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The Syntax of Quantifier Phrases and the Inherent vs. Structural Case Distinction¹

Abstract

The chief purpose of this paper is to characterise the syntax of Polish and Estonian numeral phrases in correlation with some independently motivated universal principles of case assignment. Building on Veselovská (2001), I will attempt to present a formal account of the cross-linguistic distinction between inherent and structural case and its influence on quantified expressions. As a theoretical framework, I adopt a particular model of nominal phrase structure – usually referred to as the *DP hypothesis* and attributed to Abney (1987). Following Abney (1987), it has been argued in the literature that noun phrases project up higher functional categories – Determiner Phrases (DPs) headed by D. Many linguists have raised the question whether it is reasonable to claim that there are more functional heads in nominal syntax. This paper supports the claim that Polish and Estonian numerals must be described as functional elements residing in a functional phrase projected between NP and DP. I will refer to this phrase as QP (Quantifier Phrase). Furthermore, I will show that the QP model holds for many other languages as well.

¹ An earlier, shorter version of the analysis argued for in this paper was presented at the 18th *Scandinavian Conference of Linguistics* held at Lund University (Sweden) on 18-20 May 2000 and was published in the proceedings (Rutkowski, 2001). I wish to thank the audience on that occasion for important feedback. I am also indebted to Hanna Maliszewska, Paweł M. Nowak, Robert Ryan and an anonymous *Linguistic Research Journal* reviewer for useful comments on earlier drafts of this article. Finally, special thanks are due to my Estonian

1. Introduction

Abney (1987) proposes that what has been traditionally referred to as NP (Noun Phrase) projects a higher functional category – DP (Determiner Phrase). The fact that D is a functional head in the nominal complex is widely accepted. In this paper, I will argue that, at least in some languages, numerals may occupy another functional head position: Q (Quantifier). I will focus on data from Polish and Estonian – languages belonging to unrelated language families (Indo-European and Uralic, respectively). There are many interesting syntactic similarities between Polish and Estonian nominal expressions containing numerals. I will suggest that Qs might be considered heads present and active in the syntax of both languages. The strongest evidence derives from the syntax of numerals in structural case contexts. In such positions, Polish and Estonian numerals assign a particular case value (genitive in Polish and partitive in Estonian) to the following noun. In other contexts the whole complex agrees in case. Drawing on work by Veselovská (2001), I will attempt to explain the above mixed pattern of case assignment/agreement by assuming that numerals in languages such as Polish or Estonian are crucially marked in the lexicon as functional elements. According to Emonds (2000) and Veselovská (2001), functional (grammatical) elements are inserted into the syntactic derivation at a relatively late stage. This means that they can realise their language-specific case requirements (e.g. genitive) only in structural case contexts (inherent case is related to basic thematic roles and, therefore, it must be assigned at a ‘deep’ syntactic level, i.e. before the numeral is inserted into the derivation). The above analysis of Polish and Estonian numeral expressions finds support in languages such as Czech and Slovak, on the one hand, and Inari Sami and Finnish, on the other. Therefore, the presence of the functional projection QP may be claimed to be a broader phenomenon – possibly rooted in the principles of Universal Grammar.

2. Structural and inherent case

The structural/inherent case dichotomy plays a very important role in many current syntactic frameworks, see, e.g., Chomsky (1981, 1986, 2000), Babby (1987), Franks (1995). Inherent case (also referred to as lexical) is semantically conditioned (theta-related, indicating concrete

informants: Katrin Hiietam, Kaarel Kaljurand and Maarika Traat. Naturally, any remaining errors and shortcomings are mine alone.

circumstantial relations) and/or assigned to a nominal expression by a specific lexical item (a verb or a preposition). The information concerning the subcategorised inherent case must be marked in the lexical entry of a given verb or preposition.

The inherent case has to be distinguished from the structural (configurational) case, i.e. the case which is dependent mostly on the position of a nominal construction in the surface syntactic environment. Nominative and accusative are considered structural in most languages (and certainly in the Indo-European ones). It is so in Polish. There are seven morphological cases in Polish. A sample declension pattern is given below:

(1)		Singular	Plural
	Nominative	pan 'lord'	panowie 'lords'
	Genitive	pana	panów
	Dative	panu	panom
	Accusative	pana	panów
	Instrumental	panem	panami
	Locative	panu	panach
	Vocative	panie	panowie

The Polish nominative and accusative cases are described as structural, whereas genitive, dative, instrumental and locative exemplify inherent case (cf., e.g. Franks, 1995). Nominative usually appears in the position of sentential subject. Accusative forms are (unmarked) objects of typical transitive verbs. Dative forms appear as indirect objects of ditransitive verbs. Locative is selected only by certain prepositions. Vocative is used very rarely – mainly for addressing. It remains outside the syntactic structure of a sentence (cf. Willim, 1990) and might be hypothesised not to be a case in the purely syntactic sense². Therefore, I will ignore it in the subsequent discussion, assuming that Polish has only six productive cases which are syntactically relevant.

² As argued for in Andrejewicz (1988), there is no agreement between a vocative nominal expression and the verb heading a sentence. The vocative NP/DP is never an argument of the verb.

A few basic notes on the Estonian case system are also in order³. Estonian nouns vary for the singular and the plural. They occur in one of fourteen morphological cases. It is illustrated by the declension pattern of the word *raamat* ‘book’ in (2) below.

(2)		Singular	Plural	
	Nominative	raamat	raamatud	‘(the) book(s)’
	Partitive	raamatut	raamatuid	‘book(s)’ (partial subject or object)
	Genitive	raamatu	raamatute	‘of the book(s)’
	Illative	raamatusse	raamatutesse	‘into the book(s)’
	Inessive	raamatus	raamatutes	‘in the book(s)’
	Elicative	raamatust	raamatutest	‘from, of, out of the book(s)’
	Allative	raamatule	raamatutele	‘to the book(s)’
	Adessive	raamatul	raamatutel	‘upon, on, at the book(s)’
	Ablative	raamatult	raamatutelt	‘from, off the book(s)’
	Translative	raamatuks	raamatuteks	‘for, as the book(s)’
	Terminative	raamatuni	raamatuteni	‘up to, to, until the book(s)’
	Essive	raamatuna	raamatutena	‘as the book(s)’
	Abessive	raamatuta	raamatuteta	‘without the book(s)’
	Comitative	raamatuga	raamatutega	‘with the book(s)’

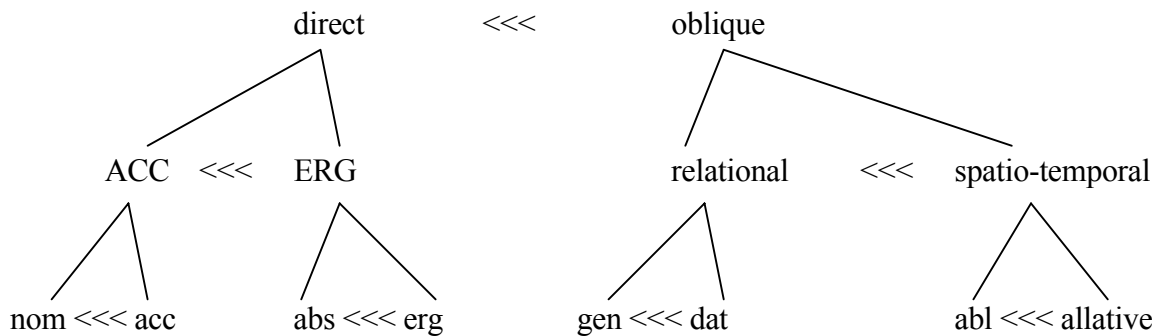
In Estonian, nominative and partitive are usually considered structural – all other cases being inherent. The Estonian partitive case could be said to be the equivalent of accusative in more familiar languages (note that the accusative form itself does not appear in the Estonian paradigm). Illative, inessive and elative are often described as interior local cases. On the other hand, allative, adessive and ablative are exterior local cases (cf. Aavik, 1982). It is worth noting that the Estonian partitive must be distinguished from what is described as (abstract) partitive in many other languages and treated as an instance of inherent case (cf. Belletti, 1988). In Estonian, nominative and partitive mark clearly structural positions (subject and

³ The Estonian data reported in this paper are taken both from published studies (mainly Aavik, 1982) and work with native speakers (Katrín Hiietam, Kaarel Kaljurand, and Maarika Traat).

direct object) and form a natural class (as opposed to other morphological cases, which appear on adverbial adjuncts – see Nemvalts, 1996)⁴.

The dichotomy between structural and inherent cases might be described in terms of the theory of semantic markedness (cf. Greenberg, 1966). Cases can be ranked in terms of cognitive, perceptual complexity (connected with the semantic notions expressed). The structural case seems to be far less complex semantically than the inherent case (as mentioned above, the structural case could be viewed as a mere reflection of surface syntactic relations in a sentence). It is reflected in morphology – Greenberg (1966) predicts that an agreement marker that represents a more marked category should be more complex than the one that carries an unmarked or less marked value. It can be noticed that, in Estonian and Polish, the morphological realisations of the inherent case are usually more complex than the structural case forms. Lapointe (1988) proposes a universal semantic notion ranking for cases:

(3) Case



In the tree diagram in (3), the lower notions (cases) are subnotions of the upper ones. A <<<< B means ‘A is semantically less complex than B.’ Within this case ranking approach, the nominative and accusative (i.e. the two most uncontroversial instances of structural case) are regarded as the default cases (the least marked ones).

What could be regarded as the characteristic feature of structural case is that its morphological instantiation may change with syntactic environment. This is illustrated in (4):

⁴ The structural character of partitive in Finnish (a language very closely related to Estonian) is extensively argued for in Vainikka and Maling (1996) and Nelson (1998).

- (4) (a) structural case
- | | | |
|------------------------------|--------|----------------------------|
| chłopak | całuje | dziewczyne |
| boy _{Nom} | kisses | girl _{Acc} |
| ‘a boy kisses a girl’ | | |
| chłopak | nie | całuje dziewczyny |
| boy _{Nom} | not | kisses girl _{Gen} |
| ‘a boy does not kiss a girl’ | | |
- (b) inherent case
- | | | |
|-------------------------------|--------|----------------------------|
| chłopak | ufa | dziewczynie |
| boy _{Nom} | trusts | girl _{Dat} |
| ‘a boy trusts a girl’ | | |
| chłopak | nie | ufa dziewczynie |
| boy _{Nom} | not | trusts girl _{Dat} |
| ‘a boy does not trust a girl’ | | |

The variation in (4) is due to the inherent vs. structural case distinction. In (4a), the so-called Genitive of Negation is illustrated: an accusative direct object of a verb changes to genitive under sentential negation (cf. Willim, 1990, Przepiórkowski, 1996). This phenomenon does not seem to be driven by semantic relations in the sentence – it is purely configurational. Such a change is impossible in (4b) since the dative (unlike the accusative) is an inherent case subcategorised by the verb *ufać* ‘to trust.’ It is not structurally determined; therefore, it cannot be influenced by a surface syntactic environment.

3. Polish numerals

In Polish, it is necessary to distinguish two types of what has been traditionally called numerals: adjectival numerals such as *jeden* ‘one’ or *dwa* ‘two,’ and proper numerals such as *pięć* ‘five.’ I will call them A-numerals and Q-numerals, respectively⁵. It is impossible to

⁵ It is possible to single out another class of numerals: N-numerals, which behave like regular nouns (assign genitive in all contexts, never agree with the quantified noun). Only a few items belong to this group: *tysiąc* ‘thousand’, *milion* ‘million’, *miliard* ‘billion,’ etc. The present paper focuses on those data which are most problematic for linguistic theory, therefore, I will not discuss N-numerals. The tripartite classification of Polish numerals (Q-numerals, A-

unify these two categories as far as their syntactic behaviour is concerned. No numerals show intrinsic gender feature. They copy this phi-feature from the following noun. However, structures with A-numerals closely resemble the standard Polish agreement pattern of nouns and adjectives, whereas Q-numerals do not exhibit agreement with the head noun with respect to case. The difference between (5a) and (5b) illustrates the divergent behaviour of the two types in question.

- (5) (a) *dwie* *kobiety*
 two_{Nom} women_{Nom}
 ‘two women’
- (b) *pięć* *kobiet*
 five_{Acc} women_{Gen}
 ‘five women’

There is independent evidence that Polish subjects containing Q-numerals must be analysed as intrinsically accusative rather than nominative⁶. Space limitations prevent a full discussion of this issue here. It is extensively justified in the generative literature (see Franks, 1995, Przepiórkowski, 1996, Rutkowski, 2000). The crucial point is the interpretation of the numeral, which is always ambiguous between nominative and accusative. However, the fact that the only demonstrative form that can be chosen by the ambiguous numeral is the accusative form strongly suggests that the numeral itself also appears in accusative:

- (6) (a) **ci* *pięciu* *mężczyzn*
 these_{Nom} five_{Nom/Acc} men_{Gen}
- (b) *tych* *pięciu* *mężczyzn*
 these_{Acc} five_{Nom/Acc} men_{Gen}
 ‘these five men’

numerals, and N-numerals) is parallel to the one proposed by Giusti and Leko (1996). They divide all quantifiers into three classes: quantifiers proper, quantity adjectives, and quantity nouns.

In the subject and accusative object positions, Q-numerals always assign genitive to the noun following them (the so-called Genitive of Quantification GEN(Q)).

- (7) (a) pięć osłów/*osły je
 five_{Acc} donkeys_{Gen} / *donkeys_{Acc} eat
 ‘five donkeys eat’
- (b) kocham pięć osłów/*osły
 I-love five_{Acc} donkeys_{Gen} / *donkeys_{Acc}
 ‘I love five donkeys’

However, the examples in (8) show that the GEN(Q) assignment does not take place in structures which are not accusative. If a nominal construction is put into the inherent case context, the Q-numeral fails to govern the genitive case, which means that the noun and its premodifiers (adjectives) take the inherent case of the whole phrase.

- (8) (a) dałem to pięciu osłom / *osłów
 I-gave it_{Acc} five_{Dat} donkeys_{Dat} / *donkeys_{Gen}
 ‘I gave it to five donkeys’
- (b) z pięcioma norwesкими żołnierzami / *żołnierzy
 with five_{Instr} Norwegian_{Instr, pl} soldiers_{Instr} / *soldiers_{Gen}
 ‘with five Norwegian soldiers’

This unusual syntactic behaviour of Polish Q-numerals posits a serious challenge to any theory of case assignment. The head constituent in a syntactic construction is usually assumed to determine category features and morphosyntactic properties (gender, case, and number) of the whole construction (see, e.g., Zwicky, 1988). Therefore, nouns cannot be considered heads in structures such as (7a-b). On the other hand, neither can Q-numerals be treated as classic heads – they cease to govern the case of their complements when put into the inherent case context. According to Payne (1993), a classic head’s ability to govern case must be independent from its own inflectional form. As will be shown below, the syntax of Polish Q-

⁶ It could be said that the nominative slot in the lexical entry of a numeral is empty. Therefore, numerals must take another structural case form (accusative) even in the sentential subject

numerals demonstrates that Payne's claim may be argued as being too strong.

4. Quantifier Phrase

As mentioned earlier, since Abney (1987), it has been widely assumed in the literature that nouns project up higher functional categories – D(eterminer)s, which head their own phrases (DPs – Determiner Phrases). Following this approach, I assume a phrase structure model in which there is a clear-cut distinction between lexical and functional categories. The two classes contribute to the semantics of an expression in different ways. The former are denotatively contentful (their appearance is driven by the intension of an expression), whereas the latter function as the necessary anchoring of lexical substance in an utterance (they influence and regulate the interpretation of their complements by marking grammatical or relational features). The metaphor that could be used here is that of a wall. Lexical elements (e.g. nouns or verbs) are like bricks that cannot form a wall (i.e. a phrase) without cement (i.e. functional projections). In terms of phrase structure, this process of anchoring is parallel to c-command (functional categories c-command lexical categories). Functional elements are also usually described as constituting closed classes (the number of functional elements in the lexicon of a given language is finite). It is important to note that the terminological opposition “lexical” vs. “functional” does not have to mean that functional categories are not realised by a lexical item (i.e. that they are phonologically empty or dependent)⁷.

Many linguists have claimed that Abney's (1987) D is not the only functional category associated with the lexical category N. On the basis of data from a variety of unrelated languages, Picallo (1991), Ritter (1991), Shlonsky (1991), Santelmann (1993), Li (1998), Benmamoun (1999), Bhattacharya (2000), among others, argue for a three-layered structure of nominal expressions. All of these researchers postulate a functional projection between NP and DP. This general line of reasoning can essentially be carried over into the syntactic description of Polish. It is beyond the goal of the present paper to analyse in detail which of the previous analyses (if any) can find support in the data from Polish. However, I will argue that, in order to describe the syntax of numeral expressions, we need to assume that Polish DPs are at least three-layered. I will refer to the additional projection in the region between

position. See Rutkowski (2000) for more discussion.

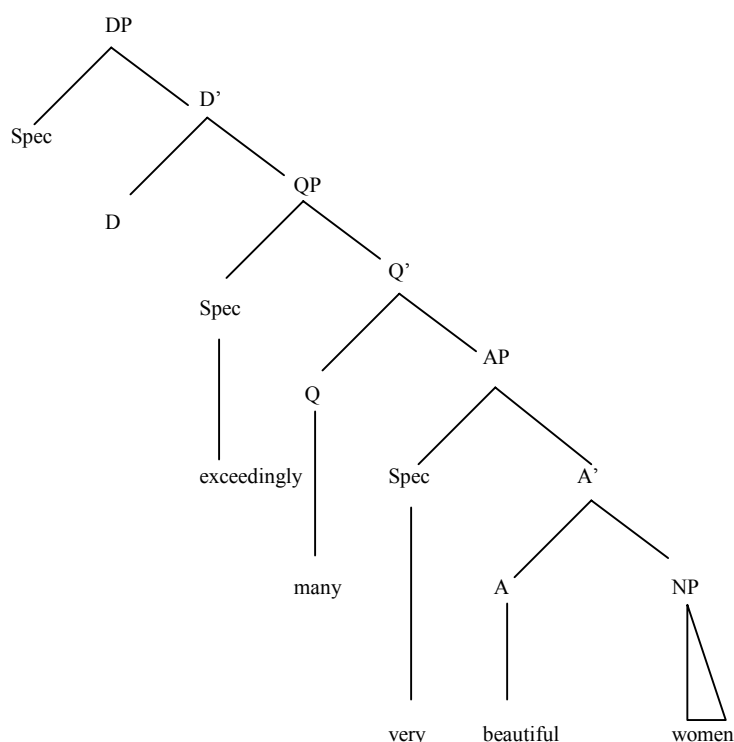
DP and NP as QP, following a well-established terminological tradition in Slavic linguistics (cf., e.g., Babby, 1988, Franks, 1995, Giusti and Leko, 1996, Przepiórkowski, 2000). Another reason to assume that numerals are Qs (instead of postulating two separate functional heads: Q and Num) is connected to the fact that numerals in languages such as Polish share many syntactic properties with the indefinite quantifiers *dużo* ‘many/much’, *mało* ‘little/few,’ etc. Due to limitations of space, the latter will not be discussed in detail in this paper but it is crucial to note that they pattern with numerals as far as genitive assignment is concerned⁸. Assuming that Q-numerals and quantifiers such as *dużo* ‘many/much’ occupy the same syntactic slot (Q), the phrase structure I am arguing for is very similar to the one sketched briefly by Abney (1987)⁹:

⁷ Therefore, Chomsky (2000) uses the term “substantive category” instead of “lexical category.”

⁸ There exists another class of quantifiers: words such as *wszyscy* ‘all’ and *każdy* ‘every.’ From a syntactic point of view, they belong to the category of adjectives in Polish – they always agree in case, gender and number with the following noun. Therefore, it seems plausible to treat them as some sort of specifier-based nominal modifiers (on a par with adjectives), rather than functional heads. They occupy an adjective-like syntactic position (they never precede D). In this respect, they are different from quantifiers meaning ‘all’ and ‘every’ in languages such as Standard Arabic, English or Italian (see, e.g., Giusti and Leko, 1995). The latter should be described as occupying a syntactic head located above DP (if we accept the phrase structure I have proposed in this paper, that position, although often referred to as Q, has to be distinguished from what I label as Q). Therefore, it must be assumed that quantifiers such as ‘all’ and ‘every’ can have a different categorical status crosslinguistically (modifier-like or head-like) and it has to be marked in the lexicon of a given language.

⁹ The only difference being that, in the present analysis, I interpret adjectives as lexical modifiers rather than functional heads (adjectives are open-class items with substantive lexical content).

(9) *exceedingly many very beautiful women* (Abney, 1987:338-339)



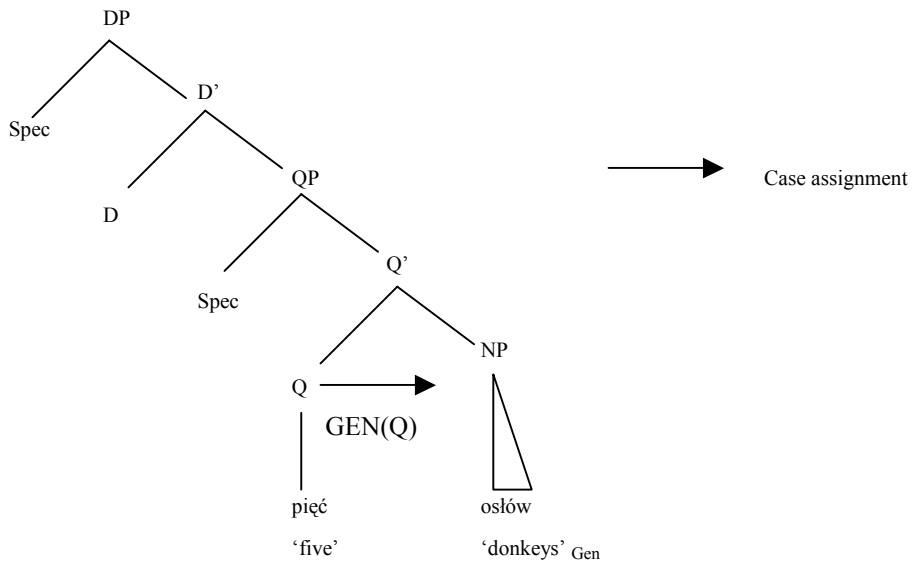
Numerals can be viewed as elements occupying a functional head since their semantic content is limited and reducible to basic arithmetic oppositions. They combine with nouns to yield quantified structures and, in this way, anchor the lexical/semantic information contained in the lexical entry of a noun with respect to quantity¹⁰. Together with the DP layer they form a referring expression that could be viewed as a complete syntactic object. This model is hypothesised to hold cross-linguistically. What is claimed to be language specific is whether the numeral occupying the Q head assigns case or not. In Polish, as has been shown in the previous sections, numerals impose GEN(Q) on the following noun¹¹. This is schematically illustrated in (10). For ease of exposition, I adopt the view that syntactic governors assign case under the head-complement relation¹².

¹⁰ Similarly as, e.g., T anchors the action denoted by a verb with respect to time, or D anchors the object denoted by a noun with respect to reference.

¹¹ The ability to assign genitive to the following NP is taken to be a property of the Q head also in Benmamoun's (1999) analysis of the Arabic quantifier *kull*.

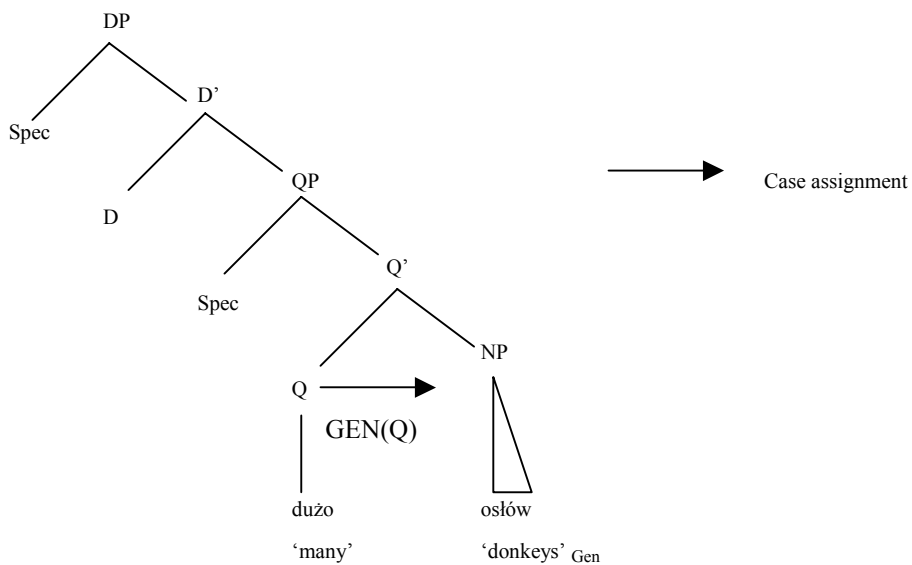
¹² This could be reinterpreted as covert case checking within a functional phrase projected above QP or movement of the formal features of a noun to the Q head filled by a numeral (resulting in checking the genitive case). However, the account presented in this paper does not depend on the way case is assigned/checked. Thus, I will not address this question here.

(10) *pięć osłów* ‘five donkeys’



In such structures, Q is the highest occupied syntactic head and it projects its own phrase (QP). As mentioned above, the Q heading a QP does not have to be a numeral. The pattern of Q-numerals occurs also with quantifiers such as *dużo* ‘many/much’:

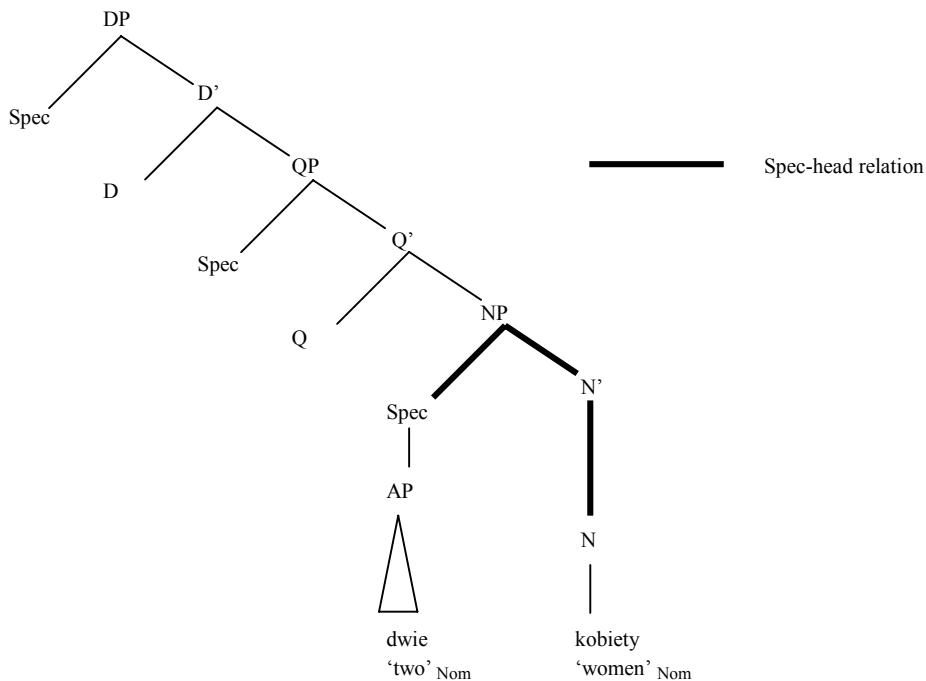
(11) *dużo osłów* ‘many donkeys’



As opposed to Q-numerals, A-numerals are always modifiers that manifest agreement with the head noun with respect to all features. It suggests a type of specifier-head agreement configuration. The phi-features of the head N are reflected on the head A of the phrase AP via

the relation between a head and its specifier (cf. Chomsky, 1995, 2000)¹³.

(12) *dwie kobiety* ‘two women’

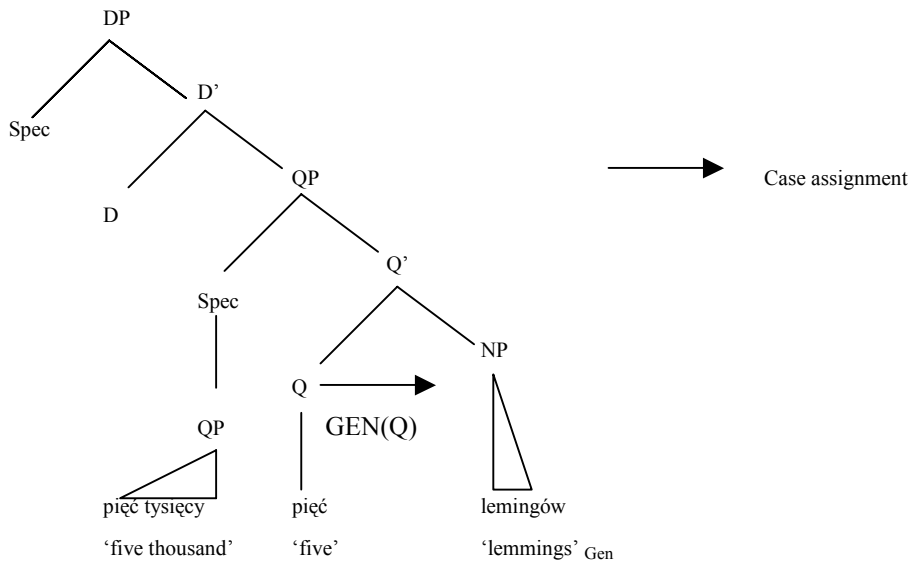


A-numerals cannot be case assigners since they are located in a specifier position (I assume that only heads assign case). Giusti and Leko (1996) and Veselovská (2001) similarly explain the difference between Q-numerals and A-numerals in other Slavic languages (Bosnian and Czech, respectively).

Additional support for the Q head hypothesis can be found in the syntax of Polish complex numerals. The last element of such structures always becomes the syntactic head of the whole. If the last element is a Q-numeral, the entire complex selects a genitive complement in structural case contexts. I assume that the preceding elements are adjoined inside the main QP. The pattern demonstrated in (13) is parallel to the structure in (10).

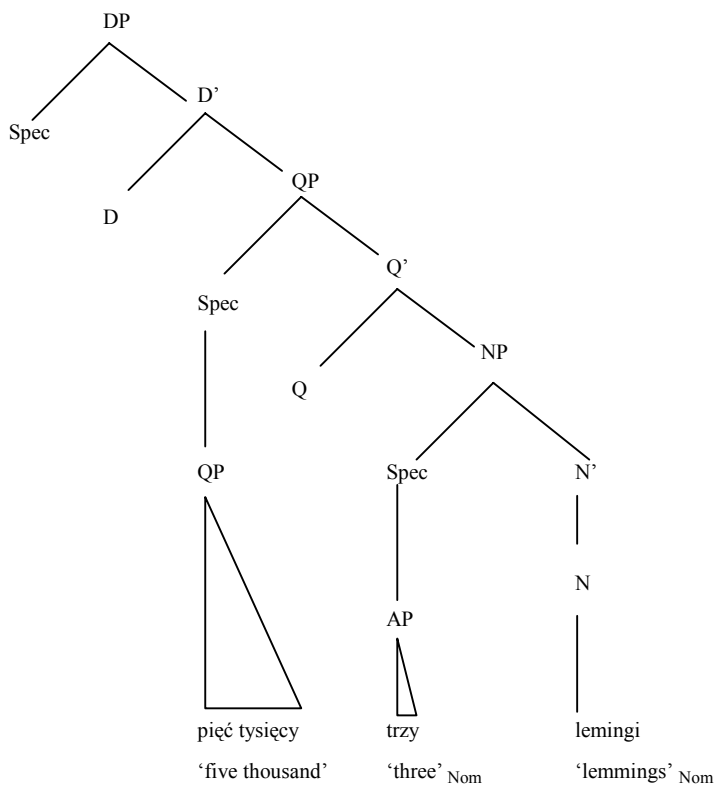
¹³ The details of how agreement is distributed from its source to the specifier-based modifier is not crucial for my analysis.

(13) *pięć tysięcy pięć lemingów* ‘5005 lemmings’



However, if the last element is an A-numeral (such as *trzy* ‘three’), what we find is regular agreement between the A-numeral and the entire phrase:

(14) *pięć tysięcy trzy lemingi* ‘5003 lemmings’



Another issue that has to be addressed is why numerals must be described as occupying Q, instead of being placed in D (which would reduce the postulated phrase structure to two layers). The data that support the QP analysis are connected with the linear order of constituents in constructions with personal pronouns. Polish numerals normally precede nouns, but follow pronouns:

- (15) (a) [DP siedmiu polityków] czytało ten artykuł
 seven politicians_{Gen} read this article
 ‘seven politicians read this article’
- (b) [DP nas siedmiu] czytało ten artykuł
 we_{Gen} seven read this article
 ‘seven of us read this article’
- (c) *[DP siedmiu nas] czytało ten artykuł¹⁴
 seven we_{Gen} read this article

The above asymmetry is easy to explain if we follow the assumptions made in this paper and combine them with independently motivated descriptions of the syntax of personal pronouns. As I have argued so far, Polish numerals occupy the head Q and assign genitive to the constituent that follows. What seems problematic in (15b) is how genitive case marking is acquired by the pronoun. According to Abney (1987), personal pronouns target the same syntactic slot as articles (i.e. the D position), the only difference being that they usually remain “dangling” – i.e. they do not take NP complements (see also Postal, 1969). However, researchers such as Cardinaletti (1993) and Progovac (1998) assume that personal pronouns do not occupy D underlyingly. Instead, pronouns are generated in N (just like regular nouns)

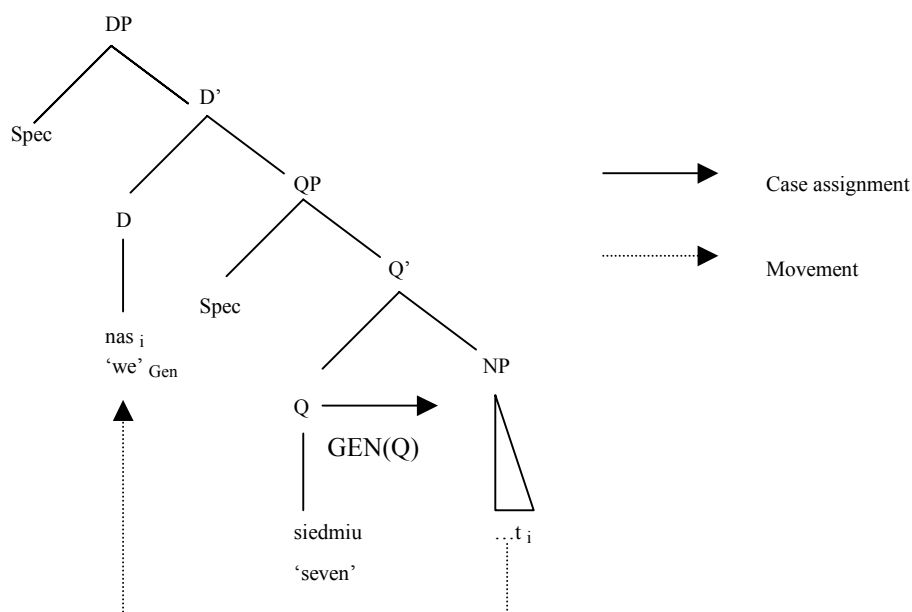
¹⁴ The element residing in Q can optionally select a PP complement. Such a complement is introduced by the preposition *z* ‘from,’ which assigns genitive independently from the numeral. In such cases, the pronoun follows the numeral. However, they are located in separate DPs:

- (i) [DP siedmiu [PP z [DP nas]]]
 seven from us_{Gen}
 ‘seven of us’

Therefore, such constructions do not influence the analysis presented here.

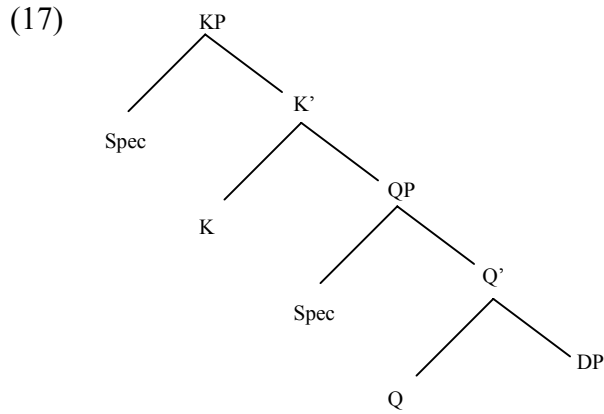
and move to D (or, stated in different theoretical terms, form a chain with it)¹⁵. This process is driven by the referentiality requirements¹⁶. Thus, the order in (15b) follows from raising the pronoun from an underlying position in N to D, crossing the numeral which occupies a fixed syntactic position. It has to happen after GEN(Q) assignment because the pronoun is in genitive. This is illustrated below:

(16) *nas siedmiu* ‘seven of us’



The above analysis makes the surface word order facts shown in (15a-b) straightforward. Such an explanation would not be possible if we adopted the phrase structure model proposed by Giusti and Leko (1996). According to these scholars, the numeral heads its own extended projection (labelled KP in order to distinguish it from the nominal extended projection) and takes a full DP complement:

¹⁵ In this paper, I will not attempt to discuss the theoretical status of what I refer to as movement.



This means that, for Giusti and Leko (1996), numerals are generated outside (above) the DP and are not part of the functional extension of the quantified noun. Thus, if we accept that pronouns end up in D (due to their referential properties), they should never precede numerals (unless moved further outside their DP).

5. Further evidence: Estonian and other languages

Questions arise about whether the phrase QP is projected universally. The data in (18b-c) below seem to provide support for the existence of the head Q in Estonian.

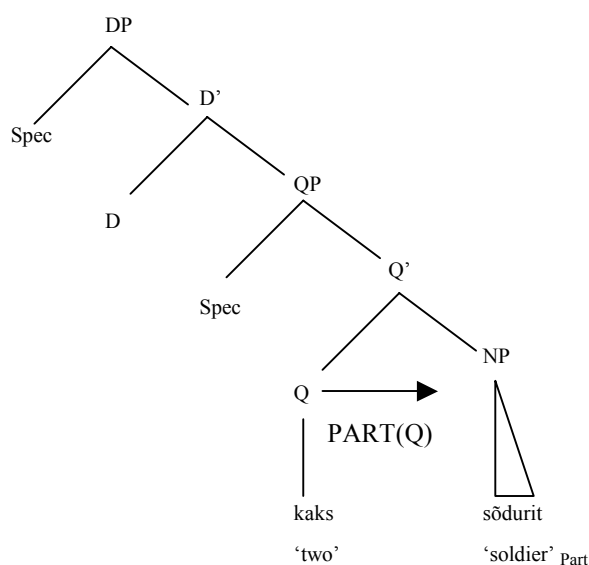
- (18) (a) *üks* *sõdur*
 one_{Nom, sg} soldier_{Nom, sg}
 ‘one soldier’
- (b) *kaks* *sõdurit*
 two_{Nom, sg} soldier_{Part, sg}
 ‘two soldiers’
- (c) **kaks* *sõdurid*
 two_{Nom, sg} soldier_{Nom, pl}

The numeral *üks* ‘one’ in (18a) behaves like an adjective (the case spreads throughout the entire phrase). I consider it to be an A-numeral. The numeral *kaks* in (18b) makes the noun assume a case form which it would not otherwise take, the partitive rather than the expected

¹⁶ It is often assumed that elements which land in the D position acquire special semantic reading (definiteness, rigid designation) – cf. Longobardi (1994).

nominative. If the numeral is taken to reside in Q, such instances of non-agreement can be accounted for in the same way as in the case of the Polish data in the previous section of this paper. The Q head takes NP complements and projects a phrase (QP), which is a complement of D. The numeral assigns Partitive of Quantification (PART(Q)) to its sister NP. This is illustrated in (19) below:

(19) *kaks sõdurit* ‘two soldiers’



It is important to stress that PART(Q) cannot be claimed to be motivated directly by semantics. In Estonian, two kinds of syntactic objects have to be distinguished: total object vs. partial object. The latter occurs when the object is not an entirety, i.e. when it is a part of a larger entity. The partial object is always in partitive, e.g.:

(20) *ta ostis leiba* _{Part}
 ‘he bought (an undefined quantity of) bread’

The above use of the partitive case involves a notion of quantification. Therefore, it might seem plausible to treat PART(Q) as its subcase. However, we can easily find constructions conveying the idea of quantification without the use of the partitive case marking¹⁷, e.g.:

¹⁷ The same comments apply to Polish. GEN(Q) is not a phenomenon that could be easily explained in terms of semantics, although it seems parallel to the so-called Partitive Genitive,

numeral complex do not have to agree with the nominal nucleus.

- (23) (a) [DP:TRANS kahe tuhandeks sõduriks]
 two thousand_{Trans} soldiers_{Trans}
 ‘as 2000 soldiers’
- (b) [DP:TRANS kahe tuhande kaheks sõduriks]
 two thousand two_{Trans} soldiers_{Trans}
 ‘as 2002 soldiers’

To summarise the discussion so far, there seems to be enough evidence to support the claim that, both in Polish and Estonian, Q-numerals are functional heads occupying Q.

The above similarities between the syntax of Polish and Estonian numeral expressions may seem accidental. However, exactly the same pattern of case assignment is found in other languages. The examples in (24) show that, cross-linguistically, numerals can be case assigners in structural case contexts.

- (24) (a) Czech (cf. Rutkowski, 2000, Veselovská, 2001) – GEN(Q) assignment:
 šest studentů přišlo
 six students_{Gen} came
 ‘six students came’
- (b) Slovak (cf. Rutkowski, 2000) – GEN(Q) assignment:
 päť pánov prišlo
 five gentlemen_{Gen} came
 ‘five gentlemen came’
- (c) Inari Sami (cf. Nelson and Toivonen, 2001) – PART(Q) assignment:
 čiččâm poccud láá tobbeen
 seven reindeer_{Part} are there
 ‘seven reindeer are there’

However, GEN(Q) is assigned by some quantifiers and not by others – see footnote 8.

- (d) Finnish (cf. Hurford, 2001, Nelson and Toivonen, 2001) – PART(Q) assignment:
 yhdeksän omena putosi maahan
 nine apple_{Part} fell earth_{III}
 ‘nine apples fell to earth’

However, those numerals never assign case in the inherent environment:

- (25) (a) s piatimi pánmi (Slovak)
 with five gentlemen_{Instr}
 ‘with five gentlemen’
 (b) čiččâm poccust lii ennuu purrâmâš (Inari Sami)
 seven reindeer_{Loc} is much food_{Nom}
 ‘seven reindeer have much food’ (lit. ‘on seven reindeers there is much food’)

A possible explanation of this cross-linguistically attested mixed pattern of case assignment/case agreement will be given in the next section.

6. Numerals in the syntactic derivation

How can we account for the fact that GEN(Q) in Polish and PART(Q) in Estonian are restricted to DPs of a particular (structural) case? We could view the unusual structural-case restriction as an example of a limitation to the least marked environment. Greenberg (1966) predicts that agreement should preferentially occur in those constructions that are marked over those that are unmarked. Therefore, it is more likely to have agreement in the inherent-case contexts. But rather than concluding that a marked environment favours agreement over an unmarked one, it may be more appropriate to explain this syntactic phenomenon in terms of a multi-level approach to the process of syntactic derivation.

Chomsky (1981, 1986) limits the class of possible case assignment types: the inherent case is always assigned at D-structure, whereas the structural case is assigned at S-structure¹⁸. Franks (1995) and Veselovská (2001) note that the distinction between the behaviour of Q-numerals in structural and inherent case patterns might follow directly from this proposal.

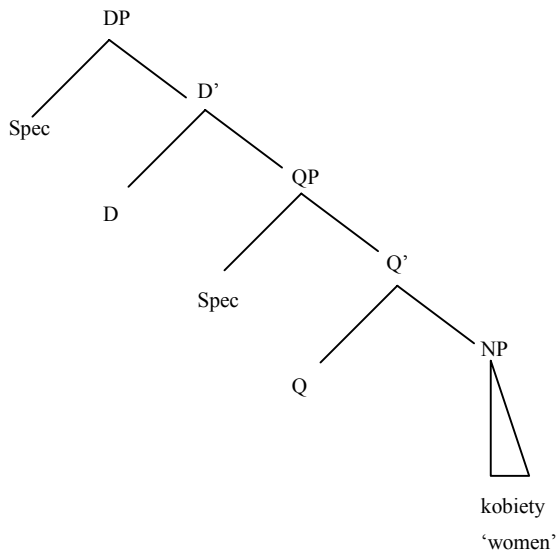
According to Emonds (2000), elements containing substantive semantic features (lexical elements) are present in the derivation from the beginning of the computation. Veselovská (2001) calls it a D-Structure merge. On the other hand, grammatical (functional) elements (containing features interpretable at LF) can be inserted into the derivation prior to Spell-out (i.e. at the point often referred to as S-Structure). Therefore, if we assume that Q-numerals are functional (due to their purely arithmetic, relational interpretation¹⁹), they must be inserted into the syntactic derivation as late as at S-structure. It is an independently motivated principle from which the facts to be explained follow naturally. The insertion of a numeral precedes the structural case assignment. Therefore, in the structural context, the Q-numeral becomes the head of the whole nominal complex and it acts as a case assigner (the noun has not been assigned any case at D-structure). On the other hand, Q-numerals are not present at D-structure, when inherent case is assigned to the DP as a whole. The inherent case percolates down to the first syntactic head available, i.e. to the noun. When the numeral is inserted into the derivation at S-structure, it has no choice but to agree with the noun. All of the above processes are represented by the diagrams in (26-27):

¹⁸ This model seems more formal than the intuitive syntactic case hierarchy introduced by Babby (1987). According to him, lexical (subcategorised) case always suppresses structural (configurational) case because the former outranks the latter in a special hierarchy.

¹⁹ Diachronically, only the lowest four numerals (those that could be described as A-numerals in Polish) evolved as part of the basic natural-language lexicon. Higher ones (Q-numerals) appeared in languages following the introduction of mathematical knowledge (they denote quantities that cannot be perceived visually due to limitations of human attention and short term memory capacity) – cf. Rutkowski (2002).

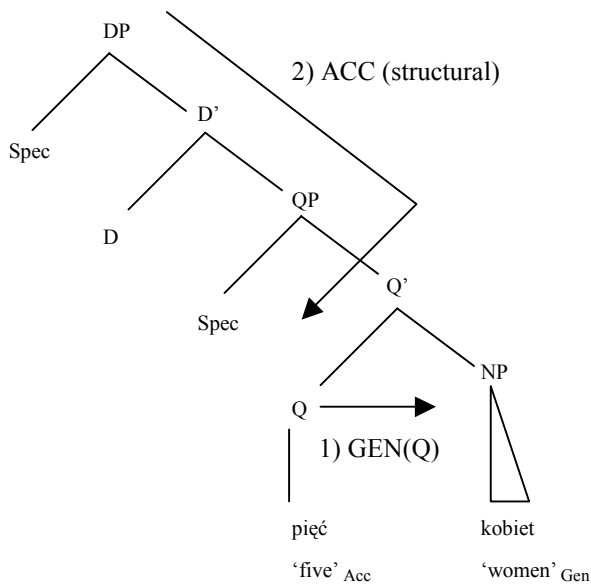
(26) The structural-case pattern

(a) D-Structure: no numeral insertion, no case assignment



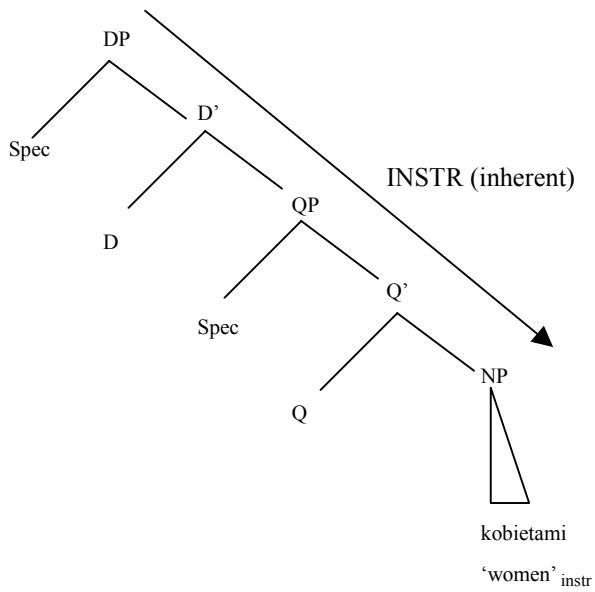
(b) S-Structure:

- 1) numeral insertion, GEN(Q) assignment
- 2) structural case assignment (from outside)

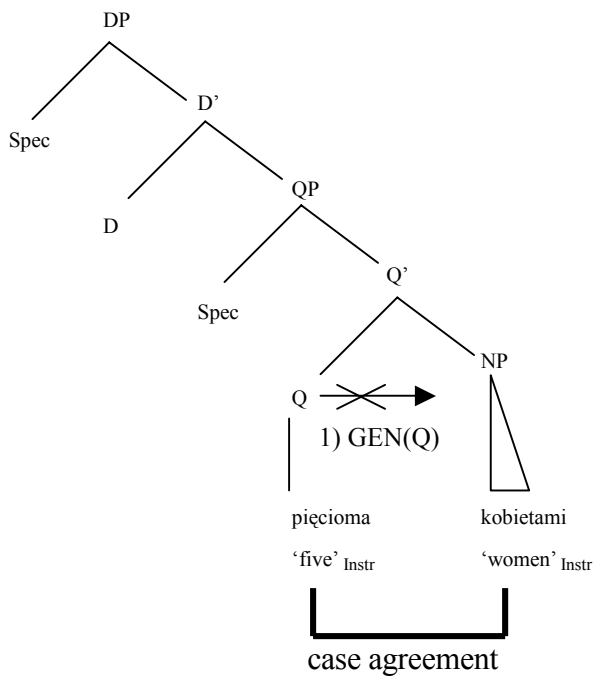


(27) The inherent-case pattern

(a) D-Structure: no numeral insertion, inherent case assignment



(b) S-Structure: numeral insertion, no GEN(Q) assignment



The last issue that has to be addressed here is how it is possible that the numeral *pięcioma* 'five' in (27b) agrees in case with the noun *kobietami* 'women' although they are not in the spec-head

relation. Recently, Chomsky (2000) has assumed that agreement features may spread both locally (from a head to a constituent in its specifier) and non-locally (among heads in an extended projection). I adopt this view. Q and N are two adjacent heads in the same extended projection. Thus, if the numeral in Q cannot assign its case (GEN(Q) or PART(Q)), it has an option of agreeing with the following noun.

It is important to note that the above model works only if we assume (unlike, e.g., Giusti and Leko, 1996) that numerals are functional elements and that they are part of the functional complex above the noun they quantify. Therefore, this model fits into the QP pattern presented in sections 4 and 5. If we treated numerals as separate lexical heads, which take a full DP complement, there would be no reasonable explanation for the fact that they cease to assign case in the lexical-case context. As shown below, in the case of regular lexical heads (such as the noun *grupa* ‘group’ in (28)) which take a DP complement, the ability to assign case is not dependent on any external factors. Case assignment takes place both in structural and in inherent contexts.

- (28) (a) kocham grupę osłów/*osły
 I-love group_{Acc} donkeys_{Gen} / *donkeys_{Acc}
 ‘I love a group of donkeys’
- (b) dałem to grupie osłów/*osłom
 I-gave it_{Acc} group_{Dat} donkeys_{Gen} / *donkeys_{Dat}
 ‘I gave it to a group of donkeys’

7. Conclusion

The syntax of numeral phrases in Polish and Estonian is an extremely complex issue. Nominal phrases containing Q-numerals do not conform to the usual pattern of case assignment. However, I have attempted to show that Polish and Estonian numeral phrases have many characteristics in common. The similarity concerns above all the selection of case. Unlike adjectives (and A-numerals), Q-numerals do not have to agree in case with their complement nouns. They act as case assigners but only in structural syntactic contexts. Any theory of Universal Grammar should be able to predict which agreement and case assignment phenomena are likely to occur in natural languages. I have tried to explain the pattern found in Polish and

Estonian (and other Slavic and Uralic languages) by postulating the functional head Q. It can be syntactically active only in structural case positions because of independently motivated principles of case assignment and lexical insertion. I believe that the above account contributes to the understanding of how individual grammars exploit the universal phrase structure devices in non-universally attested agreements.

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