(Non-)veridicality and PPI-hood: The case of the Russian attitude verb *polagat'*

Introduction Cross-linguistically, negative polarity items (NPIs) have been shown to be sensitive to different types of licensing environments. In English, NPIs such as *any* and *ever* occur in contexts that can be characterized as downward entailing (Fauconnier 1975; Ladusaw 1979). It has also been established that, in some other languages, NPIs are licensed in broader set of environments that can be described as non-veridical (Lin 1996, 1998; Haspelmath 1997; Giannakidou 1998, 2011, 2018). However, relatively little attention has been given to the question of whether there are positive polarity items (PPIs) that are sensitive to similar environments. In this study, we present a case of a PPI in the domain of attitude verbs that is sensitive to the veridicality of its environment.

The data This paper examines the Russian verb *polagat'* ('think', 'believe'), which cannot co-occur with negation – a restriction well-documented and noted in dictionaries.

(1) Ja (*ne) polagaju čto ty budeš eto delat'.
I (*NEG) believe that you will this do
'I (*don't) believe that you will do this'.

We observe, however, that there are exceptions to this restriction: the co-occurrence of negation and *polagat'* is permitted in certain non-veridical contexts – specifically, when embedded under *hope* (2), in the antecedent of a conditional (4), or in a bias question (3). *Hope* contrasts with *think*, under which the combination of negation and *polagat'* remains unacceptable (5).

(2) Ja nadejus', ty ne polagaješ čto ja budu eto delat'.
I hope you NEG believe that ja will this do
'I hope you don't believe I will do this'.

(3) Ne polagaješ li ty, čto ja budu eto delat'?
NEG believe li you that ja will this do?
'You don't believe that I will do this, do you?' A positively biased question

(4) Esli trjenjer ne polagaet, čto ty možet eto sdelat', on ne postavit
If coach NEG believe that you can this do he NEG will-put
tjebja v komandu .
you in team
'If the coach does not believe that you can do it, he will not put you on the team'

(5) *Ja dumaju, ty ne polagaeš čto ja budu eto delat'.
I think you NEG believe that ja will this do
Indented: 'I think you don't believe I will do this.

We propose that *polagat'* is a positive polarity item that cannot occur under negation. However, the presence of a higher non-veridical operator creates an appropriate licensing environment for *ne polagat'*.

Analysis We propose an account in the spirit of Zeijlstra (2022), according to which PPIs introduce a *Non-Entailment-of-Non-Existence Condition* – the mirror image of Lin's *Entailment-of-Non-Existence Condition* for NPIs (1996, 1998). We implement this condition as a presupposition introduced by *polagat'*. The verb *polagat'* is assigned a standard semantics for *believe* (6) in terms of universal quantification over doxastic alternatives. Its difference from English *believe* lies in this presupposition: *polagat'* prebelieves that *p* is compatible with the attitude holder's doxastic state.

(6) $[\![\text{polagat'}]\!]^{w0} = \lambda p_{<s,t>}.\lambda x_e$: $\exists w'[w' \in Dox(x,w_0)$ & $p(w')].\forall w[w \in Dox(x,w_0) \rightarrow p(w)]$

Under this analysis, a positive sentence containing *polagat'* can be either true or false. Furthermore, we propose that *polagat'* is a Neg-raiser. We adopt an Exh-based account of neg-raising following Jeretič (2022) and Mirrazi & Zeijlstra (2022, 2023). *polagat'* introduces subdomain alternatives that must be used by Exh. We propose that *polagat'* differs from other Neg-raisers in that the insertion of Exh is mandatory. We assume the IE+II version of Exh (Bar-Lev 2018, Bar-Lev&Fox 2020). Under negation these alternatives cannot be negated consistently with the assertion of the prejacent and therefore are asserted. Assuming that the set of A's doxastic alternatives is $\{w_1, w_2\}$, the highlighted conjuncts in (7) correspond to the two subdomain alternatives. The resulting interpretation is equivalent to that of negation taking scope below the universal quantifier. This, however, contradicts the presupposition introduced by *polagat'*, and this contradiction accounts for the ungrammaticality of *polagat'* under negation in unembedded contexts.

(7) $[\![\text{Exh A ne polagaet' } \varphi]\!]^{w0} = T$ iff $\neg\forall w[w\in\{w_1,w_2\} \rightarrow \lambda w'.[\![\varphi]\!]^{w'}(w)] \ \&\ \neg\forall w''[w''\in\{w_1\} \rightarrow \lambda w'.[\![\varphi]\!]^{w'}(w'')] \ \&\ \neg\forall w'''[w'''\in\{w_2\} \rightarrow \lambda w'.[\![\varphi]\!]^{w'}(w''')]$

T iff $\forall w[w\in\{w_1,w_1\} \rightarrow \lambda w'.\ \neg[\![\varphi]\!]^{w'}(w)]$

(8) $[\![\text{Exh A ne polagaet' } \varphi]\!]^{w0}$ is defined only if $\exists w[w\in\{w_1,w_2\} \ \&\ \lambda w'.[\![\varphi]\!]^{w'}(w)]$

Accordingly, we predict that *ne polagat'* is acceptable in two cases: (i) when the presupposition projects in a way that does not contradict the asserted content, and (ii) when no strengthening occurs.

The difference in acceptability of embedded *ne polagat'* under *believe* versus *hope* follows from how their presuppositions project. If the embedded clause contributes the presupposition *p*, the resulting presupposition in both cases is 'x believes *p*' (Karttunen 1973, 1974; Heim 1992). Neg-raising applies within the embedded clause in both constructions; however, in the case of *hope*, the presupposition is consistent with the assertion (shown in (9)), whereas in the case of *believe*, it is not (in (10)). Similarly, no conflict between the presupposition and the at-issue content is observed in the case of a bias question.

(9) ✓Hope: Presupposition: I believe you allow for the possibility that I will do this.
Assertion: In all of my preferred worlds you believe I will not do this.

(10) *Believe: Presupposition: I believe you allow for the possibility that I will do this.
Assertion: I believe that you believe that I will not do this.

We propose that **conditionals** are cases in which no strengthening occurs. In conditionals, the presupposition projects from the antecedent; however, because antecedents are downward-entailing environments, no strengthening takes place in this position. We assume that, in the absence of an overt modal, a conditional restricts the domain of a silent universal epistemic modal. Since this environment is downward entailing, the existential statement resulting from the negation of *polagat'* is stronger than the universal statement. The presupposition projects from the antecedent: the coach allows for the possibility that the addressee can perform the action, but in all worlds where the possibility of the opposite exists, he will not put the addressee on the team.

(11) $\forall w[w\in\text{Dox(speaker, } w_0) \ \&\ \exists w'[w'\in\text{Dox(coach, } w)\&\neg\text{you can do it}(w')] \rightarrow \neg\text{you in the team } w]$

(12) Presupposition: $\exists w'[w'\in\text{Dox(coach, } w_0) \ \&$ you can do it$(w')]$

Other downward entailing environments

Given that DE environments are a subset of non-veridical environments, one might expect that placing *ne polagat'* in all DE environment will make it acceptable. This, however, is not the case, as illustrated in (13), where the additional DE operator is *few*.

(13) *Malo kto ne polagajet, čto on budet eto delat'.
Few who NEG believe that he will this do
Indented: 'Few people don't believe that he will do this'.

We propose that such cases are ruled out due to positive presuppositions or implicatures contributed by the sentence. Here, the relevant inference is *'few, but some'*, which, following much of the literature, we treat as a scalar implicature derived from the competition between *few* and *no one* (abstracting away from the fact that Russian is a negative concord language). Strengthening of *polagat'* by Exh across an existential yields the inference that at least one individual believes that ¬*p*. Combined with the presupposition that this individual allows for the possibility of *p*, this results in a contradiction, leading to ungrammaticality. We assume that a single Exh operates on all the alternatives introduced by *few* and *polagat'*. In (14), the alternative introduced by *few* is shown: since individuals have distinct sets of doxastic alternatives, we represent it as a disjunction of 'allow-for-the-possibility' claims. We then construct the disjunction of all possible combinations of subdomain alternatives in (15). The *negation* of these alternatives holds only if, for at least one individual, ¬*p* is true in all of their doxastic worlds; otherwise, one of these disjunctions composed solely of *p* worlds would be false.

(14) $\neg(\exists w[w\in\{w_1,w_2\} \ \&\ \neg p(w)] \ \vee \exists w[w\in\{w_3,w_4\} \ \&\ \neg p(w)] \vee\ldots)$

(15) $\text{Alt}_{\text{subdomain}} = \{\neg(\exists w[w\in\{w_1\}\&\neg p(w)] \vee\exists w[w\in\{w_3\}\&\neg p(w)]..);$
$\neg(\exists w[w\in\{w_2\}\&\neg p(w)]\vee\exists w[w\in\{w_4\} \ \&\ \neg p(w)]\ldots)\}$

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