of weak NPI subjunctives to be Cont-CPs, (22a)-(23a), have the same explanation: the Cont head creates a non-monotone environment with these verbs.
- One thing to note is that in the same contexts pronominal weak NPI modifiers are grammatical with both nouns like 'claim' and 'situation', with or without an indicative CP:

- a. Tol'ko Mitja pomnit [[kako] by to ni bylo] slux] (čto Aja ušla).
only Mitya remembers what.kind SUBJ SPEC NEG be.PST rumor (COMP Aja left)
'Only Mitya remembers any rumor (that Aja left).'
- b. Tol'ko Mitya pomnit [[kaku] by to ni bylo] situaciju] (čto Aja ušla).
only Mitya remembers what.kind SUBJ SPEC NEG be.PST situation (COMP Aja left)
'Only Mitya remembers any situation (that Aja left).'

- Thus, the question is: why is the environment SER for the purposes of licensing adjectival NPIs, but not for subjunctive complements?
- I suggest that the particle *by* attaches below the left periphery of the clause: below COMP and Cont heads (43).



- I suggest that this structural difference correlates with the difference in the sub-constituents X for which Strawson Entailment-Reversal is calculated:
 - **for adjectival NPIs:** subdomains of the adjectival predicate
e.g.: any claim/situation vs. any funny claim/situation
 - **for complements:** subdomains of the embedded proposition
e.g.: claim/situation that Anya smokes vs. claim/situation that Anya smokes at home
- Thus, the condition for licensing polarity subjunctive could be stated as follows:

(44) **Condition for licensing polarity subjunctive**

By inside a complement clause is acceptable only if it is dominated by a constituent that is Strawson Entailment-Reversing with respect to the domain of the proposition that *by* combines with.

Sit-CPs don't disrupt monotonicity

- Due to the property in (45), sentences with Sit-CPs under negation are SER with respect to the proposition that *by* combines with: (46) \Rightarrow_s (47).

(45) For all p and q such that $p \Rightarrow_s q$:

$\exists s$ in s_0 : s exemplifies p \Rightarrow_s $\exists s$ in s_0 : s exemplifies q.

(e.g.: if there is an Anya-smoking-at-home situation, there is an Anya-smoking situation)

(46) $[[[\text{NEG}[\emptyset_a \text{ čto Anja kurila}] [1 \text{ Mitya remembers } t_1]]]]^{s_0} =$
 $\neg[\exists s, s_1 [\text{remember}(s)(s_1)(s_0) \wedge \text{Exp}(s_1)=\text{Mitya} \wedge s \text{ exemplifies}_{s_0} \{s': \text{Anya smoked in } s'\}]]$
 "It's not the case that there's an Anya-smoking situation that Mitya remembers"

(47) $[[[\text{NEG}[\emptyset_a \text{ čto Anja kurila doma}] [1 \text{ Mitya remembers } t_1]]]]^{s_0} =$
 $\neg[\exists s, s_1 [\text{remember}(s)(s_1)(s_0) \wedge \text{Exp}(s_1)=M. \wedge s \text{ exemplifies}_{s_0} \{s': \text{A. smoked at home in } s'\}]]$
 "It's not the case that there's an Anya-smoking-at-home situation that Mitya remembers"

- Sentences with Sit-CPs in upward-monotone contexts are not SER with respect to the proposition that *by* combines with: (48) \nRightarrow_s (49).

(48) $[[[\emptyset_a \text{ čto Anja kurila}] [1 \text{ Mitya remembers } t_1]]]^{s_0} =$
 $\exists s, s_1 [\text{remember}(s)(s_1)(s_0) \wedge \text{Exp}(s_1)=\text{Mitya} \wedge s \text{ exemplifies}_{s_0} \{s': \text{Anya smoked in } s'\}]$
 "There's an Anya-smoking situation that Mitya remembers"

(49) $[[[\emptyset_a \text{ čto Anja kurila doma}] [1 \text{ Mitya remembers } t_1]]]^{s_0} =$
 $\exists s, s_1 [\text{remember}(s)(s_1)(s_0) \wedge \text{Exp}(s_1)=M. \wedge s \text{ exemplifies}_{s_0} \{s': \text{A. smoked at home in } s'\}]$
 "There's an Anya-smoking-at-home situation that Mitya remembers"

Cont-CPs disrupt monotonicity

- However the same relations do not hold for individuals with propositional content: existence of an entity with content p does not entail existence of an entity whose propositional content is entailed by p (50).

(50) For all x such that there is a maximal situation s' such that x is not in s' ,¹¹
 for all p and q such that $p \Rightarrow_s q$:
 $\exists x$ in s_0 [$\text{CONT}(x)(s_0) = p$] $\not\Rightarrow_s \exists x$ in s_0 [$\text{CONT}(x)(s_0) = q$]
 (e.g.: if there is a rumor that Anya smoked at home, it doesn't mean that there is a rumor that Anya smoked—the two rumors are distinct things)

- This makes a sentence with a Cont-CP under negation be not SER, but non-monotone with respect to the proposition that by combines with: (51) $\not\Rightarrow_s$ (52).

(51) $\llbracket \llbracket \text{NEG}[\emptyset_a \text{ čto CONT Anja kurila}] [1 \text{ Mitya remembers } t_1] \rrbracket \rrbracket^{s_0} =$
 $\neg[\exists x, s_1 [\text{remember}(x)(s_1)(s_0) \wedge \text{Exp}(s_1) = \text{Mitya} \wedge \text{CONT}(x)(s_0) = \{s': \text{Anya smoked in } s'\}]]$
 “It's not the case that there's a claim/idea with the content *Anya smoked* that Mitya remembers”

(52) $\llbracket \llbracket \text{NEG}[\emptyset_a \text{ čto CONT Anja kurila doma}] [1 \text{ Mitya remembers } t_1] \rrbracket \rrbracket^{s_0} =$
 $\neg[\exists x, s_1 [\text{remember}(x)(s_1)(s_0) \wedge \text{Exp}(s_1) = M. \wedge \text{CONT}(x)(s_0) = \{s': A. \text{ smoked at home in } s'\}]]$
 “It's not the case that there's a claim/idea with the content *Anya smoked at home* that Mitya remembers”

- For example, in the context in (53), (51) is true but (52) is not.

(53) **Context:** Masha spread a rumor that Anya smoked, and Petya spread a rumor that Anya smoked at home. Mitya remembers the rumor that Petya spread, but not the rumor that Masha spread.

- This is a general state of affairs: in the absence of any additions, embedding a Cont-CP produces a non-monotone environment.
- However, there are clear cases of verbs that take Cont-CPs, but are upwards-monotone: e.g., verbs like *think* and *believe*. Monotonicity with these verbs will have to be modelled separately, for example as in (Elliott 2017):
 - an individual is an experiencer of a plurality of belief states at any given time;
 - an individual's belief states form a Boolean algebra closed under meet;
 - propositions also form a Boolean algebra;
 - when applied to *believe*-states, CONT is a homomorphism from the Boolean algebra of belief states to the Boolean algebra of propositions.
- This will ensure, e.g., that if *Susi has a belief that $p \wedge q$* , she also *has a belief that p* .

¹¹This condition eliminates individuals with propositional content which exist in all worlds from our consideration. E.g., if we think that *propositions* are individuals with propositional content, then a proposition with the content ‘Anya smoked’ exists in all worlds, thus making the consequent of (46) always true, and the implication true as well. I'm grateful to Kai von Fintel for pointing this out.

6 Some predictions

6.1 By in relative clauses

- Given the proposal, we should expect other clauses that do not contain Cont to be able to function like weak polarity subjunctives.
- It seems that relative clauses fulfill this prediction. Cf. (Beghelli 1998, Quer 1998).
 - ▶ they are monotone with respect to the proposition expressed by the relative clause;
 - ▶ *by* cannot occur in relative clauses in ‘positive’ sentences (55a);
 - ▶ *by* can occur in relative clauses in weak NPI contexts, e.g. under negation (55b), in questions (55c) and in antecedents of conditionals, (55d).

(54) $\exists x,s [\text{see}(x)(s)(\text{Mitya}) \wedge \text{woman}(x) \wedge \exists s' [\text{did-rock-climbing}(s')(x) \wedge \text{at-our-gym}(s')]] \Rightarrow_s \exists x,s [\text{see}(x)(s)(\text{Mitya}) \wedge \text{woman}(x) \wedge \exists s' [\text{did-rock-climbing}(s')(x)]]$

- (55) a. Mitya videl devušku, kotoraja (*by) zanimalas' skalolazaniem.
 Mitya saw young.woman REL (SUBJ) do.PST rock-climbing
 ‘Mitya saw a woman who did rock-climbing.’¹²
- b. Mitya ne videl devušku, kotoraja (by) zanimalas' skalolazaniem.
 Mitya NEG saw young.woman REL (SUBJ) do.PST rock-climbing
 ‘Mitya didn’t see a woman who did rock-climbing.’
 indicative: $\exists > \neg$, subjunctive: $\neg > \exists$ ¹³
- c. Mitya videl devušku, kotoraja (by) zanimalas' skalolazaniem?
 Mitya saw young.woman REL (SUBJ) do.PST rock-climbing
 ‘Did Mitya see a woman who did rock-climbing?’
- d. Esli Mitya videl devušku, kotoraja (by) zanimalas' skalolazaniem, to on
 if Mitya saw young.woman REL (SUBJ) do.PST rock-climbing then he
 mne o nej rasskažet.
 me about her will.tell
 ‘If Mitya saw a woman who did rock-climbing, he will tell me about her.’

6.2 Licensing weak NPIs in Cont-CPs

- My account makes predictions about licensing weak NPIs in complement clauses:

- (56) **Prediction about licensing weak NPIs in complement clauses:**
 Whether weak NPIs are licensed inside embedded clauses should depend not only on the higher operators, but on the meaning of the CP. If there is a higher operator that generally makes the environment SER with respect to constituents inside of it:

¹²The sentence with subjunctive is grammatical under an irrelevant conditional reading: *Mitya saw a woman who (if some condition held) would do rock-climbing*. Note that *by* can occur in consequents of conditionals (appendix A).

¹³Russian also allows genitive objects under negation, and such DPs obligatorily receive narrow scope. This makes accusative arguments under negation preferably exhibit wide scope, which is what we see with the indicative clause in (55b). The fact that subjunctive still scopes low, despite modifying an accusative DP, suggests that accusative DPs under negation can be forced into narrow scope readings when otherwise the sentence would be ungrammatical.

- ▶ If a verb combines with Sit-CPs only, weak NPIs should be licensed.
- ▶ If a verb combines with Cont-CPs only, weak NPIs should not be licensed, *unless other components of the verb's meaning make it monotone*.
- ▶ If a verb combines with both Sit-CPs and Cont-CPs, it should be able to contain weak NPIs only under the Sit-CP interpretation of the CP.

- While I am far from having explored these predictions, some tentative results are promising.
- First, verbs like *byvat* 'happen', which only take Sit-CPs, indeed can have weak NPIs inside embedded clauses under higher entailment-reversing operators, e.g. under negation:¹⁴

(59) **Sit-CP-only verb: weak NPIs are good**

Ne byvalo takogo, čto-(by) Maša prixodila **kuda-libo** vovremja.
 NEG happened such COMP-(SUBJ) Masha come.PST **where-PTCL** on.time
 'It has not happened that Masha came anywhere on time.'

- Second, verbs like *komentirovat* 'claim' only take Cont-CPs, which create non-monotone environments, hence NPIs are not licensed (60). Verbs like *verit* 'believe', are monotone despite taking Cont-CPs, and thus NPIs can occur in the clauses they combine with (61).

(60) **Cont-CP-only verb (non-monotone): weak NPI not good**

* Lena ne komentirovala, čto Ira kupila **kakoe-libo** platje.
 Lena NEG comment.on.PST COMP Ira bought **what-PTCL** dress
 Intended: 'Lena didn't comment on (a claim) that Ira bought a dress.'

(61) **Cont-CP-only verb (monotone): weak NPI good**

Maša ne verila, čto Lena ispekla **kakoj-libo** pirog.
 Masha NEG believe.PST COMP Lena baked **what-PTCL** pie
 'Lena didn't believe that Lena baked any pie.'

- Finally, verbs like *pomnit* 'remember' can have NPIs only inside Sit-CPs:

(62) **verb-taking-both-CPs: weak NPI good under Sit-CP reading only**

Mitja ne pomnit čto /čto-by Anja kurila **kakie-libo** sigary.
 Mitya NEG remembers COMP /COMP-SUBJ Anya smoke.PST **what-PTCL** sigars
 ✓ 'Mitya doesn't remember Anya smoking any sigars.'
 * 'Mitya doesn't remember (a claim/rumor) that Anya smoked some sigars.'

¹⁴This is an oversimplification based on the cases we looked at so far. The relation between the verb's meaning and the situation argument matters in this case. For example, *bojatsja* 'be afraid of' can admit situations as arguments, however it is non-monotone (57) and thus cannot license weak NPIs in its complement (58).

(57) Lena was afraid of a situation of Anya smoking at home \nRightarrow Lena was afraid of a situation of Anya smoking.

(58) * Ira ne boitsja, čto Andrej kupil **kakoj-libo** /*kakoj by to ni bylo dom*.
 Ira NEG is.afraid COMP Andrey bought what-PTCL /what SUBJ SPEC NEG be.PST house
 'Intended: Ira is no afraid of Andrey having bought any house.'

7 Concluding remarks

- The broader environment can affect clausal selection when clauses contain elements (like Russian *by*) that are sensitive to entailment properties of the environment.
- The entailment properties of the environment can be changed not only by operators outside of the clause, but also by elements making up the interpretation of the embedded clause:
 - ▶ I argued that some clauses contain a Cont head, that makes the environment non-monotone, unless additional components of meaning result in monotonicity.
- Many open questions, here are a few:
 - ★ How do we *derive* the licensing conditions for weak NPIs in Russian?
 - ★ How should we analyze other kinds of polarity subjunctives (e.g., Russian *dumat'* allows subjunctive only under negation, see appendix D)?
 - ★ Is it possible to have a uniform analysis of “selected” subjunctives (which we see with verbs like ‘want’) and polarity subjunctives?
 - ★ Can some factivity alternations arise due to interaction of scope & CP’s meaning (see Özyıldız 2018 and some speculations in appendix C)?
 - ★ How does argument structure enter into the picture?
If there are CPs that combine as internal arguments vs. CPs that modify event arguments, do they affect monotonicity properties in the same way?
 - ★ How exactly should we model monotonicity of predicates like *think* and *believe*?
Does it change when we change aspectual properties of these predicates (e.g., make them telic or perfective)?

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8 Appendix A: On uses of *by*

- The particle *by* occurs in many contexts beyond polarity subjunctives.
- First, it can occur in root clauses, and then exclamatives that express wishes are created:

(63) *By* in root clauses: expressing a wish

a. *Finite clauses*

Končilsja **by** semestr uže!

finish.PST **SUBJ** semester already

‘(I wish) that the semester would be over already!’

b. *Infinitives*

Vypit’ **by** chaju!

to.drink **SUBJ** tea.PART

‘(I wish) to drink tea!’

- While in the finite case (63a) any individual could be the subject, in the infinitival root clause (63b) the speaker is both the holder of the wish and the agent of the infinitival predicate.
- *By* in root clauses seems to have an inference that according to the speaker, the proposition expressed by the clause is less likely to hold than the opposite proposition:

(64) Prinesla **by** Maša pizzu!

bring.PFV.PST **BY** Masha pizza

‘If only Masha brought pizza!’

a. ⇒ Masha bringing pizza is desirable for the speaker.

b. ⇒ According to the speaker, Masha bringing pizza is less likely than Masha not bringing pizza.

- Second, it appears inside the morphological structure of pronouns that are weak NPIs. These pronoun consist of the following elements: a *wh*-word, *by*, particle *to* that occurs in specific indefinites, expletive negation, and the verb ‘be’ in past tense (65).

(65) **Inside the structure of weak NPIs**

- a. Každýj, kto sdelajet na uroke [kakoj **by** to ni bylo] doklad,
 everyone who do.FUT on lesson what **SUBJ** SPEC NEG be.PST presentation
 polučit xorošuju ocenku.
 get.FUT good grade
 ‘Everyone who will do any presentation during the lesson will get a good grade.’
- b. Tol’ko Lena prinetsla v gosti [čto **by** to ni bylo].
 only Lena brought in guests what **SUBJ** SPEC NEG be.PST
 ‘Only Lena brought anything to guests.’

- Third, *by* occurs in embedded clauses of a number of predicates that require subjunctive:

(66) **“Selected” subjunctives**

- a. Ja xoču čto-**by** /*čto moi tezisj prinjali na konferenciju
 I want COMP-**SUBJ** /COMP my abstract accept.PST on conference
 ‘I want my abstract to be accepted at the conference.’
- b. Neobxodimo, čto-**by** /*čto byla izmenena sudebnaja praktika
 necessary COMP-**SUBJ** /COMP was changed judicial practice
 ‘It’s necessary that the judicial practice is changed.’
- c. Ira prikazala, čto-**by** /*čto vse šli zavtrakat’.
 Ira ordered COMP-**SUBJ** /COMP everyone go.PST to.breakfast
 ‘Ira ordered that everyone would go have breakfast.’

- Fourth, *by* occurs in antecedents and consequents of counterfactual conditionals:

(67) **Counterfactual conditionals**

Esli **by** vypal sneg, amerikanske studenty ne pošli **by** na pary.
 if **SUBJ** fall.down.PST snow American students NEG go.PST **SUBJ** on lessons
 ‘If the snow had fallen, American students would not have gone to lessons.’

- Fifth, *by* occurs in relative clauses: in *ever*-free relatives, in relatives under intensional verbs, and in relatives in SER environments (68).

(68) **Certain relative clauses**

- a. *Free relatives*
 Ja sjem čto **by** ty ni prigotovil.
 I eat.FUT what **SUBJ** you NEG cook.PST
 ‘I will eat whatever you cook.’
- b. *Relatives under intentional verbs*
 Ja išču devušku, kotoraja **by** razgovarivala na vengerskom
 I am.seeking girl REL.FEM **SUBJ** speak.PST on Hungarian
 ‘I am looking for a girl who speaks Hungarian.’
 (✓ there might not be such a girl)
- c. *Relatives in SER environments*

Ja ne videla devuški, kotoraja **by** razgovarivala na vengerskom
 I NEG saw girl REL.FEM **SUBJ** speak.PST on Hungarian
 ‘I have not seen a girl who speaks Hungarian.’ (✓ there might not be such a girl)

- Finally, *by* occurs also in purpose clauses (in which indicative is prohibited), (69) and in a causative construction (in which indicative is possible as well), (70).

(69) **Purpose clauses**

Mitya podnjaj ruku čto-**by** /*čto zadat’ vopros
 Mitya raise hand COMP-**SUBJ** /COMP ask question
 ‘Mitya raised his hand in order to ask a question.’

(70) **Causative construction**

a. *Subjunctive*

On sdelał tak, čto-**by** ob ix mukax uznał ves’ mir.
 he made so **COMP-SUBJ** about their suffering find.out.PST whole world
 ‘He made it so that the whole world would learn about their suffering.’ <Link>

b. *Indicative*

Saša sdelał tak, čto ves’ šou-biznes kategoričeski rezko ot menja
 Sasha made so **COMP** whole show-business categorically abruptly from me
 otvernulsja.

turn.away.PST

‘Sasha made it so that the whole show business abruptly and categorically turned away from me.’ <Link>

9 Appendix B: On temporal & aspectual restrictions

- Although *by* always requires fake past, it is usually compatible with future interpretation and with perfective aspect:

(71) *No tense & aspect restriction in counterfactual conditionals*

Esli **by** **zavtra** **vy**-pal sneg, studenty amerikanskix vuzov
 if **SUBJ** **tomorrow** **PFV**-fall.down.PST snow students American.GEN universities.GEN
 ne pošli **by** na pary.
 NEG go.PST **SUBJ** on lessons

‘If the snow would fall (perf.) tomorrow, students of American universities would not go to lessons.’

- However polarity subjunctives show restrictions with respect to tense & aspect. First, they are incompatible with the future interpretation:¹⁵

(72) Tol’ko Vasja pomnit, čto-**by** Maša **včera** /***zavtra** prinosila pizzu.
 only Vasja remembers that-**SUBJ** Masha **yesterday** /**tomorrow** brought pizza

a. ✓ ‘Only Vasja remembers that Masha brought pizza yesterday.’

b. * ‘Only Vasja remembers that Masha will bring pizza tomorrow.’

¹⁵Future might be acceptable in a context where Vasja is a psychic and has the ability to perceive future events.

- Second, episodic present tense eventualities are somewhat degraded (73), while habitual present eventualities are good (74).

(73) ? Ja ne pomnju, čto-**by** Maša **sejčas** xodila po baram.
 I NEG remember that-**SUBJ** Masha **now** go.PST to bars
 ‘I don’t remember that Masha is bar-hopping now.’

(74) Ja ne pomnju, čto-**by** Maša kurila.
 I NEG remember that-**SUBJ** Masha smoke.PST
 ‘I don’t remember that Masha smokes.’¹⁶

- Another restriction that polarity subjunctives exhibit has to do with aspect: for the majority of the speakers that I consulted, it is impossible to have a perfective verb inside the embedded clause (75).

(75) Tol’ko Vasja pomnit, čto-**by** Maša **prinosila** /***prinesla**
 only Vasja remembers that-**SUBJ** Masha **brought.IPFV.PST** /**brought.PFV.PST**
 pizzu.
 brought pizza
 ‘Only Vasja remembers that Masha brought pizza.’

- The interpretation of the embedded clause does not have to be imperfective: it permits both perfective and imperfective uses.
- In many circumstances imperfective also has to occur on the matrix verb:

(76) Tol’ko Vasja **zamečal** / ??**zametil**, čto-**by** Maša prinosila
 only Vasja **noticed.IPFV.PST** / **noticed.PFV.PST** that-**SUBJ** Masha brought.IPFV.PST
 pizzu.
 brought pizza
 ‘Only Vasja noticed Masha bringing pizza.’

- Russian imperfect can have readings similar to existential perfect readings, and that is the reading that (76) seems to receive.
- More work is needed to study these restrictions, but they cannot be the determining factor for licensing polarity subjunctive: other languages with polarity subjunctives (e.g. Italian and French) do not seem to display them.

10 Appendix C: On factive inferences

- Different combinations of CP meaning, CP scope and mood marking also make predictions about the presence of factive inferences:

¹⁶This sentence is also compatible with the past interpretation.

Mood	Low Scope		High Scope	
	CONT-CP	SIT-CP	CONT-CP	SIT-CP
Indicative	✓ NON-FACT	✓ NON-FACT	✓ NON-FACT	✓ FACT
Subjunctive	*	✓ NON-FACT	*	*

Table 7: The predicted interpretations
(FACT—factive inference predicted, NON-FACT—no obligatory factive inference predicted)

- While subjunctives are restricted to low-scope Sit-CPs that don't have a factive inference ("it's not the case that X remembers a p-situation"), a variety of readings is expected for indicative CPs with these verbs:
 - **the factive reading** = high-scope Sit-CP
"a situation p exists, but X doesn't remember it"
 - **non-factive, but with an existential inference** = high-scope Cont-CP
"a claim p exists, but X doesn't remember it"
 - **2 other non-factive readings:** = low-scope Cont-CP and Sit-CP
"it's not the case that X remembers a claim p" and
"it's not the case that X remembers a p-situation"

10.1 Factive inference as an entailment: Sit-CPs taking wide scope

★ Factive inferences as entailments:

- ▶ Factive inferences emerge when Sit-CPs take wide or exceptionally wide scope.
- ▶ Subjunctives are Sit-CPs, but they cannot take wide scope \Rightarrow no factive inferences.
- ▶ Indicatives can be Sit-CPs taking wide scope \Rightarrow factive inferences sometimes emerge, but they can also be Cont-CPs or Sit-CPs taking narrow scope \Rightarrow factive inferences are not observed in some contexts.
- If only Sit-CPs were possible complements, we would see a factivity alternation:

(77) Low Scope of Sit-CP \Rightarrow no factive inference

$[[[\text{NEG}[\emptyset_a \text{ čto Anja kurila}] [1 \text{ Mitya remembers } t_1]]]]^{s_0} =$
 $\neg[\exists s, s_1 [\text{remember}(s)(s_1)(s_0) \wedge \text{Exp}(s_1)=\text{Mitya} \wedge s \text{ exemplifies}_{s_0} \{s': \text{Anya smoked in } s'\}]]$
 "It's not the case that there's an Anya-smoking situation that Mitya remembers"

(78) High Scope of Sit-CP \Rightarrow factive inference

$[[[[\emptyset_a \text{ čto Anja kurila}] [\text{NEG} [1 \text{ Mitya remembers } t_1]]]]]^{s_0} =$
 $\exists s [s \text{ exemplifies}_{s_0} \{s': \text{Anya smoked in } s'\}] \wedge \neg[\exists s_1 [\text{remember}(s)(s_1)(s_0) \wedge \text{Exp}(s_1)=\text{Mitya}]]$
 "There is an Anya-smoking situation and Mitya doesn't remember it"

- The LF with a Sit-CP below negation (29) will give rise to the truth-conditions in (77): (77) does not entail that there is a situation in the actual world (s_0) of Anya smoking.

- The LF with a Sit-CP above negation (30) will give rise to the truth-conditions in (78): (78) entails that there is a situation in the actual world (s_0) that exemplifies “Anya smoking”.
- Negation might be analyzable in terms of scope, but what about other environments, e.g. antecedents of conditionals, questions, restrictor of *every* etc.?
- More work is needed here, but my hope is that whatever mechanisms can derive exceptional scope of indefinites more generally can apply here as well (79).

(79) **Hypothesis:** Indicative Sit-CPs can take exceptional scope in SER environments, leading to factive inferences.

★ **Subjunctive Sit-CP clauses** cannot take wide scope due to the requirement of being in a SER environment \Rightarrow no factive inferences¹⁷

★ **Indicative Sit-CP clauses** can take both wide and narrow scope with respect to operators \Rightarrow it’s predicted that factive inferences will only *sometimes* appear.

- For Cont-CPs, two readings are predicted:

(80) **Low Scope of Cont-CP \Rightarrow no factive inference**

$[[[\text{NEG}[\emptyset_a \text{ čto Anja kurila}] [1 \text{ Mitya remembers } t_1]]]]^{s_0} =$
 $\neg[\exists x, s_1 [\text{remember}(x)(s_1)(s_0) \wedge \text{Exp}(s_1)=\text{Mitya} \wedge \text{CONT}(x)(s_0) = \{s': \text{Anya smoked in } s'\}]]]$
 “It’s not the case that there’s a claim/idea with the content *Anya smokes* that Mitya remembers.”

(81) **High Scope of Cont-CP \Rightarrow no factive inference, \checkmark existential inference**

$[[[[\emptyset_a \text{ čto Anja kurila}] [\text{NEG} [1 \text{ Mitya remembers } t_1]]]]]^{s_0} =$
 $\exists x [\text{CONT}(x)(s_0) = \{s': \text{Anya smoked in } s'\} \wedge \neg[\exists s_1 [\text{remember}(x)(s_1)(s_0) \wedge \text{Exp}(s_1)=\text{Mitya}]]]$
 “There is a claim/idea with the content *Anya smokes* and Mitya doesn’t remember it.”

- The LF with a Cont-CP below negation (29) will give rise to the truth-conditions in (80): (80) does not entail that there is a situation in the actual world (s_0) of Anya smoking.
- The LF with a Sit-CP above negation (30) will give rise to the truth-conditions in (81): (81) also doesn’t entail that there is a situation of Anya smoking in the actual world (s_0). However it does entail that there is some individual with content (claim/rumor/thought...) whose content is *Anya smokes*.

★ **Subjunctive Cont-CP clauses** do not exist \Rightarrow no readings such as (80)-(81) should be possible with subjunctives.

★ **Indicative Cont-CPs clauses** are possible, and both of the predicted readings should in principle be available, provided the context supports them.

¹⁷This analysis however makes a prediction that in sentences with *only* there should be a factive inference even with subjunctive, because such sentences presuppose that the prejacent is true. I’m grateful to Kai von Stechow and Patrick Elliott for spotting this. I have to still work out what the judgements in such cases are.

10.2 Evaluating the predictions

- First, sentences with subjunctive clauses indeed do not exhibit factive inferences (83).¹⁸

(83) **Context:** We don't know if Anya smokes and are trying to find out if she does. We have been asking several people to recall whether they encountered Anya smoking.

Mitja ne pomnit [čto-by Anja kurila]. \nRightarrow Anya smoked
Mitya NEG remembers COMP-SUBJ Anya smoke.PST

'Mitya doesn't remember that Anya smoked.'

- Second, factive inferences are very often observed with indicative clauses, this is the most salient interpretation for them (84).

(84) **Context:** We all know that Anya smoked. We're wondering if Mitya remembers this.

Mitja ne pomnit [čto Anja kurila (včera)]. \Rightarrow Anya smoked
Mitya NEG remembers COMP Anya smoke.PST (yesterday)

'Mitya doesn't remember that Anya smoked (yesterday).'

= 'Anya smoked (yesterday), and Mitya doesn't remember it.'

- Third, high-scope indicative Cont-CPs seem to be possible, although they often require a lot more context. They require that there is some individual with propositional content (thought, statement, claim etc.) that exists, but don't require the embedded clause to be true in the actual world, (85)-(86).

(85) **p-is-unknown-context:**

There is a rumor that Andrej is getting married. We don't know if this rumor is true.

Katja (ne) slyšala čto Andrej ženitsja.

Katya (NEG) heard COMP Andrej is.getting.married

'Katya heard /didn't hear that Andrej is getting married.'

= 'There's a rumor that Andrej is getting married, but Katya heard /didn't hear it.'

(86) **p-is-false-context:**

We are running an experiment: we ask our participants to memorize and recall a list of statements, some of which are true, others are false (and participants know it). When we asked Mitya to recall the statements.

a. Kakoje iz utverždenij Mitja (ne) pomnit?
what from statements Mitya (NEG) remember

'Which statement does Mitya not remember?'

¹⁸It's not incompatible with "p is true" or "p is false" being in the CG, it just does not itself imply anything about the truth of p. Consider (82), for example: it says that the speaker can't recall directly perceived situations of Anya smoking, but they know the fact that she smoked.

(82) Ja ne pomnju čto-by Anja kurila, xotja ja točno znaju čto ona kurila.
I NEG remember COMP-SUBJ Anya smoked although I definitely know COMP she smoked
'I don't remember Anya smoking, although I definitely know that she smoked.'

- b. Mitja (ne) pomnit čto Nju-Jork stolica Ameriki.
 Mitya (NEG) remembers COMP New-York capital of.America
 ‘Mitya remember/ doesn’t remember that New York is the capital of America.’

- Note that this reading is possible independently of whether the environment is SER or not.
- Fourth, the low-scope indicative Sit-CP reading is quite strongly dispreferred, as low-scope subjunctive Sit-CP is always an option in such cases, and it seems that an unambiguous sting (with subjunctive) is preferred to a highly ambiguous one (with indicative). However it is possible to force it.
- First, the modifier *takoe* ‘such’ that can occur with Sit-CPs always seem to force them to take low scope. When it occurs on top of an indicative clause, we get the desired reading:

- (87) **Context:** We don’t know if Anya smokes and are trying to find out if she does. We have been asking several people to recall whether they encountered Anya smoking.
 Mitja ne pomnit **takogo** [čto Anja kurila].
 Mitya NEG remembers **such** COMP Anya smoke.PST
 ‘Mitya doesn’t remember a situation of Anya smoking.’

- Second, it is possible to enforce low scope of indicative CPs via quantifier binding (88):¹⁹

- (88) **Context:** The speaker is a social worker who is interviewing residents about potential cases of their cars being illegally evacuated. The speaker has just interviewed a building with 10 residents and reports:
 Ni odin iz desjati žitelej ne pomnit, čto ego mašinu èvakuovali.
 not one from ten residents NEG remembers COMP his car was.evacuated
 ‘None of the 10 residents_i remember that their_i car was evacuated.’
 = “It’s not the case that there is a resident that has a car and recalls it being evacuated.”
 (no inference that there were any evacuations, can be used to imply that there have been no evacuations in this building)

- Note that with verbs that introduce real presuppositions, it is impossible to get rid of them in the same configuration:

- (89) **Context:** The speaker is a social worker who is interviewing residents about potential cases of their cars being illegally evacuated. The speaker has just interviewed a building with 10 residents and reports:
 # Ni odin iz desjati žitelej ne v kurse, čto ego mašinu èvakuovali.
 not one from ten residents NEG is.aware COMP his car was.evacuated
 ‘None of the 10 residents_i are aware that their_i car was evacuated.’
 Possible as: “The cars of 10 residents were evacuated, and none of them are aware of it.”
 (implies that all residents have cars, and all of them were evacuated)

¹⁹I am grateful to Patrick Elliott and Filipe Kobayashi for suggesting this diagnostic to me.

- Finally, the low scope of indicative Cont-CPs in SER environments is not very easy to get (see also observations about negation in Djärv 2019).
- I think that (90) is an example of this reading: here there is no factive inference and no inference that someone had previously made a statement with the content *People are allowed to not wear masks*, and the CP describes an individual with content (statement /announcement /rumor) rather than a situation.

(90) **Context:** I see my friend without a mask in the department.

Ty slyšala čo maski možno ne nosit’?
you heard COMP masks is.allowed NEG to.wear

‘Have you heard that we’re allowed to not wear masks?’

~ Is it the case that you heard a statement/rumor/announcement with the content *People are allowed to not wear masks*?

- It also seems to be possible to get a low-scope indicative Cont-CP reading in a configuration where binding forces low scope:

(91) **Context:** The speaker is a journalist interviewing celebrities about whether they are aware of any rumors about them. The speaker interviewed 10 actresses, and reports:

Ni odna iz desjati aktris ne slyšala, čo kto-to sledit za eë mašinoj.
not one of ten actresses NEG heard COMP someone is.spying after her car

‘None of the 10 actresses_i heard (a rumor) that someone is spying on her_i car.’

= “It’s not the case that there is an actress that has a car and heard a rumor that someone is spying on it.” (no inference that there has to be a rumor that someone is spying on a car, can be used to imply that there have been no such rumors /claims etc.)

- Compare again with a presuppositional verb for which this is not possible:

(92) **Context:** The speaker is a journalist interviewing celebrities about whether they are aware of any rumors about them. The speaker interviewed 10 actresses, and reports:

Ni odna iz desjati aktris ne zabyła, čo kto-to sledit za eë mašinoj.
not one of ten actresses NEG forgot COMP someone is.spying after her car

Intended: ‘None of the 10 actresses_i forgot (a rumor) that someone is spying on her_i car.’

= Possible only as: “The cars of 10 actresses are being spied on, and none of them forgot about this fact.”

★ **Tentative conclusion:** It seems that the predicted landscape of readings is attested, however more work is needed to determine why the accessibility of different interpretations with indicative clauses differs so much.

- ▶ sentences with subjunctive CPs never exhibit factive inferences;
- ▶ sentences with indicative CPs can, but don’t have to exhibit factive inferences.

★ **Many more questions, for example:**

- Is there a competition story that could explain why low scope Sit-CPs are quite dispreferred with indicative clauses in SER environments?
- “An individual with propositional content” could be something like **claim** or **rumor**, but it also could be a **fact**. Does this play a role in the picture that we observe?
- Nothing I have said prevents indicative clauses from having definite readings in addition to having indefinite readings. How could this interfere with the judgements?

11 Appendix D: On Strong NPI subjunctives in Russian

- In addition to what I’ve been calling “weak NPI subjunctive”, Russian also has a different class of verbs that take polarity subjunctives: *dumat* ‘think’, *verit* ‘believe’, *predpolagat* ‘suppose’, *podozrevat* ‘suspect’, *predstavljat* ‘imagine’, *nadejat’sja* ‘hope’.
- Subjunctives with all of these verbs behave like strong NPIs: they are possible under negation, but not in any other SER contexts. This is illustrated in (93) with *dumat* ‘think’.

(93) **Polarity subjunctive with *dumat* ‘think’**

- a. Ja dumaju čto /*čto-**by** Lena pila vodku.
I think COMP /COMP-**SUBJ** Lena drink.PST vodka
‘I think that Lena drank vodka.’
- b. Ja ne dumaju čto /čto-**by** Lena pila vodku.
I NEG think COMP /COMP-**SUBJ** Lena drink.PST vodka
‘I don’t think that Lena drank vodka.’
IND: neg-raising reading preferred, non-neg-raising also possible
SUBJ: “I think Lena drinking vodka is less likely than Lena not drinking vodka.”
- c. Ty dumaješ, čto /*čto-**by** Lena pila vodku?
You think COMP /COMP-**SUBJ** Lena drink.PST vodka
‘Do you think that Lena drank vodka?’
- d. Každyj kto dumajet čto /*čto-**by** Lena pila vodku, byl tam.
everyone who thinks COMP /COMP-**SUBJ** Lena drink.PST vodka was there
‘Everyone who thinks that Lena drank vodka was there.’
- e. Tol’ko Mitya dumajet čto /*čto-**by** Lena pila vodku
only Mitya thinks COMP /COMP-**SUBJ** Lena drink.PST vodka
‘Only Mitya thinks that Lena drank vodka.’

- The sentence with the polarity subjunctive seems to imply that the attitude holder does not hold a firm belief, but finds the embedded proposition unlikely to hold (93b).
- The possibility this kind of polarity subjunctive also depends on aspect:

- (94) Ja ne dumal /*pri-dumal /*po-dumal čto-**by** Lena pila vodku.
I NEG thought /PFV-thought /PFV-thought COMP-**SUBJ** Lena drink.PST vodka
‘I didn’t think (✓stative, *accomplishment, *achievement) that Lena drank vodka.’