The syntax of numerically quantified phrases in Polish and the theory of movement

Dominika Dziubała-Szrejbrowska

The subject matter presented in this article involves mechanisms of case distribution within nominal phrases containing cardinal numerals. The starting point for a discussion is homogeneous and heterogeneous syntax of numerals in Polish and the reanalysis of the categorial status of numeral lexemes, followed by the proposal utilizing the idea of case as a feature represented in the syntactic structure. As a consequence of the introduced model, constituents of the nominal phrase obtain case via movement to the relevant position within KP split into particular *Case Projections,* which accounts for the available case patterns preventing, at the same time, illicit structures[1].

Keywords: *structural cases, oblique cases, Genitive of Quantification, numerals, movement*

1 Introduction

In the syntax of nominal phrases in Polish and in Slavic languages in general, a special attention has been given to phrases containing numerals. Their syntax, different depending on the value of the numeral, has been widely discussed in the literature resulting in a plethora of accounts in different models of grammars and frameworks. In this paper, the attempt has been made to approach the problematic structures from yet another point of view and present the analysis of numerals based on entirely different premises.[2]

The characteristic feature of numerically quantified phrases in Polish is that we observe a distinction into the so-called lower numerals (or paucals), i.e. <5, and higher numerals, i.e. ≥5. This distinction is based on the fact, that lower numerals are congruent in case with a quantified noun and higher numerals induce Genitive on the accompanying noun. The requirement of higher numerals, however, applies only in the contexts of structural case assignment, i.e. the noun quantified by a higher numeral occurs in Genitive when the phrase appears in positions to which Nominative or Accusative are assigned. Interestingly, in the oblique case positions, the noun agrees in case with the numeral. These patterns of case distribution have led to numerous analyses which try to account for different case properties of numeral constructions via distinct structures for phrases with lower and higher numerals. In the proposed analysis the architecture of numerically quantified phrases is uniform for numerals <5 and ≥5 which is due to the fact that numerals, irrespective of their value and resulting case patterns, are treated as one category, i.e. quantifiers. Moreover, the complexities of case distribution are resolved by proposing a novel account of case based on the idea of a KP split into particular cases which have become represented in the syntactic structure in a form of separate projections, e.g. Nominative Phrase, Accusative Phrase etc. The idea of syntactic

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[2] Material presented in this article is discussed in my PhD dissertation, i.e. in Dziubała-Szrejbrowska (2014).

representation of case has been proposed by Caha (2009, 2010). In this account, the syntactic representation of case is used to derive case patterns in phrases with numerals, i.e. homogeneous syntax of lower numerals, heterogeneous syntax of higher numerals, as well as to explain case congruency of numerals ≥5 in oblique case positions. Furthermore, some attention is given to phrases containing modifiers such as demonstratives and adjectives whose case may also differ depending on its position within the phrase, i.e. whether they are in a pre-numeral, or pre-nominal position, which is also conditioned on the mechanics of case distribution within the phrase.

The paper is divided as follows; in section 2 I present constructions in Polish with numerals and I briefly go through selected analyses discussing case assignment and architecture of numerically quantified phrases. In section 3 I elaborate on the adjectival and nominal status of numerals showing that despite their origin and similarities to nouns or adjectives they should be treated as a separate category. Finally, I introduce the account in which the split KP along with some movement operations account for case distribution within numerically quantified phrases (section 4). In section 5 I conclude the article.

2 Properties of phrases with numerals

Lower numerals in Polish agree in case with a modified noun when the quantified phrase occurs in structural case positions, e.g. (1a) and (1b), and when the the phrase is found in oblique case positions, e.g. (1c). Moreover, subjects containg numerals <5 agree in gender and number with the verbal predicate, e.g. (1a).[3]

(1) a. *Dwie panie poszły do sklepu.*
two-FEM.NOM ladies-FEM.PL.NOM went-FEM.PL.PAST to shop
'Two ladies went to the shop.'

b. *Strażnicy zauważyli trzy nowe samochody.*
Guards-VIR.NOM noticed-VIR.PAST [three new cars]-ACC
'Guards noticed three new cars.'

c. *Rozmawiałam dziś z czterema sąsiadami.*
talked today with [four neighbors]-INST
'I talked to four neighbors today.'

Higher numerals, on the other hand, when they are located in the positions to which Nominative or Accusative are assigned, e.g. (2a) and (2b) respectively, quantify the noun in Genitive:

[3] List of abbreviations: ACC – Accusative, DAT – Dative, DIM – diminutive, FEM – feminine, GEN – Genitive, INST – Instrumental, NEUT – neuter, NOM – Nominative, NONVIR – nonvirile, i.e. gender in plural encompassing feminine, neuter and masculine impersonal, PAST – past, PL – plural, REF – reflexive, SG – singular, VIR – virile, i.e. gender in plural indicating human personal.

(2) a. *Pięć koleżanek spotkało się*
five-FEM.NOM friends-FEM.PL.GEN met-3SG.NEUT.PAST REF
w kinie.
in cinema
'Five friends met in the cinema.'

b. *Policjanci skonfiskowali siedem pistoletów.*
Policemen-VIR.NOM confiscated-VIR.PAST seven-ACC guns-PL.GEN
'Policemen confiscated seven guns.'

Yet, when the phrase is located in the oblique case position, the numeral and the noun agree in case, e.g. (3).

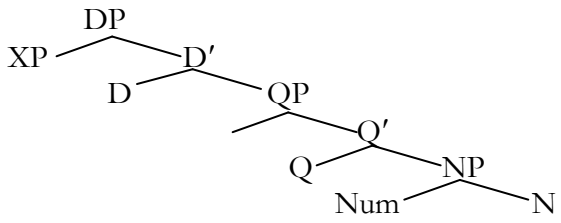
(3) *Maria podarowała sześciu przyjaciółkom*
Mary-FEM.SG.NOM gave-3SG.FEM.PAST [six friends]-FEM.PL.DAT
nowe bransoletki.
[new bracelets]-FEM.PL.ACC
'Mary gave six friends new bracelets.'

When it comes to subject-verb agreement, higher numerals in phrases placed in subject positons induce a deafault agreement, i.e. third person singular neuter form of a verb, e.g. (4).

(4) *Pięć studentek zorganizowało*
five-FEM.NOM students-FEM.PL.GEN organized-3SG.NEUT.PAST
konferencję.
conference
'Five students organized a conference.'

These case variations have resulted in the wide range of accounts within the generative framework. Within different approaches, we can distinguish between analyses in which it has been proposed that either *the noun* is the phrasal head (e.g. Babby 1987, Willim 1990, Franks 1995 for different languages; Strutyński 2005, Rappaport 2002), *the numeral* constitutes the core of the phrase (e.g. Pesetsky 1982, Saloni & Świdziński 1998, Przepiórkowski 1999, Bailyn 2003), or both *the noun* and *the numeral* are heads of the phrase (e.g. Tajsner 1990, Dziwirek 1990, Franks 1994, Bošković 2006). In some other accounts, properties of lower and higher numerals have been addressed via placing them in different positions in the structure. In Rutkowski (2002), for example, lower numerals are treated as adjectival modifiers and placed in the specifier position of NP, e.g. (5a), whereas numerals ≥5 are located in the head position of QP, e.g. (5b).

(5) a.



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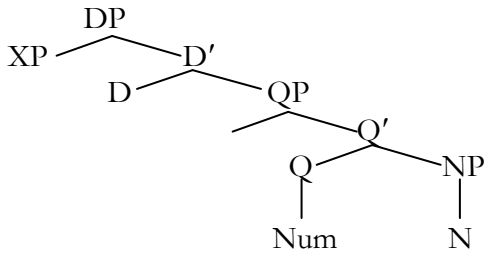
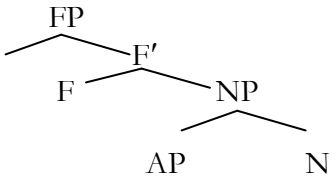


In Bošković (2006), the nominal phrase has been headed with a functional element, head F, taking NP as its complement. Lower numerals, as APs, have been located in the specifier position of NP, e.g. (6a), and higher numerals, as QPs, in the specifier of FP, e.g. (6b).

(6) a.



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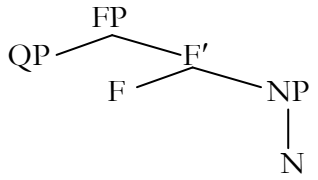


Such a placement of numerals is to ensure that numerals <5, as adjectival modifiers, share a case value with a modified noun, whereas higher ones occur with Genitive nouns. Although details of these two accounts differ, for instance in Rutkowski (2002) higher numeral as a Q head assigns Genitive to the noun, and in Bošković (2006) the source of Genitive is an F head provided that its specifier is occupied with QP (otherwise case is assigned from the outside of the projection as it is in the case of lower numerals), maintaining the distinction between numerals reflected in the architecture of a nominal phrase is a crucial aspect of each account.

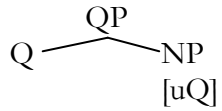
Apart from establishing various structures for numerically quantified phrases or locations of numerals within the nominal projection, different mechanisms of case distribution have been considered. In Babby (1987), case has been assigned to the maximal projection of a noun which then percolates down to other elements of the phrase. In heterogeneous syntax, the case is assigned by the Quantifier which takes precedence over Nominative and Accusative, hence Genitive of Quantification in structural case positions. In positions to which oblique cases are assigned, the same Genitivie is overriden by lexical cases hence we observe a congruency in case in phrases with higher numerals. Despite the fact, that Babby's analysis is based on the structure utilizing bar levels no longer employed in current generative accounts[4], the idea of lexical cases superceding structural ones has been widely used, e.g. in Franks (1994, 1995), to explain dicrepances in syntax of higher numerals in struictural and oblique case positions.

[4] Some other problematic aspects of his analysis for current generative framework include the recognition of D-structure and S-structure no longer valid in Minimalism. Apart from this, Babby (1987) does not discuss lower numerals.

Leaving aside GB theories of *case assignment* and moving to the minimalist framework in which case as a feature of a nominal head is checked by a functional head (T), or as in the latest versions of the Minimalist Program, the functional element being the probe searches for a proper constituent bearing case to *Agree* with, numerals and nouns are viewed as elements entering the derivation either with valued or unvalued case features depending on the context (e.g. Rappaport 2002, 2003). In structural case positions, nouns enter a derivation with an unvalued case feature, higher numerals, on the other hand, have a valued case feature. What is more, they are associated in the lexicon with Quantitive case which is spelled out on a noun as Genitive. In oblique case positions, so in positions in which constituens are selected for and required to bear a specific case determined by the lexical element, e.g. verb or preposition, nouns enter the derivation with a valued case feature. Consequently, its modifiers, e.g. higher numerals, must be introduced with unvalued case features. Lower numerals are also described as elements associated with a particular case in the lexicon, Accusative for Polish and Paucal for Russian, which is spelled out on noun via syncretism with a case of numeral, as Genitive for virile nouns in Polish or as Genitive singular in Russian.

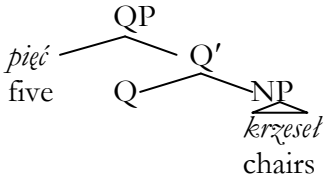
Last but not least account explaining the mechanism of case distribution is based on Pesetsky and Torrego (2001) who take Nominative case to be uninterpretable Tense feature (uT) on nominals.[5] Bailyn (2004), following the idea of case as the uninterpretable reflex of functional categories, proposes that Genitive of Quantification is nothing else as the uninterpretable Q feature on N/D. Acquiring Genitive by a noun, then, proceeds via the configuration presented in (7).

(7)



The noun becomes Genitive provided that the Q position is empty. The same proviso is necessary to obtain heterogeneous syntax so by placing the numeral in a position different than Q head, for instance, in specQP, e.g. (8).

(8)



When, however, the Q head is filled by a numeral which absorbs the case, homogeneous pattern obtains and both the numeral and the noun agree in case specified by the external element, e.g. (9).

[5] Miechowicz-Mathiasen (2012) presents a profound analysis of higher numerals in Polish employing the idea of case as uT on D. Moreover, she provides a detailed account of the *Accusative Hypothesis* introducing the source of Accusative.

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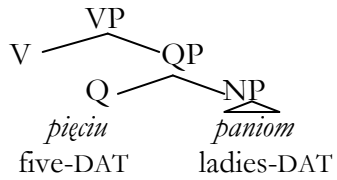

As it has been shown in selected analyses, case patterns in phrases with lower and higher numerals can be accounted for in varied ways. Instantiating distinct elements as heads of a nominal phrase, i.e. the noun, the numeral or both the noun and the numeral, proposing different sites in which lower and higher numerals are base-generated as well as diverse mechanisms of case assignment/checking constitute core issues in the accounts of numerically quantified phrases. Despite the abundance of ideas of how to explain peculiarities of syntax of numerals it is difficult to decide whether the source of variation in these phrases lies in the structure of nominals, division within numerals belonging to different categories or in mechanisms of case distribution different depending on the value of numerals. Taking these aspects into consideration, I investigate numerals looking for the account in which no reference is made to their adjectival or nominal properties and the nominal phrase maintains the same structure irrespective of the value of numerals. As a starting point in my revision of numeral syntax, I decided to reanalyze their status contesting a popular view that, due to their case properties, numerals should be juxtaposed either with adjectives (lower numerals) or with nouns (higher numerals) and, consequently, explain case distribution retaining the same structure for phrases with numerals congruent in case and requiring Genitive on the quantified noun. Then, building on Caha's (2009, 2010) novel approach to case, I pursue the idea of case being represented in the syntactic structure and heading its own projection, which together with some movement operations could deal not only with major syntactic matters involving quantifiers but also explain some collateral issues such as case of adjectives and demonstratives co-occurring in phrases with numerals.

3 On the categorial status of numerals

Lack of uniformity in the class of numerals regarding their features has given rise to the stance that numerals instead of forming a separate class are in fact elements belonging either to adjectives or to nouns. Such a view has been additionally strengthened with a combination of syntactic, morphological and semantic criteria which do not provide a conclusive answer to the status of numerals. When we look at their distribution, numerals are put together with other determiners which are located in a pre-nominal position, e.g. *te dwa ładne szczeniaki* (these two cute puppies) (Carnie 2006). Moreover, they can be modified with phrases which are also appropriate with other adjectives, e.g. *more than six* and *more than smart*, *almost two* and *almost attractive* (Hurford 1975). Furthermore, numerals <5 agree in case and gender with a noun, just like other adjectival modifiers, e.g. (10a), whereas numerals ≥5 appearing with Genitive nouns resemble other nouns taking Genitive complements, e.g. (10b).:

(10) a. *dwie* *międzynarodowe* *aktorki*
two-FEM.NOM international-FEM.PL.NOM acresses-FEM.PL.NOM
'two international actresses'

b. *pięć jajek* vs. *zebranie studentów*
five eggs-GEN meeting students-GEN
'five eggs' 'students' meeting'

When, however, some other properties of numerals are emphasized, it appears that they should be distinguished from other parts of speech. Bearing in mind that only numerals, out of the whole group of nominal modifiers, induce plural number on quantified nouns[6], and can form partitive constructions, contrary to adjectives, putting them along with adjectival modifiers does not seem to be justified. The nominal status of higher numerals, on the other hand, advocated on the basis of Genitive of Quantification and the hybrid nature of numeral lexemes such as *tysiąc* (thousand) and *milion* (million) which in contrast with other numerals, do have plural forms, e.g. *tysiąc* (thousand-SG)-*tysiące* (thousands-PL), *milion* (million-SG)-*miliony* (millions-PL), can be refuted with arguments that none of the nouns triggers plural on the nominal argument. Moreover, numerals already have their nominal counterparts, e.g. (11), which means that granting them nominal status would be highly redundant.

(11) *Grając w kości wyrzucił dwie piątki i szósteczkę*
playing in dices threw two fives-PL and six-DIM
'Playing dices he threw two fives and six.'

The plural form of lexeme *piątka* (five), additionally modified by a numeral, as well as a diminutive of lexeme *szóstka* (six), i.e. *szósteczka* (six-DIM), prove that they are nominals and elements under discussion, i.e numerals, should not be treated as such. Despite highlighting features that set numerals apart from other parts of speech, it should be mentioned that treating numerals on a par with adjectives and nouns can be partially justified when investigating their origin. Initially, i.e. in Proto-Slavonic, numerals <5 used to belong to adjectives and ≥5 to *i*-stemmed nouns which had both singular and plural forms (Siuciak 2008).[7] Yet, with time, they have undergone the process of numeralization, which has been signaled with the introduction of the *–u* ending, a characteristic feature of a numeral declination.[8] This process, however, has not been completed which can be concluded from lexemes *tysiąc* (thousand) and *milion* (million) which retained their nominal character.[9,10]

[6]Obviously, there are languages in which the presence of a numeral forces singular on a count noun as, for instance, in Hungarian, yet this property does not put numerals next to adjectives. Although numerals may modify singular nouns it is never the case that adjectives force plural on the modified noun. Thus, these two categories should not be compared.

[7] Actually, earlier, in Proto-Indoeuropean, higher numerals used to be undeclinable adjectives whereas lower numerals declined by cases and gender (Siuciak 2008).

[8] The emergence of the *–u* ending, the rise of the virile gender and formation of numerals as a separate category have been discussed in Miechowicz-Mathiasen & Dziubała-Szrejbrowska (2012).

[9] Numeral *sto* (hundred), used to be a noun and had a plural form *sta* (hundred-PL.NOM). Subsequently, it not only has become a numeral losing its plural form but also has undergone lexicalization in complex numerals, e.g. 300 used to be expressed with *trzy sta* (three hundreds) but it has become a compound *trzysta*. Following this pattern it is possible that phrases *trzy tysiące* (three thousands) will grow into one in the same manner as other compound numerals completing this way a numeral declination.

[10] The fact that lexemes such as *tysiąc* (thousand) or *milion* (million) are still in between the numeral and nominal status can be stated on the basis of patterns of subject-verb agreement. In

Analyzing various features of numerals together with their historical background, the conclusion can be drawn that these elements do possess traits which distinguish them from other parts of speech. Although some criteria, i.e. agreement in case with a modified noun and the Genitive of Quantification, suggest that they could be treated as adjectival and nominal elements, such a classification would be rather far-fetched and neglecting their distinguishing properties. Moreover, these debatable aspects of their syntax, case congruency and Genitive assignment, which usually serve the purpose of placing them along with other parts of speech, could be viewed as their idiosyncrasy. And this line of reasoning, i.e. a unified treatment of lower and higher numerals, I am pursuing in further analysis of constructions with expressions of quantity.

4 The analysis

4.1 Theoretical background

The essential part of this analysis of numeral constructions is the mechanism by means of which case is distributed within discussed phrases. The key feature of the account must be a solution which caters for homogeneous and heterogeneous syntax of numerals without amendments made to the architecture of the phrase. It seems that fulfilling this task requires a reexamination of case assignment mechanism employed by current generative theories. In consequence, I resort to the novel approach to case as introduced by Caha (2009, 2010) and try to derive problematic patterns building on the idea that case is no longer part of a feature matrix of lexical and functional elements but it is represented in a syntactic tree as a separate projection.

Caha's approach to case has been developed in accordance with the nanosyntactic view of grammar in which syntax operates not on lexical items but abstract features which build morphemes, words and larger structures. What follows, the building block on which syntax works is no longer morpheme but a feature which has become a terminal node. As a result the morphological component has ceased to be operative, hence redundant and eliminated. Basic syntactic operations, i.e. merge and move, have been triggered by the requirements of the lexicon, that is, to create structures that match those stored in the lexical component. Then, each syntactic structure is compared to the lexical one and spelled out. The selection of structures sent to the phonological component is controlled by some principles, e.g. *the Superset Principle* or *the Elsewhere Condition* which ensure that the structure constructed in syntax is contained in the structure stored in the lexicon and that the most accurate match is chosen. On the basis of the premises of nanosyntax, Caha (2009, 2010) provides the account of case marking

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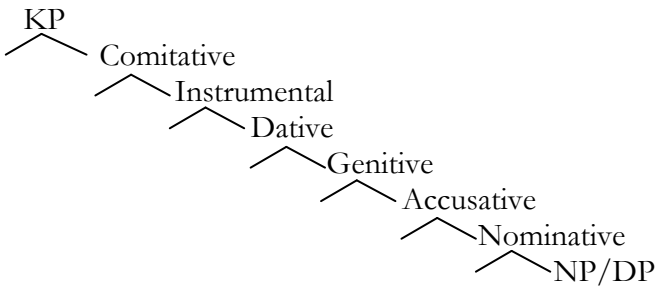
example (1a), agreement is established between *tysiąc* and the verbal predicate *protestowały* indicating its nominal status, whereas in (1b), no such agreement appears and the verb assumes a default form, i.e. 3rd person singular neuter, typical of higher numerals.

(i) a. *Tysiące* *ludzi* *protestowały* *przeciwko* *wojnie.*
thousands-FEM.PL people-PL.GEN protested-FEM.PL against war
'Thousands of people protested against the war.'
b. *Tysiące* *ludzi* *protestowało* *przeciwko* *wojnie.*
thousands-FEM.PL people-PL.GEN protested-3SG.NEUT against war
'Thousands of people protested against the war.'

and case syncretisms introducing the idea of KP split into cases and placed above the NP. The order of cases is established on the basis of recurring syncretisms in languages and the morphological makeup of cases, i.e. more morphologically complex cases contain those less composite. Consequently, Nominative as the unmarked case is placed the lowest in the hierarchy. According to the *Universal Case Contiguity* (Caha 2009: 49), case sequence as presented in (12) is the same across languages.[11,12]

(12)



The number of cases in a given language, however, is subject to variation .Yet, complying with *the Universal Case Contiguity* which also determines that only adjacent cases can be syncretic, the presence of a particular case immediately implies that every lower case is also present in a language, e.g. if a language features Instrumental, it means it also has Dative, Genitive, Accusative and Nominative. If the highest case in a language is Genitive, the other cases present in a language are Accusative and Nominative. The noun, being topped with a split KP, enters the derivation uninflected. Upon the trigger from the external selector, for instance, T selecting for Nominative, NP moves to the position above Nominative, i.e. to the position c-commanding a given case. C-command requirement, as discussed by Kayne (1994), is necessary for a linearization of the nominal stem and the case affix. If the element is selected by some other functional head, e.g. transitive v, NP moves to the position c-commanding Accusative which leads to the linearization of the noun and the Accusative suffix. Additionally, movement to obtain a particular case is restricted following Cinque (2005), i.e. movement must be leftward and the moving chunk must contain a nominal head.

My account of numeral constructions builds on Caha's insights regarding the nature of case yet I assume that every case feature is a terminal node projecting the phrase, i.e. Nominative Phrase, Accusative Phrase etc., whereas for Caha case decomposes into features which are terminals. Moreover, obtaining case by a given element is not subject to such strict linearization requirements as in Caha's work, i.e. in a current analysis case distribution is viewed as a less restrictive operation than movement of an uninflected noun to the position in which it is subsequently linearized with a case suffix as not only a noun moves to acquire case but all its declining modifiers. Such a relaxed approach ensures the presence of only one KP per a nominal phrase and not a

[11] Caha's case hierarchy is based on the case sequence introduced by Blake (1994) which additionally allowed for other cases, i.e. Ergative, Locative and Ablative.

[12] Cases such as Locative, Prepositional and Partitive can be a part of a case sequence. Yet, their position may vary depending on a language. For a detailed account of case hierarchies in languages see Caha (2009, 2010).

separate one for every lexical projection.[13] Moreover, I take Polish nominal phrases to be DPs which means that KP is not a topmost layer but is sandwiched between a DP and NP.[14] Postulation of a DP for Polish has been argued, e.g. by Migdalski (2001, 2003) who has shown that DP is necessary as a place to check deictic and referential features of demonstratives, possessive pronouns or genitival adjectives.[15] Furthermore, different word orders of a demonstrative and a noun, e.g. *ta sąsiadka* (this neighbor) vs. *sąsiadka ta* (neighbor this), as well as orders in strings containing more modifiers, e.g. demonstratives and numerals as presented in (13a) and (13b), additionally support the view that a more elaborate structure of Polish nominals is required.

(13) a. *sześć tych książek*
six these-PL.GEN books-PL.GEN
'six these books'

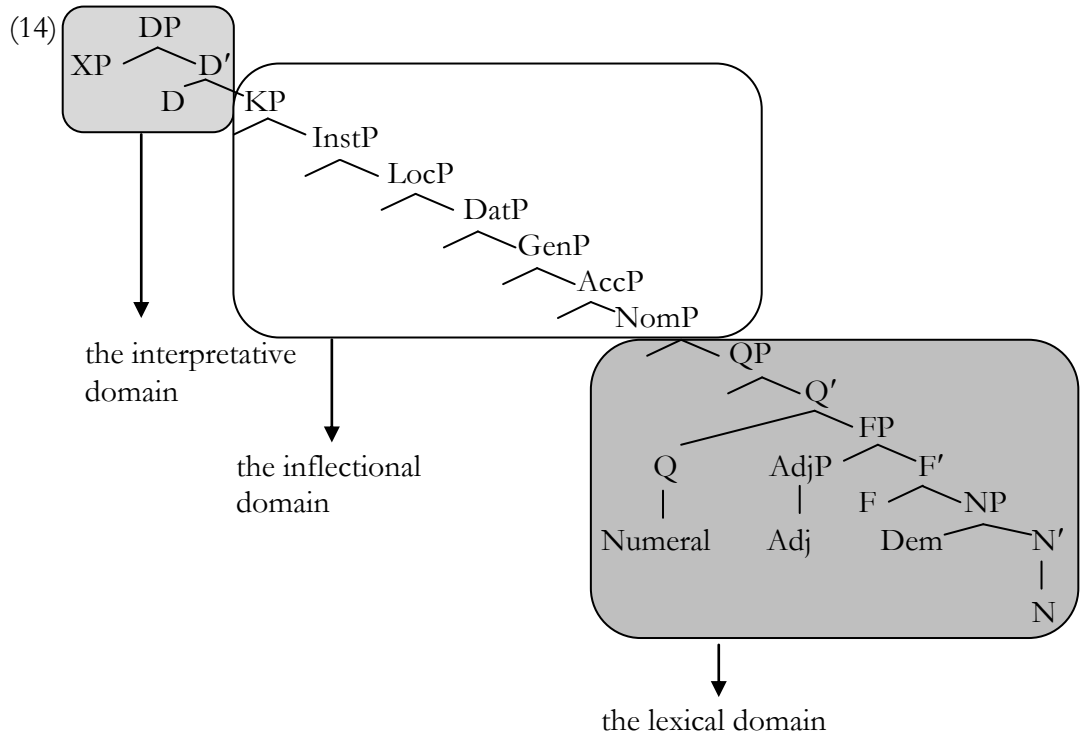
b. *tych sześć książek*
these-PL.GEN six books-PL.GEN
'these six books'

What follows, I claim that in the architecture of a nominal phrase projections are grouped within three domains. NP and projections hosting modifiers belong to the so-called *lexical domain* or *the domain of first merge* which is the place where lexical constituents are base-generated. The upper domain, i.e. *the inflectional domain,* is formed by a split KP which is the place where the noun and its modifiers can acquire case. Finally, DP constitutes *the interpretative domain*, i.e. a part of a structure to which elements move for interpretative reasons. The structure of a nominal phrase with the indication of each domain is demonstrated in (14).

[13] Caha (2009, 2010) provides only the account of a bare noun being subject to case assigning processes and does not explain how his proposal would work with other modifiers, yet a separate KP for every element bearing case seems to be a natural consequence of his leading ideas.

[14] It is important to mention that Willim (2000) has postulated KP for Polish as a projection responsible for case checking. Willim (2000) also argues against a DP hypothesis for Polish claiming that due to the lack of phonological exponents in a head or specifier position of DP, presence of this projection is not justified. For some other arguments against DP in Polish see Willim (2000).

[15] Presence or absence of DP in languages without articles such as Polish has sparked a long and widespread debate. Due to space reasons I do not discuss arguments for and against the DP hypothesis. Instead, I refer the reader to Abney (1987), Longobardi (1994), Progovac (1998), Pereltsveig (2007) or Bašić (2007) advocating *DP hypothesis* as well as Corver (1992), Zlatić (1998), Willim (2000) and numerous works by Bošković (2005, 2008, 2009, 2012) and Bošković & Gajewski (2011) arguing against it.



In Polish, the inventory of cases include Instrumental, Locative, Dative, Genitive, Accusative and Nominative.[16] Particular cases as maximal projections are subsumed under KP which demarcates the inflectional domain. In the lexical domain, the noun and its modifiers are introduced into the derivation. The crucial point here is that modifiers are not nominal adjuncts but are placed in separate projections, i.e. numerals are located in the head of QP and adjectives in specifiers of FPs in a line of Cinque (1999) and Scott (2002). Demonstratives are placed close to the head noun, i.e. in specNP.[17,18] Having introduced some theoretical guidelines regarding case assignment and the basic structure of nominal phrases in Polish, I proceed to particular examples with numerals with the account of case agreement and Genitive of Quantification in numerically quantified phrases.

[16] Placement of Locative in Polish between Instrumental and Dative results from a Locative-Dative syncretism of nouns of different genders from selected declensional classes.

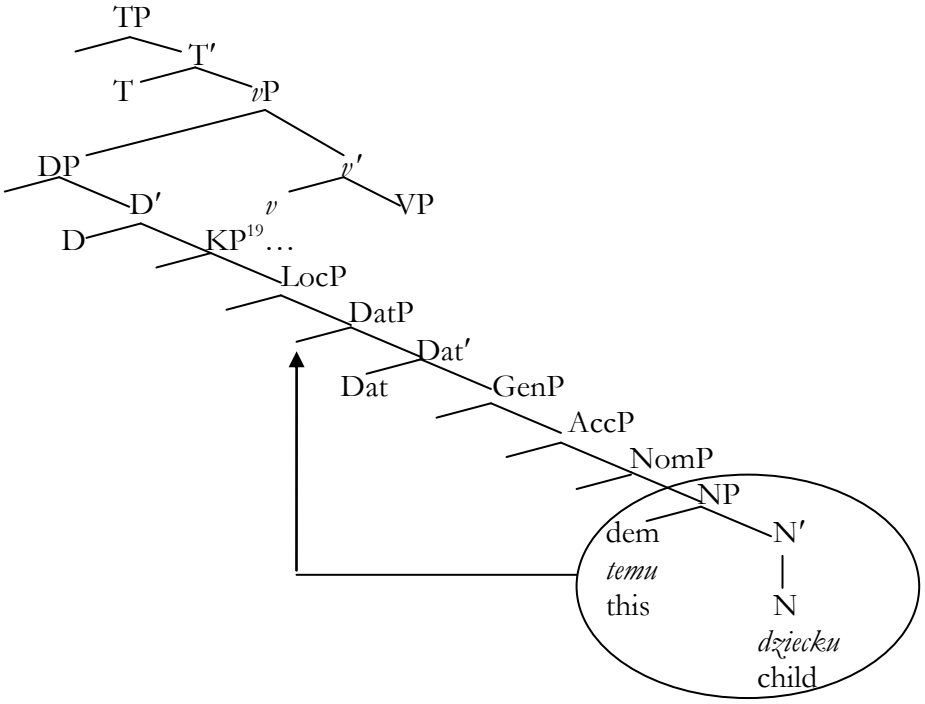
[17] The low position of demonstratives has been discussed, e.g. by Brugé (1996, 2002), Giusti (2002), Panagiotidis (2000) or Roberts (2011).

[18] Demonstratives are base-generated low in the structure, i.e. in the specifier of NP, yet they may move up to check some referential features in the higher domain. According to Migdalski (2001), demonstratives have two sets of features, i.e. [+/-referential] and [+deictic] which are checked in the specifier of DP. Thus, in a phrase *ci dwaj mężczyźni* (these two men), in which all elements bear the same case value, i.e. Nominative, a demonstrative being introduced in specNP, moves to the position within DP, which ensures the referential interpretation of the phrase. The other explanation for the movement of the demonstrative may be related to the reading of the phrase in the presence of a numeral. Leaving a demonstrative low when the quantifier is merged to the structure causes the partitive reading, i.e. *pięć tych dziewczyn* (five of these girls). Thus, to escape from the scope of the quantifier and to obtain a non-partitive reading, the demonstrative must move up.

4.2 Homogeneous and heterogeneous syntax of phrases with numerals

Considering previously introduced tenets of the analysis exploring the idea of a split KP and the fact that case as a feature becomes a head of its own projection, obtaining case by an element proceeds through the movement to a given specifier position within KP region. Upon the appearance of the external selector, e.g. T or v, requiring a nominal to bear case of particular value, the nominal phrase moves from its original position, i.e. from *the lexical domain,* to the specifier position of a given *Case Phrase* within KP, i.e. to *the inflectional domain*. The exemplary derivation of a Dative subject being initially merged in the specifier of vP is shown in (15).

(15)

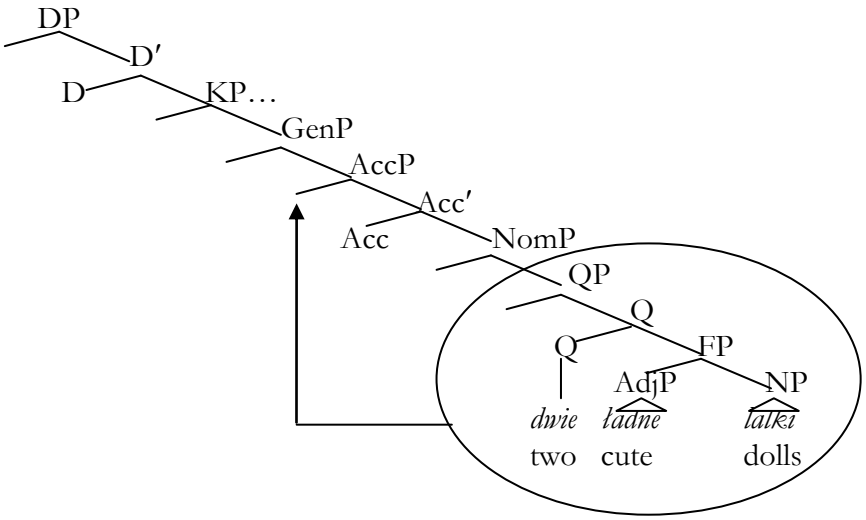


The NP is merged in a structure caseless and when the appropriate functional head is introduced in the derivation it moves to the position within KP to reach a required case. Exactly the same step, i.e. movement from *the lexical domain* to specifier of a selected *Case Projection*, occurs in phrases with lower numerals. Deriving a homogeneous case pattern in the phrase *dwie ładne lalki* (two cute dolls) proceeds through a movement of the QP to the specifier of a given *Case Projection,* in our example specAccP[20].

[19] For clarity I do not provide all *Case Projections*. Also, specifiers are added only when movement is indicated.

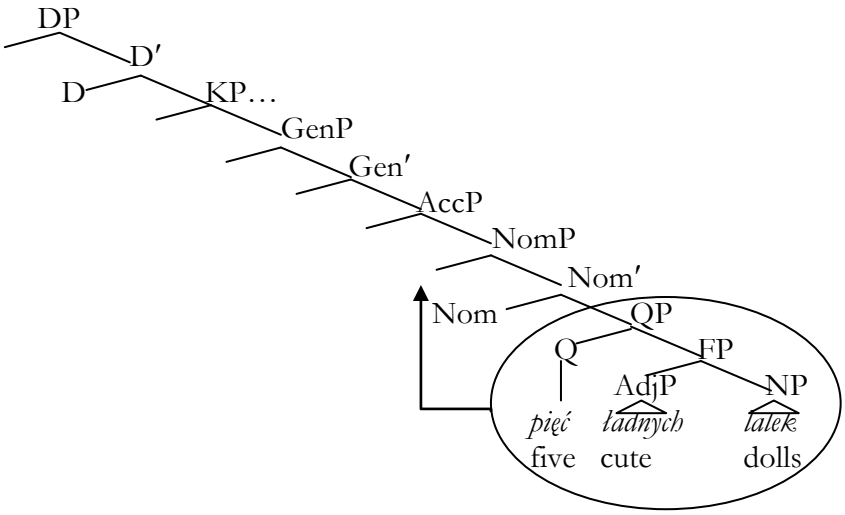
[20] Phrase *dwie ładne lalki* (two cute dolls), in this particular example is Accusative, but it has the form syncretic with Nominative. The fact that it moves to specAccP and not specNomP is contingent only on the external selector, i.e. T requiring Nominative or v requiring Accusative.

(16)



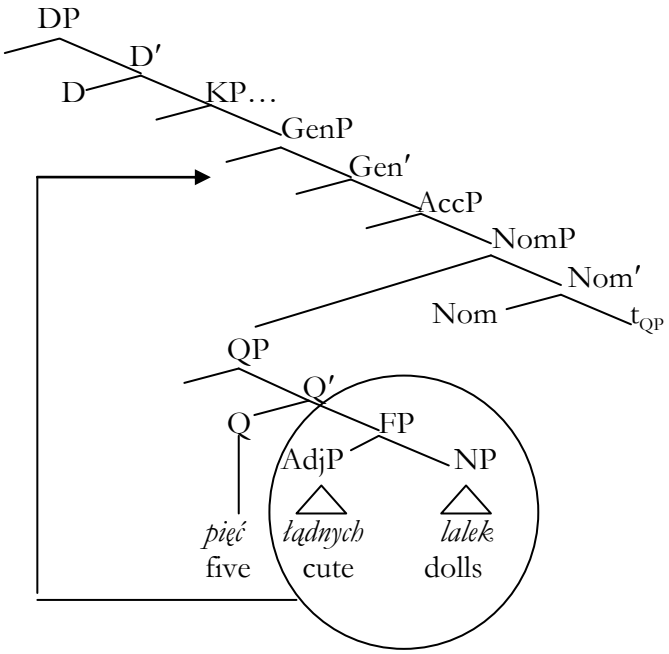
In heterogeneous syntax, on the other hand, one more round of movement is necessary in order to reach a position in which a noun could obtain Genitive. Analyzing the example with a nominal phrase with a numeral modifier in the subject position, it can be observed that T merging into the structure selects for a phrase in Nominative, thus the moment it enters the derivation, the NP and its modifiers receive trigger for movement to the specifier of NomP, e.g. (17).

(17)



This step, however, ensures only that the case requirement of the external selector has been satisfied leaving the noun Genitive-less which does not tally with the case requirements of the numeral. Therefore, the NP together with the adjective excorporates and moves to the specifier of GenP, e.g. (18)

(18)

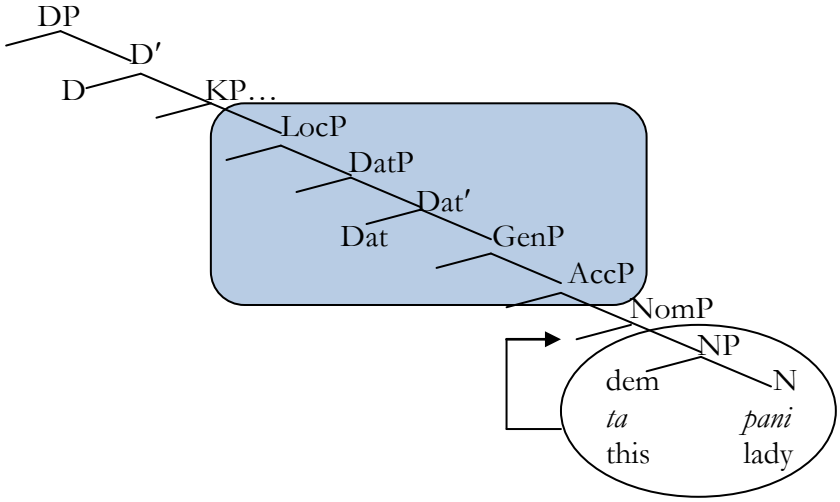


As the result of the movement in (18), the noun and the adjective end up with the expected Genitive. Yet, although all elements are settled with the appropriate case there are several issues that should be commented on before moving to the next section. The first pending question that arises is about the countercyclic derivation. Looking at the respective steps of a derivation, i.e. movement to specNomP and then movement to specGenP, it seems that operations are not cyclic as the requirement of a numeral regarding Genitive noun is fulfilled after the requirement of the external selector. Although this appears to be a very unwanted turn of events, after a more careful examination of this puzzle it may occur that only such an order of movements can lead to a successful derivation. Bearing in mind that movement is constrained as specified by Cinque (2005), i.e. it can be only leftward and the moving constituent must contain a nominal head, moving first the noun, more specifically a bare NP or NP topped with projections hosting modifiers sharing a case value with the noun, would immobilize the numeral and left caseless. In this scenario, not only one of the elements from the nominal domain would be without case but also selectional properties of the external head would not be met. Still, in both situations the derivation would fail. The other reason for presented steps might be that either the numeral as the category is a defective probe due to the inconsistency of lower and higher numerals in selecting for Genitive nouns, or the noun constitutes a defective goal which could mean that a constituent in order to participate in the probe-goal relation must be minimally KP, i.e. it must be necessarily composed of the inflectional domain. Otherwise, such a goal is inaccessible to the probe. Therefore, reaching specGenP by the noun is postponed until the external selector provides trigger for movement of the whole phrase from the lexical domain. In other words, movement of the noun to the position not primarily selected by the functional category being a legitimate probe, e.g. T or v, is parasitic on the first movement.[21] The other issue that should be addressed here is the fate of the remaining case shells which in Caha's account are spelled out either as a part of verbal morphology,

[21] Another explanation for a delayed movement of NP to specGenP might be the requirement to evacuate the lexical domain which would become hindered if the noun moved first. However, going in this direction requires more research.

as an additional morpheme on a verb or as a preposition.[22] As in Polish none of these options is observed, I propose a different solution to the remaining *Case Projections*, namely, after at least one *Case Projection* has been used the rest of the KP is no longer operative and becomes irrelevant for further computation. This step, however, refers only to *Case Projections* located above a phrase in the specifier of a given *Case Projection* as it prevents some other probes from reaching a goal which has already participated in a probe-goal relation, e.g.

(19)



After all elements of the nominal phrase, i.e. the head noun and its modifiers, are settled with the appropriate case, irrespective of the fact whether it is accomplished with one or more rounds of movement within KP, other *Case Projections* become neglected. As the final remark it is pivotal to mention the word order created through the movements within KP. As no problem emerges in homogeneous cases as all constituents reach the same position within KP, heterogeneous syntax creates configuration in which the noun precedes the numeral which is not the expected order. As a way out from this situation it can be proposed that the word order belongs to the phonological component and thus can be ignored, or further movement of some constituents should be introduced. Opting for the latter solution, the numeral has to evacuate KP and move up restoring the coveted order. This movement, however, although at first sight violating Cinque's (2005) constraint prohibiting a solitary movement of elements without a nominal head, i.e. N, is in fact licit, as it proceeds from *the inflectional domain* to DP which is permissible.[23] Although the movement of the quantifier is not related to the information structure, it proceeds to regain scope over the quantified noun.

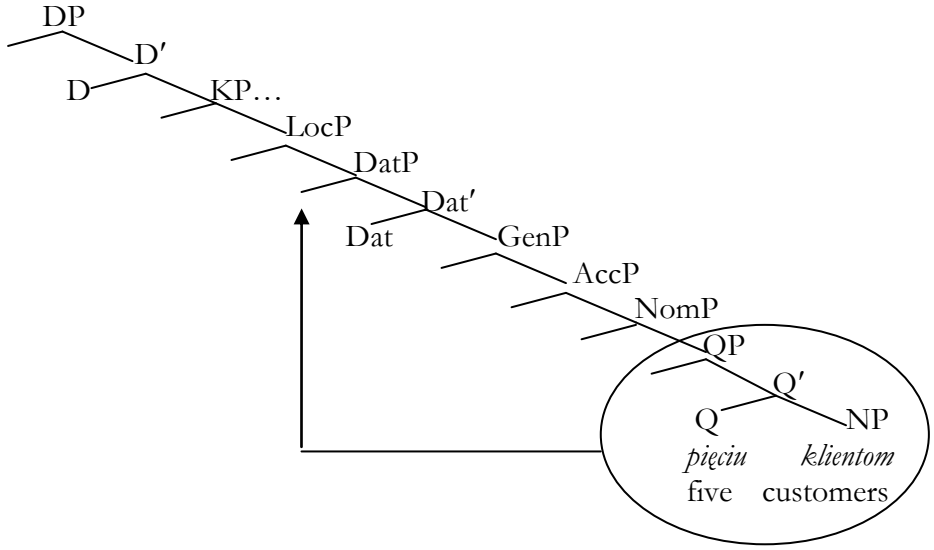
The final aspect of the numeral syntax that should be elaborated on, is the congruency of case between the higher numeral and the noun in oblique case positions. Remembering that numerals ≥5 bring about Genitive on a quantified noun the agreement in case in other contexts seems to be quite surprising. In the available accounts of numerals, this puzzling issue has been addressed by proposing that lexical cases override structural ones, thus in oblique case positions Genitive is superseded by one of the case imposed by the external head, which results in homogeneous syntax.

[22] For detailed examples from different languages see Caha (2009).

[23] Cinque (2005) allows for the movement of the chunk without a nominal head provided that it is a focus movement or any other movement caused by interpretative reasons.

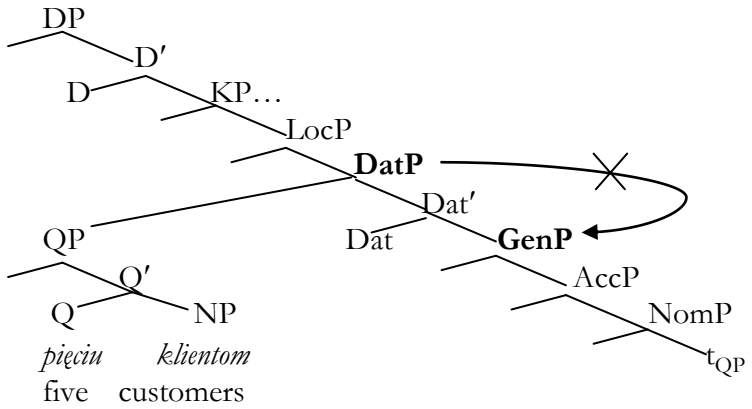
Although at first sight it may seem that higher numerals to some extent reproduce case patterns of lower numerals in that that they share a case value with the modified noun, after a closer examination of case distribution within the discussed approach it turns out that case congruency is simply a result of movement operations permitted by rules of grammar. In the example of a phrase selected by the element which subcategorizes for a Dative, Locative or Instrumental argument, the whole phrase, i.e. QP, moves to the case position dictated by the external selector, e.g. (20).

(20)



In this case, QP has moved to specDatP. The subsequent step, then, would be the excorporation of NP and its movement to the position in which it receives Genitive as determined by the numeral. This step, however, cannot be performed as the noun would have to move downward which is prohibited, e.g. (21)

(21)



Therefore, the noun has to stay in this position, i.e. specDatP, which leads to the congruency in case between the numeral and the noun.

4.3 Modifiers in numerically quantified phrases

The analysis of homogeneous and heterogeneous syntax of numerals has shown that the application of the elaborate but uniform architecture of nominals together with the

approach to case being now a part of the syntactic structure can be vital components in deriving case patterns in constructions with numerals. Yet presented examples illustrated only structures in which the primary goal was to account for cases of two major constituents, i.e. the numeral and the noun. In this section, attention is given to case of modifying elements, i.e. adjectives and demonstratives, added to the numeral-noun formation.

In principle three different options with adjectives are allowed, i.e. the one with the Genitive adjective preceding the noun, e.g. (22a), the one with the Genitive adjective preceding the numeral, e.g. (22b), or the one with the Nominative adjective in a pre-numeral position, e.g. (22c).

(22) a. *Pięć* *dobrych* *samochodów* *podjechało*
five-NOM [good cars]-NONVIR.GEN drove.up-3SG.NEUT.PAST
pod *hotel.*
to hotel
'Five good cars drove up to the hotel.'

b. *Dobrych* *pięć* *samochodów*
good-NONVIR.GEN five-NOM cars-NONVIR.GEN
podjechało *pod* *hotel.*
drove.up-3SG.NEUT.PAST to hotel
'Good five cars drove up to the hotel.'

c. *Dobre* *pięć* *samochodów* *podjechało*
[good five]-NOM cars-NONVIR.GEN drove.up-3SG.NEUT.PAST
pod *hotel.*
to hotel
'At least five cars drove up to the hotel.'

Placement of the modifier as well as its case differ depending on whether it describes the noun or refers to the numeral. This differentiation is also reflected in the structure of a nominal phrase, namely in the base-generation position of the adjective. When the adjective precedes the noun and bears Genitive it means that it is merged above NP. Moreover, it moves together with the NP to specGenP (as already shown in example (17)). When, however, the Genitive adjective precedes the numeral which is Nominative or Accusative, as in (22b), the additional movement of the modifier is required. Since the derivation proceeds exactly as in the case of (22a), i.e. the adjective moves with the noun to acquire Genitive, in the remaining step of a derivation, the adjective must move out from the inflectional domain, probably to specDP, so that the right word order can be established. Yet, the mere linearization issue should not be the primary reason for displacement, and this is in fact what happens in (22b). As word order **Adj-GEN Num-NOM/ACC N-GEN** is a more marked option than **Num-NOM/ACC Adj-GEN N-GEN**, the adjective moves to a pre-numeral position for interpretative reasons.[24] In (22c), on the other hand, the adjective shares the case value with the numeral, which technically means that it should be merged close to the numeral, e.g. in specQP or in specFP placed above QP, so that it can reach the same case position as the numeral. Also, the interpretation of the phrase with a Nominative adjective preceding the numeral

[24] The difference in meaning between two orders is out of question, yet the exact position of the displaced adjective leaving the inflectional domain is yet to be determined as apart from DP the uppermost domain may have a more elaborate structure.

implies that the modifier describes the numeral rather than the noun. As *dobre* in (22c) does not mean of good quality but it relates to the number specifying that there are at least five items its position has to be different than when it indicates the property of the object, which is also mirrored in its case marking. The additional evidence for varied positions of adjectives come from examples in which the adjective is exclusively the modifier of a noun, e.g. (23a,b) and not of a numeral, e.g. (23c).

(23)	a.	*pięć*	*zielonych*	*bananów*
		five-NOM	[green	bananas]-GEN
		‚five green bananas'		
	b.	*zielonych*	*pięć*	*bananów*
		green-GEN	five-NOM	bananas-GEN
	c.	**zielone*	*pięć*	*bananów*
		green-NOM	five-NOM	bananas-GEN

Similar variation is found in examples containing demonstratives. Here as well we observe three distinct patterns, i.e. structures in which the Genitive demonstrative precedes the Genitive noun, e.g. (24a) and (24d), the Genitive demonstrative precedes the numeral which is marked as Nominative or Accusative, e.g. (24b) and (24e), or the Nominative/Accusative demonstrative preceding the numeral with the same case value, e.g. (24c). The last case under discussion involves the Nominative form of a demonstrative preceding the numeral which is grammatical only when combined with non-virile form of a numeral and noun, e.g. (24c), whereas in virile, it renders the structure illicit, e.g. (24f).

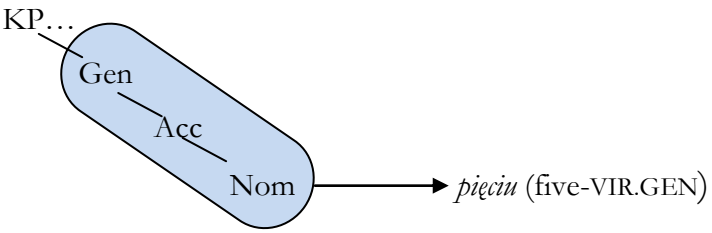
(24)	a.	*pięć*	*tych*	*dziewczyn*
		five-FEM.NOM/ACC	these-FEM.GEN	girls-FEM.PL.GEN
	b.	*tych*	*pięć*	*dziewczyn*
		these-FEM.GEN	five-FEM.NOM/ACC	girls-FEM.PL.GEN
	c.	*te*	*pięć*	*dziewczyn*
		these-FEM.NOM/ACC	five-FEM.NOM/ACC	girls-FEM.PL.GEN
	d.	*pięciu*	*tych*	*mężczyzn*
		five-VIR.GEN	these-VIR.GEN	men-VIR.GEN
	e.	*tych*	*pięciu*	*mężczyzn*
		these-VIR.GEN	five-VIR.GEN	men-VIR.GEN
	f.	**ci*	*pięciu*	*mężczyzn*
		these-VIR.NOM	five-VIR.GEN	men-VIR.GEN

The final example, i.e. (24f), with the ill-formed virile demonstrative in Nominative frequently serves as an argument for *the Accusative Hypothesis* according to which numerals do not have Nominative form and occur in Accusative, which is also supposed to explain lack of subject verb agreement with subjects containing higher numerals.[25] Although *the Accusative Hypothesis* appears to account for the ungrammaticality of a Nominative virile demonstrative with higher numerals, I decided to explore the idea that the reason for the incompatibility of a Nominative virile demonstrative and a virile numeral lies on the part

[25] *The Accusative Hypothesis* has been argued for by, e.g. Franks (2002), Przepiórkowski (2004) or Miechowicz-Mathiasen (2012). Willim (2003), on the other hand, provides arguments against the validity of the hypothesis for Polish.

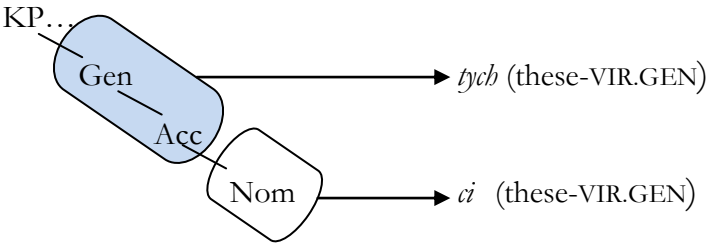
of the demonstrative. Admitting the possibility that whenever a demonstrative is base-generated close to the numeral, i.e. in specQP where it shares the case with quantifier, the source of ungrammaticality is found in the clash of forms of both constituents when they are moved to specNomP. The inadequacy of both elements results from the fact that the virile numeral has syncretic forms in Nominative, Accusative and Genitive with the proviso that syncretism spreads from Genitive to Nominative, e.g. (25).[26]

(25)



A demonstrative, on the other hand, is syncretic only in Genitive and Accusative, e.g. (26), which leads to the situation that when a phrase, QP moves to specNomP as dictated by the external selector, the numeral has indeed the Genitive form via syncretism with this case, whereas demonstrative has a Nominative which causes a mismatch of cases, hence ungrammaticality.

(26)



5 Conclusion

Syntax of numerically quantified phrases has given life to varied analyses which employed different means to explain how case is distributed in constructions with numerals. Proposals regarding the architecture of nominals, differentiated placement of lower and higher numerals and the most intricate mechanisms of case assignment have been those strategies used to address the puzzling issues. Despite the abundance of many appealing accounts of numerals, I have decided to look into the matter from a different perspective. As the first step I examined the status of numerals claiming that although they appear to share some common features with adjectives and nouns they indisputably form a separate category. Moreover, I proposed the structure of nominals in Polish composed of three domains with a DP as the uppermost layer. Then, I introduced some guiding principles of Caha's approach to case applying his idea of split KP to my analysis and proposing that acquiring case proceeds via movement to the specifier position of a chosen *Case Projection*. What follows, homogeneous syntax of lower numerals, Genitive of Quantification and case congruency of higher numerals in oblique case positions have

[26] Historically, Genitive-Accusative syncretism emerged to single out virile Nominative, yet subsequently this syncretism spread to Nominative which can be seen among higher virile numerals.

been the result of movement operations within the inflectional domain constituted by split KP. In the final part of the article, I drew attention to modifiers added to constructions with numerals, i.e. adjectives and demonstratives, whose meaning and case differ depending on their location in relation to other constituents of the nominal phrase. Importantly, I attempted to answer the question regarding the ungrammaticality of Nominative demonstrative accompanying the virile numeral. Putting aside the idea of the inherently Accusative numerals, I suggested that the illicit combinations arise due to the incomplete syncretism of cases within virile demonstrative, which causes a mismatch of forms with the Genitive numeral.

References

Abney, Steven. 1987. The English noun phrase in its sentential aspect. Massachusetts Institute of Technology, PhD dissertation.

Babby, Leonard. 1987. Case, prequantifiers, and discontinuous agreement in Russian. *Natural Language and Linguistic Theory.* 5. 91–138.

Bailyn, John Frederic. 2004. The case of Q. In Olga Arnaudova (ed.), *Formal approaches to Slavic linguistics* (FASL) 12, 1–36. Ann Arbor, Michigan: University of Michigan Press.

Bašić, Monika. 2007. On left branch extractions: A remnant movement approach. Paper presented at the First Annual Workshop on Generative Syntax, University of Novi Sad, 8–10 January.

Blake, Barry. 1994. *Case*. Cambridge University Press: Cambridge.

Bošković, Željko. 2005. On the locality of left branch extraction and the structure of NP. *Studia Linguistica* 59. 1–45.

Bošković, Željko. 2006. Case and agreement with genitive of quantification in Russian. In Cedric Boeckx (ed.), *Agreement Systems.* Amsterdam & Philadelphia: John Benjamins.

Bošković, Željko. 2008. What will you have, DP or NP?. *Proceedings of NELS 37*.

Bošković, Željko. 2009. More on the no-DP analysis of article-less languages. *Studia Linguistica* 63. 187–203.

Bošković, Željko & Jon Gajewski. 2011. Semantic correlates of the NP/DP parameter. *Proceedings of the North East Linguistic Society 39*. GLSA, University of Massachusetts, Amherst.

Bošković, Željko. 2012. On NP and clauses. In Gunther Grewendorf & Thomas E. Zimmermann (eds.), *Discourse and grammar: From sentence types to lexical categories,* 179–242. Boston: Walter de Gruyter.

Brugé, Laura. 1996. Demonstrative movement in Spanish: A Comparative approach. *Working Papers in Linguistics* 6. University of Venice, 1–53.

Brugé, Laura. 2002. The positions of demonstratives in the extended nominal projection. In Guglielmo Cinque (ed.), *Functional Structure in DP and IP*, 1–53. Oxford University Press: New York.

Caha, Pavel. 2009. Nanosyntax of Case. University of Tromsø, PhD dissertation.

Caha, Pavel. 2010. The parameters of case marking and spell out driven movement. University of Tromsø. http://ling.auf.net/lingbuzz/001026 (accessed 15 Feb 2011).

Carnie, Andrew. 2006. *Syntax: A generative introduction*. Malden: Blackwell.

Cinque, Guglielmo. 1999. *Adverbs and functional heads. A Cross-linguistic perspective*. New York: Oxford University Press.

Cinque, Guglielmo. 2005. Deriving Greenberg's Universal 20 and its exceptions. *Linguistic Inquiry* 36. 315–332.

Corver, Norbert. 1992. On deriving certain left branch extraction asymmetries: A case study in parametric syntax. *Proceedings of NELS 22*. 67–84.

Dziubała-Szrejbrowska, Dominika. 2014. Aspects of morphosyntactic constraints on quantification in English and Polish. Adam Mickiewicz University, PhD dissertation.

Dziwirek, Katarzyna. 1990. Default agreement in Polish. In Katarzyna Dziwirek, Patric Farrell & Errapel Mejías-Bikandi (eds.), *Grammatical relations: A Cross-theoretical perspective*. Stanford: CSLI Publications.

Franks, Steven. 1994. Parametric properties of numeral phrases in Slavic. *Natural Language & Linguistic Theory* 12. 597–674.
Franks, Steven. 1995. *Parameters of Slavic morphosyntax*. Oxford: Oxford University Press.
Franks, Steven. 2002. A Jakobsonian feature based analysis of the Slavic numeric quantifier Genitive. *Journal of Slavic Linguistics* 10. 145–184.
Giusti, Giuliana. 2002. The functional structure of noun phrases: A bare phrase structure approach. In Guglielmo Cinque (ed.). *Functional structure in DP and IP: The cartography of syntactic structures*, 54–90. Vol. 1. Oxford: Oxford University Press.
Hurford, James R. 1975. *The linguistics theory of numerals*. Cambridge : Cambridge University Press.
Kayne, Richard. 1994. *The antisymmetry of syntax*. Cambridge: The MIT Press.
Longobardi, Giuseppe. 1994. Reference and proper names: a theory of N-movement in syntax and logical form. *Linguistic Inquiry* 25. 609–665.
Miechowicz-Mathiasen, Katarzyna. 2012. Licensing Polish higher numerals: An account of the Accusative Hypothesis. *Generative Linguistics in Wrocław* 2. 57–75.
Miechowicz-Mathiasen, Katarzyna & Dominika Dziubała-Szrejbrowska. 2012. The role of gender in the rise of numerals as a separate category. *Journal of Historical Syntax* 1. 1–39.
Migdalski, Krzysztof. 2001. A determiner phrase approach to the structure of Polish nominals. In Piotr Bański & Adam Przepiórkowski (eds.), *Generative linguistics in Poland: Syntax and morphosyntax. Proceedings of GLIP-2 conference held in Warsaw,* 135–148. Warszawa: Instytut Podstaw Informatyki Polskiej Akademii Nauk.
Migdalski, Krzysztof. 2003. N-to-D raising in Polish. In Danuta Stanulewicz (ed.), *Papers in Language Studies. Proceedings of the Ninth Annual Conference of the Polish Association for the Study of English. Gdańsk, 26–28 April 2000*, 187–193. Gdańsk: Wydawnictwo Uniwersytetu Gdańskiego.
Panagiotidis, Phoevos. 2000. Demonstrative determiners and operators: the case of Greek. *Lingua* 110. 717–742.
Pereltsvaig, Asya. 2007. The universality of DP: a view from Russian. *Studia Linguistica* 61. 59–94.
Pesetsky, David. 1982. Paths and categories. Massachusetts Institute of Technology, PhD dissertation.
Pesetsky, David & Esther Torrego. 2001. T-to-C: An account and its consequences. In Michael Kenstowicz (ed.), *Ken Hale, a life in language,* 355–426. Cambridge, MA: The MIT Press.
Progovac, Ljiljana. 1998. Determiner phrase in a language without determiners. *Linguistics* 34. 165–179.
Przepiórkowski, Adam. 1999. Case assignment and the complement-adjunct dichotomy: A non-configurational constraint-based approach. University of Tübingen, PhD dissertation.
Przepiórkowski, Adam. 2004. O wartości przypadka podmiotów liczebnikowych. *Bulletin De La Société Polonaise De Linguistique, fasc*. LX. 133–143.
Rappaport, Gilbert. 2002. Numeral Phrases in Russian: A minimalist approach. *Journal of Slavic Linguistics* 10. 327–340.
Rappaport, Gilbert. 2003. Case syncretism, features and the morphosyntax of Polish numeral phrases. In Piotr Bański & Adam Przepiórkowski (eds.), *Generative Linguistics in Poland 5,* 123–137. Warsaw: Academy of Sciences.
Roberts, Ian. 2011. FOFC in DP: Universal 20 and the nature of demonstratives. University of Cambridge, manuscript.
Rutkowski, Paweł. 2002. The Syntax of quantifier phrases and the inherent vs. structural case distinction. *Linguistic Research* 7. 43–74.
Saloni, Zygmunt & Marek Świdziński. 1998. *Składnia współczesnego języka polskiego* [Syntax of contemporary Polish]. Warszawa: Państwowe Wydawnictwo Naukowe.
Scott, Garry-John. 2002. Stacked adjectival modification and the structure of nominal phrases. In Guglielmo Cinque (ed.), *Functional structure in DP and IP: The cartography of syntactic structures. 1,Vol,* 91–120. New York: Oxford University Press.
Siuciak, Mirosława. 2008. *Kształtowanie się kategorii gramatycznej liczebnika w języku polskim* [Development of the numeral as a separate category in Polish]. Katowice: Wydawnictwo Uniwersytetu Śląskiego.
Strutyński, Janusz. 2005. *Gramatyka polska* [Grammar of Polish]. Kraków: Wydawnictwo Tomasz Strutyński.
Tajsner, Przemysław. 1990. Case marking in English and Polish: A Government and Binding study. Adam Mickiewicz University, PhD dissertation.

Willim, Ewa. 1990. On case-marking in Polish. *Papers and Studies in Contrastive Linguistics*, XXV. 203–220.
Willim, Ewa. 2000. On the grammar of Polish nominals. In Roger Martin, David Michaels & Juan Uriagereka (eds.), *Step by Step*, 319–346. Cambridge: The MIT Press.
Willim, Ewa. 2003. O przypadku fraz z liczebnikiem typu pięć w podmiocie i mechanizmach akomodacji [The case of phrases with a numeral five in subject positions and mechanisms of accommodation]. *Polonica* 22/23. 233–254.
Zlatić, Larisa. 1998. Slavic noun phrases are NPs not DPs. Paper presented at the Workshop on comparative Slavic morphosyntax, Indiana University, 5–7 June.