The Subjunctive and Tense in Russian*†

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Abstract

This paper discusses the interaction between subjunctive and tense in Russian. It makes a proposal explaining why Russian subjunctive occurs only with past tense or infinitive verbs. The meaning of subjunctive conditionals is compositionally derived. Subjunctive verbal complements and bare subjunctives are also discussed.

1 Introduction

The Russian particle *by* is generally glossed as subjunctive morphology. It is required in the subjunctive compliment of the verbs *xotet'* ('want'), *prosit'* ('ask'), and some others. It is also used in subjunctive conditionals, as well as a number of other contexts. Interestingly, in all available environments, *by* occurs only with the past tense or infinitive form of the verb, never with present or future. However, past, present, and future interpretations are generally permitted with *by*. (There are exceptions.) Following Iatridou (2000), we will call the presence of past tense morphology without a past tense interpretation "fake past".

Our task in this paper will be to describe the semantics of past tense and subjunctive in Russian. We will explain why *by* occurs only with past tense and infinitives. To do so, we will formalize some of the ideas in Iatridou (2000), as well as providing a formal denotation for *by*. We will see how these formalisms allow us to derive reasonable denotations for subjunctive conditionals. We will also discuss how these denotations come into play in the compliments of verbs selecting for subjunctive, as well as in unembedded subjunctives.

2 Subjunctive Conditionals as Discussed in Iatridou (2000)

Compare the following English conditionals:

(1) a. If Peter eats an apple, he will get better.
b. If Peter ate an apple, he would get better.

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†I wrote a paper on the semantics of the subjunctive marker *by* for 24.970. It included the general idea of how subjunctive and ExclF (cf. Iatridou (2000)) might combine, as well as a description of a number of contexts in which the subjunctive occurs. There were no formalisms in the 24.970 paper, and other than some exposition on ExclF, the vast majority of the work in this paper is new.

Let *Peter eats an apple* be P, and *Peter feels better* be Q. Both (1a) and (1b) state something like: "In all topic worlds, P implies Q." Unlike the non-subjunctive conditional in (1a), however, the subjunctive conditional in (1b) additionally carries the implicature that P is false in the actual world. Subjunctive conditionals are hence also known as *counterfactual conditionals*. Note that $\neg P$ is an implicature, not an entailment, as it can be canceled, as shown in example (3) in Iatridou (2000):

(2) If the patient had the measles, he would have exactly the symptoms he has now. We conclude, therefore, that the patient has the measles.

Iatridou (2000) provides an account of the implied counterfactuality by proposing that the past tense morpheme actually represents an exclusion feature (ExclF) which can range over times or worlds.

Suppose T(x) is Topic(x), i.e. the x being discussed, and C(x) is the x that for all we know is the x of the speaker. Then Iatridou (2000) proposes the following skeletal meaning for ExclF.

(3) ExclF: T(x) excludes C(x).

When x ranges over times, T(t) is set of times being discussed ("topic time"), C(t) is the set of times that for all we know are the times of the speaker ("utterance time"), and (3) yields:

(4) The topic time excludes the utterance time.

Assuming that there is no such thing as a future tense and that a future interpretation is derived though other means (e.g. modality), (4) allows us to derive a regular past tense reading.

Now, if x ranges over worlds instead of times, T(w) is the set of worlds being discussed ("topic worlds"), C(w) is the set of worlds that for all we know are the worlds of the speaker ("actual world"), and (3) yields:

(5) The topic worlds exclude the actual world.

Iatridou (2000) proposes that in subjunctive conditionals, ExclF ranges over worlds, resulting in a fake past reading. The paper hypothesizes that that if a proposition were known to be true in the actual world, the actual world would be included in the set of topic worlds when discussing the proposition. Since in subjunctive conditionals the actual world is not in the set of topic worlds, the antecedent is not known to be true in the actual world, and may be known to be false. We thus obtain the implicature that the antecedent in subjunctive conditionals is false, which fits with our intuitions.

3 Formalizing the Proposal in Iatridou (2000)

In this section, we provide formal denotations for ExclF and **by** (the subjunctive). We choose to work in a system where tense and world arguments are syntactically represented. The denotation of ExclF will therefore be somewhat more general than the skeletal proposal above.

Note that we will assume that we always work with sets of worlds and times. A set may contain only a single element. This allows us not to worry about whether we should be talking about the $\subseteq$ or about the $\in$ relationship.

(6) [[**ExlcF**]] = $\lambda x_\alpha .\ \lambda y_\alpha .\ x \not\subseteq y$[1]

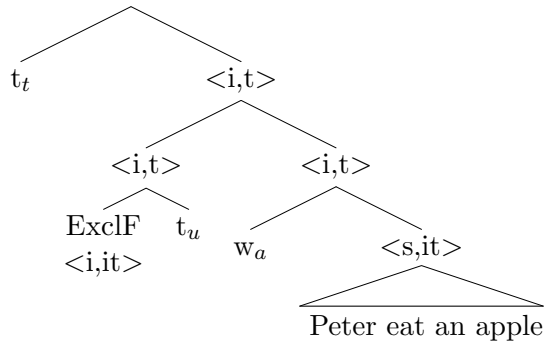
The type α can be either times (i) or worlds (s). If x is the utterance time and y is the set of topic times, we obtain the meaning in (4). If x is the actual world and y is the set of topic worlds, we obtain the meaning in (5).

First, let us verify that the denotation in (6) can be used to derive an appropriate meaning for a simple past tense sentence.

(7) Peter ate an apple.

Suppose t_t be the topic time, t_u the utterance time, and w_a the actual world. Consider the following structure for (7).

(8)



Suppose **Peter eat an apple** has the following denotation.

(9) [[**Peter eat an apple**]] = λw . λt . Peter eats an apple at t in w

ExclF combines with a time argument by functional application (FA), and then with a predicate by predicate modification (PM). The resulting denotation is then as desired:

(10) [[**Peter ate an apple**]] = Peter eats an apple at time t_t in w_a and $t_u \not\subseteq t_t$

Consider the types of the expressions involved. ExclF has either type <i,it> or <s,st>. In the former case, it acts as a regular past tense. In the latter case, it excludes a given world.

ExclF thus cannot combine with a predicate that takes both a world and a time directly. For ExclF to be able to act as a regular past tense, predicates taking a time and a world argument must take a world argument first, resulting in an expression of type <i,t>. ExclF can then combine with this expression by predicate modification (PM) after taking a time argument.

If a predicate took a time before taking a world, the derivation would crash, as ExclF could combine neither with an expression of type <i,st>, nor one of type <s,t>. Thus by specifying the type of ExclF, we specified the order that predicates must take their world and time arguments in.

Note also that when simply combining with a predicate like **Peter eat an apple**, there is no optionality as to whether ExclF takes worlds or times. Since we have shown that the predicate

[1] Another way to define ExclF, consistent with theories of past tense would be: [[**ExclF**]] = $\lambda x_\alpha .\ \lambda P_{<\alpha,t>} .\ \exists$x' such that x' $\neq$ x and P(x) = 1. However, the existential in this denotation of ExclF does not allow us to obtain the universal scoping over worlds which is required for a reasonable denotation of subjunctive conditionals. We therefore do not have the option of using this denotation for ExclF.

must have type <i,st>, ExclF needs to have the type <i,it> to combine with it and thus is required to act as a regular past tense. This correctly predicts that something is required in addition – in particular, **by** – for ExclF to be able to apply to worlds.

We now move on to discussing Russian examples, though we hope the analysis can be extended to other languages. Suppose the subjunctive morpheme *by* has the following denotation:

(11) $[[\textbf{by}]] = \lambda P_{<s,it>} \,.\, \lambda w \,.\, \exists t\, [P(w)(t) = 1]$

By thus saturates the time argument of a predicate that first takes a world argument, and then a time argument.

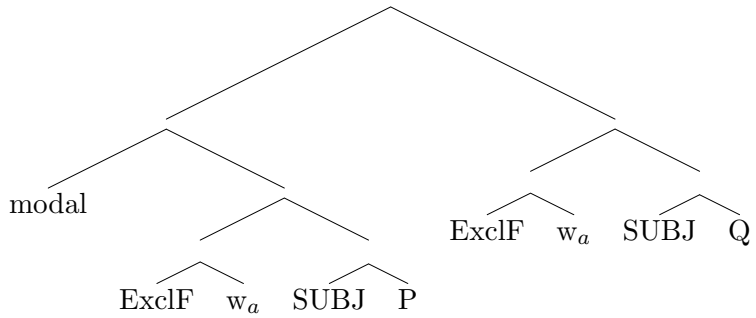
Consider what happens when we put together ExclF and **by**. **By** takes a predicate of type <s,it> and returns a predicate of type <s,t>. For ExclF to be able to merge with an expression containing **by**, it thus needs to be of type <s,st>. The nodes will then be able to combine by PM. Thus when ExclF occurs with **by**, we correctly predict that ExclF is required to apply to worlds. Again, there is no optionality as to which form ExclF takes.

4 Compositional Semantics for Subjunctive Conditionals

Having proposed denotations for ExclF and the subjunctive (**by**), we now need a semantics for subjunctive conditionals in order to put things together. As discussed in Kratzer (1986), we assume that there is a covert modal allowing us to form conditionals. A subjunctive conditional could have the following structure.

(12) If ExclF SUBJ P, then ExclF SUBJ Q.

(13)



We could then use the following denotation for the modal:

(14) $[[\textbf{modal}]] = \lambda P_{<s,t>} \,.\, \lambda Q_{<s,t>} \,.\, \forall w\, [P(w) \longrightarrow Q(w)]$[2]

We would then obtain the following denotation for the conditional in (12):

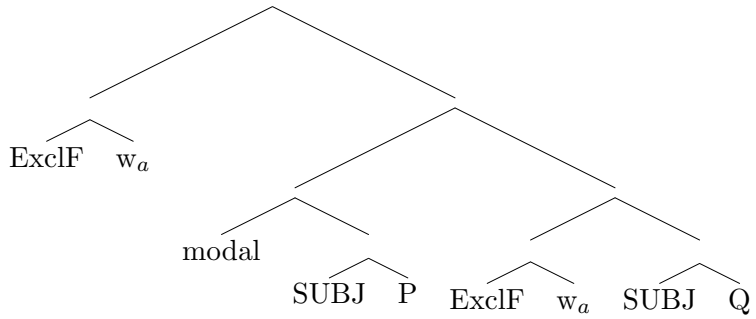
[2]Unfortunately, this denotation for the modal cannot be used to derive the meanings of non-subjunctive conditionals in any obvious way, and neither can the denotation proposed in (17). We thus need a different modal for non-subjunctive conditionals, though perhaps one of the modals could be expressed in terms of the other. We will not discuss this issue further in this paper.

(15) [[**modal ExclF w_a SUBJ P ExclF w_a SUBJ Q**]] = ∀w [[∃t such that P(w)(t) = 1 and $w_a \not\subseteq$ w] ⟶ [∃t' such that Q(w)(t') = 1 and $w_a \not\subseteq$ w]] =
∀w such that $w_a \not\subseteq$ w [[∃t such that P(w)(t) = 1] ⟶ [∃t' such that Q(w)(t') = 1]]

The two denotations above can be equated because false ⟶ false, and so the condition is always satisfied when $w_a \subseteq$ w. We can therefore only check whether the condition is satisfied when $w_a \not\subseteq$ w.

There is another possible structure for the conditional in (12).

(16)



Here, the ExclF from the antecedent clause raises above the modal. We would then need a different denotation for the modal:

(17) [[**modal**]] = $\lambda P_{<s,t>}$. $\lambda Q_{<s,t>}$. $\lambda R_{<s,t>}$. ∀w such that R(w) = 1 [P(w) ⟶ Q(w)]

The subjunctive conditional then has the denotation:

(18) [[**ExclF w_a modal SUBJ P ExclF w_a SUBJ Q**]] = ∀w such that $w_a \not\subseteq$ w [[∃t such that P(w)(t) = 1] ⟶ [∃t' such that Q(w)(t') = 1 and $w_a \not\subseteq$ w]] =
∀w such that $w_a \not\subseteq$ w [[∃t such that P(w)(t) = 1] ⟶ [∃t' such that Q(w)(t') = 1]]

We could also change the tree structure and denotation of the modal so that the modal merges with R first and obtain the same result. If the past tense morphology in the consequent clause were vacuous or also raised, like ExclF in the antecedent, the truth conditions also would not change.

The truth conditions obtained with the two tree structures and denotations for the modal considered are the same, and appear to be approximately correct. In both cases, the past tense has a fake past meaning. In both versions, the worlds that are the same as the actual world can be excluded from consideration, creating the implicature of counterfactuality. The fact that the second denotation proposed excludes the actual world directly, rather than just being equivalent in terms of truth conditions to a statement that excludes the actual world from consideration, perhaps means that it's the second proposal that's on the right track.

Also, we want to restrict the set of worlds considered to those somehow "similar" to the actual world. (We will not attempt to define similarity here.) The relationship between the antecedent and the consequent does not need to hold in outlandish worlds for the conditional to be true. Thus, the modal has to take a function $R_{<s,t>}$ that restricts the set of worlds being considered, as in the second denotation proposed. Note, however, that this does not require that ExclF raise to merge with the modal as part of R.

5 Tense in Subjunctive Conditionals

As discussed above, past tense is required in subjunctive conditionals and is fake. Fake past tense is required both in the antecedent and the consequent.

(19) a. *Esli by Petja est (sejchas) jabloko, ...
if SUBJ Peter eats-IMP (today) apple

b. *Esli by Petja s"est/budet est' (zavtra) jabloko, ...
if SUBJ Peter will eat-PERF/will eat-IMP (tomorrow) apple

c. Esli by Petja s"el/el vchera/sejchas/zavtra jabloko, ...
if SUBJ Peter ate-PERF/ate-IMP yesterday/today/tomorrow apple
'If Peter ate/were eating an apple now/tomorrow, ...'
'If Peter had eaten/had been eating an apple yesterday, ...'

(20) a. *Esli by Petja s"el jabloko, on by (segodnja) vyzdoravlivaet.
if SUBJ Peter ate-PERF apple, he SUBJ (today) gets better-IMP

b. *Esli by Petja s"el jabloko, on by (zavtra) vyzdorovit/budet
if SUBJ Peter ate-PERF apple, he SUBJ (tomorrow) will get better-PERF/will
vyzdoravlivat'.
get better-IMP

c. Esli by Petja s"el jabloko, on by vchera/segodnja/zavtra
if SUBJ Peter ate-PERF apple, he SUBJ yesterday/today/tomorrow
vyzdorovil/vyzdoravlival.
got better-PERF/got better-IMP
'If Peter ate an apple, he would get/be getting better today/tomorrow.'
'If Peter had eaten an apple, he would have gotten/been getting better yesterday.'

As shown in examples (19a,b) and (20a,b), both the antecedent and the consequent of subjunctive conditionals require past morphology. (19c) and (20c) illustrate the fact that the interpretation of the antecedent and consequent in subjunctive conditionals can be past, present, or future.

The proposed denotations in the previous section also result in the time at which the antecedent is true being determined independently from the time at which the consequent is true. The data supports this claim.

(21) a. Esli by Petja s"el vchera jabloko, on by segodnja vyzdorovil.
if SUBJ Peter ate-PERF yesterday apple, he SUBJ today got better-PERF
'If Peter had eaten an apple yesterday, he would have gotten better today.'

b. Esli by Petja s"el segodnja jabloko, on by zavtra vyzdorovil.
if SUBJ Peter ate-PERF today apple, he SUBJ tomorrow got better-PERF
'If Peter ate an apple today, he would get better tomorrow.'

c. Esli by Mashe bylo sejchas desjat' let, ona by rodilas' v 1996om godu.
if SUBJ Mary was now ten years, she SUBJ was born in 1996 year
'If Mary were ten years old right now, she would have been born in 1996.'

6 Subjunctive Complements of Verbs

We have seen that the proposed denotations for the subjunctive and past tense can be used to obtain the desired meaning for subjunctive conditionals. Of course, we also want our denotations to provide the appropriate meaning in the complement of a verb selecting for subjunctive.

One such verb is *xotet'* ('want'), which takes a subjunctive complement when the subject of the sentence is different from the subject of the embedded proposition. In that case, fake past tense is required in the embedded proposition.

(22) a. Masha hochet chtoby Petja s"el jabloko.
Mary wants that SUBJ Peter ate-PERF apple
'Mary wants for Peter to eat an apple.'

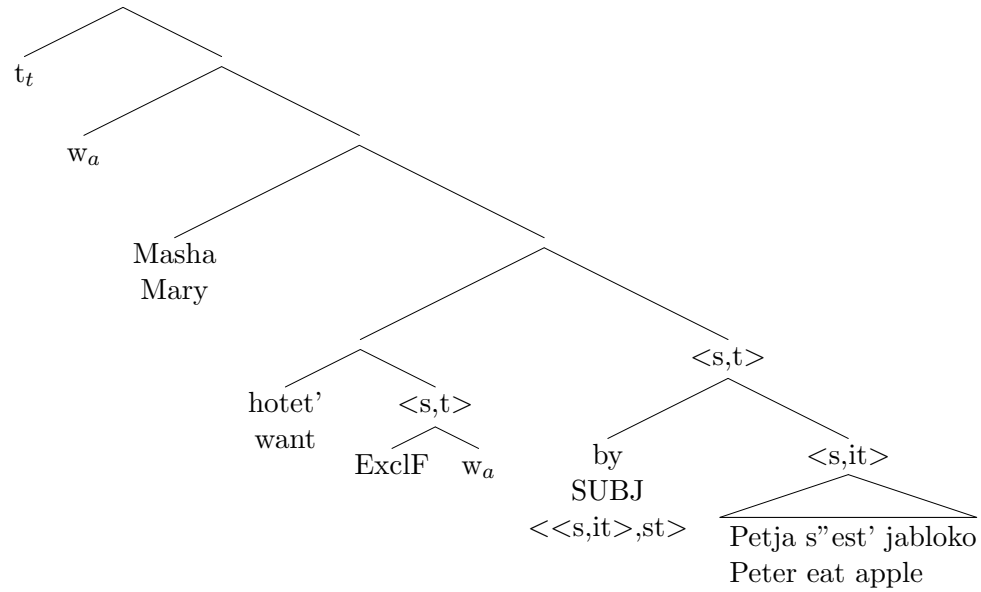
b. *Masha hochet chtoby Petja est/budet est'/s"est jabloko.
Mary wants that SUBJ Peter eats-IMP/will eat-IMP/will eat-PERF apple

Suppose **want** has the following denotation:

(23) [[**want**]] = $\lambda R_{<s,t>}$. $\lambda P_{<s,t>}$. λx_e . λw . λt . for all worlds w' consistent with what x wants at t in w such that R(w') = 1 [P(w') = 1]

We propose the following structure for (22a).

(24)



For the reader's convenience, we will use English translations of the words in the Russian sentence in (22a) when writing the denotations below.

Using the denotation for **Peter eat an apple** given in (9) above, we obtain:

(25) a. [[**SUBJ Peter eat apple**]] = λw . $\exists t$ such that Peter eats an apple at t in w

b. [[$\mathbf{t_t}$ $\mathbf{w_a}$ **Mary want ExclF** $\mathbf{w_a}$ **SUBJ Peter eat apple**]] = for all worlds w' consistent with what Mary wants at t_t in w_a such that $w_a \not\subseteq$ w' [$\exists$t such that Peter eats an apple at t in w']

The resulting denotation explains the fact that the past in (22a) is a fake past. It also suggests that, in the same way as with the counterfactual conditionals, there is an implicature that the proposition P taken by *want* is not true in the actual world. This seems to be consistent with my intuitions about (22a).

The denotation for **xotet'** ('want') above may seem somewhat complicated, but it is necessary for **xotet'** to take [[**ExclF** $\mathbf{w}_a$]] as a separate argument in order to avoid having the sentence in (22a) entail that Peter does not eat an apple in w. There is definitely no such entailment, as it is perfectly fine to say the following:

(26) Petja spit. I xorosho. Ja xochu, chtoby Petja spal.
Peter sleeps. and good. I want that SUBJ Peter slept-IMP
'Peter is sleeping. That's good. I want for Peter to be sleeping.'

Furthermore, the fact that **xotet'** takes a function R that specifies the properties of the worlds w' for which we need to check whether the predicate P is true for w' is useful in another way. It means that further restrictions on the w' to which we must apply P can be specified and combined by PM with the restriction imposed by ExclF.

For example, consider the world w_1 in which Mary wins the lottery tomorrow, but Peter (alas!) fails to eat an apple. Mary would probably prefer this state of affairs to many situations in which Peter does eat an apple, so w_1 is consistent with what Mary wants. But that surely doesn't mean that Mary doesn't really want Peter to eat an apple. Therefore, it seems that we want to impose some sort of restriction on w' specifying that P only applies to w' when w' is to some extent similar to w_a. As with conditionals, we will not attempt to define the relevant notion of similarity here.

6.1 Tense in Subjunctive Complements

As shown above, the subjunctive complement of **xotet'** must contain a past tense morpheme along with **by**. However, past tense readings of the desired proposition are to be disallowed.

(27) a. Ja xochu, chtoby Masha zavtra s"ela jabloko.
I want that SUBJ Mary tomorrow ate-PERF apple
'I want for Mary to eat an apple tomorrow.'

b. Ja xochu, chtoby Masha sejchas ela jabloko.
I want that SUBJ Mary now ate-IMP apple
'I want for Mary to be eating an apple right now.'

c. *Ja xochu, chtoby Masha vchera s"ela jabloko.
I want that SUBJ Mary yesterday ate-IMP apple

While (27a) is a fine thing to say. (27b) sounds like a slightly odd thing to say, but is OK. However, (27c) makes no sense. This is a fact about Russian, not about all desires about the past. In English, we can say:

(28) I want for Mary to have eaten an apple yesterday.

I do not at present have an account as to why past readings are allowed in subjunctive conditionals but not in subjunctive verbal complements.

Note that we have so far assumed that the present tense is vacuous. We will now reconsider this assumption, but the change will not affect the discussion above in any significant way.

7 The Distribution of *By* and Present Tense

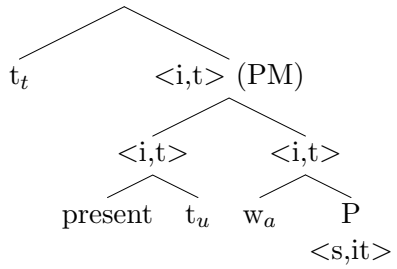
As we have seen in the examples above, *by* does not occur with present tense in subjunctive conditionals and in the subjunctive complement of *xotet'*. More generally, *by* never occurs with present tense. We have also seen that it cannot occur with future, but we assumed above that future is not a separate tense. Thus, if we can derive *[present *by*], the ungrammaticality of future with *by* will follow.

We can obtain the ungrammaticality of present tense with *by* through a type mismatch if we propose the following denotation for **present**.

(29) $[[\textbf{present}]] = \lambda t_1 \,.\, \lambda t_2 \,.\, t_1 \subseteq t_2$

The present will thus allow us to specify that the utterance time is in the context time. It is a denotation that parallels the denotation for ExclF. Simple present tense sentences will then have the following tree structure.

(30)



The resulting denotation will be:

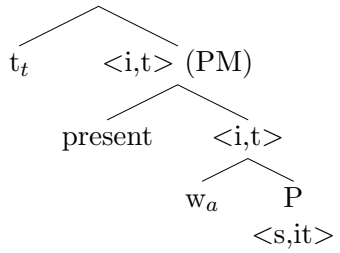
(31) $P(w_a)(t_t) = 1$ and $t_u \subseteq t_t$

If this choice of denotation proves undesirable for independent reasons, we can instead propose a denotation that simply checks the type of the proposition it merges with:

(32) $[[\textbf{present}]] = \lambda P_{<i,t>} \,.\, \lambda t \,.\, P(t) = 1$

The corresponding tree structure would then be:

(33)



The resulting denotation is the same as when present tense is vacuous.

(34) $P(w_a)(t_t) = 1$

Let us now consider the types of **by** and **present**. Recall that the order in which P takes its arguments was fixed when we defined ExclF.

By has the type <<s,it>, st>. It can thus merge with a predicate of type <s,it>, yielding an expression of type <s,t>. **Present**, on the other hand, has either type <i,it> or <i,t>, depending on which of the denotations above we choose. Thus neither functional application (FA) nor predicate modification (PM) allows **by** and **present** to merge at some point in the derivation, no matter which of the two denotations for **present** proposed above we select. The fact that **by** saturates the tense argument of the predicate it takes results in a crash when we attempt to combine it with **present**.

We have thus provided an account of why **by** cannot occur with present tense.

8 Subjunctive in Unembedded Contexts

Russian subjunctive can occur in (apparently, at least) unembedded contexts. It can be used with past tense or with infinitives.

(35) a. Oj, s"el by Petja (vchera/zavtra) jabloko!
oh ate-PERF SUBJ Peter (yesterday/tomorrow) apple
'Would that Peter had eaten an apple yesterday!'
'Would that Peter ate an apple tomorrow!'

b. Oj, s"est' by Pete (vchera/zavtra) jabloko!
oh eat-INF SUBJ Peter (yesterday/tomorrow) apple
'Would that Peter had eaten an apple yesterday!'
'Would that Peter ate an apple tomorrow!'

The propositions expressed in the sentences in (35a) and (35b) seem to implicitly quantify over worlds consistent with what the speaker wants and/or with what is good for Peter. It is hard to discern any difference in meaning between them. Our theory predicts that in (35a) the actual world is excluded from the worlds being discussed, while no such prediction is made for (35b). However, both (35a) and (35b) imply counterfactuality when referring to the past. They also seem to express doubt when referring to the future. This suggests that there may be a source of counterfactuality in the sentences in (35) in addition to ExclF in (35a).

It is unsurprising, given our theory, that infinitives can be combined with **by**. In fact, it is to be expected. Infinitives are tenseless, and so **by** will not be excluded the way it was when the sentences discussed contained present tense. Bare infinitives do not form sentences for lack of a time argument, but **by** saturates the time argument of the preposition it combines with. For example, for the denotation of the infinitive combined with **by** in (35b), we would obtain:

(36) [[**SUBJ Peter eat apple**]] = $\lambda w . \exists t$ [Peter eats an apple at t in w]

We will not discuss how the worlds this function applies to are determined.

9 Conclusion

In this paper, we considered a formal proposal for the denotation of ExclF, which was given a skeletal meaning in Iatridou (2000). Combining this with a denotation for Russian subjunctive, we were able to obtain appropriate meanings for subjunctive conditionals, as well as subjunctive complements of verbs. By adding a proposed denotation for present tense, we were able to explain (albeit somewhat stipulatively) why the Russian subjunctive occurs only with past tense and infinitive verbs.

A number of questions remain. One issue is why in some environments subjunctive clauses cannot obtain a past interpretation, while in others they can. Another question is why there seems to be virtually no difference in meaning between subjunctives with infinitive verbs and subjunctive with past tense verbs. Determining a notion of similarity that would provide the appropriate set of worlds for consideration in subjunctive conditionals and verbs with subjunctive complements is another avenue of exploration. It would also be useful to consider whether the distribution of *by* can be explained within a different theory of counterfactual conditionals, for example the one in Ippolito (2003) or Arregui (2005). If it proves to be difficult or impossible, this would be a point in favor of Iatridou (2000). Finally, the discussion of subjunctive and tense begs for cross-linguistic research.

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