

BEATA TRAWIŃSKI

Leibniz Institute for the German Language, Mannheim

ORCID: 0000-0002-1705-6911

Negation raising and mood

A corpus-based study of Polish *sądzić* ‘think’ and *wierzyć* ‘believe’

1. Introduction¹

It is known that with certain verbs (such as *think* or *believe*), a negation in the matrix clause can be understood as negating an embedded proposition. Such verbs are referred to as negation raising predicates and are attested in many languages (cf. Fillmore, 1963, Bartsch, 1973; Horn, 1978; Gajewski, 2007, among others). The notion of negation raising / negative raising (NR) or, originally, negative transportation, goes back to Fillmore, 1963 and the syntactic approach assuming that the representation of negation is raised out of the embedded clause to be realized syntactically in the matrix clause.² The phenomenon can be illustrated by the contrast between (1) and (2). While the sentence in (1), including a negation within the embedded clause, has only one reading, two readings are possible in (2): According to Reading 1, the negation is interpreted within the matrix clause and according to Reading 2, the negation is interpreted within the embedded clause (NR reading).

¹ I am very grateful to Piotr Bański, the editors of this volume, and the anonymous reviewers for their helpful comments, corrections and suggestions. I am also indebted to the audience of the 8th International Conference *Grammar and Corpora*, organized by the Institute of Polish Language of the Polish Academy of Sciences in Kraków (Poland) and held online on November 25–27, 2020.

² The notion was adopted in many other approaches, such as R. Lakoff (1969), Ross (1973), Prince (1976) or, more recently, Collins & Postal (2014, 2017); see also Kiparsky (1970), Jackendoff (1971), Pollock (1976), Klima (1964), Lasnik (1972), Zeijlstra (2018) as well as the semantic-pragmatic approaches, which essentially go back to Bartsch (1973), such as Horn (1978), Horn and Bayer (1984), Tovena (2001), Sailer (2006), Gajewski (2007), Romoli (2013), among others. See also Crowley (2019), who argues that both purely syntactic and semantic-pragmatic approaches are needed in order to account for the full range of data. For some experimental studies on negation raising in Czech, see Dočekal and Dotlačil (2016) and for a cross-linguistic overview of negation raising and related phenomena, see Moscati (2010).

- (1) Phil thinks Mary will not come.
Reading: Phil thinks that it is not the case that Mary will come.
- (2) Phil doesn't think Mary will come.
Reading 1: It is not the case that Phil thinks Mary will come.
Reading 2: Phil thinks that it is not the case that Mary will come. = (1) [NR]

A piece of evidence for the presence of semantic negation in the embedded clause can be provided by the occurrence of (strong) Negative Polarity Items (NPIs), which require a clause-mate negation. As (3) shows, the NPI *lift a finger* must occur in the scope of a negation within the same clause. In structures with NR readings, this NPI can still be licensed, as illustrated by (4). This indicates that the embedded clause entails a semantic negation (which, however, is syntactically realized in the matrix clause).

- (3) Phil will *(not) lift a finger to help Mary.
- (4) Mary doesn't think that Phil will lift a finger to help her. [NR]

It has also been observed that NR predicates behave in a way similar to performatives (R. Lakoff, 1969; Prince, 1976); they prefer the first person present non-progressive form (in English). An and White (2020) further show that the following properties of embedded clauses influence whether NR inferences are triggered: the semantics of the embedded predicate (eventive versus stative verbs) and finiteness (finite versus non-finite clauses), which implies the presence or absence of tense and the presence or absence of an overt subject. This paper focuses on another factor triggering NR inferences, based on corpus evidence from Polish: the mood of the embedded clause (indicative versus subjunctive).

In the next section, theoretical background relevant to the phenomenon of NR will be provided, particularly Horn's Uncertainty Principle (1978) and performativity hypothesis by Prince (1976). In Section 3, basic facts on clausal complementation in Polish will be introduced and the issue of NR in Polish will be discussed. Section 4 presents a corpus study on two NR predicates in Polish. Section 5 presents conclusions and theoretical implications arising from the results of this corpus study. A summary of the paper is provided in Section 6.

2. Theoretical background

It has been observed that NR is possible only with certain predicates. This can be shown by the contrast between (1) and (2) above on the one hand, and (5) and (6) on the other hand. The examples demonstrate that a NR reading is available with the verb *think* but not with the verb *claim*.

- (5) Phil claims that Mary will not come.
- (6) Phil doesn't claim that Mary will come.
Reading 1: It is not the case that Phil claims Mary will come.
#Reading 2: Phil claims that it is not the case that Mary will come. [NR not available]

A list of predicates which can license a NR reading for English has been proposed by Horn (1978, p. 187). These predicates are classified into a number of semantic categories and include:

- (7) NR predicates in English (Horn 1978, p. 187)
- a. [OPINION] *think, believe, suppose, imagine, expect, reckon (anticipate, guess)*
 - a' [PERCEPTION] *seem, appear, look like, sound like, feel like...*
 - b. [PROBABILITY] *be probable, be likely, figure to*
 - c. [INTENTION / VOLITION] *want, intend, choose, plan*
 - c' [JUDGMENT / (WEAK) OBLIGATION] *be supposed to, ought, should, be desirable, advise, suggest*

The following list presents NR predicates in Russian (Luborsky, 1972, in: Horn, 1978) and demonstrates marked similarities with the English list:

- (8) NR predicates in Russian (Luborsky, 1972, in: Horn, 1978)
- a. [OPINION] *dumat' 'think', ozidat' 'expect'*
 - a'. [PERCEPTION] *pokazat'sja 'appear', vidno 'appear'*
 - b. [PROBABILITY] *verojatno 'probably'*
 - c. [INTENTION / VOLITION] *xotet' 'want', zamysljat' 'intend', namerevat'sja 'plan'*
 - c'. [JUDGMENT / (WEAK) OBLIGATION] *dolzen 'should', sovetovat' 'advise'*

Based on the lists in Horn (1978), Modrzejewska (1981) formulated a list of NR predicates for Polish (including a comparison with English). This list includes the following predicates:

- (9) NR predicates in Polish (Modrzejewska, 1981)
- a. [OPINION] *być zdania 'think', ?mniemać 'be of the opinion', myśleć 'think', przypuszczać 'suppose', sądzić 'think / be of the opinion', spodziewać się 'expect', uważać 'be of the opinion', wątpić 'doubt', wierzyć 'believe', wyobrażać sobie 'imagine'*
 - a'. [PERCEPTION] *wydawać się 'seem / appear', zdawać się 'seem / appear'*
 - b. [PROBABILITY] *prawdopodobne 'probable / likely'*
 - c. [INTENTION / VOLITION] *chcieć 'want', mieć (as in mieć coś zrobić = 'to be to do something'), mieć ochotę 'feel like', mieć zamiar 'intend', życzyć sobie 'wish'*
 - c'. [JUDGMENT / (WEAK) OBLIGATION] *powinien 'should', pożądane 'desirable', radzić 'advise', wskazane 'advisable'*

This cross-linguistic comparison shows that the identification of NR predicates with the classes proposed by Horn is fairly consistent. However, it does not imply that all cross-linguistic equivalents of a negation raiser will also be negation raisers. For example, the English verb *hope* is not a NR predicate, while its German equivalent *hoffen* is. Furthermore, the inventory of NR predicates within the particular semantic classes

may vary across languages. Moreover, synonymous predicates in a single language may have different properties as far as NR is concerned. Horn (1978, p. 215) provides the examples of the English *be likely*, which is a NR predicate, versus *be probable*, which is not, and of the English verb *suppose*, which is a NR predicate, versus *guess*, which is not. Acceptance of a predicate as a negation raiser can also vary across speakers.

In the following subsections, two semantic-pragmatic approaches are discussed which address the questions of why certain predicates are negation raisers and why a speaker uses a NR construction instead of a lower negation.

a. The Uncertainty Principle (Horn 1978)

The Uncertainty Principle proposed by Horn (1978) is a pragmatic constraint which concerns the strength of negation. According to Horn (1978, p. 132), “negative force weakens with the distance of the negative element from the constituent with which it is logically associated.”³ Thus, the further negation occurs from its associated clause, the more of a speaker’s uncertainty it conveys about the negation of that clause. When the Uncertainty Principle clashes with the meaning of a structure, no NR occurs. This happens, according to Horn, in the case of factive and implicative predicates.

Horn (1978) defines a scale of proposition-embedding predicates, where any element on the scale entails all elements to its left on the same scale. The entailment relations are determined on the basis of the behavior of elements in specific scalar constructions. All predicates are divided into an epistemic class and a deontic class and are arranged along this scale. Horn’s (1978, p. 194) scale is presented in Figure 1.

<i>be able</i> <i>be possible</i>	← WEAKER →	<i>believe, suppose, think</i> <i>be likely, probable</i> <i>figure to</i> <i>seem, appear, look like</i>	<i>know, realize</i> <i>be clear, evident</i> <i>be sure, certain</i> <i>be odd, significant</i>
– STRONGER →			
<i>may, might</i> <i>can, could</i> <i>allow, permit, let</i> <i>be allowed</i> <i>be legal</i>		<i>should, ought to, better</i> <i>be supposed to</i> <i>be desirable, advisable</i> <i>be a good idea</i> <i>want, choose, intend, plan to</i> <i>suggest, advise</i>	<i>must, have to</i> <i>need, be necessary</i> <i>be obligatory</i> <i>make, cause, force</i> <i>order, demand, force</i>

Fig. 1. Horn’s (1978) scale of proposition-embedding predicates

Factive predicates (such as *know*) are arranged at the strong end of the scale. Their subjects know that the embedded proposition is true and therefore, they cannot be

³ Cf. also Bolinger (1968), R. Lakoff (1969), G. Lakoff (1970) and Sheintuch & Wise (1976) for similar observations. For morphosyntactic effects related to the distance between negation and the negated element in Polish (in particular the accusative-genitive conversion), see Świdziński (1998).

uncertain about it. Implicative predicates (such as *be able*), which do not presuppose but entail the truth of the embedded proposition, are arranged at the weak end of the scale. NR occurs only with the predicates in a mid-scalar position (such as *believe*): they are non-factive and non-implicative, even under negation. That explains their NR potential. Thus, the Uncertainty Principle can be applied to those predicates.

Polish predicates can be similarly arranged along a scale according to their strength and classified as weak (for example *jest możliwe* ‘is possible’), mid (for example *sądzić* ‘think’) and strong (for example *wiedzieć* ‘know’). Figure 2 shows the scale of proposition-embedding predicates for Polish proposed in Modrzejewska (1981, p. 51).

<i>jest możliwe</i> <i>być zdolnym</i>	<i>wydawać się</i> <i>jest prawdopodobne,</i> <i>przypuszczać,</i> <i>sądzić, myśleć</i>	<i>wiedzieć,</i> <i>jest pewne,</i> <i>jest oczywiste</i>
← WEAK –		
– STRONG →		
<i>móc, potrafić,</i> <i>pozwałać</i>	<i>chcieć, powinien</i> <i>radzić, mieć zamiar</i>	<i>musieć, zmusić</i>

Fig. 2. Scale of proposition-embedding predicates for Polish (Modrzejewska, 1981)

As in English, NR occurs only with the predicates in the mid-scalar position, such as *sądzić* ‘think’, *myśleć* ‘think’ etc.

b. The Performativity Hypothesis (Prince, 1976)

Prince (1976) suggests that negation raisers behave in a way similar to performatives, and argues that the matrix verb (onto which the negation can be raised) is a semi-performative predicate, a meta-statement HEDGE. This proposal correlates, according to Prince (1976), with the following facts: (i) the verbs are all used in a metaphoric sense (“hold the opinion”), (ii) like typical performative predicates (such as *name* or *swear*), they do not take the progressive form (in English), and (iii) they exhibit a marked preference for the first person present. She shows that if an (English) predicate is in the progressive or the future tense form, NR does not appear, even if this predicate satisfies the mid-scalar position on the Horn scale. In this case, this predicate will be understood literally, and not metaphorically as “hold the opinion” (cf. (10), based on Prince, 1976).

- (10) *I’m not guessing you like roast goose, do you?
 *I will not think that John will leave until tomorrow.
 ?I didn’t think that John would leave until tomorrow.

The performative nature of NR has been already postulated by R. Lakoff (1969). She observed that NR structures in English may occur with tag questions formed from

the verb in the embedded sentence only when the subject of the matrix verb is the first person pronoun *I* and the verb is in the present tense (the canonical form of classical performatives). This is illustrated by the examples in (11), provided in R. Lakoff (1969).

- (11) I don't suppose the Yankees will win, will they?
 *He doesn't suppose the Yankees will win, will / won't they?
 *I didn't suppose the Yankees would win, would(n't) they?

The preference for the first person pronoun and present tense can also be observed in Polish NR structures. As pointed out in Modrzejewska (1981), the following sentences are not synonymous. The verb *myśleć* 'think' in the future tense denotes a mental activity rather than "holding the opinion." In other words, it is used in its literal sense and cannot raise negation.

- (12) a. Będę myślała, że nie ma ich w domu.
 'I will think that they are not at home.'
 b. Nie będę myślała, że są w domu.
 'I won't think that they are at home.'

Modrzejewska (1981) further argues that if the matrix subject is in the third person, the synonymy is less obvious than it is in the case of the first person, cf. (13) and (14), respectively.

- (13) a. Piotr przypuszcza, że transformacje nie istnieją.
 'Peter supposes that transformations don't exist.'
 b. Piotr nie przypuszcza, że transformacje istnieją.
 'Peter doesn't suppose that transformations exist.'
- (14) a. Przypuszczam, że transformacje nie istnieją.
 'I suppose that transformations don't exist.'
 b. Nie przypuszczam, że transformacje istnieją.
 'I don't suppose that transformations exist.'

Here, I adopt the performativity hypothesis put forward by Prince (1976) and the Uncertainty Principle together with the scale of proposition-embedding predicates proposed by Horn (1978), and will examine those proposals for Polish using corpus data. In the next section, basic facts concerning clausal complementation in Polish and NR in Polish will be introduced.⁴

⁴ For (morpho)syntactic aspects of verbal negation in Polish see Świdziński (1987, 1992, 1998, 2000), Przepiórkowski and Kupść (1997) or Przepiórkowski and Świdziński (1997), among others. Note that subordinate clauses are, in general, boundaries for Negative Concord in Polish, which also holds for *żeby*-clauses selected by NR predicates.

3. Clausal complementation and NR in Polish

In Polish, two types of clausal complements in regard to the mood of the embedded predicate can be distinguished: indicative complement clauses, introduced by the complementizer *że* 'that' (15) and subjunctive complement clauses, introduced by the complementizer *żeby* 'so that' or its variants *aby*, *ażeby*, *by*, *coby*, and *izby* (16).

- (15) Karol narzekał, że Ola głośno śpiewa.
 Karol was-complaining ŻE Ola loudly sings
 'Karol was complaining that Ola sings loudly.'

- (16) Karol nalegał, żeby Ola głośno śpiewała.
 Karol was-insisting ŻEBY Ola loudly sing
 'Karol was insisting that Ola (should) sing loudly.'

With neutral, non-NR matrix predicates, neither of the types of clauses exhibit specific restrictions on their usage/distribution and interpretation of sentential negation. As the sentences in (17) and (18) demonstrate, both indicative complement clauses introduced by the complementizer *że* 'that' and subjunctive complement clauses introduced by the complementizer *żeby* 'so that' are compatible with affirmative and negative contexts. Negation is always interpreted within the clause where it appears.

- (17) Karol (nie) narzekał, że Ola (nie) śpiewa głośno.
 Karol NEG was-complaining ŻE Ola NEG sings loudly
 'Karol was (not) complaining that Ola (doesn't) sing(s) loudly.'

- (18) Karol (nie) nalegał, żeby Ola głośno (nie) śpiewała.
 Karol NEG was-insisting ŻEBY Ola loudly NEG sing
 'Karol was (not) insisting that Ola (should) (not) sing loudly.'

Both types of complement clauses can be selected by NR predicates in Polish (if it is compatible with their selectional requirements). To illustrate this, the NR verb *sądzić* 'think' is used, which occupies a very central position on the Horn-scale for Polish proposed by Modrzejewska (1981). The example in (19) shows that sentences headed by the verb *sądzić* 'think' which selects indicative *że*-clauses are compatible both with affirmative and negative contexts.

- (19) a. Jan sądzi, że Ewa wróci.
 Jan thinks ŻE Ewa return
 'Jan thinks that Ewa will return.'
 b. Jan sądzi, że Ewa nie wróci.
 Jan thinks ŻE Ewa NEG return
 'Jan thinks that Ewa will not return.'

- c. Jan nie sądzi, że Ewa wróci.
 Jan NEG thinks ŻE Ewa return
 'Jan does not think that Ewa will return.'
 Reading 1: It is not the case that Jan thinks Ewa will return.
 Reading 2: Jan thinks that it is not the case that Ewa will return. (NR)
- d. Jan nie sądzi, że Ewa nie wróci.
 Jan NEG thinks ŻE Ewa NEG return
 'Jan does not think that Ewa will not return.'
 Reading 1: It is not the case that Jan thinks Ewa will not return.
 Reading 2: Jan thinks that it is not the case that Ewa will not return. (NR)

Note that (19c) and (19d) have two readings, an NR reading and a non-NR reading.

The examples in (20) show sentences with the verb *sądzić* which combines with subjunctive complement clauses headed by the complementizer *żeby*.

- (20) a. *Jan sądzi, żeby Ewa wróciła.
 Jan thinks ŻEBY Ewa return
 'Jan thinks that Ewa would return.' (intended)
- b. *Jan sądzi, żeby Ewa nie wróciła.
 Jan thinks ŻEBY Ewa NEG return
 'Jan thinks that Ewa would not return.' (intended)
- c. Jan nie sądzi, żeby Ewa wróciła.
 Jan NEG thinks ŻEBY Ewa return
 'Jan does not think that Ewa would return.'
 Reading 1: It is not the case that Jan thinks Ewa would return.
 Reading 2: Jan thinks that it is not the case that Ewa would return. (NR)
- d. Jan nie sądzi, żeby Ewa nie wróciła.
 Jan NEG thinks ŻEBY Ewa NEG return
 'Jan does not think that Ewa would not return.'
 Reading 1: It is not the case that Jan thinks Ewa would not return.
 Reading 2: Jan thinks that it is not the case that Ewa would not return. (NR)

Here, the two readings, an NR and a non-NR reading are also available (cf. (20c) and (20d)). However, in contrast to the indicative counterpart, the negation in the matrix clause is obligatory (cf. (20a) and (20b) versus (20c) and (20d)).

The two patterns of clausal complementation with NR predicates in Polish are summarized in Table 1.

Matrix clause	Neg-Raising Verb	COMP	Embedded clause
(NEG)	sądzić, myśleć, wierzyć ...	że	Indicative
*(NEG)	sądzić, myśleć, wierzyć ...	żeby	Subjunctive

Table 1. Patterns of clausal complementation with NR predicates in Polish

Given this variation in syntactic complementation available with NR verbs in Polish, the question arises whether one complementation type correlates with the NR reading more, or in a way different from the other. More specifically: does the subjunctive mood affect NR inferences more than the indicative mood (or vice versa)? To answer these questions, a corpus study described in the following section was conducted.

4. Corpus study

In the corpus study under consideration, two Polish NR predicates (mid-scalar predicates on the Horn scale) were examined: *sądzić* ‘think’ and *wierzyć* ‘believe’. The balanced version of the National Corpus of Polish (NKJP, Przepiórkowski et al. (2012); <http://nkjp.pl>) with 300 million tokens was the source of data used here. The data was extracted according to the following patterns:

- (21) a. nie [base=„sądzić”] [pos=„interp”] [base=„żeby|że|by|aby”]
 b. nie [base=„wierzyć”] [pos=„interp”] [base=„żeby|że|by|aby”]

The task was to quantitatively describe the distribution of relevant morphosyntactic forms of these two verbs and to correlate these frequencies with the distribution of the indicative and subjunctive complements. The underlying assumption was that basically, both an NR reading and a non-NR reading are possible with negated NR predicates but with a NR reading, a marked preference for the first person present can be attested (following Prince, 1976). Thus, the first person present form can be considered as an indicator of an NR reading.

The overall distribution of the verbs *sądzić* ‘think’ and *wierzyć* ‘believe’ in the balanced NKJP is presented in Table 2. As the table shows, the frequency of *sądzić* is considerably higher than the frequency of *wierzyć* in the sample examined. Furthermore, the distribution of *że-* and accordingly *żeby-* complements is different for *sądzić* and *wierzyć*, exhibiting inverse proportions.

Verb	że	żeby	
<i>sądzić</i> ‘think’	962 = 31.73%	2070 = 68.27%	3032 = 100%
<i>wierzyć</i> ‘believe’	61 = 64.21%	34 = 35.79%	95 = 100%

Table 2. Distribution of *sądzić* and *wierzyć* in the balanced NKJP

21 different morphosyntactic form types were found for *sądzić*, which result from the combination of different values of the categories person, number, gender, tense and mood. As Figure 3 shows, a strong preference of *żeby*-clauses for the first-person singular present form can be observed.

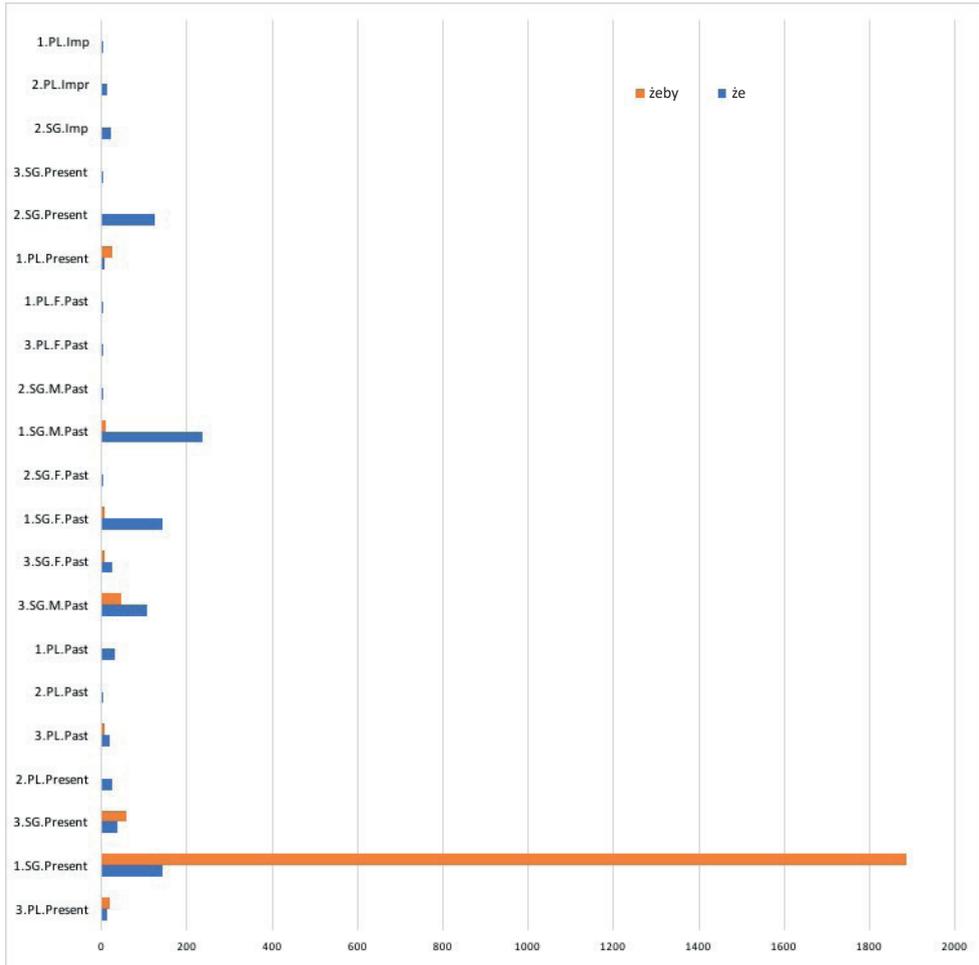


Fig. 3. Distribution of morphosyntactic forms of *sądzić* 'think'

13 morphosyntactic form types were identified for *wierzyć*. In this case, again, *żeby*-clauses show a strong preference for the first-person singular present form, which is demonstrated in Figure 4.

To make the picture clearer, the frequencies for all genders were aggregated and the simplified datasets were analysed statistically. The diagram in Figure 5 shows the relative distribution of *że*- and *żeby*-clauses across 15 forms (reduced from 21) for *sądzić*. As can be seen, first-person present forms (both singular and plural) occur most frequently with *żeby*-clauses. The distribution of third-person present forms (both singular and plural) is more balanced, as far as their occurrence with *żeby*- and *że*-clauses is concerned. Past forms are used most frequently with *że*-clauses.

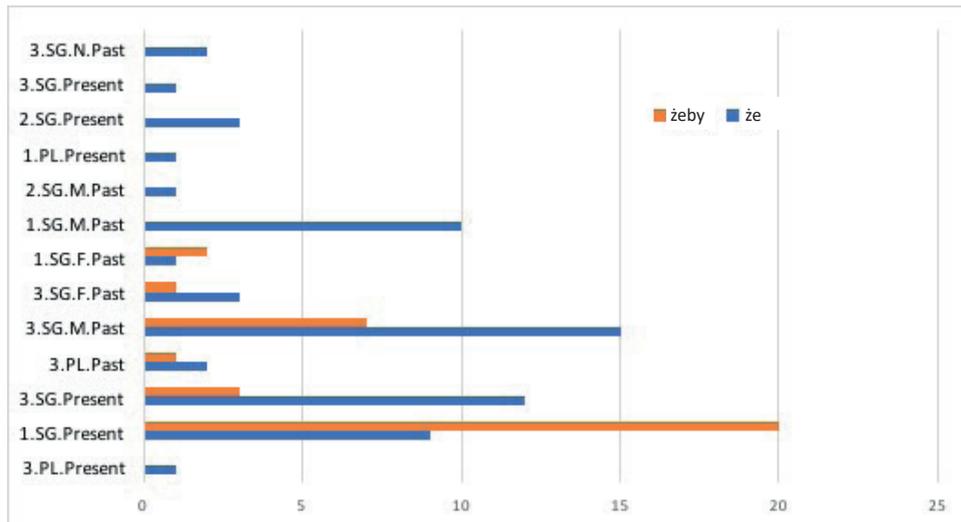


Fig. 4. Distribution of morphosyntactic forms of *wierzyć* 'believe'

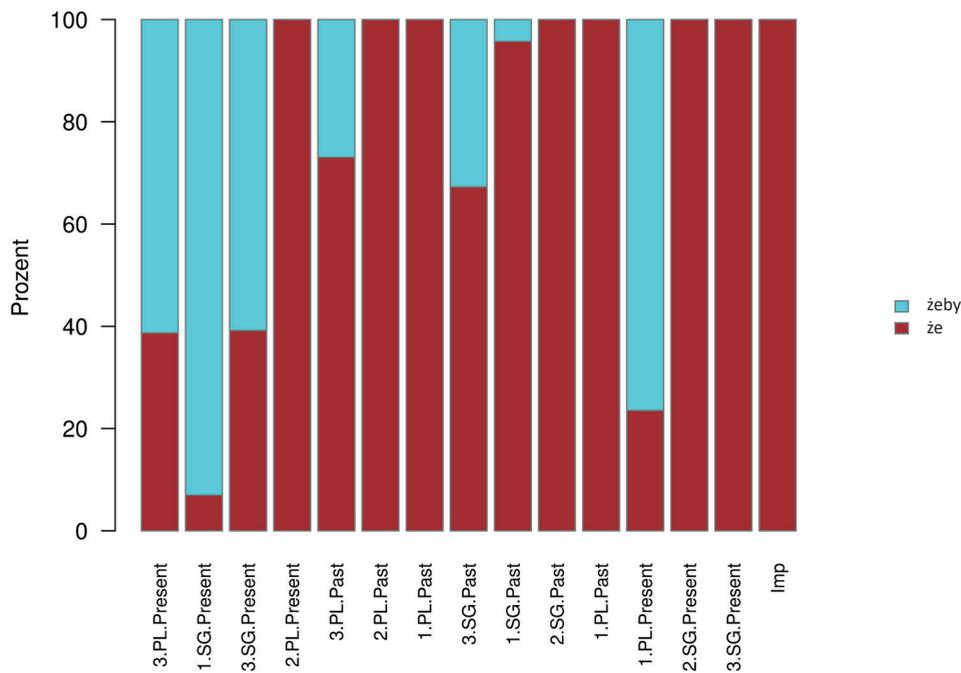


Fig. 5. Relative distributions of forms of *sądzić* 'think'

The following association plot demonstrates the under-representation of the first person singular present form for *że*-clauses and the over-representation of this form for *żeby*-clauses. It also shows a positive association of all other forms with *że*-clauses and their negative association with *żeby*-clauses.

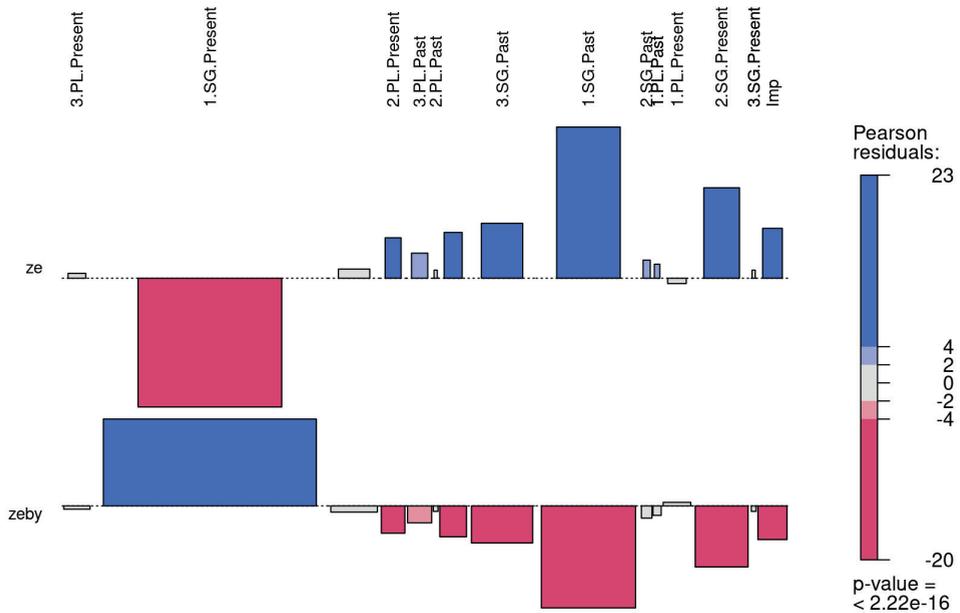


Fig. 6. Association plot for *sądzić* 'think'

The diagram in Figure 7 shows the relative distribution of *że*- and *żeby*-clauses across 9 forms (reduced from 13) for *wierzyć*. In this case again, the first person singular present form occurs more frequently with *żeby*-clauses than with *że*-clauses. Past forms are used most frequently with *że*-clauses.

The association plot in Figure 8 again illustrates an under-representation of the first person singular present form for *że*-clauses and over-representation of this form for *żeby*-clauses. As far as all other forms are concerned, no significant associations were found concerning *że*- and *żeby*-clauses.

To conclude, the corpus distribution of the two NR predicates *sądzić* and *wierzyć* shows clear patterns. If these verbs are used with a *żeby*-clause (the subjunctive mood), they strongly tend to occur in the first person singular present form. If these verbs are used with a *że*-clause (the indicative mood), the first person singular present form is still possible but strongly dispreferred. Moreover, these patterns occur regardless of the overall individual preferences of those verbs for *że*- and *żeby*-clauses, respectively (cf. Table 2).

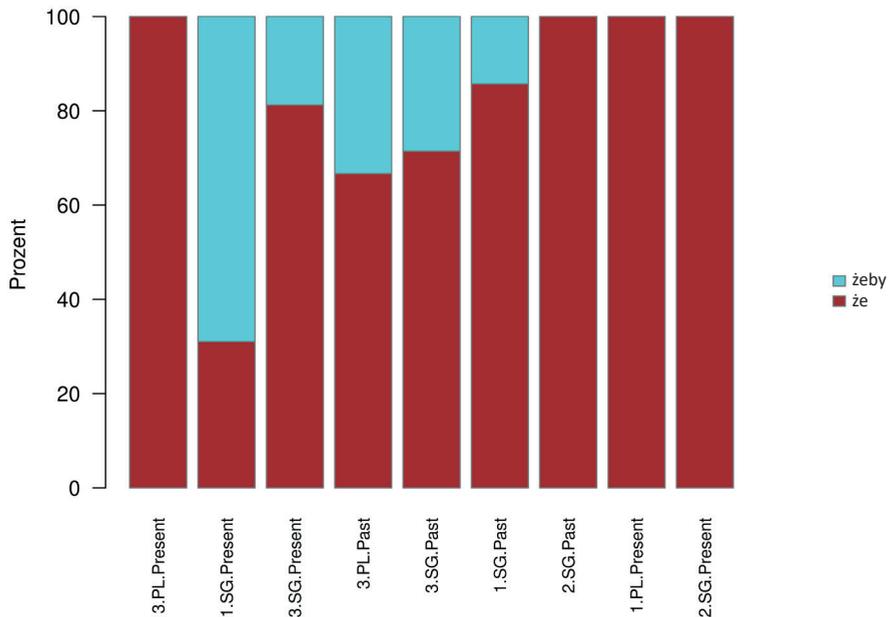


Fig. 7. Relative distributions of forms of *wierzyć* 'believe'

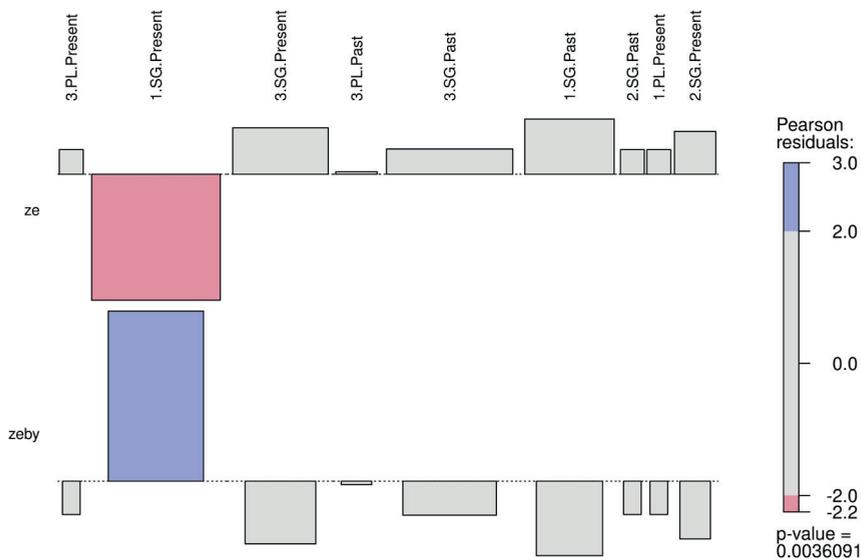


Fig. 8. Association plot for *wierzyć* 'believe'

5. Theoretical implications

The results of the corpus study of the two Polish NR predicates *sądzić* ‘think’ and *wierzyć* ‘believe’ empirically validate the performativity hypothesis to NR put forward by Prince (1976) only for those mid-scalar predicates which take subjunctive complements. These findings correspond to the observations made in Prince (1976) for French. In French, if NR applies, then the embedded verb is in the subjunctive mood. But in Polish, NR with indicative complements is still possible. Given that these two types of NR constructions are possible in Polish and given their complementary distribution regarding the morphosyntax of the matrix predicate, two degrees of speaker’s (un)certainly about the negation of the embedded proposition can be postulated to be encoded by the respective construction type. Thus, by virtue of Horn’s (1978) Uncertainty Principle, both NR constructions involving indicative complements and NR constructions involving subjunctive complements express speaker’s uncertainty concerning the truth of the embedded proposition. This uncertainty can, however, be assumed to be weaker in NR structures with indicative complements and be stronger in NR structures with subjunctive complements. The uncertainty in NR structures with subjunctive complements is intensified by the subjunctive mood, which is typically selected if the epistemic agent is not committed to the truth of the embedded proposition (the propositional attitude is non-veridical) as opposed to the indicative mood, which is selected if the epistemic agent is committed to the truth of the embedded proposition (the propositional attitude is veridical) (cf. Siegel 2009, Giannakidou 2009, 2011). In Polish, only the stronger NR structures (those including the subjunctive mood) can be considered as performatives.

The results of the corpus study presented in this paper suggest that Horn’s (1978) mid-scalar predicates, that is predicates which can trigger NR, do not form a homogeneous class in Polish as far as the degree of the encoded (un)certainly is concerned. Rather, they should be divided into two groups according to their usage with indicative versus subjunctive complements. Mid-scalar predicates with indicative complements should be plotted more to the right of the scale (strong) and mid-scalar predicates with subjunctive complements should be located more to the left (weak).

Finally, given the obligatoriness of the matrix negation in NR structures with subjunctive complements, it is plausible to assume that those structures are in the process of developing into specialized devices encoding a high degree of uncertainty in Polish.

6. Summary

In this paper, the distribution of the Polish NR predicates *sądzić* ‘think’ and *wierzyć* ‘believe’ was examined in the balanced version of the National Corpus of Polish. Horn’s Uncertainty Principle (1978), his scale of proposition-embedding predicates, and the

performativity hypothesis put forward by Prince (1976) were adopted as the theoretical background. Both verbs occupy the mid-scalar position on Horn's (1978) scale of (un)certainty. However, they exhibit two selectional patterns under matrix negation and NR reading: they can select indicative complement clauses introduced by the complementizer *że* 'that' and subjunctive complement clauses introduced by the complementizer *żeby* 'so that' or its variants. The results of the corpus study presented above show that there is a strong correlation between the occurrence of *żeby*-complements and preference for the first person singular present form of the matrix predicate. It has been thus argued that these findings support the performativity hypothesis to NR by Prince (1976) only for those (usages of) mid-scalar predicates which take subjunctive complements. It has been further suggested that Polish mid-scalar predicates can encode different degrees of (un)certainty regarding the truth of the embedded proposition depending on the mood of their clausal complements. NR structures with indicative complements express weaker uncertainty, and NR structures with subjunctive complements express stronger uncertainty. Moreover, on the basis of the fact that the matrix negation in NR structures with subjunctive complements is obligatory, these structures can be seen as emerging devices for encoding a high degree of uncertainty in Polish.

References

- An, H.Y., & White, A.S. (2020). The lexical and grammatical sources of neg-raising inferences. In *Proceedings of the Society for Computation in Linguistics (SCiL) 2020*, 220–233.
- Bartsch, R. (1973). 'Negative transportation' gibt es nicht. *Linguistische Berichte*, 27, 1–7.
- Bolinger, D. (1968). Postposed main phrases: An English rule for the Romance subjunctive. *Canadian Journal of Linguistics*, 14, 3–30.
- Collins, Ch., & Postal, P. (2014). *Classical NEG Raising: An essay on the syntax of negation*. Cambridge, MA: MIT Press.
- Collins, Ch., & Postal, P. (2017). Interclausal NEG Raising and the scope of negation. *Glossa: A Journal of General Linguistics*, 2, 1–29.
- Crowley, P. (2019). Neg-raising and Neg movement. *Natural Language Semantics*, 27, 1–17.
- Dočekal, M., & Dotlačil, J. (2016). Experimental evidence for neg-raising in Slavic. *Linguistica*, 56(1), 93–109. <https://doi.org/10.4312/linguistica.56.1.93-109>.
- Fillmore, Ch.J. (1963). The position of embedding transformations in a grammar. *WORD*, 19(2), 208–231.
- Gajewski, J.R. (2007). Neg-raising and polarity. *Linguistics and Philosophy*, 30(3), 289–328.
- Giannakidou, A. (2009). The dependency of the subjunctive revisited: Temporal semantics and polarity. *Lingua*, 119, 1883–1908.
- Giannakidou, A. 2011. Nonveridicality and mood choice: Subjunctive, polarity, and time. In R. Musan, M. Rathert (eds.), *Tense across languages* (pp. 59–90). Berlin: De Gruyter.
- Horn, L.R. (1978). Remarks on neg-raising. *Syntax and Semantics*, 9, 129–220.
- Horn, L.R., & Bayer, S. (1984). Shortcircuited implicature: A negative contribution. *Linguistics and Philosophy*, 7(4), 397–414.
- Jackendoff, R. (1971). On some questionable arguments about quantifiers and negation. *Language*, 47, 282–297.

- Kiparsky, P. (1970). Semantic rules in grammar. In H. Benediktsson (ed.), *The Nordic Languages and Modern Linguistics* (pp. 262–285). Reykjavik: Visindafelag Íslendinga.
- Klima, E. (1964). Negation in English. In J.A. Fodor, & J. Katz (Eds.), *The Structure of Language* (pp. 246–323). Prentice Hall–Englewood Cliffs/New Jersey: University of Michigan Press.
- Lakoff, G. (1970). Pronominalization, negation, and the analysis of adverbs. In R. Jacobs, & P. Rosenbaum (eds.), *Readings in English Transformational Grammar* (pp. 145–165). Waltham: Ginn.
- Lakoff, R. (1969). A syntactic argument for negative transportation. In R.I. Binnick et al. (eds.), *Papers from the Fifth Regional Meeting of the Chicago Linguistic Society* (pp. 140–147). Chicago: University of Chicago.
- Lasnik, H. (1972). *Analyses of Negation in English*. [Unpublished MIT Ph.D. dissertation].
- Luborsky, P. (1972). *Neg-Hopping in English and Russian: A Comparative Description*. Unpublished Honors thesis, Harvard University, Cambridge, Massachusetts.
- Modrzejewska, E. (1981). Neg-raising predicates in English and Polish. *Papers and Studies in Contrastive Linguistics*, 13, 41–52.
- Moscato, V. (2010). *Negation raising. Logical form and linguistic variation*. Cambridge: Cambridge Scholars Publishing.
- Pollack, J.M. (1976). A re-analysis of neg-raising in English. *Working Papers in Linguistics*, 21, 189–239.
- Prince, E. (1976). The syntax and semantics of NEG raising, with evidence from French. *Language*, 52, 404–426.
- Przepiórkowski, A. et al. (2012). *Narodowy Korpus Języka Polskiego*. Warszawa: PWN.
- Przepiórkowski, A., & Kupść, A. (1997). Unbound negative concord in Polish. A lexicalist HPSG approach. Computational linguistics in the Netherlands 1996. In: J. Landsbergen, J. Odjik, K. van Deemter, & G. Veldhuijzen van Zanten (eds.), *Papers from the Seventh CLIN Meeting* (pp. 129–143).
- Przepiórkowski, A., & Świdziński, M. (1997). Polish verbal negation revisited: A metamorphosis vs. HPSG account. *IPI PAN Research Report*, 829. Warsaw: Institute of Computer Science, Polish Academy of Sciences.
- Świdziński, M. (1987). *Formalny opis składniowy polskich zdań o składniku zdaniowym*. Warszawa: Wydział Polonistyki UW.
- Świdziński M. (1992). *Gramatyka formalna języka polskiego*. Warszawa: Wydawnictwa UW.
- Świdziński, M. (1998). Negacja w polszczyźnie. Uwikłania składniowe imiesłowów, gerundiów i quasi-gerundiów. *Prace Filologiczne*, XLIII, 463–472.
- Ross, J.R. (1973). Slifting. In M.P. Schutzenburger, M. Gross, & M. Halle (eds.), *The Formal Analysis of Natural Languages: Proceedings of the First International Conference* (pp. 133–169). The Hague: Mouton.
- Sailer, M. (2006). Don't believe in underspecified semantics: Neg-raising in lexical resource semantics. In O. Bonami, & P. Cabredo Hofherr (eds.), *Empirical Issues in Syntax and Semantics*, 6 (pp. 375–403).
- Sheintuch, G., & Wise, K. (1976). On the pragmatic unity of the rules of Neg-raising and Neg-attraction. In S.S. Mufwene, C.A. Walker, & S.B. Steever (eds.), *Papers from the Twelfth Regional Meeting of the Chicago Linguistic Society* (pp. 548–557). Chicago: Chicago Linguistic Society.
- Siegel, L. (2009). Mood selection in Romance and Balkan. *Lingua*, 119, 1859–1882.
- Świdziński, M. (2000). Negativity transmission in Polish constructions with participles and gerunds. *Journal of Slavic Linguistics*, 8, 66–110.
- Tovena, L.M. (2001). Neg-raising: Negation as failure. In J. Hoeksema, H. Rullmann, V. Sanchez-Valencia, & T. van der Wouden (eds.), *Perspectives on Negation and Polarity Items* (pp. 331–356). Amsterdam: John Benjamins.
- Xiang, Y. (2013). Neg-raising: Focus and implicatures. *Proceedings of Sinn und Bedeutung*, 18, 487–503.
- Zeijlstra, H. (2018). Does neg-raising involve negraising? *Topoi*, 37(3), 417–443.

SUMMARY

Keywords: negation Raising, subjunctive, (un)certainty, performativity, Polish, corpus

The paper describes the distribution of two negation raising predicates in Polish: *sądzić* 'think' and *wierzyć* 'believe' in the National Corpus of Polish with a particular focus on their morphosyntax and the mood of their clausal complements. The aim was to examine whether there are any correlations between these two parameters, and to what extent negation raising with those verbs exhibits performative features (in terms of Prince, 1976). The results of the study support the performative approach to negation raising as per Prince (1976) only for cases with subjunctive complements. The corpus findings further imply that Polish negation raising predicates encode two different degrees of (un)certainty concerning the truth of the embedded proposition depending on the mood of their complements. Structures with indicative complements express weaker uncertainty than structures with subjunctive complements.

STRESZCZENIE

Podnoszenie negacji a tryb czasownika. Analiza korpusowa czasowników *sądzić* i *wierzyć*

Słowa kluczowe: podnoszenie negacji, subjunktyw, (nie) pewność, performatywność, język polski, korpus

Artykuł opisuje dystrybucję dwóch czasowników podnoszących negację w języku polskim: *sądzić* i *wierzyć* w Narodowym Korpusie Języka Polskiego ze szczególnym uwzględnieniem ich cech morfoskładniowych oraz trybu orzeczenia w zdaniach dopełnieniowych. Celem była analiza korelacji zachodzących między tymi dwoma parametrami oraz zbadanie, w jakim stopniu zjawisko podnoszenia negacji wykazuje cechy performatywne (w ujęciu Prince, 1976). Wyniki przeprowadzonych badań korpusowych przemawiają za performatywnym podejściem do podnoszenia negacji jedynie w przypadku zdań z subjunktywem. Ponadto sugerują one, że polskie czasowniki podnoszące negację kodują dwa różne stopnie (nie) pewności mówiącego co do prawdziwości propozycji zawartej w zdaniu dopełnieniowym. Zdania z subjunktywem w zdaniu dopełnieniowym zdają się wyrażać większą niepewność niż zdania z orzeczeniem w trybie orzekającym.