

Polish Verbal Negation Revisited: A Metamorphosis vs. HPSG Account*

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Streszczenie • Abstract

Negacja werbalna w polskim raz jeszcze: Analiza metamorficzna i HPSG

Niniejszy raport przedstawia dwie analizy składniowe negacji werbalnej w języku polskim osadzone w dwóch różnych formalizmach lingwistycznych: gramatyce metamorficznej i Head-driven Phrase Structure Grammar. Prezentujemy w nim szereg faktów związanych z negacją werbalną a następnie szczegółowo analizujemy je w formalizmie metamorficznym. Przedstawiamy także zarys analizy HPSG obejmującej te same fakty, lecz opierającej się na innych intuicjach lingwistycznych.

Polish Verbal Negation Revisited: A Metamorphosis vs. HPSG Account

This report presents two syntactic analyses of Polish verbal negation set up in two different linguistic formalisms: Metamorphosis Grammar and Head-driven Phrase Structure Grammar. After presenting a plethora of facts concerning verbal negation, we move to providing a detailed metamorphosis account of these facts. We also sketch an HPSG analysis of the same coverage suggesting how both formalisms can capture various linguistic generalizations in an elegant way.

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Contents

1	Introduction	3
2	Verbal Negation in Polish	3
2.1	Basic Facts	4
2.1.1	Genitive of Negation	4
2.1.2	Negative Concord	5
2.2	Negative Concord as Unbounded Dependency	6
2.2.1	Across NP and PP Boundaries	6
2.2.2	Across Subordinate Clauses	6
2.3	Verb Clusters	7
2.3.1	Genitive of Negation and Verb Clusters	8
2.3.2	Negative Concord and Verb Clusters	8
3	The Metamorphosis Approach	8
3.1	Fundamentals	8
3.2	The Treatment of Negation	9
3.2.1	The Finite Phrase	10
3.2.2	Other Phrases	10
3.2.3	The Required Phrase	10
3.3	Some Improvements	11
3.3.1	Preposition <i>bez</i> ‘without’	11
3.3.2	Negation within Verb Clusters	12
3.4	New Challenges	14
4	The HPSG Approach	15
4.1	Case Assignment	15
4.2	Unbounded Negative Concord	15
4.3	Verb Clusters	16
5	Conclusions	18

1 Introduction

Recent years have witnessed some resurgence of interest in syntactic negation within the generative paradigm, which was started by the seminal article of Pollock (1989).¹ Pollock was the first to try to account for a range of syntactic phenomena by postulating an “articulated” INFL(ection) node, split into various “functional nodes”, among them the Neg(ation) node. Soon publications on other languages have appeared discussing (usually supporting) the need to introduce additional functional categories in those languages.²

Unfortunately, in much of this work empirical data play a secondary role: they are taken into account only as long as they provide evidence for the authors’ theoretical claims, e.g., as to how many functional nodes (and in what order) IP (Inflectional Phrase) should subsume.

This article takes a different tack. We start from a broad range of syntactic phenomena related to verbal negation in Polish, try to get the data right and then model them. From this perspective, the choice of a particular formalism, be it GB, Optimality Theory, TAG, HPSG, LFG or Metamorphosis Grammars is secondary and should be made strictly on the basis of ability of that formalism to precisely express both linguistic generalizations and exceptions therefrom. Our formalism of choice is Metamorphosis Grammars (MG) of Colmerauer (1978), which is the formalism of the largest formal grammar of Polish written to date (Świdziński, 1992). However, we also present an alternative analysis formulated in Head-driven Phrase Structure Grammar (HPSG) of Pollard and Sag (1994) and discuss the ways in which it captures certain generalizations in a more elegant way.

MG and HPSG are, in many respects, poles apart: the former is based on syntax rules, the lexicon encoding normally only the basic morphological and syntactical categories, the latter is highly lexicalized, with a pauperized syntactic component. However, there are two important aspects which these formalisms have in common. First of all, they are both based on solid logical foundations: MG simply provides syntactic sugar for a subset of Predicate Logic, cf. Colmerauer (1978) and Kowalski (1974, 1979), while HPSG is based on a logic of typed feature structures, cf. King (1989, 1994) and Carpenter (1992). Secondly, theories formalized in MG or HPSG can be more or less directly implemented, cf. Warren and Pereira (1980) and Bolc *et al.* (1996) respectively. We believe that the differences and similarities of the formalisms at hand make it an interesting and purposeful enterprise to try to describe a complex natural language mechanism in both of them and see which generalizations it is easier to express in which of the formalisms.

The plan of the article is following: section 2 presents in detail two interesting phenomena related to verbal negation, section 3 is devoted to an account of verbal negation extending the grammar of Świdziński (1992), section 4 sketches a competing analysis of the same phenomena based on somewhat different observations and formulated within HPSG, and, finally, section 5 briefly compares the analyses of the preceding sections.

2 Verbal Negation in Polish

We concentrate in this section on the syntactic behaviour of verbal negation. In particular, we present basic empirical facts concerning Genitive of Negation and Negative Concord in section 2.1, show that the latter phenomenon is unbounded in a sense to be made precise in section 2.2, and discuss an intriguing behaviour of both phenomena in the context of Polish verb clusters in section 2.3.³

¹Apart from many articles on the topic, two monographs have appeared recently, Progovac (1994) and Haegeman (1995).

²Cf. e.g. Śpiewak and Szymańska (1995) and Witkoś (1996) for some discussion on Polish.

³An objection has been raised by the reviewer of this report concerning the terms *Genitive of Negation* and *Negative Concord*. Without taking positions as to whether these notions make sense, we would like to note that both have become standard in contemporary linguistics: see e.g. Pesetsky (1982), Timberlake (1986), Lasnik (1992), King (1995), Borovikova (1996), Witkoś (1996) on *Genitive of Negation* and Labov (1972), Bayer (1990), Aranovich (1993), van der Wouden and Zwarts (1993), Dowty (1994), Progovac (1994), Ladusaw (1995), Haegeman and Zanuttini (1996) on *Negative Concord*.

It should be noted at the outset that this article does not deal with the issue of whether verbal negation should be treated as a syntactic or as a morphological phenomenon. The views range from the traditional one, in which the negative element *nie* ‘not’ is said to be a particle (Bąk, 1984, p.190), (Jaworski, 1986, p.47), (Bartnicka and Satkiewicz, 1990, p.156), through analyzing *nie* as a proclitic (Śpiewak and Szymańska, 1995, p.135), (Witkoś, 1996, p.3), to arguing for its prefix role (Saloni and Świdziński, 1985, p.109), (Kupść and Przepiórkowski, 1997). The analyses developed here are in principle compatible with any of those approaches.

2.1 Basic Facts

The first of the phenomena we consider, the Genitive of Negation (GoN; section 2.1.1), is relatively well-known and has been described both by Polish structuralists, Kuryłowicz (1971), and by linguists working within the generative paradigm, Willim (1990) and Witkoś (1996). It should be noted that this phenomenon occurs not only in Polish, but also in some other Slavic languages, e.g., Russian, as well as in typologically and diachronically less related languages, such as Finnish or French.⁴

The other phenomenon we describe here is the so-called Negative Concord (NC; section 2.1.2), which is much less known than GoN and a source of misunderstandings. For example, the Polish grammars of Szober (1953), Klemensiewicz (1986), Jodłowski (1976), Bąk (1984) and Jaworski (1986) ignore this issue, while Bartnicka and Satkiewicz (1990) miss the generalization stating that “the presence of the negative particle *nie*... often implies presence... of negative pronouns.”⁵

The basic characteristics of both GoN and NC have been dealt with in Świdziński (1992) (within the MG formalism), and in Przepiórkowski (1996a) and Przepiórkowski and Kupść (1996, 1997b,a) (within HPSG). The rest of this section is based on the latter three papers.

2.1.1 Genitive of Negation

Genitive of Negation in Polish can be characterized as follows: an accusative object of a verb appearing in a declarative sentence changes its case marking to genitive under sentential negation. This is illustrated by the following example:

- (1) a. *Janek lubi Marię.*
 John_{nom} likes Mary_{acc}
 ‘John likes Mary.’
- b. *Janek nie lubi Marii.*
 John_{nom} not likes Mary_{gen}
 ‘John does not like Mary.’

Unlike in Czech, where GoN has practically ceased to exist, or in Russian, where it is in the state of withdrawal (cf. Timberlake (1986)), GoN is a fully productive phenomenon in Polish: even though the accusative replaces the genitive in many other syntactic environments, the genitive remains the only possibility under sentential negation.^{6,7}

It is worth noting that Genitive of Negation does not affect dative and instrumental complements:

⁴By GoN in French we mean the alternation between an indefinite article in positive contexts and *de* in negative contexts (Polański, 1993, p.355).

⁵“Obecność partykuły przeczącej *nie* w orzeczeniu pociąga za sobą często występowanie w zdaniu zaimków przeczących i innych leksykalnych wykładników negacji.” (Bartnicka and Satkiewicz, 1990, p.156).

⁶Actually, this rule has a few exceptions. Buttler *et al.* (1971) give two conditions under which the accusative is allowed. (Cf. also Rybicka-Nowacka (1990).) The first is semantical in nature: sometimes the accusative can appear when the sentence has a positive meaning despite its apparent negation. The second, which is structural, says that the accusative is allowed when the complement is “far” from the finite verb. We do not try to model these exceptions in this paper.

⁷We do not deal in this paper with two other phenomena which are sometimes thought to be special cases of Genitive of Negation: the possibility of accusative “bare NP adverbials” to change their case under sentential negation (Franks and Dziwerek, 1993; Borovikova, 1996) and the genitive case of the “subject” of negated existential copula (Witkoś, 1996).

- (2) a. *Janek pomaga Tomkowi.*
 John_{nom} helps Tom_{dat}
 ‘John is helping Tom.’
- b. *Janek nie pomaga Tomkowi.*
 John_{nom} not helps Tom_{dat}
 ‘John is not helping Tom.’
- (3) a. *Janek pogardza Tomkiem.*
 John_{nom} despises Tom_{ins}
 ‘John despises Tom.’
- b. *Janek nie pogardza Tomkiem.*
 John_{nom} not despises Tom_{ins}
 ‘John does not despise Tom.’

Also prepositional arguments are not affected by negation:

- (4) a. *Janek czeka na Marię.*
 John_{nom} waits on Mary_{acc}
 ‘John is waiting for Mary.’
- b. *Janek nie czeka na Marię.*
 John_{nom} not waits on Mary_{acc}
 ‘John is not waiting for Mary.’

2.1.2 Negative Concord

As mentioned at the beginning of this section, Negative Concord in Polish has remained ignored by linguists for a long time (probably due to the apparent obviousness of the phenomenon). The basic facts are simple: whenever the subject, an object or a modifier of a verb is (or contains) a negative pronoun, the verb has to be negated:⁸

- (5) a. *Nikt nie przyszedł.*
 nobody not came
 ‘Nobody came.’
- b. * *Nikt przyszedł.*
- (6) a. *Marysia niczego nie dała Jankowi.*
 Mary_{nom} nothing_{gen} not give_{past} John_{dat}
 ‘Mary did not give John anything.’
- b. * *Marysia niczego dała Jankowi.*
- (7) a. *Nigdy nie prosił o pomoc.*
 never not asked-he for help
 ‘He never asked for help.’
- b. * *Nigdy prosił o pomoc.*
- (8) a. *Marysia wcale nie podróżuje.*
 Mary at all not travels
 ‘Mary does not travel at all.’
- b. * *Marysia wcale podróżuje.*

⁸See Przepiórkowski (1997) and Przepiórkowski and Kupść (1997a) for a comparison of Polish NC to that of other languages, especially Romance.

NC is triggered by at least the following pronouns: *nikt* ‘nobody’, *nic* ‘nothing’, *niczyj* ‘nobody’s’, *żaden* ‘none’, *nigdzie* ‘nowhere’, *nigdy* ‘never’, *wcale* ‘not-at-all’, *bynajmniej* ‘under no circumstances’, *nijak* ‘nohow’, *donikąd* ‘to nowhere’, and *znikąd* ‘from nowhere’.

There is an interesting idiosyncrasy concerning NC:⁹ apart from negated verbal elements, the ‘negation requirement’ introduced by a negative pronoun can be satisfied also by preposition *bez* ‘without’. In this respect *bez* differs from other prepositions, compare (9) with (10) below.

- (9) *Zaczął bez żadnych wstępów.*
 started-he without none introductions
 ‘He started right away.’
- (10) a. * *Zaczął z żadnymi wstęпами.*
 started-he with none introductions
 b. * *Wiedział o niczym.*
 Knew-he about nothing
 c. * *Marysia czekała na nikogo.*
 Mary waited on nobody

2.2 Negative Concord as Unbounded Dependency

2.2.1 Across NP and PP Boundaries

As noted in Przepiórkowski and Kupść (1996, 1997a), negative pronouns seem to influence the polarity of the verb in an unbounded manner, i.e., across an arbitrary number of nominal and prepositional phrasal boundaries. This is illustrated by the examples below:

- (11) a. *Nie słuchałem plotek o nikim.*
 not listened-I gossip about nobody
 ‘I was not listening to gossip about anybody.’
 b. * *Słuchałem plotek o nikim.*
- (12) a. *Biografia syna żadnego prezydenta mnie nie zainteresowała.*
 biography son_{poss} none president_{poss} me not interested
 ‘No biography of any president’s son was interesting for me.’
 b. * *Biografia syna żadnego prezydenta mnie zainteresowała.*
- (13) a. *Gazety z plotkami o żonach władców państw żadnego kontynentu nie są interesujące.*
 Newspapers with rumours about wives of rulers of countries of none continent not
są interesujące.
 are interesting
 ‘No newspapers with gossip about wives of rulers of countries of any continent are interesting.’
 b. * *Gazety z plotkami o żonach władców państw żadnego kontynentu są interesujące.*

Note that in example (11), Negative Concord works across one NP and one PP boundary, in (12) — across three NP boundaries, and in (13) — across six NP and two PP boundaries.

2.2.2 Across Subordinate Clauses

Unlike nominal and prepositional phrases, sentential phrases (subordinate clauses) are boundaries for NC, i.e., if a dependent of the lower verb is (or contains) a negative pronoun, then the verbal negation has to be realized on the lower, rather than on the higher verb. This does not depend on the kind of subordinate clause, be it an indicative clause, (14), a subjunctive clause, (15), an indirect question, (16), or a relative clause, (17). Note that it is not finiteness that blocks the dependency, cf. (15).

⁹This idiosyncrasy was first noticed in Przepiórkowski and Kupść (1996, 1997a).

- (14) a. *Jan powiedział, że niczego nie widział.*
 John said that nothing not saw
 ‘John said that he did not see anything.’
 b. * *Jan nie powiedział, że niczego widział.*
- (15) a. *Jan prosił, żeby niczego nie ruszać w jego pokoju.*
 John asked that nothing not touch_{inf} in his room
 ‘John asked not to touch anything in his room.’
 b. * *Jan nie prosił, żeby niczego ruszać w jego pokoju.*
- (16) a. *Jan zastanawiał się, kto nikogo nie spotkał.*
 John wondered SELF who nobody not met
 ‘John wondered who had not met anybody.’
 b. * *Jan nie zastanawiał się, kto nikogo spotkał.*
- (17) a. *Człowiek, który nikomu nie ufał, został prezydentem.*
 man who nobody not trusted became president
 ‘The man who trusted nobody became a president.’
 b. * *Człowiek, który nikomu ufał, nie został prezydentem.*

2.3 Verb Clusters

The term we use in the title of this section calls for some explanation, as it is not standard in Polish linguistics. By verb clusters we mean chains of verbs, not necessarily linearly contiguous, such that each (apart from the main verb) is subcategorized for by another, and none (again, perhaps apart from the main verb) is modified (introduced) by a complementizer. Thus, for example, the verbs in bold face in examples (18) make up verb clusters, while those in (19) do not.¹⁰

- (18) a. *Piotrek **wolał** **wracać** do domu.*
 Peter preferred return_{inf} to home
 ‘Peter preferred to go back home.’
 b. *Marysia **będzie musiała** **chyba obiecać** **więcej tego nie robić.***
 Mary will must_{past} perhaps promise_{inf} more this not do
 ‘Perhaps Mary will have to promise not to do this anymore.’
- (19) a. *Piotrek **wolał**, **żeby** **wracać** do domu.*
 Peter preferred that_{subj} return_{inf} to home
 ‘Peter preferred (for us) to go back home.’
 b. *Marysia **pytała** Marka, **co** **począć.***
 Mary asked Mark what do_{inf}
 ‘Mary was asking Mark what to do.’

As we will show below, generalizations concerning distribution of GoN and NC seem to break down in the context of verb clusters.¹¹

¹⁰Thus, the term as we use it has nothing to do with phonology (consonant clusters) or morphology (clitic clusters), but all to do with such syntactic verb(al) clusters as German *gemacht werden sollen hätte* or English *may be coming* (Crystal, 1997, p.410).

¹¹We are aware of only two attempts to account for these interactions, namely Witkoś (1996) and Przepiórkowski and Kupść (1997b,a).

2.3.1 Genitive of Negation and Verb Clusters

We have claimed above that in Polish the otherwise accusative complement of a verb becomes genitive when the verb is negated. However, this is not the whole truth. As the examples below show, negating any of the verbs (also a few of them) in a cluster triggers the genitive case on the object of the lowest verb:

- (20) a. *Jan chciał kupić ten dom.*
John wanted buy_{inf} this_{acc} house_{acc}
'John wanted to buy this house.'
b. *Jan nie chciał kupić tego domu.*
not this_{gen} house_{gen}
c. *Jan chciał nie kupić tego domu.*
d. *Jan nie chciał nie kupić tego domu.*
- (21) a. *Mogę chcieć to napisać.*
may-I want_{inf} this_{acc} write_{inf}
'I may want to write this.'
b. *Nie mogę chcieć tego napisać.*
not this_{gen}
c. *Mogę nie chcieć tego napisać.*
d. *Mogę chcieć tego nie napisać.*
e. *Nie mogę nie chcieć tego napisać.*
....

2.3.2 Negative Concord and Verb Clusters

Also the Negative Concord facts get more tangled when it is the lowest verb whose object (or modifier) contains a negative pronoun. In such a case one of the verbs in the cluster has to be negated, although not necessarily the lowest one.

- (22) a. *Jan chciał niczego nie kupować.*
John wanted nothing not buy_{inf}
'John wanted not to buy anything.'
b. *Jan nie chciał niczego kupować.*
- (23) a. *Jan nie chciał próbować nikogo pokochać.*
John not wanted try_{inf} nobody love_{inf}
'John did not want to try to love anybody.'
b. *Jan chciał nie próbować nikogo pokochać.*
c. *Jan chciał próbować nikogo nie pokochać.*

3 The Metamorphosis Approach

3.1 Fundamentals

The formal grammar of Polish mentioned in section 1 was compiled in the late 1980's (Świdziński, 1992). It provides a near-exhaustive and fine-grained description of the language, with a particular emphasis on various agreement phenomena typical of highly inflecting languages. Of those, negation received a thorough treatment therein, probably for the first time in Polish linguistics.

The grammar employs the formalism of Metamorphosis Grammar (cf. Colmerauer (1978) for the original article and Abramson and Dahl (1989) for developments). Syntactic units are represented by terms, each stamped with an appropriate set of parameters which formalize grammatical features of those units. Rules of the grammar, fairly numerous and complicated, define particular units as sequences of other units, establishing correspondences between grammatical features.

The general philosophy is that the values of parameters a given unit uses “percolate down” through the syntactic tree, affecting most of its constituents. One can say that what is usually referred to as unbounded dependencies occupies a prominent position in this grammar: system-typical syntactic connections are unbounded. Among those features that percolate down is, *inter alia*, negation.

Let us consider the example (6a) repeated below.

- (6a) *Marysia niczego nie dała Jankowi.*
 Mary_{nom} nothing_{gen} not give_{past} John_{dat}
 ‘Mary did not give John anything.’

This is, as we call it, an elementary sentence. It is composed of a finite phrase and three required phrases (cf. Świdziński and Szpakowicz (1994)). The elementary sentence is, first of all, assigned three syntactic parameters (requirement parameters) that express subcategorization. Beside those, the sentence has some 10 more parameters — morphological (aspect, tense, mood, person, gender-number) and syntactic (negation and some others).

The values of respective parameters of this sentence are, among others, those: aspect PERFECTIVE, tense PAST, mood DECLARATIVE, person 3RD, gender-number FEMININE_SINGULAR; requirement1 NOMINATIVE, requirement2 ACCUSATIVE, requirement3 DATIVE, negation NOT.

Those values, be they fixed (as in our case) or not, are transmitted down to each constituent of this sentence: the whole package (except the requirement parameters) is assigned not only to *nie dała* (which is quite natural) but also to *Marysia, niczego*, and *Jankowi*. Many parameters (a majority, in fact) percolate down only to vanish without a trace somewhere at a lower level, but some properly account for most general syntactic mechanisms within simple sentences.

Rules which define the elementary sentence are fairly numerous, each describing one permutation of the constituents. There is a special type of required phrases: the NULL one; its realization is an empty string. A rule which maps the S-DO-V-IO ordering is given below (we include here only the relevant parameters; reqn is a type of required phrase):

- (24) ELEMENTARY_SENTENCE (... ,req1,req2,req3,neg,...)
 = REQUIRED_PHRASE (req1,...,neg,...)
 REQUIRED_PHRASE (req2,...,neg,...)
 FINITE_PHRASE (... ,req1,req2,req3,...,neg,...)
 REQUIRED_PHRASE (req3,...,neg,...).

3.2 The Treatment of Negation

As noted above, the value of negation assigned to the complete elementary sentence is shared by all of its components. In particular, the three required phrases in our example inherit the value NOT (“negative”) from the finite phrase — or, which amounts to the same, from the sentence itself.

Intuitively, the “source” of the value NOT for a given elementary sentence is either 1) the negative particle *nie* ‘not’ preceding the finite verb in it, or 2) some form of the negative pronoun that appears somewhere in this sentence, or 3) a required genitive-like noun phrase in accusative position.¹² If for a given sentence either 1) or 2) is true, then 3) is as well (but not vice versa, of course).

A system of rules formalizing these observations is presented below.

¹²We neglect here the fourth “negativity introducer”: the conjunction *ani* ‘nor’, which requires that verbal conjuncts it joins together be negative.

3.2.1 The Finite Phrase

The finite phrase is defined as a verbal phrase (`VERBAL_PHRASE`), which, in its turn, is interpreted as a verbal construction with negation (`V_CON_NEG`):¹³

```
(25) FINITE_PHRASE (... ,req1,req2,req3,... ,neg,... )
     = VERBAL_PHRASE (... ,req1,req2,req3,... ,neg,... ).

     VERBAL_PHRASE (... ,req1,req2,req3,... ,neg,... ).
     = V_CON_NEG (... ,neg,... ).
```

There are two different realizations of the verbal construction with negation, depending on the value of the parameter `neg` (`V_CON` denotes verbal construction):

```
(26) V_CON_NEG (... ,NOT,... )
     = % nie
       V_CON (... ).

     V_CON_NEG (... ,YES,... )
     = V_CON (... ).
```

3.2.2 Other Phrases

Rules that define phrases of almost all kinds (except sentential phrases) take care of providing each of the constituents of a given phrase with the value of `neg` which comes from the top. At the very bottom of the hierarchy for each type of a phrase there are lexical rules introducing pronominal negative terminals that bear the value `NOT` by definition:

```
(27) N_CON (case,... ,NOT,... )
     = NEG_PRON (NOMINAL,case,... ).

     ADV_CON (... ,NOT,... )
     = NEG_PRON (ADVERBIAL,... ).

     NEG_PRON (NOMINAL,NOMINATIVE,... )
     = % nikt.
     NEG_PRON (NOMINAL,GENITIVE,... )
     = % nikogo.
     NEG_PRON (ADVERBIAL,... ).
     = % nigdy
     = % nigdzie
     = % znikad.
```

where `N_CON` — nominal construction, `ADV_CON` — adverbial construction, `NEG_PRON` — negative pronoun; the symbol `%` marks terminal elements. As it is easy to see, the value of `neg` comes from the bottom (from “inside”, i.e., from the lexicon).

3.2.3 The Required Phrase

The required phrase has a number of particular realizations which, at the level of an elementary sentence, are given by respective values of the requirement parameters. Some rules define nominal complements:

```
(28) REQUIRED_PHRASE (NOMINATIVE,... ,neg,... )
     = NOMINAL_PHRASE (NOMINATIVE,... ,neg,... ).

     REQUIRED_PHRASE (ACCUSATIVE,... ,YES,... )
     = NOMINAL_PHRASE (ACCUSATIVE,... ,YES,... ).
```

¹³It is usually accompanied by some required phrases (we return to this problem later).

```
REQUIRED_PHRASE (ACCUSATIVE,...,NOT,...)
= NOMINAL_PHRASE (GENITIVE,...,NOT,...).
```

Of those three rules, the first rule is not sensitive to negation. The last two, on the contrary, really are: the last describes exactly the so-called Genitive of Negation. Thus, for example, the elementary sentence *Marysia niczego nie dała Jankowi* ((6) on page 5) has the following interpretation:

```
(29) ELEMENTARY_SENTENCE (... ,NOMINATIVE,ACCUSATIVE,DATIVE,NOT,...)
      REQUIRED_PHRASE (NOMINATIVE,...,NOT,...)
      NOMINAL_PHRASE (NOMINATIVE,...,NOT,...)
      (...)
      % Marysia
      REQUIRED_PHRASE (ACCUSATIVE,...,NOT,...)
      NOMINAL_PHRASE (GENITIVE,...,NOT,...)
      (...)
      N_CON (GENITIVE,...,NOT,...)
      NEG_PRON (NOMINAL,GENITIVE,...)
      % niczego
      FINITE_PHRASE (... ,NOMINATIVE,ACCUSATIVE,DATIVE,...,NOT,...)
      VERBAL_PHRASE (... ,NOMINATIVE,ACCUSATIVE,DATIVE,...,NOT,...)
      V_CON_NEG (... ,NOT,...)
      PART (NIE)
      (...)
      % nie
      V_CON
      (...)
      % dała
      REQUIRED_PHRASE (DATIVE,...,NOT,...)
      NOMINAL_PHRASE (DATIVE,...,NOT,...)
      (...)
      % Jankowi
```

3.3 Some Improvements

The Metamorphosis approach to Polish syntax given in Świdziński (1992), though extensive, subtle and (relatively) compact, does not account for certain phenomena. The treatment of negation therein is a good example of inaccuracies of the grammar.

3.3.1 Preposition *bez* ‘without’

The rule defining a prepositional realization of the required phrase takes the following form (*prep* stands for preposition):

```
(30) REQUIRED_PHRASE (prep,...,neg,...)
      = PREPOSITION (prep,case)
      NOMINAL_PHRASE (case,...,neg,...).
```

It states that the negation value of the nominal constituent of the prepositional phrase and the respective value of the elementary sentence are identical. This is not necessarily true for prepositional phrases with *bez*, as the example (9) (repeated below) demonstrates:

```
(9) Zaczął bez żadnych wstępów.
      started-he without none introductions
      ‘He started right away.’
```

We should add a special rule:

- (31) REQUIRED_PHRASE (BEZ, ..., neg, ...)
 = PREPOSITION (BEZ, case)
 NOMINAL_PHRASE (case, ..., neg1, ...).

which does not require that the negation value of REQUIRED_PHRASE (i.e., of the elementary sentence itself) and the respective value of a nominal phrase after *bez* match. An augmented description properly explains (9), as well as the sentences below:

- (32) *Nie zaczął bez żadnych wstępów.*
 not he-started without none introductions
 ‘He did not start right away.’

- (10a)* *Zaczął z żadnymi wstępami.*
 started-he with none introductions

3.3.2 Negation within Verb Clusters

This problem is more troublesome. The rule which introduces an infinitival realization of the required phrase:

- (33) REQUIRED_PHRASE (asp, ..., neg, ...)
 = VERBAL_PHRASE (INF, asp, ..., req1, req2, req3, ..., neg, ...).

where *asp* — aspect, forces *neg* of the whole elementary sentence to match with *neg* of the infinitive. Since “negativity” of a given verbal phrase means that its center contains the negative particle *nie* before the finite verb, the system of rules accounts only for these sentences:

- (34) *Piotrek chciał wracać do domu.*
 Peter wanted to-return to home
 ‘Peter wanted to go back home.’
- (35) *Piotrek nie chciał nie wracać do domu.*
 Peter not wanted not to-return to home
 ‘It is not the case Peter wanted not to go back home.’

while excluding these:

- (36) *Piotrek nie chciał wracać do domu.*
 Peter not wanted to-return to home
 ‘Peter did not want to go back home.’
- (37) *Piotrek chciał nie wracać do domu.*
 Peter wanted not to-return to home
 ‘Peter wanted not to go back home.’

which are perfectly well-formed. In the latter examples the *neg* parameters need not match within the verbal phrase.

It might seem at first glance that we should reformulate the rule defining the infinitival realization of the required phrase:

- (38) REQUIRED_PHRASE (asp, ..., neg, ...)
 = VERBAL_PHRASE (INF, asp, ..., req1, req2, req3, ..., neg1, ...).

But even if we did it, we would face another problem. The new rule given above would permit these examples:

- (39)* *Piotrek nie chciał widzieć Marię.*
 Peter not wanted to-see Mary_{acc}
 ‘Peter did not want to see Mary.’

- (40) * *Piotrek nie chciał widzieć nic.*
 Peter not wanted to-see nothing_{acc}
 ‘Peter did not want to see anything.’

which are deviant. In other words, negation percolation should not be cancelled; rather, we should restrict it.

The idea of the solution is this: “the higher — the more powerful”. If we consider a verbal phrase with another (embedded) verbal phrase, we will see that the highest negativity affects everything, the value NOT being transported down the hierarchy. If the highest value of negation is YES, then nothing can be predicted concerning lower values: they depend on lower verbals.

First, it is necessary to redefine the verbal phrase by allowing it to contain three required phrases. We include then a free modifier placing it after V_CON_NEG. Finally, three different values of the negation parameter are assigned to the five constituents of the verbal phrase (and to that phrase as a whole). The rule is as follows:¹⁴

- (41) VERBAL_PHRASE (... ,req1,req2,req3,... ,neg,...)
 = REQUIRED_PHRASE (req1,... ,neg2,...)
 REQUIRED_PHRASE (req2,... ,neg2,...)
 V_CON_NEG (... ,neg1,...)
 FREE_MODIFIER (... ,neg2,...)
 REQUIRED_PHRASE (req3,... ,neg2,...).

We bind the three neg values with a condition which we can call “negation calculation”: NEG_CALC(neg,neg1,neg2). The condition is fulfilled if either (A) both neg1 and neg2 are equal to NOT, or (B) neg1 is equal to YES and neg2 is equal to neg — that is, to the “outside” value of the whole phrase.

Obviously, the case of “negativity” of the whole elementary sentence, with all its consequences, is sufficiently accounted for by original rules given in the previous section. The examples we give below are intended to illustrate what happens within the verbal phrase — no matter whether it belongs to a “negative”, or “affirmative” elementary sentence (or verbal phrase). Note that the neg value (non-indexed) comes from the top, that is, it is inherited from the unit embedding the verbal phrase.

The case (A) is shown below:

- (42) (*Chciał // Nie chciał*) *nie widzieć nigdy Marii.*
 (he-wanted // not he-wanted) not to-see never Mary_{gen}
 ‘(He wanted // did not want (= refused)) not to see Mary at any time.’

- (43) (...)
 VERBAL_PHRASE (... ,NOT,...) neg=NOT
 V_CON_NEG (... ,NOT,...) neg1=NOT
 (...)
 % nie
 % widzieć
 FREE_MODIFIER (... ,NOT,...) neg2=NOT
 (...)
 NEG_PRON (ADVERBIAL,...)
 % nigdy
 REQUIRED_PHRASE (ACCUSATIVE,NOT,...) neg2=NOT
 NOMINAL_PHRASE (GENITIVE,... ,NOT,...)
 (...)
 % Marii

Case (B):

¹⁴Again, we choose one permutation, although the complete grammar must include rules for all permutations. It should still be remembered that required phrases may be of the NULL type. Free modifiers can be empty as well.

- (44) *(Chciał) widzieć Marię.*
 (he-wanted) to-see Mary_{acc}
 ‘(He wanted) to see Mary.’
- (45) (...)

VERBAL_PHRASE (... ,YES,...)	neg=YES
V_CON_NEG (... ,YES,...)	neg1=YES
(...)	
% widzieć	
FREE_MODIFIER (... ,YES,...)	neg2=neg=YES
REQUIRED_PHRASE (ACCUSATIVE,YES,...).	neg2=neg=YES
NOMINAL_PHRASE (ACCUSATIVE,... ,YES,...)	
(...)	
% Marie	
- (46) *(Nie chciał) widzieć nikogo.*
 (not wanted-he) to-see nobody_{gen}
 ‘(He did not want) to see nobody.’
- (47) (...)

VERBAL_PHRASE (... ,NOT,...)	neg=NOT
V_CON_NEG (... ,YES,...)	neg1=YES
(...)	
% widzieć	
FREE_MODIFIER (... ,NOT,...)	neg2=neg=NOT
REQUIRED_PHRASE (ACCUSATIVE,NOT,...).	neg2=neg=NOT
NOMINAL_PHRASE (GENITIVE,... ,NOT,...)	
(...)	
N_CON (GENITIVE,... ,NOT,...)	
NEG_PRON (NOMINAL,GENITIVE,...).	
% nikogo	

3.4 New Challenges

It should be added that the improvements sketched in the previous section do not solve the problem completely. Other negation islands in Polish also require thorough treatment. The examples below show that re-definition of a number of syntactic units is necessary: adverbial phrase (48), adjectival phrase (49), and nominal phrase (50).

- (48) *Umarł, nie poznawszy córki.*
 he-died not having-recognized daughter_{gen}
 ‘He died without recognizing his daughter.’
- (49) a. *Widziałem go nie pamiętającego niczego.*
 I-saw him not remembering nothing_{gen}
 ‘I saw him remember(ing) nothing.’
- b. *Jej samochód, nigdy nie uruchamiany, nie ruszy nigdy.*
 her car, never not started, not will-start never
 ‘Her car, never started so far, won’t start any more.’
- (50) *Niepodanie mu żadnego lekarstwa było tragiczną pomyłką.*
 not-giving him none medicine was fatal mistake
 ‘It was a fatal mistake not to give him any medicine.’

4 The HPSG Approach

We now move to an alternative analysis of Polish verbal negation. This analysis is formulated within the Head-driven Phrase Structure Grammar formalism of Pollard and Sag (1994) and it is based on the work reported in Przepiórkowski (1995b), Przepiórkowski (1996a, 1995a), Przepiórkowski (1996b) and Przepiórkowski and Kupść (1996, 1997b,a). Since there is no room here for an introduction to HPSG, we present only the basic ideas of the account. The reader is referred to the references cited above for details and formal characteristics of the particular solutions.

4.1 Case Assignment

On the basis of case assignment facts related to nominalization, GoN and subject-verb agreement, as well as the distribution of *dużo*-phrases (i.e., numeral phrases headed by *dużo*-type indefinite numerals) and *nic* ‘nothing’, we argue that the structural vs. lexical (inherent) case dichotomy, as known in GB and transferred to HPSG by Heinz and Matiasek (1994), is present in Polish. In this approach, lexical cases are those cases which are assigned by lexical items and never change with the syntactic environment, e.g., dative, instrumental and genitive assigned by verbs, while structural cases might change if the environment changes, e.g., an accusative object becomes genitive if the verb is negated, the nominative subject of a verb becomes genitive in the process of nominalization. Also, some lexical items are argued to assume only structural cases, e.g., *dużo* ‘a lot’ can appear only in nominative, accusative and some genitive positions.

While lexical case is assigned directly by lexical items, structural case is assigned by syntactic principles. For example, the verb *pomagać* marks its object as dative and its subject as structural. Dative is a lexical case, so it cannot be changed, but structural is underspecified and has to be resolved (to nominative, accusative or genitive) in the syntax by the Case Principle.

The Case Principle is a set of implications of the form “if the lexical item is . . . (e.g., a positive verb), then its structural object (or subject) gets resolved to . . . (e.g., accusative or nominative)”. In this setup, GoN is modelled by the clause of Case Principle which says “if the lexical item is a negated verb, then its structural object is resolved to genitive”. This means that case assignment occurs on the verb’s argument structure and, hence, it is a strictly local phenomenon.

4.2 Unbounded Negative Concord

The analysis of NC is based on the lexicalized approach to unbounded dependencies (such as long movement) advocated by Sag (1996, 1995).¹⁵ In this approach, some lexical items introduce the dependency (e.g., signal a missing constituent), other lexical items simply “pass it up”, i.e., gather from their own arguments (and adjuncts) information about the dependencies introduced lower down the tree, other items “satisfy” the dependency, i.e., do not pass it up (e.g., in the case of *easy*-adjectives, they realize the missing constituent as their subject, cf. Flickinger and Nerbonne (1992)), and still other neither satisfy the dependency, nor pass it higher up, i.e., they create islands for (they block) the dependency.

Assume that all lexical items have the feature (parameter) NEG-CONC (NEGative CONCord), whose values can be ‘+’ or ‘-’. NEG-CONC+ means that the lexical item “brings negation requirement”, while NEG-CONC- means that it does not.

Since “negation requirement” originates from negative pronouns, all negative pronouns are lexically specified as NEG-CONC+. Some lexical items, such as nouns and prepositions (apart from *bez*) simply look at their complements (and modifiers), and if any of them “brings the negation requirement”, they pass it higher up, i.e., they “require negation” themselves. NEG-CONC of such items is a function of NEG-CONC values of their dependents. Other lexical items, such as negated verbs¹⁶ and the preposition *bez*, “discharge” the negation requirement and do not pass it higher up,

¹⁵See also Pollard and Yoo (1996) for a similar HPSG approach to quantifier scoping.

¹⁶After Kupść and Przepiórkowski (1997), we assume here that verbal negation is a morphological process, however, little hinges on this assumption.

that is, negated verbs and *bez* are lexically specified as NEG-CONC−.¹⁷ Finally, non-negated verbs require all their complements to be “negation-free”, i.e., not to bring the “negation requirement”. In other words, non-negated verbs force their dependents to be NEG-CONC−, and they themselves are NEG-CONC−.

We will illustrate this mechanism with example (9) (repeated below).

- (9) *Zaczął bez żadnych wstępów.*
 started-he without none introductions
 ‘He started right away.’

- *żadnych*: lexically specified as NEG-CONC+;
- *wstępów*: a noun, so its NEG-CONC is ‘+’ iff NEG-CONC of any of its dependents (arguments or modifiers) is ‘+’. The only dependent is *żadnych*, it is NEG-CONC+, and so is *wstępów*;
- *żadnych wstępów*: a phrase, its NEG-CONC is the same as that of its head, i.e., it is ‘+’;
- *bez*: lexically specified as NEG-CONC−, that is, although its argument *żadnych wstępów* is NEG-CONC+, both the lexical item *bez* and the whole phrase *bez żadnych wstępów* are NEG-CONC−, i.e., the “negation requirement” has been “discharged”;
- *zaczął*: a positive verb, its NEG-CONC, as well as NEG-CONC of its dependents are specified as ‘−’. The only dependent is *bez żadnych wstępów*, it is ‘−’, so no feature value clash ensues and the phrase is predicted to be grammatical.

Of course, substituting some other preposition for *bez* in (9) should result in an ungrammatical sentence. This is indeed so:

- (10a)* *Zaczął z żadnymi wstępami.*
 started-he with none introductions

- *żadnymi wstępami*: as above, i.e., NEG-CONC+;
- *z*: preposition other than *bez*, i.e., NEG-CONC+ iff any of its dependents is NEG-CONC+. Since *żadnymi wstępami* is NEG-CONC+, so is *z*, as well as the whole phrase *z żadnymi wstępami*;
- *zaczął*: a positive verb, its NEG-CONC, as well as NEG-CONC of its dependents are specified as ‘−’. The only dependent is *z żadnymi wstępami*, it is ‘+’, clash of feature values, the phrase is ungrammatical.

4.3 Verb Clusters

It should be clear from the preceding section that we treat GoN as an essentially local phenomenon: any verb’s structural object is genitive if this verb is negated, and accusative otherwise. Also NC, which is unbounded in the sense that nominal and prepositional boundaries do not block it, is local in the sense that if any of a verb’s dependents brings “negation requirement”, this verb has to be negated, otherwise the verb is positive. This models well the facts described in sections 2.1 and 2.2, but fails miserably on the verb cluster facts of section 2.3.

To see the problem consider the following example.¹⁸

- (51) *Janek nie chciał kupować żadnego samochodu.*
 John not wanted buy_{inf} none car_{gen}
 ‘John did not want to buy any car.’

¹⁷Note that in this account the exceptional behaviour of *bez* is encoded in the lexicon, rather than via positing an additional syntactic rule as in section 3.3.1.

¹⁸Cf. also (22) on page 8 and (46) on page 14.

First of all, the verb *kupować* is a transitive verb subcategorizing for a structural object. Clearly, this verb is not negated (although *chciał* is), so its object should bear the accusative case rather than the genitive. However, in (51), not only is the genitive object *żadnego samochodu* acceptable, but actually, were it the accusative *żaden samochód*, the sentence would be ungrammatical. Hence, our account of GoN gives false predictions here. Moreover, the NC analysis of the previous section does not fare any better. As *żadnego samochodu* introduces the “negation requirement”, the verb *kupować* should be negated. In (51) it is not negated, and still the sentence is completely grammatical.

The solution presented below differs crucially from that of section 3 in that we are not trying to amend the ways in which negation “percolates” or case is assigned. Instead, we provide an analysis of Polish verb clusters in which the generalizations concerning GoN and NC made above have to be altered only minimally, without changing the strict locality status of both phenomena. In other words, we argue that what is special about the behaviour of GoN and NC in the context of verb clusters is exactly verb clusters, rather than GoN or NC.

The main observation on which our analysis is based is that in verb clusters the objects of the lower verbs behave as if they were really objects of the higher, negated verbs. That is, if *żadnego samochodu* were analysed as an object of *nie chciał*, rather than of *kupować*, then the grammaticality of (51) would be accounted for: since *nie chciał* is a negated verb, its structural object *żadnego samochodu* has to bear the genitive case, and because *żadnego samochodu* introduces “negation requirement”, its governing verb, i.e., *nie chciał*, has to be negated.

In order to model this observation we employ the “argument inheritance” (or “argument raising”) technique of Hinrichs and Nakazawa (1990, 1994), which has become a standard HPSG method of accounting for complex predicate formation.¹⁹ We will illustrate this method with an HPSG lexical entry for *nie chciał* ‘not wanted-he’ (52).²⁰

$$(52) \left[\begin{array}{l} \textit{word} \\ \text{PHON } \langle \textit{nie chciał} \rangle \\ \text{HEAD } \left[\begin{array}{l} \textit{verb} \\ \text{NEG } + \\ \text{VFORM } \textit{fin} \end{array} \right] \\ \text{SUBJ } \langle \textit{NP} \rangle \\ \text{COMPS } \left(\left[\begin{array}{l} \text{HEAD } \left[\begin{array}{l} \textit{verb} \\ \text{VFORM } \textit{inf} \end{array} \right] \\ \text{LEX } + \\ \text{COMPS } \boxed{1} \end{array} \right] \right) \oplus \boxed{1} \end{array} \right]$$

The lexical entry (52) is encoded as an attribute-value matrix (AVM) of the type *word* whose PHONOLOGY is *nie chciał*. According to this AVM, *nie chciał* is a negated finite verb, which subcategorizes for (syntactically implies) an NP subject (‘NP’ is actually an abbreviation for another complex AVM) and for a complement: an infinitival lexical verb (i.e., a word rather than a phrase). Moreover, it also subcategorizes for all the COMPLEMENTS of the infinitival verb, i.e., it appends (‘ \oplus ’) the list of complements of the lower verb at the end of its own COMPS list. In other words, the complements of the infinitival verb are raised to the argument structure of the main verb.

Some care must be taken to ensure that the dependents of the lowest verb are raised only to the (nearest) negated verb (if any). For example, in (53), the object *niczego* should be raised only to *nie chciał*, as shown in (54),²¹ rather than to *mogę*.

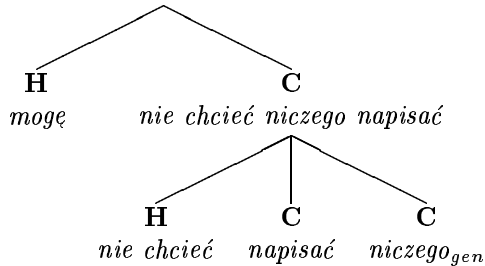
(53) *Mogę nie chcieć niczego napisać.*
 might-I not want_{inf} nothing_{gen} write_{inf}
 ‘I may not want to write anything.’

¹⁹See, e.g., Miller (1992) for an approach to French complex predicates based on similar ideas (though formulated in a hybrid GPSG-HPSG formalism), or Monachesi (1995) for applying the technique to the analysis of clitic climbing in Italian.

²⁰We assume here that *nie* should be analysed as a verbal prefix pace Kupś and Przepiórkowski (1997).

²¹**H** stands for head, **C** for complement.

(54) *mogę nie chcieć niczego napisać*



The reader is referred to the works cited in the beginning of this section for further details of the HPSG analysis presented here.

5 Conclusions

In this article, we sketched two analyses of an interesting and little known syntactic mechanism of Polish. Two radically different formalisms, Metamorphosis Grammars and Head-driven Phrase Structure Grammar were employed, leading to two very different accounts, both capturing the same data.

The MG solution is based on intricate percolation of the `neg` parameter, whose function overlaps with the function of the `NEG-CONC` feature of the HPSG account: both are used to pass Negative Concord information. However, `neg` is also responsible for the so-called Genitive of Negation (cf. page 11). Thus, retaining the traditional constituent structure of verb clusters, the MG approach uniformly accounts for the full range of both GoN and NC data by skillfully manipulating the values of `neg` on various rules. Crucially, this account makes no claim as to strict locality of these two phenomena.

On the other hand, such a claim is made in the HPSG account. Thus, in order to explain the apparent exception to this generalization, i.e., the behaviour of GoN and NC in Verb Clusters, a special constituent structure of Verb Clusters is posited, i.e., a uniform treatment of GoN and NC is obtained by setting up complex lexical entries of verbs belonging to such clusters (cf. (52) on page 17), rather than via additional syntactic rules. Apart from that, both phenomena are described by separate modules of the grammar, i.e., the Case Principle and the constraints on the values of `NEG-CONC`.

It should be noted that it would be as difficult to formalize the “argument raising” strict locality HPSG account in MG, as it would be awkward to multiply the number of syntactic rules and attach to them conditions responsible for the values of specific parameters in HPSG. (This situation is analogous to programming languages: doing symbolic reasoning in C would be as unreasonable as using Prolog for complex numerical calculations.) It is thus clear that each formalism is better suited to describing different kinds of linguistic intuitions, though both are well-suited to providing rigidly formal descriptions of natural language phenomena.

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