JOURNAL of SLAVIC LINGUISTICS

VOLUME 33 · FASL ISSUE · PROCEEDINGS OF FASL 32

Negation in Czech polar questions

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ABSTRACT

The meaning of negation in polar questions has been investigated primarily on data coming from English. This paper focuses on the syntax-semantics interface of negation and selected particles in Czech polar questions. We explore the interpretation of negation depending on its syntactic position as well as its relation to question bias. Our analysis of the so-called outer negation relies on Repp's 2013 operator FALSUM. We report on data from a naturalness judgment task where it is shown that (i) FALSUM is preferred in interrogative polar questions, (ii) declarative word order is preferred in evidentially biased contexts, (iii) FALSUM is compatible with any type of evidential bias (positive, negative, neutral), (iv) the particle náhodou is licensed by FALSUM, and (v) the particle copak is sensitive to contextual evidence.

KEYWORDS polar questions · negation · bias · Czech

1 INTRODUCTION

A polar question (PQ) asks whether its prejacent p holds or not, which, in turn, corresponds to the two possible answers: 'yes' and 'no'. For example, the meaning of the PQ *Is John cooking?* in (1-a) can be captured by a set containing both its possible answers, as in (1-b) (Hamblin 1973; see also Karttunen 1977, Groenendijk & Stokhof 1984).

(1) a. Is John cooking?
b. $\pi = \{p, \neg p\} = \{[\![\text{John is cooking}]\!], [\![\text{John is not cooking}]\!]\}$

Negation in PQs, such as in (2), has been the point of interest for a long time now, mainly its status on the syntactic, semantic and pragmatic levels (e.g. Ladd 1981, Büring & Gunlogson 2000, Romero & Han 2004:a.o.).

(2) a. Isn't John cooking? — interrogative PQ, high neg
b. Is John not cooking? — interrogative PQ, low neg
c. John isn't / is not cooking? — declarative PQ

It has been noticed that PQs like in (2) receive different interpretations based on the position of negation (HIGH vs. LOW; AnderBois 2019) as well as their word order (interrogative vs. declarative). Moreover, these PQs are claimed to express the speaker's expectation of a certain answer, i.e. bias (Sudo 2013, Gärtner & Gyuris 2017).

Our paper explores similar issues raised by negation in Czech PQs, with special attention paid to its syntax–semantics interface. Our research questions are: (i) how is negation interpreted in Czech PQs and (ii) how does this relate to the question's bias. In §2 we argue that PQs with negation are not freely interchangeable with positive PQs. We introduce two readings of negation – inner and outer – and their connection to word order as well as bias. The analysis of outer negation by means of the operator FALSUM (due to Repp 2006, 2013) is described in more detail in §3. §4 puts forth an analysis of negation in Czech PQs with respect to the verb position. In §5 we report on a naturalness judgment task we ran in order to test some of the predicted effects. We describe the experimental design and its results, which shed light on how negation in Czech PQs is interpreted. Finally, §6 focuses on two question particles – *náhodou* and *copak* (translated

as 'by chance' and 'what then', respectively) – which seem to be specialized for expressing different types of bias. §7 concludes.

2 NEGATION IN CZECH PQS

The main strategy of forming a PQ in Czech is using interrogative word order (V1) along with rising intonation (Křížková 1968, Štícha 1995a, Dryer 2013). Such PQs, especially when they do not contain negation, are considered neutral and unbiased, which means that the speaker wishes to find out whether p or $\neg p$ holds, without being biased to one of the alternatives. Czech PQs can also exhibit declarative word order (nonV1) as long as the rising intonation is preserved. The declarative word order is said to signal that the speaker might already have some inclination towards p or $\neg p$ as possible answers (Štícha 1995a, Gunlogson 2002).

Apart from changes in word order, speaker's bias can be expressed by adding negation to the PQ, although its status in Czech PQs is debated. Some of the more traditional accounts of Czech claim that there is no difference between PQs with and without negation (Grepl 1965, Šmilauer 1969, Daneš et al. 1987, Dušková 2012) and that these forms are mutually interchangeable. An opposing view is provided e.g. by Štícha (1984, 1995a,b), Běličová (1989), Malá (2008), Kopecký (2010), who attempt to demonstrate the distinct features and patterns of usage of negative PQs. We side with the latter view, claiming that negation brings a special meaning layer to PQs, namely bias. We use Sudo's 2013 dichotomy of EPISTEMIC and EVIDENTIAL BIAS. Epistemic bias stems from the private belief, hope, fear etc. of the speaker, and could be characterized as a conventional implicature. Evidential bias, on the other hand, is more likely a presupposition: its source is indirect or inferential evidence accessible to both discourse participants, which makes it part of the common ground. English PQs with negation are said to carry positive epistemic bias (speaker believes/hopes etc. that p) and negative or neutral evidential bias (there is contextual evidence that $\neg p$, or neither that p nor that $\neg p$) (Gärtner & Gyuris 2017).

Negation in Czech is signaled by the negative prefix *ne* which is attached to the finite verb. Unlike the English particle *not*, it cannot be "stranded" upon verb movement and thus always moves with the verb. The high vs. low negation contrast evident in English (see (2)) thus necessarily goes hand in hand with the interrogative vs. declarative contrast in Czech PQs. In PQs this leads to two positions of negation in the structure – HIGH and LOW – which reflects what we have said about word order in Czech PQs earlier. Example (3-a) shows high negation in a V1 PQ; example (3-b) shows low negation in a nonV1 PQ. Since the prefix is inseparable from the verb, Czech lacks V1 PQs with low negation, cf. (2-b) in English.

(3) a. Nekoupil si Petr auto?
NEG.bought REFL Petr car
'Hasn't Petr bought any car?' high negation (V1)

b. Petr si nekoupil auto?
Petr REFL NEG.bought car
'Petr hasn't bought any car?' low negation (nonV1)

The syntactic position of the negative marker has been noticed to affect its interpretation. Generally, two readings of negation in PQs are distinguished: INNER (canonical), which licenses negative polarity items (NPIs) and negative concord items (NCIs), and OUTER (expletive or pleonastic), which allows for positive polarity items (PPIs) without being outscoped by them. For English, Romero & Han (2004) argue that low negation (*Is John not cooking?*) correlates with inner negation, whereas high negation (*Isn't John cooking*) is ambiguous between inner and outer negation. Recent research disputes the latter and claims that high negation is associated with the outer negation reading (AnderBois 2019, Goodhue 2022). The main goal of this article is to explore the situation in Czech,

especially the syntax–semantics mapping of negation in PQs, as well as their behavior in context. In the next section, we focus on the phenomenon of outer negation in Czech and on its relation to bias.

3 OUTER NEGATION IN CZECH

Outer negation, unlike the canonical inner negation, does not operate at the propositional level and, crucially, allows for PPIs in its scope. Apart from root PQs, it occurs also in other environments. Example (4) shows outer negation in an embedded PQ along with the PPI *nějaké* (roughly 'some'). In (5), outer negation appears in an embedded subjunctive clause under a FEAR predicate. This environment seems to be hostile to inner negation, as NCIs are infelicitous here. Example (6) shows outer negation in two types of exclamatives, the first one being a wh-exclamative, the second one is very close in meaning to the FEAR predicate sentence in (5).

(4) Embedded PQs

a. Zeptal se mě, jestli si Petr nekoupil nějaké auto.
asked REFL me if REFL Petr NEG.bought DET.PPI car
'He asked me if Petr has bought a car.'

(5) FEAR predicates

a. Petr se bál, aby {někdo / *nikdo} nepřišel.
Petr REFL feared C.SBJV someone.PPI anyone.NCI NEG.came
'Petr feared that someone would come.'

(6) Exclamatives

a. Co on (všechno) nepoví!
what he everything NEG.tell
'The things he says!'

b. Aby Dana nebyla těhotná!
C.SBJV Dana NEG.was pregnant
'I fear Dana is pregnant!'

Even though these data deserve more attention, here we only focus on outer negation in root PQs.

Building on Repp (2013) and Romero (2015), we analyze outer negation as the commitment-related operator FALSUM (cf. its counterpart VERUM; Romero & Han 2004). A general denotation of this operator, given in (7), conveys the speaker's belief (x gets resolved to the speaker by default) that all the worlds compatible with the conversational goals are such that p does not belong to the common ground (CG) in these worlds.

(7) $[\![\text{FALSUM}]\!]^x(p) = \lambda w : \forall w' \in \text{Epi}_x(w)[\forall w'' \in \text{Conv}_x(w')[p \notin \text{CG}_{w''}]]$

In PQs, FALSUM is located between the question operator Q and the proposition p (see (8)), which ensures its distinctiveness from inner negation, which usually resides inside p. Furthermore, the question operator shifts the perspective from the speaker to the addressee (i.e., x maps to the addressee).

(8) $[_{\text{ForceP}}\ Q\ [_{\text{StrengthP}}\ \text{FALSUM}\ [\ \text{proposition}\ p\ ]]]$

By asking an outer negation question, the speaker wants the addressee to express his or her commitment that p does not belong to the common ground. A natural motivation for asking such a question occurs in a situation where it has been suggested (e.g. by the addressee) that p does not belong to the CG. If that is in conflict with what the speaker had been committed to – namely that p *does* belong to the CG – it comes as no surprise that the speaker wishes to resolve this conflict ('Is it really the case / Are you sure that p does not belong to the CG?').

Yet it has been shown that outer negation PQs are licensed in contexts where no such conflict arises (Domaneschi et al. 2017, Goodhue 2022). More specifically, it suffices if the speaker is (or had been, prior to asking) committed to *p* belonging to CG; contextual evidence that *p* is not part of CG is not necessary (as long as there is no evidence that *p* *is* part of CG, i.e., if there is no positive evidential bias).

Šimík (to appear) suggested that outer or rather high negation (i.e. negation on V1) in Czech has an even weaker meaning. Not only does it not require negative evidential bias, it is not even necessarily tied to speaker's (prior) commitment to *p*. All that outer negation conveys is speaker-related epistemic possibility, that is, that the speaker considers it *possible* that *p*. This assumption makes two predictions which are yet to be tested properly. One is that Czech high negation has a broader distribution than English high negation. The other is that Czech high negation is compatible with positive evidential bias, in which case it is used to suggest a possible explanation of the observed effect. The latter point is illustrated by example (9), where the speaker (A) has no prior belief that Marek cleaned the third floor (*p*) and at the same time the earbud is positive evidence for *p*. Despite that, the use of high negation is possible and even preferred over dropping it. The analysis is further supported by the fact that the PQ can contain the particle *náhodou,* which roughly translates as 'by (any) chance' and whose English version has been considered to be incompatible with speaker's epistemic commitment (Sadock 1971, Bill & Koev 2021). (See §6 for related experimental evidence.)

(9) *Scenario:* Two hotel cleaning service coordinators (A and B) are walking around the hotel and inspecting the progress made. A has no idea about the cleaning plan for today (esp. who is responsible for what), only B does. When on the third floor, A and B find an earbud that A suspects belongs to Marek, one of the cleaners. A asks:

Neuklízel Marek (náhodou) třetí patro? 'Has Marek cleaned the third
NEG.cleaned Marek NÁHODOU third floor
floor (by any chance)?'

For purposes of this paper, we assume that the weak epistemic bias conveyed by Czech high/outer negation in PQs is compatible with Repp's (2013) baseline semantics for FALSUM. Indeed, the strong epistemic and conversational commitment conveyed by FALSUM is tied not to the speaker in PQs, but rather to the addressee.

Our research question concerning outer negation is about its bias profile in relation to the syntactic position of negation. We assume that Czech high negation conveys (weak) epistemic bias and is indifferent towards contextual evidence. This stands in opposition to low (and also inner) negation, which seems to be sensitive to contextual evidence and to express (negative) evidential bias. These assumptions are put to test in the experiment. Before that, we introduce our analysis of the syntax of negation in Czech PQs.

4 SYNTACTIC ANALYSIS

Let us take stock: we have said that in Czech the syntactic position of the negated verb in a PQ is either V1 (high negation) or nonV1 (low negation). We have introduced the binary opposition of inner negation and FALSUM as the two interpretations that can be triggered in a PQ. What is left to resolve is which interpretation is associated with which syntactic position.

Our syntactic analysis is based on Zeijlstra's 2004 syntactic account of negation in strict negative concord languages like Czech.[1] Zeijlstra models negative concord as Agree, where two or more negative elements in a sentence result in one semantic representation of negation at LF. Negation is triggered by an operator which carries the [iNeg] feature

[1] Our aim in this section is to provide a baseline analysis of how the syntax of negation in PQs can be modeled, without an ambition to provide a full-fledged proposal and a comparison to other possible approaches.

(see (10)). Negative concord items (NCIs), e.g. *žádný* 'no.DET.NCI', *nikdo* 'nobody.NCI', *nic* 'nothing.NCI' etc., have to be accompanied by a negative marker – the verbal prefix *ne* – while it is irrelevant whether they precede or follow it in the word order. Both NCIs and the prefix carry the [uNeg] feature, which means that they are do not map to negation at the LF–semantic interface.

(10) a. Petr neřekl nikomu nic.
Petr NEG.said nobody.NCI nothing.NCI
'Petr hasn't said anything to anyone.'
b. $[_{CP}$ Petr $[_{TP}$ $Op\neg_{[iNeg]}$ neřekl$_{[uNeg]}$ $[_{NP}$ nikomu$_{[uNeg]}]$ $[_{NP}$ nic$_{[uNeg]}]]]$

The goal of Agree carrying [iNeg] c-commands the probe(s) carrying [uNeg] and thus appears higher than them in the structure.[2]

We assume that in Czech V1 PQs the operator carrying [iNeg] is the (modified) FALSUM, which c-commands and licenses the negative verb carrying [uNeg], as schematized in (11).

(11) $[_{ForceP}$ Q $[_{StrengthP}$ FALSUM$_{[iNeg]}$ $[_{PolP}$ NEG-V$_{[uNeg]}$ $[_{CP}$ … $[_{TP}$ SUBJECT t_V …]]]]

The idea behind this is that when the verb undergoes movement to the initial position, it remains in the scope of FALSUM, but it is no longer in the scope of the canonical negative operator $Op\neg$. Since FALSUM cannot license NCIs, they are considered to be infelicitous in V1 PQs, whereas PPIs are allowed. This analysis predicts that negation in V1 PQs, such as (3-a), is interpreted as outer negation. V1 PQs are expected to be underspecified in the requirements on the contextual evidence, as we presume that FALSUM is primarily employed to convey speaker's epistemic bias rather than evidential bias.

The picture is different for nonV1 PQs, where the negative verb is low enough in the structure to be licensed either by FALSUM, or by $Op\neg$. Importantly, it is not licensed by both at the same time, see (12).

(12) $[_{ForceP}$ Q $[_{StrengthP}$ {FALSUM$_{[iNeg]}$} $[_{CP}$ SUBJECT $[_{TP}$ {$Op\neg_{[iNeg]}$} NEG-V$_{[uNeg]}$ …]]]]

(12) predicts that nonV1 PQs are potentially ambiguous between the inner and outer negation readings, depending on the currently applied operator – either $Op\neg$ or FALSUM, respectively. One way to disambiguate these interpretations is to include indefinites: $Op\neg$ licenses NCIs, whereas FALSUM allows for PPIs. As has been already noticed by others (e.g. Gunlogson 2002, Sudo 2013), nonV1 PQs are expected to occur in evidentially biased contexts implying $\neg p$ rather than unbiased ones. In the next section we present our experiment, which was designed to test these predictions about negation in Czech PQs.

5 MAIN EXPERIMENT

To investigate the behavior of negation in Czech PQs, we ran a series of naturalness judgment experiments in the form of an online questionnaire on the L-Rex platform (Starschenko & Wierzba 2022). The experimental set-up consisted of the main experiment, where we compared the syntactic licensing of FALSUM with that of inner negation, and then several other experiments focused on selected question particles, including *náhodou* and *copak*.

In total, there were 75 participants who filled in the questionnaire. All of them were native speakers of Czech, mostly students from the Charles University. They were compensated with university credits for their participation. We did not collect their personal information (except for their email addresses) and their answers were anonymized.

[2] This leads Zeijlstra to the idea of Upward Agree, which has been recently challenged, e.g. by Deal (2022), who provides arguments for treating negative concord as Downward Agree, or by Bárány & van der Wal (2022), who present empirical evidence against Upward Agree. We have nothing to contribute to this discussion.

Before the actual task, the participants read instructions on how to proceed in it.

The participants were asked to rate how natural a PQ was in a given context. The individual items had the form of a short dialogue between person A and person B. The utterance by A served as the context, the utterance by B was the PQ to be rated. We tried to keep the items as simple as possible in order not to overwhelm the participants. The contextual information provided by A, in particular the embedded relative clause, represented the source of evidential bias. There was no indication of epistemic bias.

Naturalness was rated on a Likert scale ranging from 1 (= completely unnatural) to 7 (= completely natural). Each participant was exposed to 82 stimuli in a pseudo-randomized order. The stimuli were distributed over lists using the Latin Square design. The stimuli were presented in the written mode; i.e., we have not controlled for prosody and question meaning was only conveyed by the question mark.

In what follows we describe the main part of the experiment with its findings and some implications for the syntax-semantics(-pragmatics) of negation in Czech PQs.

5.1 DESIGN

In the main experiment, we zoomed in on what interpretation of the negative verb is preferred depending on its syntactic position and the preceding context. In a fully crossed 2 × 2 × 2 design (8 unique conditions), we manipulated (within items and within participants) the variables VERB POSITION, INDEFINITE and CONTEXT. As for VERB POSITION, the inflected negative verb was either placed initially in the PQ (= V1), or not (= nonV1). Each PQ contained an INDEFINITE, either the NCI *žádný* (a proxy for inner negation), or the PPI *nějaký* (a proxy for outer negation/FALSUM). CONTEXT served as the source of evidential bias and it was either negative (implying ¬*p*), or neutral (implying neither *p* nor ¬*p*). The manipulations are illustrated in (13) (see the italicized parts), where the relative clause in A's utterance hosts the CONTEXT manipulation, and B's polar question hosts the manipulation of VERB POSITION and INDEFINITE. 32 items like (13) were constructed (4 per unique condition). While constructing the experimental items we made sure that none of the contexts would *entail* a ¬*p* answer to B's question, since it would be unnatural to pose a (non-rhetorical) question in a situation where the interrogated issue has already been settled. Instead, the negative context merely implied ¬*p*.

(13) A: Dana má na zahradě záhon, *který vybudovala před rokem*.
Dana has in garden garden.bed, which built before year
'Dana has a garden bed, which she built a year ago.' neutral

A′: Dana má na zahradě záhon, *kam zasadila zeleninu*.
Dana has in garden garden.bed, where planted vegetables
'Dana has a garden bed, where she planted vegetables.' negative

B: *Nezasadila* tam Dana {*žádné* / *nějaké*} květiny?
NEG.planted there Dana DET.NCI DET.PPI flowers
'Didn't Dana plant there any / some flowers?' V1

B': Dana tam *nezasadila* {*žádné* / *nějaké*} květiny?
Dana there NEG.planted DET.NCI DET.PPI flowers
'Dana didn't plant there any / some flowers?' nonV1

5.2 PREDICTIONS AND RESULTS

In anticipation of the results, we formulate our predictions separately for the two conditions of VERB POSITION. For V1 polar questions, our analysis predicts that negation will only be interpreted as outer negation; this should translate as a main effect of INDEFINITE in our design: PPIs are expected to be more natural than NCIs. Since V1 PQs only convey epistemic, not evidential bias, we do not expect any effect of CONTEXT. For nonV1 polar questions, our analysis predicts both the inner and outer negation reading to be available;

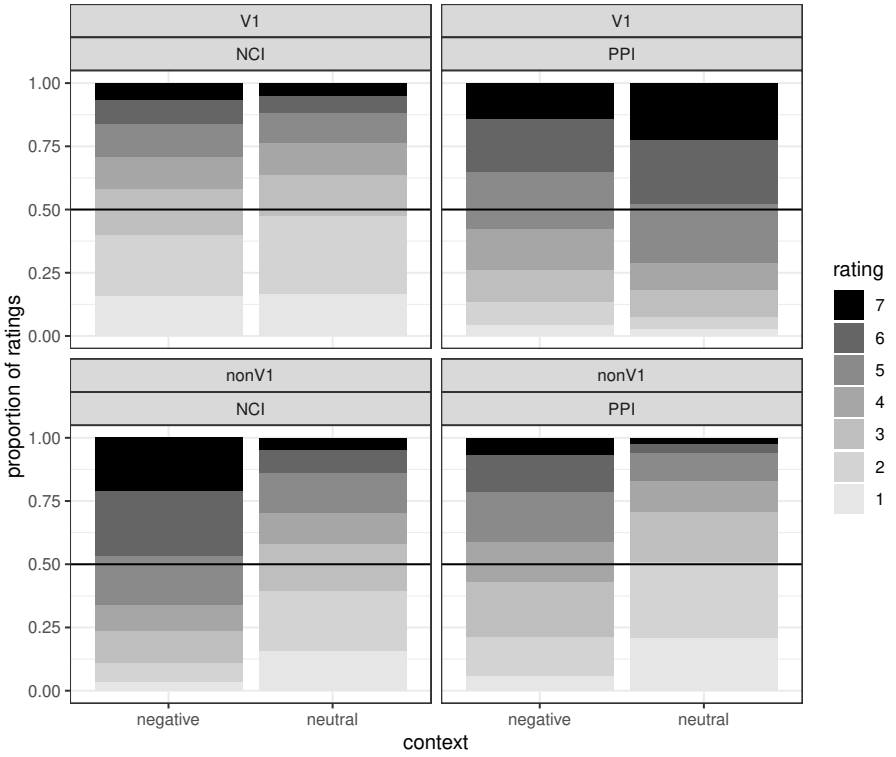


Figure 1: Proportions of ratings in all the unique conditions of the main experiment

i.e., we do not expect any effect of INDEFINITE. We do, however, expect an effect of CONTEXT: nonV1 questions (i.e., declarative questions) are expected to be more felicitous in a negative context than in a neutral context.

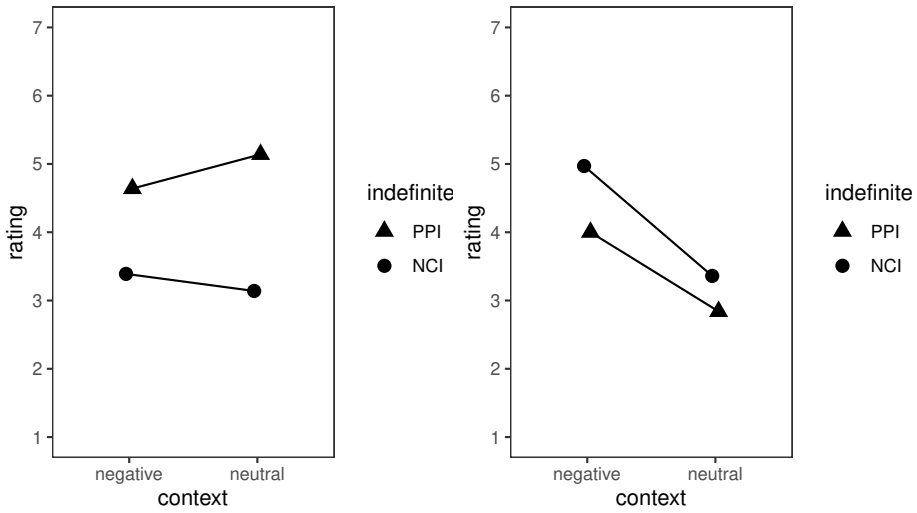
In order to evaluate the effects of our manipulations on the dependent variable (rating), we fitted two Cumulative Link Mixed Models (clmm function of the `ordinal` package of R; Christensen 2022), one for each value of VERB POSITION, using CONTEXT, INDEFINITE (both sum-coded), and their interaction as fixed effects and random intercepts for items and participants as random effects. Raw results with median value for each condition (cut through by the line at 0.50) are shown in Figure 1. The mean ratings, more directly visualizing the effects and interactions, are summarized in Figure 2. We first describe the results for V1 PQs and then turn to nonV1 PQs.

In V1 PQs we see a main effect of INDEFINITE on the naturalness of the PQ ($z = -15.674, p < .001$). CONTEXT does not show any statistically significant effect ($z = -1.374, p = 0.169$), although we observe an interaction between CONTEXT and INDEFINITE ($z = 2.933, p < 0.01$): the effect of INDEFINITE is more pronounced in the neutral context than in the negative context. A post-hoc model reveals that this interaction is driven by the simple effect of CONTEXT nested within the PPI level of INDEFINITE ($z = -3.522, p < .001$); the simple effect of CONTEXT within the NCI level is not significant ($z = 1.104, p = .27$).

When it comes to nonV1 PQs, we see a strong preference for negatively biased contexts (main effect of CONTEXT: $z = 8.674, p < 0.01$). Also, NCIs were rated higher than PPIs (main effect of INDEFINITE: $z = 6.208, p < 0.01$).

5.3 DISCUSSION

The results from the experiment show some clear tendencies which negative PQs Czech follow. Although our methodology did not allow us to control for a number of variables,



(a) V1 results (b) nonV1 results

Figure 2: Mean ratings in all the unique conditions of the main experiment

esp. the participants' background, motivation or understanding of the task, there emerged a few patterns which were by and large judged as more or less natural.

The results of V1 PQs are consistent with our predictions. The clause-initial verb is too high to be licensed by the canonical negative operator *Op*¬ and can only be licensed by FALSUM. In other words, clause-initial negated verb conveys outer, but not inner negation. This explains why NCIs are judged as significantly less natural in V1 PQs than PPIs. We further assumed that while negative V1 PQs might trigger a weak positive epistemic bias, they should not require negative evidential bias (Repp 2013, Sudo 2013, Gärtner & Gyuris 2017). The results are consistent with this expectation, as evidenced by the fact that V1 PQs are equally natural in both negative and neutral context. What we do see, however, is that outer negation V1 PQs are more natural in neutral than in negative context. We hypothesize that this is due to a potential competition with nonV1 PQs: since nonV1 PQs are devoted to conveying negative evidential bias (see the discussion below), the participants might have expected to see nonV1 rather than V1 PQs in negative contexts. That in turn could have led to the lower perceived naturalness of V1 PQs in negative contexts.

As we have pointed out in §3, Czech FALSUM has a broader distribution than the English one as well as a different semantic make-up. In one of the subexperiments, we tested negative V1 PQs in positive contexts; see (14), where Eva's scoring the first place strongly implies her winning a prize.

(14) A: Eva se zúčastnila lingvistické olympiády, kde skončila jako první.
Eva REFL participated linguistic olympiad where ended as first
'Eva participated in a linguistic olympiad, where she won the first place.'
B: Nevyhrála Eva nějakou cenu? 'Didn't Eva win a prize?'
NEG.won Eva DET.PPI prize?

PQs in contexts like those in (14) were rated as very natural (the median rating was 6; cf. the analogous condition presented in a neutral context, whose median was 5; see Fig. 1). This leads us to the conclusion that Czech FALSUM, unlike the English one, is compatible with all three types of evidential bias (neutral, negative and positive) and thus is insensitive to contextual polarity. We assume that this insensitivity to context is due to FALSUM being tied to epistemic bias – an assumption which would have to be

further tested.

As for nonV1 PQs, our analysis predicts that the low negative verb can be licensed either by FALSUM, or by *Op*¬, but not by both at the same time. Our results show that in nonV1 PQs inner negation is preferred (main effect of INDEFINITE). However, the outer interpretation was also available as long as a negatively biased context was provided. This is in line with our predictions about FALSUM being able to license even a negative verb located lower in the structure.

The results are furthermore consistent with our expectation that nonV1 PQs would be sensitive to contextual evidence. More specifically, we see that negative nonV1 PQs are more natural in negative contexts. For instance, the PQ uttered by B in (15) would receive higher rating when presented with the negative context (A') rather than with the neutral one (A). This is in line with much previous research (e.g. Gunlogson 2002), where it has been noticed that declarative PQs (of which our negative nonV1 PQs are a subtype) require contextual evidence in order to be felicitous. This tendency is also evident in corpus data (Onoeva & Staňková to appear).

(15) A: Jirka otevřel příborník, ve kterém měl velký nepořádek.
Jirka opened drawer in which had huge mess
'Jirka opened a cutlery drawer, which was messy.' neutral
A′: Jirka otevřel příborník, ze kterého vyndal vidličky.
Jirka opened drawer from which took-out forks
'Jirka opened a cutlery drawer and took out forks from there.' negative
B: Jirka nevyndal z příborníku *žádné* nože?
Jirka NEG.took-out from drawer DET.NCI knives
'Jirka didn't take out any knives from the cutlery drawer?' nonV1

It seems that inner negation, be it in V1 or nonV1 PQs, is strongly tied to negatively biased contexts, and, consequently, to evidential bias. We could say that by inner negation the speaker questions or double-checks evidential bias, whereas by FALSUM they question epistemic bias. When looking at outer negation, we see that its bias profile depends on the syntactic position of negation: when it is high (V1), it does not require evidential bias, as opposed to low negation (nonV1), where it requires negative evidential bias. Bias profile of outer negation PQs is thus not unified. We continue the discussion about negation and bias in the next section, this time examining particles.

6 PARTICLES *náhodou* AND *copak*

So far we have looked at how the position of a finite negative verb is connected to the interpretation it triggers, and how this is, in turn, reflected in the PQ's bias profile. Another phenomenon that can shed light on the biases of a PQ are certain question particles. In the experiment, we tested two of them: *náhodou* and *copak*.

In sum, we suggest that *náhodou* and *copak* have different implications with respect to bias: the first one, much like its licensor FALSUM, is tied to epistemic bias, the latter one is associated with evidential bias (or rather the clash of epistemic and evidential bias). In the experiment we aimed at determining which negative operator can license *náhodou* and on how (biased/unbiased) context licenses the use of *copak*.

6.1 *NÁHODOU*

Náhodou (lit. 'by chance') was expected to occur only under negation, i.e. it would not be licensed in positive PQs, see (16-a) vs. (16-b). This expectation stems not only from our own intuition, but also from corpus data, where *náhodou* in PQs appears virtually exclusively under negation; Šimík to appear reports that all 100 random instances of *náhodou* in PQs in the SYN v11 corpus of Czech (Křen et al. 2022) were sentences with negation. Since *náhodou* conveys epistemic bias (esp. hope on the side of the speaker;

Štícha 1984, Daneš et al. 1987, Běličová 1989, Grepl & Karlík 1998) and seems to be insensitive to contextual evidence, we suggest that the negative operator licensing it is FALSUM. For example, in (16-a), the speaker hopes/thinks it is possible that Karel is going to Brno (that *p*), although it could also follow a context which implies that ¬*p*, or that neither *p*, nor ¬*p*; all these options are available.

(16) a. Nepojede Karel *náhodou* do Brna?
NEG.go.FUT Karel NÁHODOU to Brno
'Is Karel going to Brno, by any chance?'
b. ?Pojede Karel *náhodou* do Brna?
go.FUT Karel NÁHODOU to Brno
[Intended] 'Is Karel going to Brno, by any chance?'

One of our experiments was designed to test which type of negation can license *náhodou*. We constructed 8 items in a 2 × 2 design. The manipulated variables were CONTEXT (neutral vs. negatively biased) and INDEFINITE (NCI vs. PPI). All the PQs contained a negative verb in the initial position. One example item is provided in (17), the manipulated content is in italics. Again, we manipulated INDEFINITE to prompt the inner (NCI) and outer (PPI) readings of the negation.

(17) A: Mikuláš cestoval vlakem, *který jel do Košic*.
Mikuláš traveled by.train which went to Košice
'Mikuláš was on the train which went to Košice.' neutral
A′: Mikuláš cestoval vlakem, *kde stál dlouho v uličce*.
Mikuláš traveled by.train where stood long in aisle
'Mikuláš was on a train, where he stood in the aisle.' negative
B: Nezarezervoval si Mikuláš náhodou {*žádné* / nějaké} sedadlo?
NEG.booked REFL Mikuláš NÁHODOU DET.NCI DET.PPI seat
'Didn't Mikuláš book a seat?'

According to our expectations, *náhodou* was preferred when the negation was interpreted as outer, i.e. as FALSUM, as is evident from Figure 3. The main effect of INDEFINITE on naturalness rating ($z = -12.845$, $p < .001$) supports the finding that *náhodou* requires FALSUM in order to be licensed. Based on this we suggest that *náhodou* could be used as an overt indicator of the covert FALSUM operator being present in the structure.

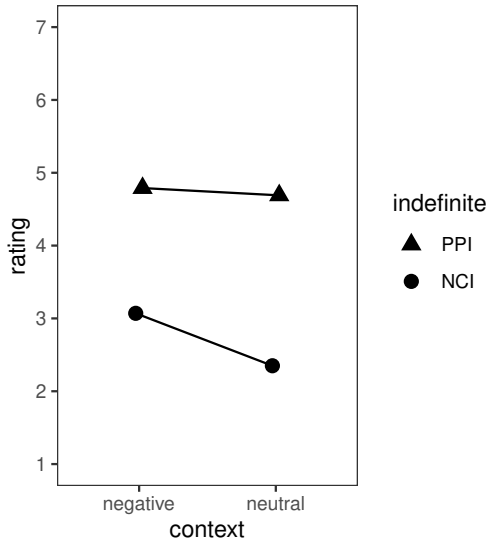


Figure 3: Mean ratings in all the unique conditions of the *náhodou* subexperiment

Both neutral and negatively biased context were judged to be suitable for outer negation *náhodou* PQs, just like in the main experiment (§5.2). We conjecture that *náhodou*, or more generally FALSUM PQs are primarily employed to raise the issue of speaker's epistemic bias, regardless of the current contextual information, which is why the two types of context are equally acceptable.

So far we have been discussing *náhodou* in V1 PQs. It is possible to use *náhodou* even in a nonV1 PQ, although it is conditioned by the presence of a contrastive topic in the sentence. For example, in (18), the referent of the subject *Petr* is in contrast with the already mentioned referent of *Hanka*. Due to the preference for the contrastive topic to appear in the clause-initial position, the negative verb in the PQ can stay in situ. However, in order for *náhodou* to be licensed, the negation must – by hypothesis – be licensed by FALSUM. That this is indeed the case is testified by the infelicity of the NCI *žádný*. What is more, the negative verb must be contrastively focused (indicated by small caps), presumably in order for the association with FALSUM to be ensured.

(18) A: Hanka si koupila knihu.
Hanka REFL bought book
'Hanka bought a book.'
B: A $[\text{Petr}]_{\text{CT}}$ si náhodou $[\text{NEKOUPIL}]_{\text{F}}$ {nějakou / *žádnou} knihu?
and Petr REFL NÁHODOU NEG.bought DET.PPI DET.NCI book
'And as for Petr, did he buy a book, too, by any chance?'

Even in (18), the PQ conveys that the speaker thinks it possible that Petr bought a book. The given context does not imply *p* neither ¬*p*. In the next subsection we discuss *copak*, which contrasts with *náhodou* exactly in its requirements on the current contextual evidence.

6.2 *COPAK*

Copak is different from *náhodou* in that it strongly indicates a conflict between speaker's prior belief and the currently available evidence (Štícha 1995b, Nekula 1996, Malá 2008, Šebestová & Malá 2016). *Copak* is licensed in both positive and negative PQs; the polarity of the PQ corresponds to the polarity of the contextual evidence. That means that (19-a) requires a context suggesting that *p* ('Petr is asleep'), e.g. seeing the light in Petr's bedroom off at midnight, whereas (19-b) a context suggesting that ¬*p* ('Petr is not asleep'), e.g. seeing the light in Petr's bedroom on at midnight. At the same time, (19-a) implies that the speaker thought that ¬*p* and (19-b) implies that the speaker thought that *p*.

(19) a. *Copak* Petr spí?
COPAK Petr sleep.PRS
'Petr is asleep?'
b. *Copak* Petr nespí?
COPAK Petr NEG.sleep.PRS
'Petr isn't asleep?'

We tested the hypothesis that *copak* PQs require an evidentially biased context in an experiment with a 2 × 2 design. CONTEXT was either (positively or negatively) biased, or neutral; and POLARITY OF THE PQ was either positive, or negative (i.e. inner negation). The bias always matched the polarity of the PQ, i.e. for a positive PQ it was biased positively, for a negative PQ it was biased negatively; see the example item in (20) below with manipulated content in italics. Positive PQs contained a PPI, whereas negative ones an NCI.

(20) A: Václav dorazil na letiště, *které nedávno zmodernizovali*.
Václav arrived to airport which recently modernized
'Václav arrived to an airport, which was recently modernized.' neut

A′: Václav dorazil na letiště, *kde prošel pasovou kontrolou*.
Václav arrived to airport where passed passport control
'Václav arrived to an airport, where he passed the passport control.' pos
A″: Václav dorazil na letiště, *odkud odletěl helikoptérou*.
Václav arrived to airport from.where flew by.helicopter
'Václav arrived to an aiport, from where he left in a helicopter.' neg
B: Copak Václav {*nastoupil* / *nenastoupil*} do {*nějakého* / *žádného*} letadla?
COPAK Václav boarded NEG.boarded in DET.PPI DET.NCI airplane
'Václav boarded an airplane? / Václav didn't board an airplane?'

The results of this experiment are shown in Figure 4. Overall, *copak* PQs were more natural in biased rather than neutral contexts (main effect of CONTEXT; $z = 9.372$, $p < .001$). This supports the claim that *copak* is a particle which is used to express speaker's surprise about the current contextual evidence. By questioning the evidence, the speaker lets the addressee know that their (speaker's) prior belief was in contrast to what they are hearing/observing at the time of the conversation.

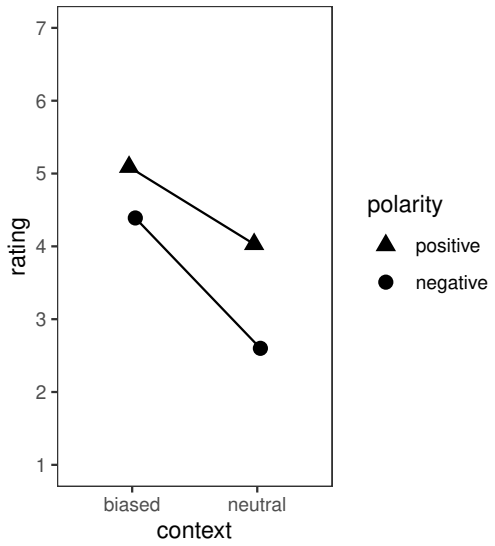


Figure 4: Mean ratings in all the unique conditions of the *copak* subexperiment

It should be noted that *copak* seems to be sensitive to contextual evidence just like word order as well as inner negation in §5.2, i.e. they all preferred biased contexts. This stands in opposition to the results of *náhodou* and FALSUM which are acceptable in any type of context.

When we zoom out a little and look at the issue of particles in Slavic PQs, we could draw a parallel between Czech *copak* and other particles sensitive to evidential bias, e.g. *czyby* in Polish and *razve* in Russian. *Razve* has been recently tested experimentally by Repp & Geist (2022), who found out its sensitivity to evidential bias. Particles like these tend to be associated with distinct bias profiles and their various shades.

7 CONCLUSION

This paper is centered around negation in Czech polar questions. Negative PQs in Czech have been claimed to be interchangeable in meaning with their positive counterparts. We proposed that negation in Czech PQs conveys an additional layer of meaning, which can be subsumed under the term BIAS, and, therefore, cannot be that easily substituted by positive PQs. We looked more closely at the phenomenon of outer (also called expletive

or pleonastic) negation in Czech PQs and modeled it as the FALSUM operator. We claimed that it is primarily associated with epistemic bias, unlike inner negation, which is more sensitive to contextual evidence. We proposed an analysis of how outer (aka FALSUM) and inner negation are syntactically licensed with respect to the position of the verb. The analysis was supported by experimental findings from a naturalness judgment task. In our main experiment, we compared the behavior of FALSUM vs. inner negation. The results showed a strong preference of FALSUM for the V1 word order as well as the overall effect of context on word order. In particular, the nonV1 word order in PQs is more natural in biased contexts. We have further discovered that Czech outer negation (FALSUM) is compatible with any kind of evidential bias – negative, neutral, as well as positive (cf. Gärtner & Gyuris 2017), as long as it is expressed by V1 PQs. The results of the main experiment are further corroborated by two additional experiments involving particles. One experiment provided evidence that the particle *náhodou* 'by chance' is an indicator of FALSUM. Another experiment confirmed that the particle *copak* is sensitive to contextual evidence, similarly to word order.

This work provides solid empirical underpinnings about the semantic behavior of negation in Czech PQs, but it also leaves many issues open. One such issue concerns the differential semantic behavior of outer negation when the negation is expressed on a fronted verb (V1 PQs) or on a verb left in its canonical position (nonV1 PQs). Although we have analyzed both types of negation in terms of the FALSUM operator and have diagnosed it by its compatibility with (narrow-scoping) positive polarity indefinites, it is clear that the surface position of the negation (or the verb hosting it) strongly correlates with the absence (V1) or presence (nonV1) of requirements on the context of use (aka evidential bias). Another issue concerns a more detailed cross-linguistic, and more specifically cross-Slavic comparison. Slavic languages, despite being closely related genealogically, exhibit quite different formal strategies of expressing PQs (see Šimík to appear for a recent survey); for instance, Russian relies on a dedicated pitch accent (Meyer & Mleinek 2006) (alongside the stylistically marked option of verb fronting combined with the encliticized particle *li*; see, e.g., Schwabe 2004); Polish lacks the verb fronting observed in Czech (and in Russian), but can use a PQ-initial interrogative particle *czy* instead. It will be very informative to see what consequences these different strategies have on the interpretive options of negation in PQs. We hope to address these and related issues in our future work.

ACKNOWLEDGEMENTS

The study was funded by the Czech Science Foundation (GAČR), project *Modelling the question–statement opposition in Slavic languages* (No. 21-31488J), pursued in collaboration with Humboldt-Universität zu Berlin (funding from DFG). We would like to acknowledge the valuable feedback of (alphabetically) Kateřina Hrdinková, Roland Meyer, Maria Onoeva, Maria Razguliaeva. We are also grateful to the audiences of FASL 32 and EGG 2023 for their valuable feedback.

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ABBREVIATIONS

CG	common ground	NPI	negative polarity item
NEG	negation	PPI	positive polarity item
NCI	negative concord item	PQ	polar question
nonV1	non-initial verb position	V1	initial verb position

REFERENCES

AnderBois, Scott. 2019. Negation, alternatives, and negative polar questions in American English. In Klaus von Heusinger, Edgar Onea & Malte Zimmerman (eds.), *Questions in discourse - volume 1: Semantics*, 118–171. Leiden, Boston: Brill.

Běličová, Helena. 1989. Zjišťovací otázky kladné a záporné v slovanských jazycích. *Slavia* 58. 97–105.

Bill, Cory & Todor Koev. 2021. Verum accent IS VERUM, but not always focus. In Patrick Farrell (ed.), *Proceedings of the Linguistic Society of America 6(1)*, 188–202. Washington, DC: Linguistic Society of America.

Bárány, András & Jenneke van der Wal. 2022. We don't agree (only) upward. *Linguistic inquiry* 53(3). 501–521.

Büring, Daniel & Christine Gunlogson. 2000. *Aren't positive and negative polar questions the same?* Manuscript. UCSC/UCLA. https://semanticsarchive.net/Archive/mY-wOGNhO/polar_questions.pdf.

Christensen, Rune Haubo Bojesen. 2022. Ordinal: Regression models for ordinal data. https://CRAN.R-project.org/package=ordinal.

Daneš, František, Zdeněk Hlavsa & Miroslav Grepl. 1987. *Mluvnice češtiny 3: Skladba*. Prague: Academia.

Deal, Amy Rose. 2022. Negative concord as downward Agree. In Breanna Pratley, Özge Bakay, Eva Neu & Peyton Deal (eds.), *Proceedings of NELS 52(1)*, 235–244. Amherst: GSLA.

Domaneschi, Filippo, Maribel Romero & Bettina Braun. 2017. Bias in polar questions: Evidence from English and German production experiments. *Glossa: A journal of general linguistics* 2(1). 26.

Dryer, Matthew S. 2013. Polar questions (v2020.3). In Matthew S. Dryer & Martin Haspelmath (eds.), *The world atlas of language structures online*, Zenodo.

Dušková, Libuše. 2012. *Mluvnice současné angličtiny na pozadí češtiny*. Prague: Academia.

Goodhue, Daniel. 2022. Isn't there more than one way to bias a polar question? *Natural language semantics* 30(4). 379–413.

Grepl, Miroslav. 1965. O větách tázacích. *Naše řeč* 48(5). 276–291.

Grepl, Miroslav & Petr Karlík. 1998. *Skladba češtiny*. Olomouc: Votobia.

Groenendijk, Jeroen & Martin Stokhof. 1984. *Studies on the semantics of questions and the pragmatics of answers*. Amsterdam: University of Amsterdam.

Gunlogson, Christine. 2002. Declarative questions. In Brendan Jackson (ed.), *Proceedings of SALT 12*, 124–143.

Gärtner, Hans-Martin & Beáta Gyuris. 2017. On delimiting the space of bias profiles for polar interrogatives. *Linguistische Berichte* 251. 293–316.

Hamblin, Charles L. 1973. Questions in Montague English. *Foundations of language* 10(1). 41–53.

Karttunen, Lauri. 1977. Syntax and semantics of questions. *Linguistics and philosophy* 1(1). 3–44.

Kopecký, Jakub. 2010. Komunikační funkce záporných otázek zjišťovacích. *Naše řeč* 93(1). 1–15.

Křen, M., V. Cvrček, M. Hnátková, T. Jelínek, J. Kocek, D. Kováříková, J. Křivan, J. Milička, V. Petkevič, p: Procházka, H. Skoumalová, J. Šindlerová & M. Škrabal. 2022. *Corpus SYN, version 11 from 14. 12. 2022*. Prague: Ústav Českého národního korpusu FF UK. https://www.korpus.cz/.

Křížková, Helena. 1968. Tázací věta a některé problémy tzv. aktuálního (kontextového) členění. *Naše řeč* 51(4). 200–210.

Ladd, D. Robert. 1981. A first look at the semantics and pragmatics of negative questions and tag questions. In Roberta A. Hendrick (ed.), *Papers from the regional meeting of the Chicago Linguistic Society 17*, 164–171. Chicago: Chicago Linguistic Society.

Malá, Markéta. 2008. Czech negative polar questions and their English counterparts in the parallel Czech-English corpus. In František Štícha & Mirjam Fried (eds.), *Grammar & corpora / Gramatika a korpus 2007*, 261–269. Prague: Academia.

Meyer, Roland & Ina Mleinek. 2006. How prosody signals force and focus: A study of pitch accents in Russian yes-no questions. *Journal of pragmatics* 38(10). 1615–1635.

Nekula, Marek. 1996. *System der Partikeln im Deutschen und Tschechischen: Unter besonderer Berücksichtigung der Abtönungspartikeln*. Tübingen: Niemeyer.

Onoeva, Mariia & Anna Staňková. to appear. Polar questions in Russian and Czech: An exploratory spoken corpus investigation. In Berit Gehrke, Denisa Lenertová, Daria Seres Roland Meyer, Luka Szucsich & Joanna Zaleska (eds.), *Advances in formal Slavic linguistics 2022*, Language Science Press.

Repp, Sophie. 2006. ¬(A&B). Gapping, negation and speech act operators. *Research on language and computation* 4(4). 397–423.

Repp, Sophie. 2013. Common ground management: Modal particles, illocutionary negation and verum. In Daniel Gutzmann & Hans-Martin Gärtner (eds.), *Beyond expressives: Explorations in use-conditional meaning*, 231–274. Leiden, Boston: Brill.

Repp, Sophie & Ljudmila Geist. 2022. Negative polar questions in Russian: Question bias and question concern. Manuscript, University of Cologne and University of Stuttgart.

Romero, Maribel. 2015. High negation in subjunctive conditionals and polar questions. *Proceedings of Sinn und Bedeutung* 19. 519–536.

Romero, Maribel & Chung-Hye Han. 2004. On negative yes/no questions. *Linguistics and philosophy* 27(5). 609–658.

Sadock, Jerrold M. 1971. Queclaratives. In *Papers from the seventh regional meeting of the Chicago Linguistic Society*, 223–231. Chicago: Chicago Linguistic Society.

Schwabe, Kerstin. 2004. The particle *li* and the left periphery of Slavic yes/no interrogatives. In Horst Lohnstein & Susanne Trissler (eds.), *The syntax and semantics of the left periphery* 9, 385–430. Berlin, New York: Mouton de Gruyter.

Šebestová, Denisa & Markéta Malá. 2016. Anglické překladové protějšky českých vět s částicemi copak a jestlipak. *Časopis pro moderní filologii* 98. 228–237.

Šimík, Radek. to appear. Polar question semantics and bias: Lessons from Slavic/Czech. In Berit Gehrke & Radek Šimík (eds.), *Topics in the semantics of Slavic languages*, Language Science Press.

Šmilauer, Vladimír. 1969. *Novočeská skladba*. Prague: Státní pedagogické nakladatelství.

Starschenko, Alexej & Marta Wierzba. 2022. L-Rex. https://github.com/2e2a/l-rex.

Štícha, František. 1984. Konkurence kladu a záporu v otázkách zjišťovacích. *Naše řeč* 67(2). 76–83.

Štícha, František. 1995a. Otázky predikátové: inference, implicitnost a explicitní výrazy ilokučních funkcí I. *Slovo a slovesnost* 56(2). 98–109.

Štícha, František. 1995b. Otázky predikátové: inference, implicitnost a explicitní výrazy ilokučních funkcí II. *Slovo a slovesnost* 56(3). 204–217.

Sudo, Yasutada. 2013. Biased polar questions in English and Japanese. In Daniel Gutzmann & Hans-Martin Gärtner (eds.), *Beyond expressives: Explorations in use-conditional meaning*, vol. 28, 275–295. Leiden, Boston: Brill.

Zeijlstra, Hedde. 2004. *Sentential negation and negative concord*. Utrecht: LOT.